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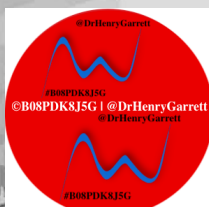
Report | Exposition | References | Research

# SuperHyperMultipartite

Ideas | Approaches | Accessibility | Availability

**Dr. Henry Garrett**

Report | Exposition | References | Research #22 2023







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In this scientific research book, there are some scientific research chapters on "Extreme Neutrosophic SuperHyper", "Neutrosophic SuperHyper", and "Neutrosophic SuperHyper" by two (Extreme/Neutrosophic) notions, namely, Extreme Neutrosophic SuperHyper and Neutrosophic SuperHyper. With scientific researches on the basic properties, the scientific research book starts to make Extreme Neutrosophic SuperHyper theory and Neutrosophic SuperHyper theory more (Extremely/Neutrosophically) understandable.

Some scientific studies and scientific researches about neutrosophic graphs, are proposed as book in the following by Henry Garrett (2022) which is indexed by Google Scholar and has more than 3230 readers in Scribd. It's titled "Beyond Neutrosophic Graphs" and published by Ohio: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United States. This research book covers different types of notions and settings in neutrosophic graph theory and neutrosophic SuperHyperGraph theory.

[Ref] Henry Garrett, (2022). "Beyond Neutrosophic Graphs", Ohio: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United States. ISBN: 978-1-59973-725-6 (<http://s.unm.edu/BeyondNeutrosophicGraphs.pdf>).

Also, some scientific studies and scientific researches about neutrosophic graphs, are proposed as book in the following by Henry Garrett (2022) which is indexed by Google Scholar and has more than 4117 readers in Scribd. It's titled "Neutrosophic Duality" and published by Florida: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. This research book presents different types of notions SuperHyperResolving and SuperHyperDominating in the setting of duality in neutrosophic graph theory and neutrosophic SuperHyperGraph theory. This research book has scrutiny on the complement of the intended set and the intended set, simultaneously, it's smart to consider a set but acting on its complement that what's done in this research book which is popular in the terms of high readers in Scribd.

[Ref] Henry Garrett, (2022). "Neutrosophic Duality", Florida: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. ISBN: 978-1-59973-743-0 (<http://s.unm.edu/NeutrosophicDuality.pdf>).



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# CHAPTER 1

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## ABSTRACT

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In this scientific research book, there are some scientific research chapters on “Extreme SuperHyperMultipartite” and “Neutrosophic SuperHyperMultipartite” about some scientific research on SuperHyperMultipartite by two (Extreme/Neutrosophic) notions, namely, Extreme SuperHyperMultipartite and Neutrosophic SuperHyperMultipartite. With scientific research on the basic scientific research properties, the scientific research book starts to make Extreme SuperHyperMultipartite theory and Neutrosophic SuperHyperMultipartite theory more (Extremely/Neutrosophicly) understandable.

In the some chapters, in some researches, new setting is introduced for new SuperHyperNotions, namely, a SuperHyperMultipartite and Neutrosophic SuperHyperMultipartite . Two different types of SuperHyperDefinitions are debut for them but the scientific research goes further and the SuperHyperNotion, SuperHyperUniform, and SuperHyperClass based on that are well-defined and well-reviewed. The literature review is implemented in the whole of this research. For shining the elegancy and the significancy of this research, the comparison between this SuperHyperNotion with other SuperHyperNotions and fundamental SuperHyperNumbers are featured. The definitions are followed by the examples and the instances thus the clarifications are driven with different tools. The applications are figured out to make sense about the theoretical aspect of this ongoing research. The “Cancer’s Recognition” are the under scientific research to figure out the challenges make sense about ongoing and upcoming research. The special case is up. The cells are viewed in the deemed ways. There are different types of them. Some of them are individuals and some of them are well-modeled by the group of cells. These types are all officially called “SuperHyperVertex” but the relations amid them all officially called “SuperHyperEdge”. The frameworks “SuperHyperGraph” and “Neutrosophic SuperHyperGraph” are chosen and elected to scientific research about “Cancer’s Recognition”. Thus these complex and dense SuperHyperModels open up some avenues to scientific research on theoretical segments and “Cancer’s Recognition”. Some avenues are posed to pursue this research. It’s also officially collected in the form of some questions and some problems. Assume a SuperHyperGraph. Then  $\delta$ -SuperHyperMultipartite is a maximal of SuperHyperVertices with a maximum cardinality such that either of the following expressions hold for the (Neutrosophic) cardinalities of SuperHyperNeighbors of  $s \in S$  : there are  $|S \cap N(s)| > |S \cap (V \setminus N(s))| + \delta$ ; and  $|S \cap N(s)| < |S \cap (V \setminus N(s))| + \delta$ . The first Expression, holds if  $S$  is an  $\delta$ -SuperHyperOffensive. And the second Expression, holds if  $S$  is an  $\delta$ -SuperHyperDefensive; a Neutrosophic  $\delta$ -SuperHyperMultipartite is a maximal Neutrosophic of SuperHyperVertices with maximum Neutrosophic cardinality such

that either of the following expressions hold for the Neutrosophic cardinalities of SuperHyper-Neighbors of  $s \in S$  there are:  $|S \cap N(s)|_{Neutrosophic} > |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta$ ; and  $|S \cap N(s)|_{Neutrosophic} < |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta$ . The first Expression, holds if  $S$  is a Neutrosophic  $\delta$ -SuperHyperOffensive. And the second Expression, holds if  $S$  is a Neutrosophic  $\delta$ -SuperHyperDefensive It's useful to define a "Neutrosophic" version of a SuperHyperMultipartite . Since there's more ways to get type-results to make a SuperHyperMultipartite more understandable. For the sake of having Neutrosophic SuperHyperMultipartite, there's a need to "redefine" the notion of a "SuperHyperMultipartite ". The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values. Assume a SuperHyperMultipartite . It's redefined a Neutrosophic SuperHyperMultipartite if the mentioned Table holds, concerning, "The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph" with the key points, "The Values of The Vertices & The Number of Position in Alphabet", "The Values of The SuperVertices&The maximum Values of Its Vertices", "The Values of The Edges&The maximum Values of Its Vertices", "The Values of The HyperEdges&The maximum Values of Its Vertices", "The Values of The SuperHyperEdges&The maximum Values of Its Endpoints". To get structural examples and instances, I'm going to introduce the next SuperHyperClass of SuperHyperGraph based on a SuperHyperMultipartite . It's the main. It'll be disciplinary to have the foundation of previous definition in the kind of SuperHyperClass. If there's a need to have all SuperHyperMultipartite until the SuperHyperMultipartite, then it's officially called a "SuperHyperMultipartite" but otherwise, it isn't a SuperHyperMultipartite . There are some instances about the clarifications for the main definition titled a "SuperHyperMultipartite ". These two examples get more scrutiny and discernment since there are characterized in the disciplinary ways of the SuperHyperClass based on a SuperHyperMultipartite . For the sake of having a Neutrosophic SuperHyperMultipartite, there's a need to "redefine" the notion of a "Neutrosophic SuperHyperMultipartite" and a "Neutrosophic SuperHyperMultipartite ". The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values. Assume a Neutrosophic SuperHyperGraph. It's redefined "Neutrosophic SuperHyperGraph" if the intended Table holds. And a SuperHyperMultipartite are redefined to a "Neutrosophic SuperHyperMultipartite" if the intended Table holds. It's useful to define "Neutrosophic" version of SuperHyperClasses. Since there's more ways to get Neutrosophic type-results to make a Neutrosophic SuperHyperMultipartite more understandable. Assume a Neutrosophic SuperHyperGraph. There are some Neutrosophic SuperHyperClasses if the intended Table holds. Thus SuperHyperMultipartite, SuperHyperMultipartite, SuperHyperMultipartite, SuperHyperMultipartite, SuperHyperMultiPartite, and SuperHyperWheel, are "Neutrosophic SuperHyperMultipartite", "Neutrosophic SuperHyperMultipartite", "Neutrosophic SuperHyperMultipartite", "Neutrosophic SuperHyperMultipartite", "Neutrosophic SuperHyperMultiPartite", and "Neutrosophic SuperHyperWheel" if the intended Table holds. A SuperHyperGraph has a "Neutrosophic SuperHyperMultipartite" where it's the strongest [the maximum Neutrosophic value from all the SuperHyperMultipartite amid the maximum value amid all SuperHyperVertices from a SuperHyperMultipartite .] SuperHyperMultipartite . A graph is a SuperHyperUniform if it's a SuperHyperGraph and the number of elements of SuperHyperEdges are the same. Assume a Neutrosophic SuperHyperGraph. There are some SuperHyperClasses as follows. It's SuperHyperMultipartite if it's only one SuperVertex as intersection amid two given SuperHyperEdges with two exceptions; it's SuperHyperMultipartite if it's only one SuperVertex

as intersection amid two given SuperHyperEdges; it's SuperHyperMultipartite it's only one SuperVertex as intersection amid all SuperHyperEdges; it's SuperHyperMultipartite it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming two separate sets, has no SuperHyperEdge in common; it's SuperHyperMultiPartite it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming multi separate sets, has no SuperHyperEdge in common; it's a SuperHyperWheel if it's only one SuperVertex as intersection amid two given SuperHyperEdges and one SuperVertex has one SuperHyperEdge with any common SuperVertex. The SuperHyperModel proposes the specific designs and the specific architectures. The SuperHyperModel is officially called "SuperHyperGraph" and "Neutrosophic SuperHyperGraph". In this SuperHyperModel, The "specific" cells and "specific group" of cells are SuperHyperModeled as "SuperHyperVertices" and the common and intended properties between "specific" cells and "specific group" of cells are SuperHyperModeled as "SuperHyperEdges". Sometimes, it's useful to have some degrees of determinacy, indeterminacy, and neutrality to have more precise SuperHyperModel which in this case the SuperHyperModel is called "Neutrosophic". In the future research, the foundation will be based on the "Cancer's Recognition" and the results and the definitions will be introduced in redeemed ways. The recognition of the cancer in the long-term function. The specific region has been assigned by the model [it's called SuperHyperGraph] and the long cycle of the move from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily identified since there are some determinacy, indeterminacy and neutrality about the moves and the effects of the cancer on that region; this event leads us to choose another model [it's said to be Neutrosophic SuperHyperGraph] to have convenient perception on what's happened and what's done. There are some specific models, which are well-known and they've got the names, and some SuperHyperGeneral SuperHyperModels. The moves and the traces of the cancer on the complex tracks and between complicated groups of cells could be fantasized by a Neutrosophic SuperHyperMultipartite(-/SuperHyperMultipartite, SuperHyperMultipartite, SuperHyperMultipartite, SuperHyperMultipartite, SuperHyperWheel). The aim is to find either the longest SuperHyperMultipartite or the strongest SuperHyperMultipartite in those Neutrosophic SuperHyperModels. For the longest SuperHyperMultipartite, called SuperHyperMultipartite, and the strongest SuperHyperMultipartite, called Neutrosophic SuperHyperMultipartite, some general results are introduced. Beyond that in SuperHyperMultipartite, all possible SuperHyperMultipartites have only two SuperHyperEdges but it's not enough since it's essential to have at least three SuperHyperEdges to form any style of a SuperHyperMultipartite. There isn't any formation of any SuperHyperMultipartite but literarily, it's the deformation of any SuperHyperMultipartite. It, literarily, deforms and it doesn't form. A basic familiarity with SuperHyperGraph theory and Neutrosophic SuperHyperGraph theory are proposed.

**Keywords:** SuperHyperGraph, (Neutrosophic) SuperHyperMultipartite, Cancer's Recognition

**AMS Subject Classification:** 05C17, 05C22, 05E45

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## Beyond Neutrosophic Graphs

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rHyperMultipartite, SuperHyperMultipartite, SuperHyperWheel). The aim is to find either the longest SuperHyperMultipartite or the strongest SuperHyperMultipartite in those Neutrosophic SuperHyperModels. For the longest SuperHyperMultipartite, called SuperHyperMultipartite, and the strongest SuperHyperMultipartite, called Neutrosophic SuperHyperMultipartite, some general results are introduced. Beyond that in SuperHyperMultipartite, all possible SuperHyperMultipartites have only two SuperHyperEdges but it's not enough since it's essential to have at least three SuperHyperEdges to form any style of a SuperHyperMultipartite. There isn't any formation of any SuperHyperMultipartite but literarily, it's the deformation of any SuperHyperMultipartite. It, literarily, deforms and it doesn't form. A basic familiarity with SuperHyperGraph theory and Neutrosophic SuperHyperGraph theory are proposed.

**Keywords:** Neutrosophic SuperHyperGraph, Neutrosophic SuperHyperMultipartite, Cancer's

Neutrosophic Recognition

**AMS Subject Classification:** 05C17, 05C22, 05E45

Some scientific studies and scientific researches about neutrosophic graphs, are proposed as book in the following by Henry Garrett (2022) which is indexed by Google Scholar and has more than 3181 readers in Scribd. It's titled "Beyond Neutrosophic Graphs" and published by Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United State. This research book covers different types of notions and settings in neutrosophic graph theory and neutrosophic SuperHyperGraph theory.

[Ref] Henry Garrett, (2022). "*Beyond Neutrosophic Graphs*", Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United States. ISBN: 978-1-59973-725-6 (<http://fs.unm.edu/BeyondNeutrosophicGraphs.pdf>).

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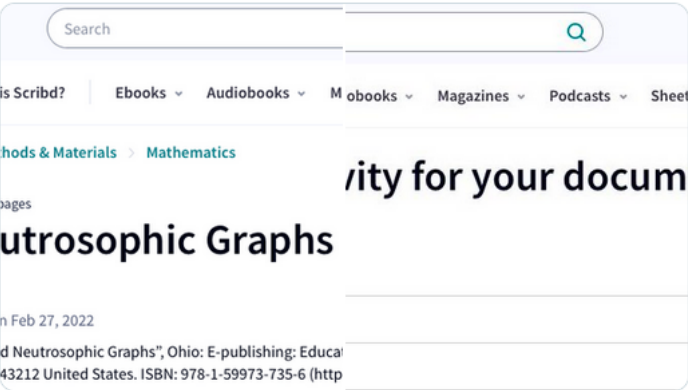
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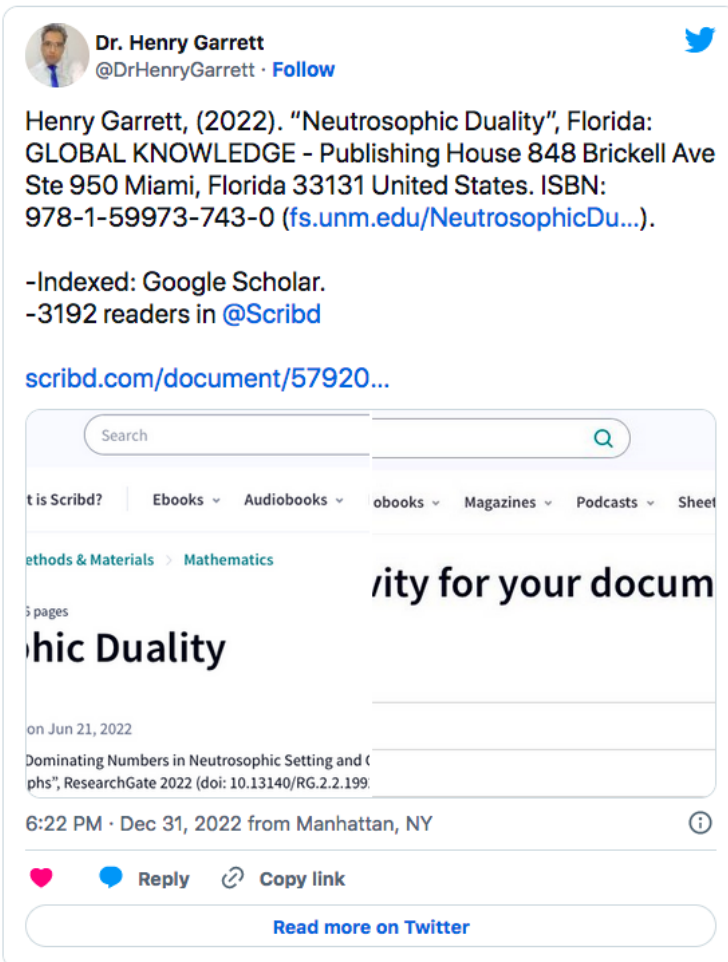
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## CHAPTER 2

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# BACKGROUND

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There are some scientific researches covering the topic of this research. In what follows, there are some discussion and literature reviews about them date back on January 22, 2023. 263 264

First article is titled “properties of SuperHyperGraph and neutrosophic SuperHyperGraph” in **Ref. [HG1]** by Henry Garrett (2022). It’s first step toward the research on neutrosophic SuperHyperGraphs. This research article is published on the journal “Neutrosophic Sets and Systems” in issue 49 and the pages 531-561. In this research article, different types of notions like dominating, resolving, coloring, Eulerian(Hamiltonian) neutrosophic path, n-Eulerian(Hamiltonian) neutrosophic path, zero forcing number, zero forcing neutrosophic- number, independent number, independent neutrosophic-number, clique number, clique neutrosophic-number, matching number, matching neutrosophic-number, girth, neutrosophic girth, 1-zero-forcing number, 1-zero- forcing neutrosophic-number, failed 1-zero-forcing number, failed 1-zero-forcing neutrosophic-number, global- offensive alliance, t-offensive alliance, t-defensive alliance, t-powerful alliance, and global-powerful alliance are defined in SuperHyperGraph and neutrosophic SuperHyperGraph. Some Classes of SuperHyperGraph and Neutrosophic SuperHyperGraph are cases of research. Some results are applied in family of SuperHyperGraph and neutrosophic SuperHyperGraph. Thus this research article has concentrated on the vast notions and introducing the majority of notions. 265 266 267 268 269 270 271 272 273 274 275 276 277 278

The seminal paper and groundbreaking article is titled “neutrosophic co-degree and neutrosophic degree alongside chromatic numbers in the setting of some classes related to neutrosophic hypergraphs” in **Ref. [HG2]** by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on general forms without using neutrosophic classes of neutrosophic SuperHyperGraph. It’s published in prestigious and fancy journal is entitled “Journal of Current Trends in Computer Science Research (JCTCSR)” with abbreviation “J Curr Trends Comp Sci Res” in volume 1 and issue 1 with pages 06-14. The research article studies deeply with choosing neutrosophic hypergraphs instead of neutrosophic SuperHyperGraph. It’s the breakthrough toward independent results based on initial background. 279 280 281 282 283 284 285 286 287 288

The seminal paper and groundbreaking article is titled “Super Hyper Dominating and Super Hyper Resolving on Neutrosophic Super Hyper Graphs and Their Directions in Game Theory and Neutrosophic Super Hyper Classes” in **Ref. [HG3]** by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on fundamental SuperHyperNumber and using neutrosophic SuperHyperClasses of neutrosophic SuperHyperGraph. It’s published in prestigious and fancy journal is entitled “Journal of Mathematical Techniques and Computational Mathematics(JMTCM)” with abbreviation “J 289 290 291 292 293 294 295

Math Techniques Comput Math” in volume 1 and issue 3 with pages 242-263. The research article 296  
studies deeply with choosing directly neutrosophic SuperHyperGraph and SuperHyperGraph. 297  
It’s the breakthrough toward independent results based on initial background and fundamental 298  
SuperHyperNumbers. 299

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State. This research book covers different types of notions and settings in neutrosophic graph 385  
theory and neutrosophic SuperHyperGraph theory. 386

Also, some scientific studies and scientific researches about neutrosophic graphs, are proposed 387



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Applications, Applied Mathematics, Applied Research, Cancer, Cancer’s Recognitions, Combinatorics, Edge, Edges, Graph Theory, Graphs, Latest Research, Literature Reviews, Modeling, Neutrosophic Graph, Neutrosophic Graph Theory, Neutrosophic Science, Neutrosophic SuperHyperClasses, Neutrosophic SuperHyperGraph, Neutrosophic SuperHyperGraph Theory, neutrosophic SuperHyperGraphs, Neutrosophic SuperHyperMultipartite, Open Problems, Open Questions, Problems, Pure Math, Pure Mathematics, Questions, Real-World Applications, Recent Research, Recognitions, Research, scientific research Article, scientific research Articles, scientific research Book, scientific research Chapter, scientific research Chapters, Review, SuperHyperClasses, SuperHyperEdges, SuperHyperGraph, SuperHyperGraph Theory, SuperHyperGraphs, SuperHyperMultipartite, SuperHyperModeling, SuperHyperVertices, Theoretical Research, Vertex, Vertices.	609
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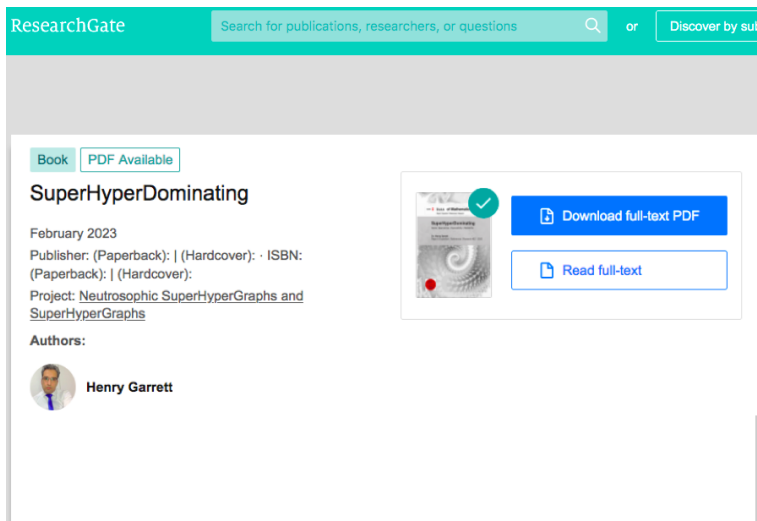


Figure 2.2: “#110th Book” || SuperHyperMultipartite February 2023 License: CC BY-NC-ND 4.0 Print length: 362 pages Project: Neutrosophic SuperHyperGraphs and SuperHyperGraphs

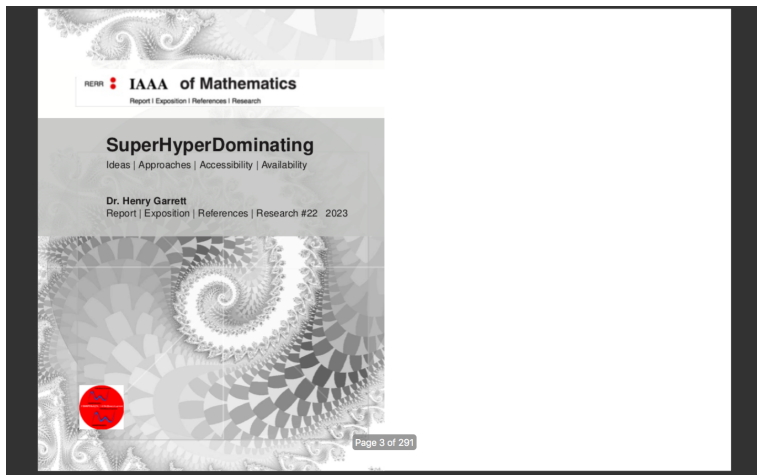


Figure 2.3: “#110th Book” || SuperHyperMultipartite February 2023 License: CC BY-NC-ND 4.0 Print length: 362 pages Project: Neutrosophic SuperHyperGraphs and SuperHyperGraphs



In this scientific research book, there are some scientific research chapters on “Extreme SuperHyperMultipartite” and “Neutrosophic SuperHyperMultipartite” about some researches on Extreme SuperHyperMultipartite and neutrosophic SuperHyperMultipartite.

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## CHAPTER 3

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634 The words of mind and th

635 minds of words, are too

636 eligible to be in the stage

637 of acknowledgements

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## Extreme SuperHyperDominating

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## CHAPTER 5

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### **New Ideas On Super Missing By Hyper Searching Of SuperHyperDominating In Cancer's Recognition With (Neutrosophic) SuperHyperGraph**

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## CHAPTER 6

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## ABSTRACT

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In this scientific research, (Different Neutrosophic Types of Neutrosophic SuperHyperDominating). 684  
Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 685  
Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  686  
or  $E'$  is called Neutrosophic e-SuperHyperDominating if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such 687  
that  $V_a \in E_i, E_j$ ; Neutrosophic re-SuperHyperDominating if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , 688  
such that  $V_a \in E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 689  
Neutrosophic v-SuperHyperDominating if  $\forall V_i \in V_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that  $V_i, V_j \in E_a$ ; 690  
and Neutrosophic rv-SuperHyperDominating if  $\forall V_i \in V_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that 691  
 $V_i, V_j \in E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; Neutro- 692  
sophic SuperHyperDominating if it's either of Neutrosophic e-SuperHyperDominating, Neutro- 693  
sophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv- 694  
SuperHyperDominating. ((Neutrosophic) SuperHyperDominating). Assume a Neutrosophic Super- 695  
rHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a Neutrosophic SuperHyperEdge 696  
(NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called an Extreme SuperHyperDominating if it's either of 697  
Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic 698  
v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an 699  
Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme 700  
SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperEdges in the consecutive 701  
Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they 702  
form the Extreme SuperHyperDominating; a Neutrosophic SuperHyperDominating if it's either of 703  
Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic 704  
v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a 705  
Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of 706  
the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic 707  
cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices 708  
such that they form the Neutrosophic SuperHyperDominating; an Extreme SuperHyperDom- 709  
inating SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperDominating, Neutro- 710  
sophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic 711  
rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  712  
is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Ex- 713  
treme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an 714  
Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges 715  
and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; 716

and the Extreme power is corresponded to its Extreme coefficient; a Neutrosophic SuperHyperDominating SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; and the Neutrosophic power is corresponded to its Neutrosophic coefficient; an Extreme V-SuperHyperDominating if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; a Neutrosophic V-SuperHyperDominating if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; an Extreme V-SuperHyperDominating SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; and the Extreme power is corresponded to its Extreme coefficient; a Neutrosophic SuperHyperDominating SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; and the Neutrosophic power is corresponded to its Neutrosophic coefficient. In this scientific research, new setting is introduced for new SuperHyperNotions, namely, a SuperHyperDominating and Neutrosophic SuperHyperDominating. Two different types of SuperHyperDefinitions are debut for them but the research goes further and the SuperHyperNotion, SuperHyperUniform, and SuperHyperClass based on that are well-defined and well-reviewed. The literature review is implemented in the whole of this research. For shining the elegancy and the significance of this research, the comparison between this SuperHyperNotion with other SuperHyperNotions and fundamental SuperHyperNumbers are featured. The definitions are followed by the examples



and the instances thus the clarifications are driven with different tools. The applications are 763  
figured out to make sense about the theoretical aspect of this ongoing research. The “Cancer’s 764  
Recognition” are the under research to figure out the challenges make sense about ongoing and 765  
upcoming research. The special case is up. The cells are viewed in the deemed ways. There are 766  
different types of them. Some of them are individuals and some of them are well-modeled by 767  
the group of cells. These types are all officially called “SuperHyperVertex” but the relations 768  
amid them all officially called “SuperHyperEdge”. The frameworks “SuperHyperGraph” and 769  
“Neutrosophic SuperHyperGraph” are chosen and elected to research about “Cancer’s Recog- 770  
nition”. Thus these complex and dense SuperHyperModels open up some avenues to research 771  
on theoretical segments and “Cancer’s Recognition”. Some avenues are posed to pursue this 772  
research. It’s also officially collected in the form of some questions and some problems. As- 773  
sume a SuperHyperGraph. Assume a SuperHyperGraph. Then  $\delta$ -SuperHyperDominating is 774  
a maximal of SuperHyperVertices with a maximum cardinality such that either of the fol- 775  
lowing expressions hold for the (Neutrosophic) cardinalities of SuperHyperNeighbors of  $s \in S$  : 776  
there are  $|S \cap N(s)| > |S \cap (V \setminus N(s))| + \delta$ ; and  $|S \cap N(s)| < |S \cap (V \setminus N(s))| + \delta$ . The 777  
first Expression, holds if  $S$  is an  $\delta$ -SuperHyperOffensive. And the second Expression, holds 778  
if  $S$  is an  $\delta$ -SuperHyperDefensive; a Neutrosophic  $\delta$ -SuperHyperDominating is a maximal 779  
Neutrosophic of SuperHyperVertices with maximum Neutrosophic cardinality such that 780  
either of the following expressions hold for the Neutrosophic cardinalities of SuperHyper- 781  
Neighbors of  $s \in S$  there are:  $|S \cap N(s)|_{Neutrosophic} > |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta$ ; 782  
and  $|S \cap N(s)|_{Neutrosophic} < |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta$ . The first Expression, holds 783  
if  $S$  is a Neutrosophic  $\delta$ -SuperHyperOffensive. And the second Expression, holds if  $S$  is a 784  
Neutrosophic  $\delta$ -SuperHyperDefensive It’s useful to define a “Neutrosophic” version of a Super- 785  
HyperDominating . Since there’s more ways to get type-results to make a SuperHyperDominating 786  
more understandable. For the sake of having Neutrosophic SuperHyperDominating, there’s a 787  
need to “redefine” the notion of a “SuperHyperDominating ”. The SuperHyperVertices and the 788  
SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, 789  
there’s the usage of the position of labels to assign to the values. Assume a SuperHyperDominating 790  
. It’s redefined a Neutrosophic SuperHyperDominating if the mentioned Table holds, concerning, 791  
“The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to 792  
The Neutrosophic SuperHyperGraph” with the key points, “The Values of The Vertices & The 793  
Number of Position in Alphabet”, “The Values of The SuperVertices&The maximum Values of Its 794  
Vertices”, “The Values of The Edges&The maximum Values of Its Vertices”, “The Values of The 795  
HyperEdges&The maximum Values of Its Vertices”, “The Values of The SuperHyperEdges&The 796  
maximum Values of Its Endpoints”. To get structural examples and instances, I’m going to 797  
introduce the next SuperHyperClass of SuperHyperGraph based on a SuperHyperDominating 798  
. It’s the main. It’ll be disciplinary to have the foundation of previous definition in the kind 799  
of SuperHyperClass. If there’s a need to have all SuperHyperDominating until the SuperHy- 800  
perDominating, then it’s officially called a “SuperHyperDominating” but otherwise, it isn’t a 801  
SuperHyperDominating . There are some instances about the clarifications for the main definition 802  
titled a “SuperHyperDominating ”. These two examples get more scrutiny and discernment 803  
since there are characterized in the disciplinary ways of the SuperHyperClass based on a Supe- 804  
rHyperDominating . For the sake of having a Neutrosophic SuperHyperDominating, there’s a 805  
need to “redefine” the notion of a “Neutrosophic SuperHyperDominating” and a “Neutrosophic 806  
SuperHyperDominating ”. The SuperHyperVertices and the SuperHyperEdges are assigned by 807  
the labels from the letters of the alphabets. In this procedure, there’s the usage of the position 808

of labels to assign to the values. Assume a Neutrosophic SuperHyperGraph. It's redefined 809  
"Neutrosophic SuperHyperGraph" if the intended Table holds. And a SuperHyperDominating are 810  
redefined to a "Neutrosophic SuperHyperDominating" if the intended Table holds. It's useful to 811  
define "Neutrosophic" version of SuperHyperClasses. Since there's more ways to get Neutrosophic 812  
type-results to make a Neutrosophic SuperHyperDominating more understandable. Assume a 813  
Neutrosophic SuperHyperGraph. There are some Neutrosophic SuperHyperClasses if the intended 814  
Table holds. Thus SuperHyperPath, SuperHyperDominating, SuperHyperStar, SuperHyperBi- 815  
partite, SuperHyperMultiPartite, and SuperHyperWheel, are "Neutrosophic SuperHyperPath", 816  
"Neutrosophic SuperHyperDominating", "Neutrosophic SuperHyperStar", "Neutrosophic Super- 817  
HyperBipartite", "Neutrosophic SuperHyperMultiPartite", and "Neutrosophic SuperHyperWheel" 818  
if the intended Table holds. A SuperHyperGraph has a "Neutrosophic SuperHyperDominating" 819  
where it's the strongest [the maximum Neutrosophic value from all the SuperHyperDominating 820  
amid the maximum value amid all SuperHyperVertices from a SuperHyperDominating.] Super- 821  
HyperDominating. A graph is a SuperHyperUniform if it's a SuperHyperGraph and the number 822  
of elements of SuperHyperEdges are the same. Assume a Neutrosophic SuperHyperGraph. There 823  
are some SuperHyperClasses as follows. It's SuperHyperPath if it's only one SuperVertex as 824  
intersection amid two given SuperHyperEdges with two exceptions; it's SuperHyperDominating if 825  
it's only one SuperVertex as intersection amid two given SuperHyperEdges; it's SuperHyperStar 826  
it's only one SuperVertex as intersection amid all SuperHyperEdges; it's SuperHyperBipartite it's 827  
only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, 828  
forming two separate sets, has no SuperHyperEdge in common; it's SuperHyperMultiPartite it's 829  
only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, 830  
forming multi separate sets, has no SuperHyperEdge in common; it's a SuperHyperWheel if it's 831  
only one SuperVertex as intersection amid two given SuperHyperEdges and one SuperVertex 832  
has one SuperHyperEdge with any common SuperVertex. The SuperHyperModel proposes 833  
the specific designs and the specific architectures. The SuperHyperModel is officially called 834  
"SuperHyperGraph" and "Neutrosophic SuperHyperGraph". In this SuperHyperModel, The 835  
"specific" cells and "specific group" of cells are SuperHyperModeled as "SuperHyperVertices" 836  
and the common and intended properties between "specific" cells and "specific group" of cells 837  
are SuperHyperModeled as "SuperHyperEdges". Sometimes, it's useful to have some degrees of 838  
determinacy, indeterminacy, and neutrality to have more precise SuperHyperModel which in this 839  
case the SuperHyperModel is called "Neutrosophic". In the future research, the foundation will 840  
be based on the "Cancer's Recognition" and the results and the definitions will be introduced 841  
in redeemed ways. The recognition of the cancer in the long-term function. The specific region 842  
has been assigned by the model [it's called SuperHyperGraph] and the long cycle of the move 843  
from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily 844  
identified since there are some determinacy, indeterminacy and neutrality about the moves and 845  
the effects of the cancer on that region; this event leads us to choose another model [it's said 846  
to be Neutrosophic SuperHyperGraph] to have convenient perception on what's happened and 847  
what's done. There are some specific models, which are well-known and they've got the names, 848  
and some SuperHyperGeneral SuperHyperModels. The moves and the traces of the cancer on the 849  
complex tracks and between complicated groups of cells could be fantasized by a Neutrosophic 850  
SuperHyperPath(-/SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyper- 851  
Multipartite, SuperHyperWheel). The aim is to find either the longest SuperHyperDominating 852  
or the strongest SuperHyperDominating in those Neutrosophic SuperHyperModels. For the 853  
longest SuperHyperDominating, called SuperHyperDominating, and the strongest SuperHyper- 854

Dominating, called Neutrosophic SuperHyperDominating, some general results are introduced. 855  
Beyond that in SuperHyperStar, all possible SuperHyperPaths have only two SuperHyperEdges 856  
but it's not enough since it's essential to have at least three SuperHyperEdges to form any style of 857  
a SuperHyperDominating. There isn't any formation of any SuperHyperDominating but literarily, 858  
it's the deformation of any SuperHyperDominating. It, literarily, deforms and it doesn't form. 859  
A basic familiarity with Neutrosophic SuperHyperDominating theory, SuperHyperGraphs, and 860  
Neutrosophic SuperHyperGraphs theory are proposed. 861

**Keywords:** Neutrosophic SuperHyperGraph, SuperHyperDominating, Cancer's Neutrosophic 862

Recognition 863

**AMS Subject Classification:** 05C17, 05C22, 05E45 864



## CHAPTER 7

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# Background

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There are some scientific researches covering the topic of this research. In what follows, there are some discussion and literature reviews about them date back on January 22, 2023. 867

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First article is titled “properties of SuperHyperGraph and neutrosophic SuperHyperGraph” in **Ref. [HG1]** by Henry Garrett (2022). It’s first step toward the research on neutrosophic SuperHyperGraphs. This research article is published on the journal “Neutrosophic Sets and Systems” in issue 49 and the pages 531-561. In this research article, different types of notions like dominating, resolving, coloring, Eulerian(Hamiltonian) neutrosophic path, n-Eulerian(Hamiltonian) neutrosophic path, zero forcing number, zero forcing neutrosophic- number, independent number, independent neutrosophic-number, clique number, clique neutrosophic-number, matching number, matching neutrosophic-number, girth, neutrosophic girth, 1-zero-forcing number, 1-zero- forcing neutrosophic-number, failed 1-zero-forcing number, failed 1-zero-forcing neutrosophic-number, global- offensive alliance, t-offensive alliance, t-defensive alliance, t-powerful alliance, and global- powerful alliance are defined in SuperHyperGraph and neutrosophic SuperHyperGraph. Some Classes of SuperHyperGraph and Neutrosophic SuperHyperGraph are cases of research. Some results are applied in family of SuperHyperGraph and neutrosophic SuperHyperGraph. Thus this research article has concentrated on the vast notions and introducing the majority of notions.

The seminal paper and groundbreaking article is titled “neutrosophic co-degree and neutrosophic degree alongside chromatic numbers in the setting of some classes related to neutrosophic hypergraphs” in **Ref. [HG2]** by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on general forms without using neutrosophic classes of neutrosophic SuperHyperGraph. It’s published in prestigious and fancy journal is entitled “Journal of Current Trends in Computer Science Research (JCTCSR)” with abbreviation “J Curr Trends Comp Sci Res” in volume 1 and issue 1 with pages 06-14. The research article studies deeply with choosing neutrosophic hypergraphs instead of neutrosophic SuperHyperGraph. It’s the breakthrough toward independent results based on initial background.

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The seminal paper and groundbreaking article is titled “Super Hyper Dominating and Super Hyper Resolving on Neutrosophic Super Hyper Graphs and Their Directions in Game Theory and Neutrosophic Super Hyper Classes” in **Ref. [HG3]** by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on fundamental SuperHyperNumber and using neutrosophic SuperHyperClasses of neutrosophic SuperHyperGraph. It’s published in prestigious and fancy journal is entitled “Journal of Mathematical Techniques and Computational Mathematics(JMTCM)” with



abbreviation “J Math Techniques Comput Math” in volume 1 and issue 3 with pages 242-263. 900  
The research article studies deeply with choosing directly neutrosophic SuperHyperGraph and 901  
SuperHyperGraph. It’s the breakthrough toward independent results based on initial background 902  
and fundamental SuperHyperNumbers. 903  
In some articles are titled “0039 | Closing Numbers and SupeV-Closing Numbers as 904  
(Dual)Resolving and (Dual)Coloring alongside (Dual)Dominating in (Neutrosophic)n- 905  
SuperHyperGraph” in **Ref. [HG4]** by Henry Garrett (2022), “0049 | (Failed)1-Zero-Forcing 906  
Number in Neutrosophic Graphs” in **Ref. [HG5]** by Henry Garrett (2022), “Extreme Super- 907  
HyperClique as the Firm Scheme of Confrontation under Cancer’s Recognition as the Model in 908  
The Setting of (Neutrosophic) SuperHyperGraphs” in **Ref. [HG6]** by Henry Garrett (2022), 909  
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**[HG32]** by Henry Garrett (2023), “(Neutrosophic) SuperHyperStable on Cancer’s Recognition 972  
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**[HG34]** by Henry Garrett (2022), “(Neutrosophic) 1-Failed SuperHyperForcing in Cancer’s 976  
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“Basic Notions on (Neutrosophic) SuperHyperForcing And (Neutrosophic) SuperHyperMod- 978  
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Based on Neutrosophic SuperHyperEdge (NSHE) in Neutrosophic SuperHyperGraph (NSHG)” 983  
in **Ref. [HG38]** by Henry Garrett (2022), there are some endeavors to formalize the basic 984  
SuperHyperNotions about neutrosophic SuperHyperGraph and SuperHyperGraph. 985  
Some scientific studies and scientific researches about neutrosophic graphs, are proposed as book 986  
in **Ref. [HG39]** by Henry Garrett (2022) which is indexed by Google Scholar and has more 987  
than 3230 readers in Scribd. It’s titled “Beyond Neutrosophic Graphs” and published by Ohio: 988  
E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United 989  
State. This research book covers different types of notions and settings in neutrosophic graph 990  
theory and neutrosophic SuperHyperGraph theory. 991

Also, some scientific studies and scientific researches about neutrosophic graphs, are proposed 992  
as book in **Ref. [HG40]** by Henry Garrett (2022) which is indexed by Google Scholar and has 993  
more than 4117 readers in Scribd. It's titled "Neutrosophic Duality" and published by Florida: 994  
GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 995  
United States. This research book presents different types of notions SuperHyperResolving and 996  
SuperHyperDominating in the setting of duality in neutrosophic graph theory and neutrosophic 997  
SuperHyperGraph theory. This research book has scrutiny on the complement of the intended set 998  
and the intended set, simultaneously. It's smart to consider a set but acting on its complement 999  
that what's done in this research book which is popular in the terms of high readers in Scribd. 1000  
See the seminal scientific researches [**HG1; HG2; HG3**]. The formalization of the notions on 1001  
the framework of Extreme SuperHyperDominating theory, Neutrosophic SuperHyperDominating 1002  
theory, and (Neutrosophic) SuperHyperGraphs theory at [**HG4; HG5; HG6; HG7; HG8;** 1003  
**HG9; HG10; HG11; HG12; HG13; HG14; HG15; HG16; HG17; HG18; HG19; HG20;** 1004  
**HG21; HG22; HG23; HG24; HG25; HG26; HG27; HG28; HG29; HG30; HG31; HG32;** 1005  
**HG33; HG34; HG35; HG36; HG37; HG38**]. Two popular scientific research books in Scribd 1006  
in the terms of high readers, 3230 and 4117 respectively, on neutrosophic science is on [**HG39;** 1007  
**HG40**]. 1008

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## Applied Notions Under The Scrutiny Of The Motivation Of This Scientific Research

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In this scientific research, there are some ideas in the featured frameworks of motivations. I try to bring the motivations in the narrative ways. Some cells have been faced with some attacks from the situation which is caused by the cancer's attacks. In this case, there are some embedded analysis on the ongoing situations which in that, the cells could be labelled as some groups and some groups or individuals have excessive labels which all are raised from the behaviors to overcome the cancer's attacks. In the embedded situations, the individuals of cells and the groups of cells could be considered as "new groups". Thus it motivates us to find the proper SuperHyperModels for getting more proper analysis on this messy story. I've found the SuperHyperModels which are officially called "SuperHyperGraphs" and "Extreme SuperHyperGraphs". In this SuperHyperModel, the cells and the groups of cells are defined as "SuperHyperVertices" and the relations between the individuals of cells and the groups of cells are defined as "SuperHyperEdges". Thus it's another motivation for us to do research on this SuperHyperModel based on the "Cancer's Recognition". Sometimes, the situations get worst. The situation is passed from the certainty and precise style. Thus it's the beyond them. There are three descriptions, namely, the degrees of determinacy, indeterminacy and neutrality, for any object based on vague forms, namely, incomplete data, imprecise data, and uncertain analysis. The latter model could be considered on the previous SuperHyperModel. It's SuperHyperModel. It's SuperHyperGraph but it's officially called "Extreme SuperHyperGraphs". The cancer is the disease but the model is going to figure out what's going on this phenomenon. The special case of this disease is considered and as the consequences of the model, some parameters are used. The cells are under attack of this disease but the moves of the cancer in the special region are the matter of mind. The recognition of the cancer could help to find some treatments for this disease. The SuperHyperGraph and Extreme SuperHyperGraph are the SuperHyperModels on the "Cancer's Recognition" and both bases are the background of this research. Sometimes the cancer has been happened on the region, full of cells, groups of cells and embedded styles. In this segment, the SuperHyperModel proposes some SuperHyperNotions based on the connectivities of the moves of the cancer in the forms of alliances' styles with the formation of the design and the architecture are formally called " SuperHyperDominating" in the themes of jargons and buzzwords. The prefix "SuperHyper" refers to the theme of the embedded styles to figure out the background for the SuperHyperNotions. The recognition of the cancer in the long-term function. The specific region has been assigned by the model [it's called SuperHyperGraph] and the long cycle of the move

from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily 1043  
identified since there are some determinacy, indeterminacy and neutrality about the moves and 1044  
the effects of the cancer on that region; this event leads us to choose another model [it's said to be 1045  
Extreme SuperHyperGraph] to have convenient perception on what's happened and what's done. 1046  
There are some specific models, which are well-known and they've got the names, and some general 1047  
models. The moves and the traces of the cancer on the complex tracks and between complicated 1048  
groups of cells could be fantasized by a Extreme SuperHyperPath (-/SuperHyperDominating, 1049  
SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). The aim 1050  
is to find either the optimal SuperHyperDominating or the Extreme SuperHyperDominating 1051  
in those Extreme SuperHyperModels. Some general results are introduced. Beyond that in 1052  
SuperHyperStar, all possible Extreme SuperHyperPath s have only two SuperHyperEdges but 1053  
it's not enough since it's essential to have at least three SuperHyperEdges to form any style of a 1054  
SuperHyperDominating. There isn't any formation of any SuperHyperDominating but literarily, 1055  
it's the deformation of any SuperHyperDominating. It, literarily, deforms and it doesn't form. 1056

**Question 8.0.1.** *How to define the SuperHyperNotions and to do research on them to find the “ 1057  
amount of SuperHyperDominating” of either individual of cells or the groups of cells based on the 1058  
fixed cell or the fixed group of cells, extensively, the “amount of SuperHyperDominating” based 1059  
on the fixed groups of cells or the fixed groups of group of cells? 1060*

**Question 8.0.2.** *What are the best descriptions for the “Cancer's Recognition” in terms of these 1061  
messy and dense SuperHyperModels where embedded notions are illustrated? 1062*

It's motivation to find notions to use in this dense model is titled “SuperHyperGraphs”. 1063  
Thus it motivates us to define different types of “ SuperHyperDominating” and “Extreme 1064  
SuperHyperDominating” on “SuperHyperGraph” and “Extreme SuperHyperGraph”. Then the 1065  
research has taken more motivations to define SuperHyperClasses and to find some connections 1066  
amid this SuperHyperNotion with other SuperHyperNotions. It motivates us to get some instances 1067  
and examples to make clarifications about the framework of this research. The general results 1068  
and some results about some connections are some avenues to make key point of this research, 1069  
“Cancer's Recognition”, more understandable and more clear. 1070

The framework of this research is as follows. In the beginning, I introduce basic definitions to clarify 1071  
about preliminaries. In the subsection “Preliminaries”, initial definitions about SuperHyperGraphs 1072  
and Extreme SuperHyperGraph are deeply-introduced and in-depth-discussed. The elementary 1073  
concepts are clarified and illustrated completely and sometimes review literature are applied to 1074  
make sense about what's going to figure out about the upcoming sections. The main definitions and 1075  
their clarifications alongside some results about new notions, SuperHyperDominating and Extreme 1076  
SuperHyperDominating, are figured out in sections “ SuperHyperDominating” and “Extreme 1077  
SuperHyperDominating”. In the sense of tackling on getting results and in order to make sense 1078  
about continuing the research, the ideas of SuperHyperUniform and Extreme SuperHyperUniform 1079  
are introduced and as their consequences, corresponded SuperHyperClasses are figured out to 1080  
debut what's done in this section, titled “Results on SuperHyperClasses” and “Results on Extreme 1081  
SuperHyperClasses”. As going back to origin of the notions, there are some smart steps toward 1082  
the common notions to extend the new notions in new frameworks, SuperHyperGraph and 1083  
Extreme SuperHyperGraph, in the sections “Results on SuperHyperClasses” and “Results on 1084  
Extreme SuperHyperClasses”. The starter research about the general SuperHyperRelations and 1085  
as concluding and closing section of theoretical research are contained in the section “General 1086  
Results”. Some general SuperHyperRelations are fundamental and they are well-known as 1087

fundamental SuperHyperNotions as elicited and discussed in the sections, “General Results”, “ 1088  
SuperHyperDominating”, “Extreme SuperHyperDominating”, “Results on SuperHyperClasses” 1089  
and “Results on Extreme SuperHyperClasses”. There are curious questions about what’s done 1090  
about the SuperHyperNotions to make sense about excellency of this research and going to 1091  
figure out the word “best” as the description and adjective for this research as presented 1092  
in section, “ SuperHyperDominating”. The keyword of this research debut in the section 1093  
“Applications in Cancer’s Recognition” with two cases and subsections “Case 1: The Initial Steps 1094  
Toward SuperHyperBipartite as SuperHyperModel” and “Case 2: The Increasing Steps Toward 1095  
SuperHyperMultipartite as SuperHyperModel”. In the section, “Open Problems”, there are some 1096  
scrutiny and discernment on what’s done and what’s happened in this research in the terms 1097  
of “questions” and “problems” to make sense to figure out this research in featured style. The 1098  
advantages and the limitations of this research alongside about what’s done in this research to 1099  
make sense and to get sense about what’s figured out are included in the section, “Conclusion 1100  
and Closing Remarks”. 1101





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## Extreme Preliminaries Of This Scientific Research On the Redeemed Ways

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In this section, the basic material in this scientific research, is referred to [Single Valued Neutrosophic Set](Ref.[HG38],Definition 2.2,p.2), [Neutrosophic Set](Ref.[HG38],Definition 2.1,p.1), [Neutrosophic SuperHyperGraph (NSHG)](Ref.[HG38],Definition 2.5,p.2), [Characterization of the Neutrosophic SuperHyperGraph (NSHG)](Ref.[HG38],Definition 2.7,p.3), [t-norm](Ref.[HG38], Definition 2.7, p.3), and [Characterization of the Neutrosophic SuperHyperGraph (NSHG)](Ref.[HG38],Definition 2.7,p.3), [Neutrosophic Strength of the Neutrosophic SuperHyperPaths] (Ref.[HG38],Definition 5.3,p.7), and [Different Neutrosophic Types of Neutrosophic SuperHyperEdges (NSHE)] (Ref.[HG38],Definition 5.4,p.7). Also, the new ideas and their clarifications are addressed to Ref.[HG38].

In this subsection, the basic material which is used in this scientific research, is presented. Also, the new ideas and their clarifications are elicited.

**Definition 9.0.1** (Neutrosophic Set). (Ref.[HG38],Definition 2.1,p.1).

Let  $X$  be a space of points (objects) with generic elements in  $X$  denoted by  $x$ ; then the **Neutrosophic set**  $A$  (NS  $A$ ) is an object having the form

$$A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$$

where the functions  $T, I, F : X \rightarrow ]^{-}0, 1^{+}[$  define respectively the a **truth-membership function**, an **indeterminacy-membership function**, and a **falsity-membership function** of the element  $x \in X$  to the set  $A$  with the condition

$$^{-}0 \leq T_A(x) + I_A(x) + F_A(x) \leq 3^{+}.$$

The functions  $T_A(x), I_A(x)$  and  $F_A(x)$  are real standard or nonstandard subsets of  $]^{-}0, 1^{+}[$ .

**Definition 9.0.2** (Single Valued Neutrosophic Set). (Ref.[HG38],Definition 2.2,p.2).

Let  $X$  be a space of points (objects) with generic elements in  $X$  denoted by  $x$ . A **single valued Neutrosophic set**  $A$  (SVNS  $A$ ) is characterized by truth-membership function  $T_A(x)$ , an indeterminacy-membership function  $I_A(x)$ , and a falsity-membership function  $F_A(x)$ . For each point  $x$  in  $X$ ,  $T_A(x), I_A(x), F_A(x) \in [0, 1]$ . A SVNS  $A$  can be written as

$$A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}.$$

**Definition 9.0.3.** The **degree of truth-membership, indeterminacy-membership and falsity-membership of the subset**  $X \subset A$  of the single valued Neutrosophic set  $A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$ :

$$T_A(X) = \min[T_A(v_i), T_A(v_j)]_{v_i, v_j \in X},$$

$$I_A(X) = \min[I_A(v_i), I_A(v_j)]_{v_i, v_j \in X},$$

and  $F_A(X) = \min[F_A(v_i), F_A(v_j)]_{v_i, v_j \in X}.$

**Definition 9.0.4.** The **support** of  $X \subset A$  of the single valued Neutrosophic set  $A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$ :

$$\text{supp}(X) = \{x \in X : T_A(x), I_A(x), F_A(x) > 0\}.$$

**Definition 9.0.5** (Neutrosophic SuperHyperGraph (NSHG)). (Ref.[HG38], Definition 2.5, p.2). 1117  
 Assume  $V'$  is a given set. a **Neutrosophic SuperHyperGraph** (NSHG)  $S$  is an ordered pair 1118  
 $S = (V, E)$ , where 1119

- (i)  $V = \{V_1, V_2, \dots, V_n\}$  a finite set of finite single valued Neutrosophic subsets of  $V'$ ; 1120
- (ii)  $V = \{(V_i, T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i)) : T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i) \geq 0\}$ ,  $(i = 1, 2, \dots, n)$ ; 1121
- (iii)  $E = \{E_1, E_2, \dots, E_{n'}\}$  a finite set of finite single valued Neutrosophic subsets of  $V$ ; 1122
- (iv)  $E = \{(E_{i'}, T_{V'}(E_{i'}), I_{V'}(E_{i'}), F_{V'}(E_{i'})) : T_{V'}(E_{i'}), I_{V'}(E_{i'}), F_{V'}(E_{i'}) \geq 0\}$ ,  $(i' = 1, 2, \dots, n')$ ; 1123
- (v)  $V_i \neq \emptyset$ ,  $(i = 1, 2, \dots, n)$ ; 1124
- (vi)  $E_{i'} \neq \emptyset$ ,  $(i' = 1, 2, \dots, n')$ ; 1125
- (vii)  $\sum_i \text{supp}(V_i) = V$ ,  $(i = 1, 2, \dots, n)$ ; 1126
- (viii)  $\sum_{i'} \text{supp}(E_{i'}) = V$ ,  $(i' = 1, 2, \dots, n')$ ; 1127
- (ix) and the following conditions hold:

$$T_{V'}(E_{i'}) \leq \min[T_{V'}(V_i), T_{V'}(V_j)]_{V_i, V_j \in E_{i'}},$$

$$I_{V'}(E_{i'}) \leq \min[I_{V'}(V_i), I_{V'}(V_j)]_{V_i, V_j \in E_{i'}},$$

and  $F_{V'}(E_{i'}) \leq \min[F_{V'}(V_i), F_{V'}(V_j)]_{V_i, V_j \in E_{i'}}$

where  $i' = 1, 2, \dots, n'$ . 1128

Here the Neutrosophic SuperHyperEdges (NSHE)  $E_{j'}$  and the Neutrosophic SuperHyperVertices 1129  
 (NSHV)  $V_j$  are single valued Neutrosophic sets.  $T_{V'}(V_i)$ ,  $I_{V'}(V_i)$ , and  $F_{V'}(V_i)$  denote the 1130  
 degree of truth-membership, the degree of indeterminacy-membership and the degree of 1131  
 falsity-membership the Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to the Neutrosophic 1132  
 SuperHyperVertex (NSHV)  $V$ .  $T_{V'}(E_{i'})$ ,  $I_{V'}(E_{i'})$ , and  $F_{V'}(E_{i'})$  denote the degree of truth- 1133  
 membership, the degree of indeterminacy-membership and the degree of falsity-membership 1134  
 of the Neutrosophic SuperHyperEdge (NSHE)  $E_{i'}$  to the Neutrosophic SuperHyperEdge (NSHE) 1135  
 $E$ . Thus, the  $ii'$ th element of the **incidence matrix** of Neutrosophic SuperHyperGraph (NSHG) 1136  
 are of the form  $(V_i, T_{V'}(E_{i'}), I_{V'}(E_{i'}), F_{V'}(E_{i'}))$ , the sets  $V$  and  $E$  are crisp sets. 1137

**Definition 9.0.6** (Characterization of the Neutrosophic SuperHyperGraph (NSHG)). 1138  
(Ref.[HG38], Definition 2.7, p.3). 1139

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . The 1140  
Neutrosophic SuperHyperEdges (NSHE)  $E_{i'}$  and the Neutrosophic SuperHyperVertices (NSHV) 1141  
 $V_i$  of Neutrosophic SuperHyperGraph (NSHG)  $S = (V, E)$  could be characterized as follow-up 1142  
items. 1143

- (i) If  $|V_i| = 1$ , then  $V_i$  is called **vertex**; 1144
- (ii) if  $|V_i| \geq 1$ , then  $V_i$  is called **SuperVertex**; 1145
- (iii) if for all  $V_i$ s are incident in  $E_{i'}$ ,  $|V_i| = 1$ , and  $|E_{i'}| = 2$ , then  $E_{i'}$  is called **edge**; 1146
- (iv) if for all  $V_i$ s are incident in  $E_{i'}$ ,  $|V_i| = 1$ , and  $|E_{i'}| \geq 2$ , then  $E_{i'}$  is called **HyperEdge**; 1147
- (v) if there's a  $V_i$  is incident in  $E_{i'}$  such that  $|V_i| \geq 1$ , and  $|E_{i'}| = 2$ , then  $E_{i'}$  is called 1148  
**SuperEdge**; 1149
- (vi) if there's a  $V_i$  is incident in  $E_{i'}$  such that  $|V_i| \geq 1$ , and  $|E_{i'}| \geq 2$ , then  $E_{i'}$  is called 1150  
**SuperHyperEdge**. 1151

If we choose different types of binary operations, then we could get hugely diverse types of 1152  
general forms of Neutrosophic SuperHyperGraph (NSHG). 1153

**Definition 9.0.7** (t-norm). (Ref.[HG38], Definition 2.7, p.3). 1154

A binary operation  $\otimes : [0, 1] \times [0, 1] \rightarrow [0, 1]$  is a **t-norm** if it satisfies the following for 1155  
 $x, y, z, w \in [0, 1]$ : 1156

- (i)  $1 \otimes x = x$ ; 1157
- (ii)  $x \otimes y = y \otimes x$ ; 1158
- (iii)  $x \otimes (y \otimes z) = (x \otimes y) \otimes z$ ; 1159
- (iv) If  $w \leq x$  and  $y \leq z$  then  $w \otimes y \leq x \otimes z$ . 1160

**Definition 9.0.8.** The **degree of truth-membership, indeterminacy-membership and falsity-membership of the subset**  $X \subset A$  of the single valued Neutrosophic set  $A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$  (with respect to t-norm  $T_{norm}$ ):

$$T_A(X) = T_{norm}[T_A(v_i), T_A(v_j)]_{v_i, v_j \in X},$$

$$I_A(X) = T_{norm}[I_A(v_i), I_A(v_j)]_{v_i, v_j \in X},$$

and  $F_A(X) = T_{norm}[F_A(v_i), F_A(v_j)]_{v_i, v_j \in X}.$

**Definition 9.0.9.** The **support** of  $X \subset A$  of the single valued Neutrosophic set  $A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$ :

$$supp(X) = \{ x \in X : T_A(x), I_A(x), F_A(x) > 0 \}.$$

**Definition 9.0.10.** (General Forms of Neutrosophic SuperHyperGraph (NSHG)). 1161

Assume  $V'$  is a given set. a **Neutrosophic SuperHyperGraph** (NSHG)  $S$  is an ordered pair 1162  
 $S = (V, E)$ , where 1163

- (i)  $V = \{V_1, V_2, \dots, V_n\}$  a finite set of finite single valued Neutrosophic subsets of  $V'$ ; 1164
- (ii)  $V = \{(V_i, T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i)) : T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i) \geq 0\}$ ,  $(i = 1, 2, \dots, n)$ ; 1165
- (iii)  $E = \{E_1, E_2, \dots, E_{n'}\}$  a finite set of finite single valued Neutrosophic subsets of  $V$ ; 1166
- (iv)  $E = \{(E_{i'}, T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'})) : T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'}) \geq 0\}$ ,  $(i' = 1, 2, \dots, n')$ ; 1167
- (v)  $V_i \neq \emptyset$ ,  $(i = 1, 2, \dots, n)$ ; 1168
- (vi)  $E_{i'} \neq \emptyset$ ,  $(i' = 1, 2, \dots, n')$ ; 1169
- (vii)  $\sum_i \text{supp}(V_i) = V$ ,  $(i = 1, 2, \dots, n)$ ; 1170
- (viii)  $\sum_{i'} \text{supp}(E_{i'}) = V$ ,  $(i' = 1, 2, \dots, n')$ . 1171

Here the Neutrosophic SuperHyperEdges (NSHE)  $E_{j'}$  and the Neutrosophic SuperHyperVertices (NSHV)  $V_j$  are single valued Neutrosophic sets.  $T_{V'}(V_i), I_{V'}(V_i)$ , and  $F_{V'}(V_i)$  denote the degree of truth-membership, the degree of indeterminacy-membership and the degree of falsity-membership the Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to the Neutrosophic SuperHyperVertex (NSHV)  $V$ .  $T'_{V'}(E_{i'}), I'_{V'}(E_{i'})$ , and  $F'_{V'}(E_{i'})$  denote the degree of truth-membership, the degree of indeterminacy-membership and the degree of falsity-membership of the Neutrosophic SuperHyperEdge (NSHE)  $E_{i'}$  to the Neutrosophic SuperHyperEdge (NSHE)  $E$ . Thus, the  $ii'$ th element of the **incidence matrix** of Neutrosophic SuperHyperGraph (NSHG) are of the form  $(V_i, T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'}))$ , the sets  $V$  and  $E$  are crisp sets. 1172-1180

**Definition 9.0.11** (Characterization of the Neutrosophic SuperHyperGraph (NSHG)). (Ref.[HG38], Definition 2.7,p.3). 1181-1182

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . The Neutrosophic SuperHyperEdges (NSHE)  $E_{i'}$  and the Neutrosophic SuperHyperVertices (NSHV)  $V_i$  of Neutrosophic SuperHyperGraph (NSHG)  $S = (V, E)$  could be characterized as follow-up items. 1183-1186

- (i) If  $|V_i| = 1$ , then  $V_i$  is called **vertex**; 1187
- (ii) if  $|V_i| \geq 1$ , then  $V_i$  is called **SuperVertex**; 1188
- (iii) if for all  $V_i$ s are incident in  $E_{i'}$ ,  $|V_i| = 1$ , and  $|E_{i'}| = 2$ , then  $E_{i'}$  is called **edge**; 1189
- (iv) if for all  $V_i$ s are incident in  $E_{i'}$ ,  $|V_i| = 1$ , and  $|E_{i'}| \geq 2$ , then  $E_{i'}$  is called **HyperEdge**; 1190
- (v) if there's a  $V_i$  is incident in  $E_{i'}$  such that  $|V_i| \geq 1$ , and  $|E_{i'}| = 2$ , then  $E_{i'}$  is called **SuperEdge**; 1191-1192
- (vi) if there's a  $V_i$  is incident in  $E_{i'}$  such that  $|V_i| \geq 1$ , and  $|E_{i'}| \geq 2$ , then  $E_{i'}$  is called **SuperHyperEdge**. 1193-1194

This SuperHyperModel is too messy and too dense. Thus there's a need to have some restrictions and conditions on SuperHyperGraph. The special case of this SuperHyperGraph makes the patterns and regularities. 1195-1197

**Definition 9.0.12.** A graph is **SuperHyperUniform** if it's SuperHyperGraph and the number of elements of SuperHyperEdges are the same. 1198-1199

To get more visions on SuperHyperUniform, the some SuperHyperClasses are introduced. It makes to have SuperHyperUniform more understandable.

**Definition 9.0.13.** Assume a Neutrosophic SuperHyperGraph. There are some SuperHyperClasses as follows.

- (i). It's **Neutrosophic SuperHyperPath** if it's only one SuperVertex as intersection amid two given SuperHyperEdges with two exceptions;
- (ii). it's **SuperHyperCycle** if it's only one SuperVertex as intersection amid two given SuperHyperEdges;
- (iii). it's **SuperHyperStar** it's only one SuperVertex as intersection amid all SuperHyperEdges;
- (iv). it's **SuperHyperBipartite** it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming two separate sets, has no SuperHyperEdge in common;
- (v). it's **SuperHyperMultiPartite** it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming multi separate sets, has no SuperHyperEdge in common;
- (vi). it's **SuperHyperWheel** if it's only one SuperVertex as intersection amid two given SuperHyperEdges and one SuperVertex has one SuperHyperEdge with any common SuperVertex.

**Definition 9.0.14.** Let an ordered pair  $S = (V, E)$  be a Neutrosophic SuperHyperGraph (NSHG)  $S$ . Then a sequence of Neutrosophic SuperHyperVertices (NSHV) and Neutrosophic SuperHyperEdges (NSHE)

$$V_1, E_1, V_2, E_2, V_3, \dots, V_{s-1}, E_{s-1}, V_s$$

is called a **Neutrosophic SuperHyperPath** (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_1$  to Neutrosophic SuperHyperVertex (NSHV)  $V_s$  if either of following conditions hold:

- (i)  $V_i, V_{i+1} \in E_{i'}$ ;
- (ii) there's a vertex  $v_i \in V_i$  such that  $v_i, V_{i+1} \in E_{i'}$ ;
- (iii) there's a SuperVertex  $V'_i \in V_i$  such that  $V'_i, V_{i+1} \in E_{i'}$ ;
- (iv) there's a vertex  $v_{i+1} \in V_{i+1}$  such that  $V_i, v_{i+1} \in E_{i'}$ ;
- (v) there's a SuperVertex  $V'_{i+1} \in V_{i+1}$  such that  $V_i, V'_{i+1} \in E_{i'}$ ;
- (vi) there are a vertex  $v_i \in V_i$  and a vertex  $v_{i+1} \in V_{i+1}$  such that  $v_i, v_{i+1} \in E_{i'}$ ;
- (vii) there are a vertex  $v_i \in V_i$  and a SuperVertex  $V'_{i+1} \in V_{i+1}$  such that  $v_i, V'_{i+1} \in E_{i'}$ ;
- (viii) there are a SuperVertex  $V'_i \in V_i$  and a vertex  $v_{i+1} \in V_{i+1}$  such that  $V'_i, v_{i+1} \in E_{i'}$ ;
- (ix) there are a SuperVertex  $V'_i \in V_i$  and a SuperVertex  $V'_{i+1} \in V_{i+1}$  such that  $V'_i, V'_{i+1} \in E_{i'}$ .

**Definition 9.0.15.** (Characterization of the Neutrosophic SuperHyperPaths).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . a Neutrosophic SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_1$  to Neutrosophic SuperHyperVertex (NSHV)  $V_s$  is sequence of Neutrosophic SuperHyperVertices (NSHV) and Neutrosophic SuperHyperEdges (NSHE)

$$V_1, E_1, V_2, E_2, V_3, \dots, V_{s-1}, E_{s-1}, V_s,$$

could be characterized as follow-up items.

- (i) If for all  $V_i, E_{j'}, |V_i| = 1, |E_{j'}| = 2$ , then NSHP is called **path**; 1229
- (ii) if for all  $E_{j'}, |E_{j'}| = 2$ , and there's  $V_i, |V_i| \geq 1$ , then NSHP is called **SuperPath**; 1230
- (iii) if for all  $V_i, E_{j'}, |V_i| = 1, |E_{j'}| \geq 2$ , then NSHP is called **HyperPath**; 1231
- (iv) if there are  $V_i, E_{j'}, |V_i| \geq 1, |E_{j'}| \geq 2$ , then NSHP is called **Neutrosophic SuperHyper-Path** . 1232

**Definition 9.0.16** (Neutrosophic Strength of the Neutrosophic SuperHyperPaths). (Ref.[HG38],Definition 5.3,p.7).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . A Neutrosophic SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_1$  to Neutrosophic SuperHyperVertex (NSHV)  $V_s$  is sequence of Neutrosophic SuperHyperVertices (NSHV) and Neutrosophic SuperHyperEdges (NSHE)

$$V_1, E_1, V_2, E_2, V_3, \dots, V_{s-1}, E_{s-1}, V_s,$$

have

- (i) **Neutrosophic t-strength**  $(\min\{T(V_i)\}, m, n)_{i=1}^s$ ; 1235
- (ii) **Neutrosophic i-strength**  $(m, \min\{I(V_i)\}, n)_{i=1}^s$ ; 1236
- (iii) **Neutrosophic f-strength**  $(m, n, \min\{F(V_i)\})_{i=1}^s$ ; 1237
- (iv) **Neutrosophic strength**  $(\min\{T(V_i)\}, \min\{I(V_i)\}, \min\{F(V_i)\})_{i=1}^s$ . 1238

**Definition 9.0.17** (Different Neutrosophic Types of Neutrosophic SuperHyperEdges (NSHE)). (Ref.[HG38],Definition 5.4,p.7).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called

- (ix) **Neutrosophic t-connective** if  $T(E) \geq$  maximum number of Neutrosophic t-strength of SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to Neutrosophic SuperHyperVertex (NSHV)  $V_j$  where  $1 \leq i, j \leq s$ ; 1241
- (x) **Neutrosophic i-connective** if  $I(E) \geq$  maximum number of Neutrosophic i-strength of SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to Neutrosophic SuperHyperVertex (NSHV)  $V_j$  where  $1 \leq i, j \leq s$ ; 1242

- (xi) **Neutrosophic f-connective** if  $F(E) \geq$  maximum number of Neutrosophic f-strength of SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to Neutrosophic SuperHyperVertex (NSHV)  $V_j$  where  $1 \leq i, j \leq s$ ;
- (xii) **Neutrosophic connective** if  $(T(E), I(E), F(E)) \geq$  maximum number of Neutrosophic strength of SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to Neutrosophic SuperHyperVertex (NSHV)  $V_j$  where  $1 \leq i, j \leq s$ .

**Definition 9.0.18.** (Different Neutrosophic Types of Neutrosophic SuperHyperDominating).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  or  $E'$  is called

- (i) **Neutrosophic e-SuperHyperDominating** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that  $V_a \in E_i, E_j$ ;
- (ii) **Neutrosophic re-SuperHyperDominating** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that  $V_a \in E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ;
- (iii) **Neutrosophic v-SuperHyperDominating** if  $\forall V_i \in E_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ;
- (iv) **Neutrosophic rv-SuperHyperDominating** if  $\forall V_i \in E_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that  $V_i, V_j \in E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ;
- (v) **Neutrosophic SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating.

**Definition 9.0.19.** ((Neutrosophic) SuperHyperDominating).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called

- (i) an **Extreme SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperEdges in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating;
- (ii) a **Neutrosophic SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating;



- (iii) an **Extreme SuperHyperDominating SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; and the Extreme power is corresponded to its Extreme coefficient;
- (iv) a **Neutrosophic SuperHyperDominating SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; and the Neutrosophic power is corresponded to its Neutrosophic coefficient;
- (v) an **Extreme V-SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating;
- (vi) a **Neutrosophic V-SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating;
- (vii) an **Extreme V-SuperHyperDominating SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; and the Extreme power is corresponded to its Extreme coefficient;
- (viii) a **Neutrosophic SuperHyperDominating SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neut-

rosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; and the Neutrosophic power is corresponded to its Neutrosophic coefficient.

**Definition 9.0.20.** ((Extreme/Neutrosophic) $\delta$ -SuperHyperDominating).  
Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Then

- (i) an  $\delta$ -**SuperHyperDominating** is a Neutrosophic kind of Neutrosophic SuperHyperDominating such that either of the following expressions hold for the Neutrosophic cardinalities of SuperHyperNeighbors of  $s \in S$  :

$$|S \cap N(s)| > |S \cap (V \setminus N(s))| + \delta; \quad \boxed{136EQN1}$$

$$|S \cap N(s)| < |S \cap (V \setminus N(s))| + \delta. \quad \boxed{136EQN2}$$

The Expression (28.1), holds if  $S$  is an  $\delta$ -**SuperHyperOffensive**. And the Expression (28.1), holds if  $S$  is an  $\delta$ -**SuperHyperDefensive**;

- (ii) a **Neutrosophic  $\delta$ -SuperHyperDominating** is a Neutrosophic kind of Neutrosophic SuperHyperDominating such that either of the following Neutrosophic expressions hold for the Neutrosophic cardinalities of SuperHyperNeighbors of  $s \in S$  :

$$|S \cap N(s)|_{Neutrosophic} > |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta; \quad \boxed{136EQN3}$$

$$|S \cap N(s)|_{Neutrosophic} < |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta. \quad \boxed{136EQN4}$$

The Expression (28.1), holds if  $S$  is a **Neutrosophic  $\delta$ -SuperHyperOffensive**. And the Expression (28.1), holds if  $S$  is a **Neutrosophic  $\delta$ -SuperHyperDefensive**.

For the sake of having a Neutrosophic SuperHyperDominating, there's a need to “**redefine**” the notion of “Neutrosophic SuperHyperGraph”. The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values.

**Definition 9.0.21.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . It's redefined **Neutrosophic SuperHyperGraph** if the Table (28.1) holds.

It's useful to define a “Neutrosophic” version of SuperHyperClasses. Since there's more ways to get Neutrosophic type-results to make a Neutrosophic more understandable.

**Definition 9.0.22.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . There are some **Neutrosophic SuperHyperClasses** if the Table (28.2) holds. Thus Neutrosophic SuperHyperPath, SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyperMultiPartite, and SuperHyperWheel, are **Neutrosophic SuperHyperPath**, **Neutrosophic SuperHyperCycle**, **Neutrosophic SuperHyperStar**, **Neutrosophic SuperHyperBipartite**, **Neutrosophic SuperHyperMultiPartite**, and **Neutrosophic SuperHyperWheel** if the Table (28.2) holds.

136DEF1

136DEF2

Table 9.1: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph Mentioned in the Definition (28.0.23)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

136TBL3

Table 9.2: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph, Mentioned in the Definition (28.0.22)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

136TBL4

Table 9.3: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph Mentioned in the Definition (28.0.23)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

136TBL1

It's useful to define a "Neutrosophic" version of a Neutrosophic SuperHyperDominating. Since there's more ways to get type-results to make a Neutrosophic SuperHyperDominating more Neutrosophicly understandable.

For the sake of having a Neutrosophic SuperHyperDominating, there's a need to "redefine" the Neutrosophic notion of "Neutrosophic SuperHyperDominating". The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values.

**Definition 9.0.23.** Assume a SuperHyperDominating. It's redefined a **Neutrosophic Super-HyperDominating** if the Table (28.3) holds.

136DEF1

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# Extreme SuperHyperDominating But As The Extensions Excerpt From Dense And Super Forms

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136EXM1

**Example 10.0.1.** Assume a Extreme SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$  in the mentioned Extreme Figures in every Extreme items.

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- On the Figure (29.1), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward.  $E_1$  and  $E_3$  are some empty Extreme SuperHyperEdges but  $E_2$  is a loop Extreme SuperHyperEdge and  $E_4$  is a Extreme SuperHyperEdge. Thus in the terms of Extreme SuperHyperNeighbor, there's only one Extreme SuperHyperEdge, namely,  $E_4$ . The Extreme SuperHyperVertex,  $V_3$  is Extreme isolated means that there's no Extreme SuperHyperEdge has it as a Extreme endpoint. Thus the Extreme SuperHyperVertex,  $V_3$ , is excluded in every given Extreme SuperHyperDominating.

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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 3z. \end{aligned}$$

1390

- On the Figure (29.2), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward.  $E_1, E_2$  and  $E_3$  are some empty Extreme SuperHyperEdges but  $E_4$  is a Extreme SuperHyperEdge. Thus in the terms of Extreme SuperHyperNeighbor, there's only one Extreme SuperHyperEdge, namely,  $E_4$ . The Extreme SuperHyperVertex,  $V_3$  is Extreme isolated means that there's no Extreme SuperHyperEdge has it as a Extreme endpoint. Thus the Extreme SuperHyperVertex,  $V_3$ ,

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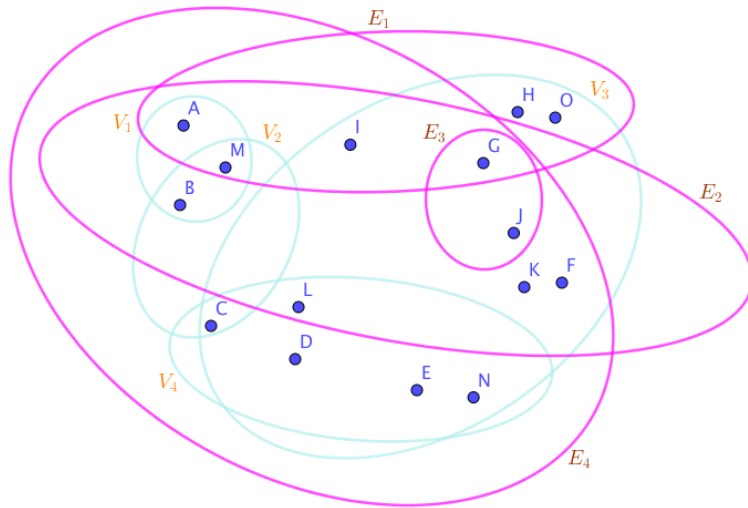


Figure 10.1: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG1

is excluded in every given Extreme SuperHyperDominating.

1397

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-Quasi-SuperHyperDominating SuperHyperPolynomial}} &= 3z. \end{aligned}$$

1398

- On the Figure (29.3), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward.

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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 3z. \end{aligned}$$

1401

- On the Figure (29.4), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward.

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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_1, V_4\}. \end{aligned}$$

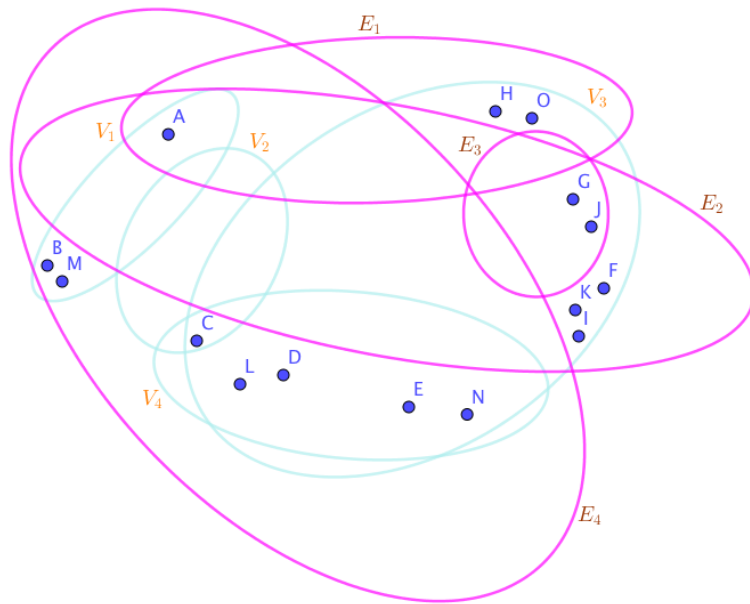


Figure 10.2: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG2

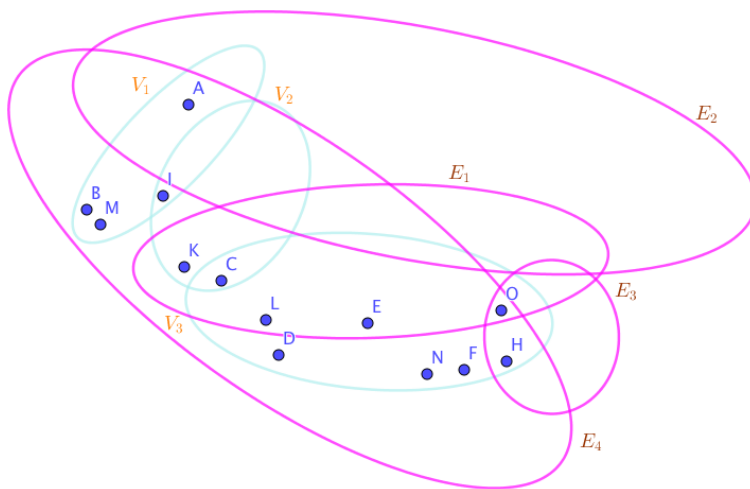


Figure 10.3: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG3

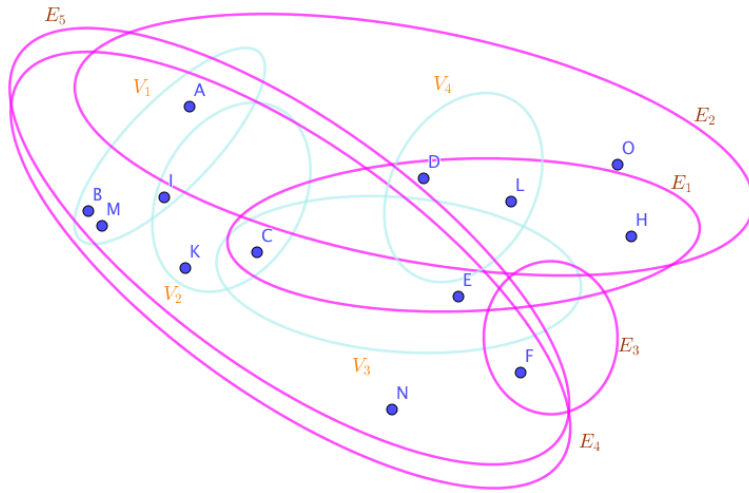


Figure 10.4: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG4

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= \\ 5 \times 3z^2. \end{aligned}$$

1404

- On the Figure (29.5), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1405  
 inating, is up. The Extreme Algorithm is Extremely straightforward. 1406

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= z. \end{aligned}$$

1407

- On the Figure (29.6), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1408  
 inating, is up. The Extreme Algorithm is Extremely straightforward. 1409

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \\ = \{E_{3i+1}_{i=0}^3, E_{3i+23}_{i=0}^3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= \\ = 3 \times 3z^8. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \\ = \{V_{3i+1}_{i=0}^3, V_{3i+11}_{i=0}^3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= \end{aligned}$$



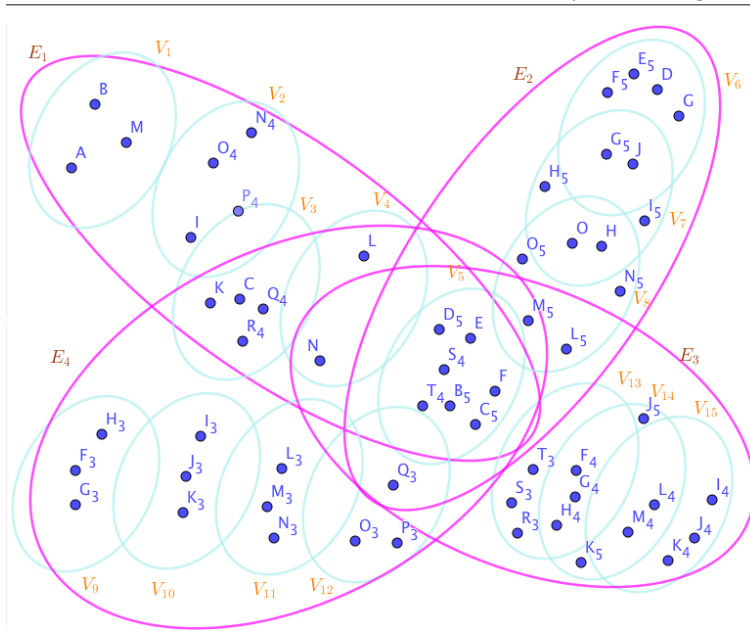


Figure 10.5: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG5

$$= 3 \times 3z^8.$$

1410

- On the Figure (29.7), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward. 1411 1412

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} = \{E_{15}, E_{16}, E_{17}\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} = 3 \times 3z^3.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} = \{V_3, V_6, V_8\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} = 4 \times 5 \times 5z^3.$$

1413

- On the Figure (29.8), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward. 1414 1415

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} = \{E_4\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} = z.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} = \{V_3, V_6, V_8\}.$$

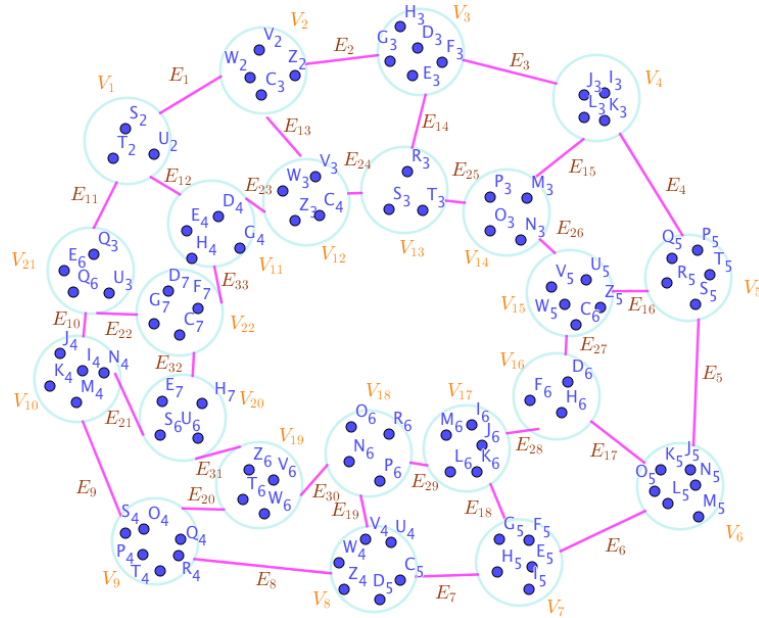


Figure 10.6: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG6

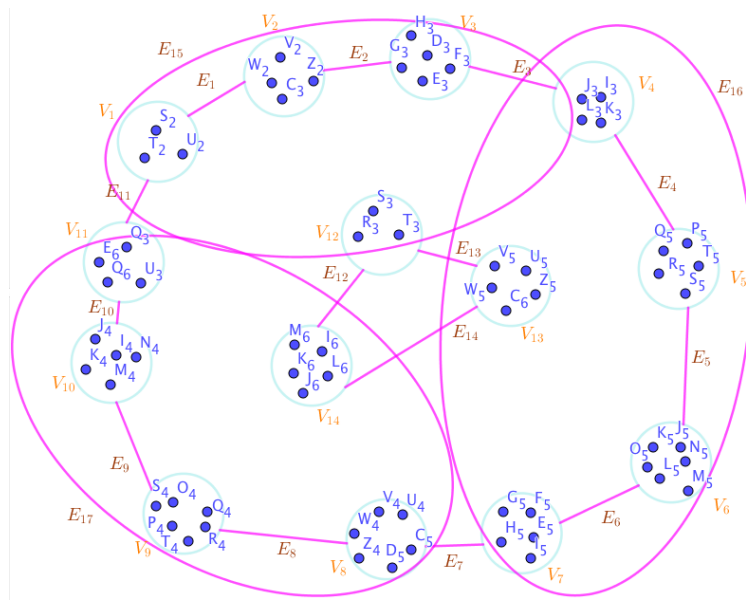


Figure 10.7: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG7

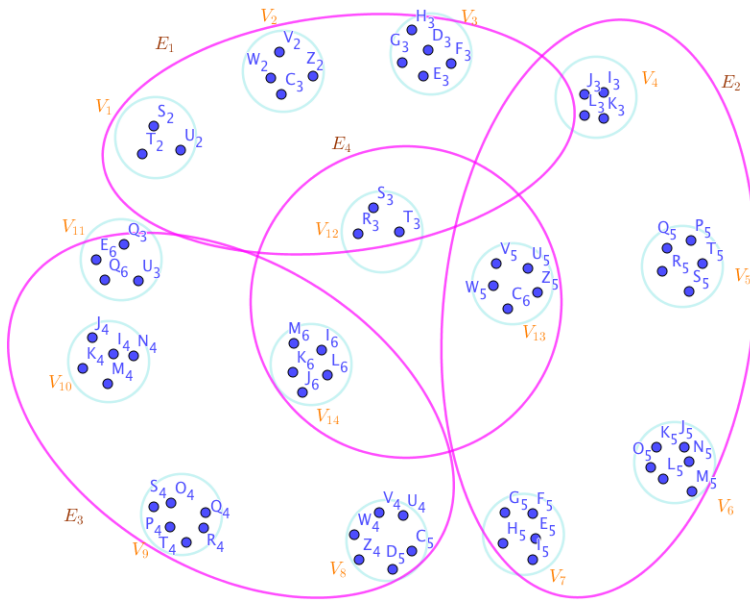


Figure 10.8: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG8

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= \\ &= 4 \times 5 \times 5z^3. \end{aligned}$$

1416

- On the Figure (29.9), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward. 1417  
1418

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_{3i+1}_{i=0}^3, E_{23}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= 3z^5. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_{3i+1}_{i=0}^3, V_{11}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= 3 \times 11z^5. \end{aligned}$$

1419

- On the Figure (29.10), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1420

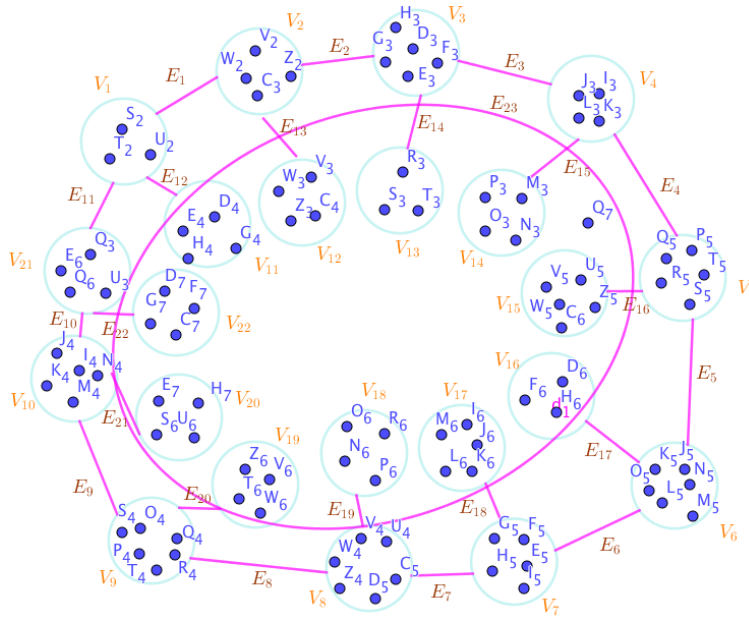


Figure 10.9: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG9

inating, is up. The Extreme Algorithm is Extremely straightforward.

1421

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_3, V_6, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= \\ &= 4 \times 5 \times 5z^3. \end{aligned}$$

1422

- On the Figure (29.11), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward.

1423

1424

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_1, E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= \\ &= 3 \times 3z^3. \end{aligned}$$

1425

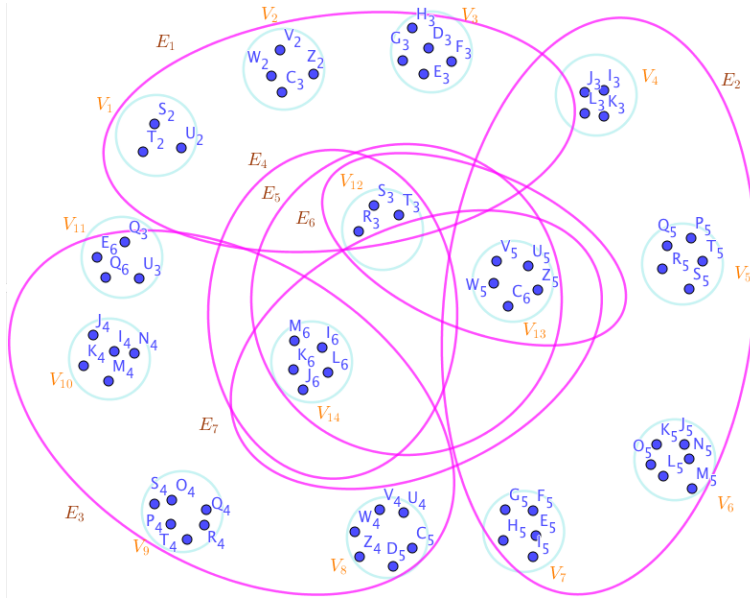


Figure 10.10: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG10

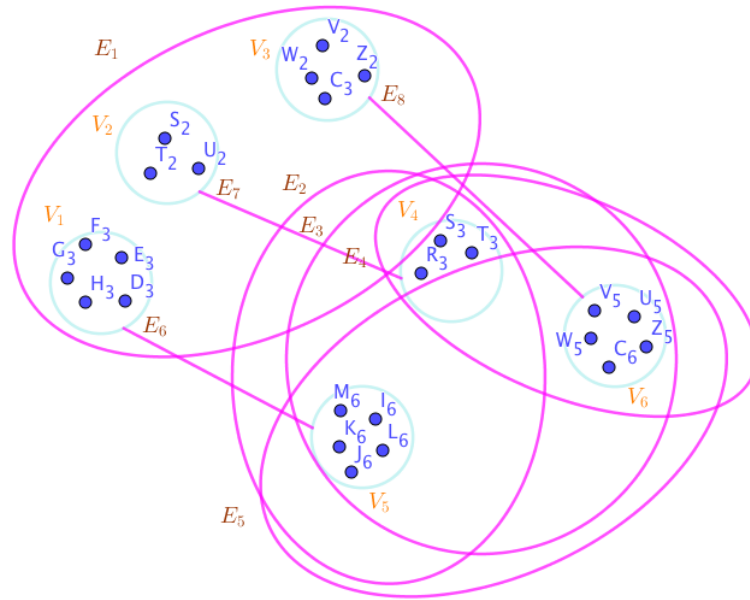


Figure 10.11: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG11

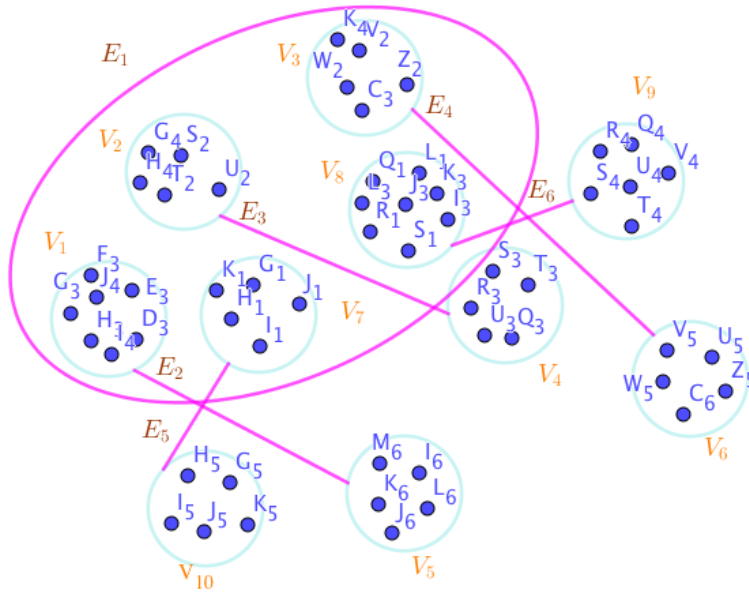


Figure 10.12: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG12

- On the Figure (29.12), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1426  
 inating, is up. The Extreme Algorithm is Extremely straightforward. 1427

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_{i=1}^{i \neq 4,5,6}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 5 \times 5z^5. \end{aligned}$$

1428

- On the Figure (29.13), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1429  
 inating, is up. The Extreme Algorithm is Extremely straightforward. 1430

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominatingConnected}} &= \{E_3, E_9\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 3 \times 3z^2. \end{aligned}$$

1431

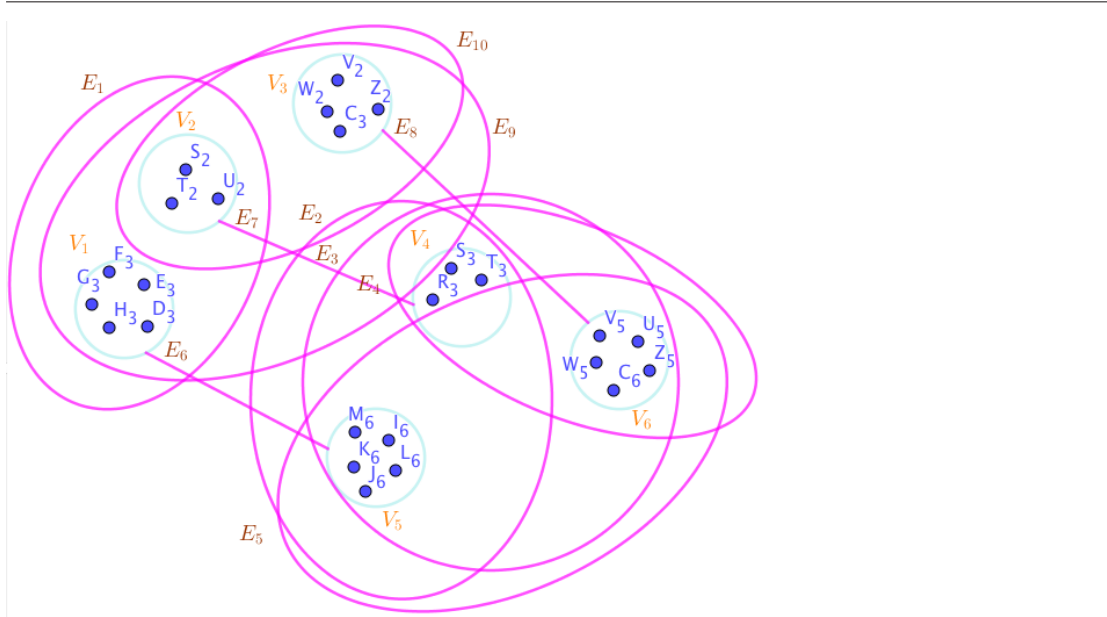


Figure 10.13: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG13

- On the Figure (29.14), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1432  
 inating, is up. The Extreme Algorithm is Extremely straightforward. 1433

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= z. \end{aligned}$$

1434

- On the Figure (29.15), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1435  
 inating, is up. The Extreme Algorithm is Extremely straightforward. 1436

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= 4z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= z^2. \end{aligned}$$

1437

- On the Figure (29.16), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1438



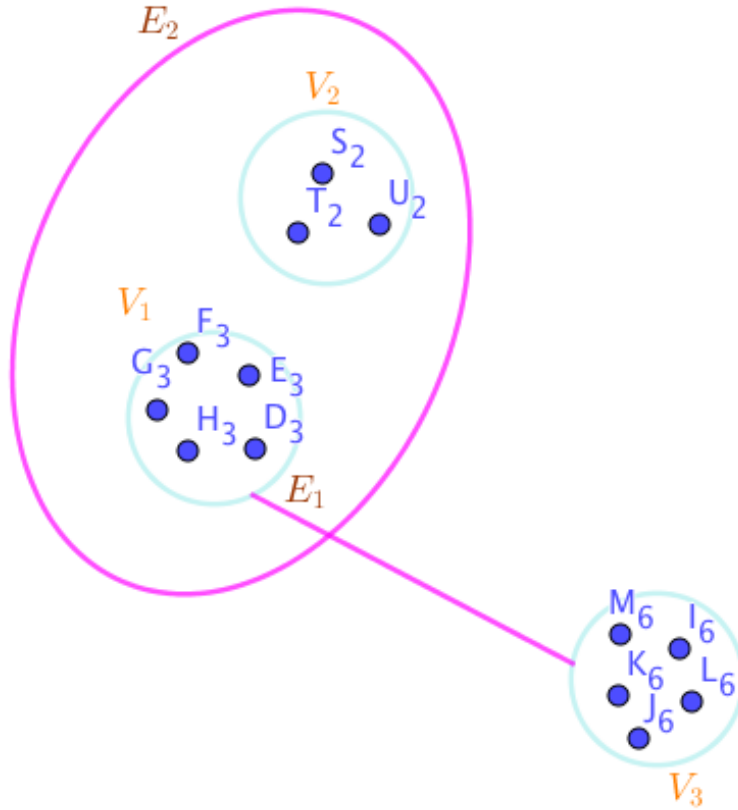


Figure 10.14: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG14

inating, is up. The Extreme Algorithm is Extremely straightforward.

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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= 4z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 4 \times 3z^3. \end{aligned}$$

1440

- On the Figure (29.17), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDom- 1441  
 inating, is up. The Extreme Algorithm is Extremely straightforward. 1442

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= 4z^2. \end{aligned}$$

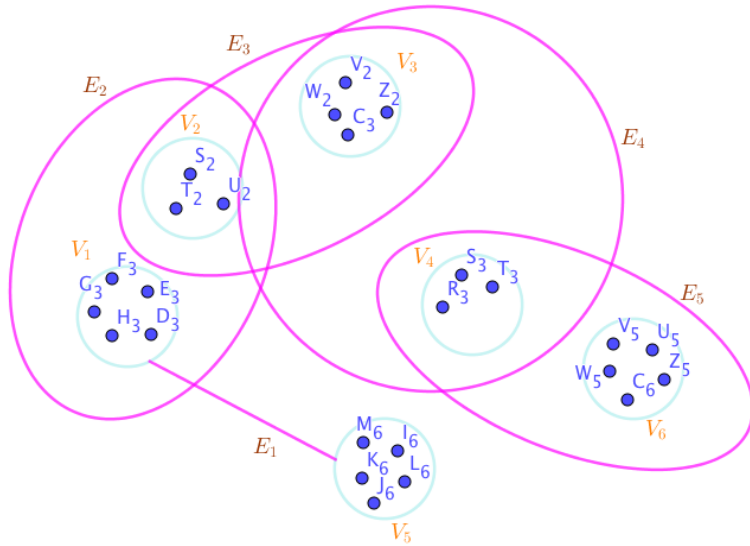


Figure 10.15: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG15

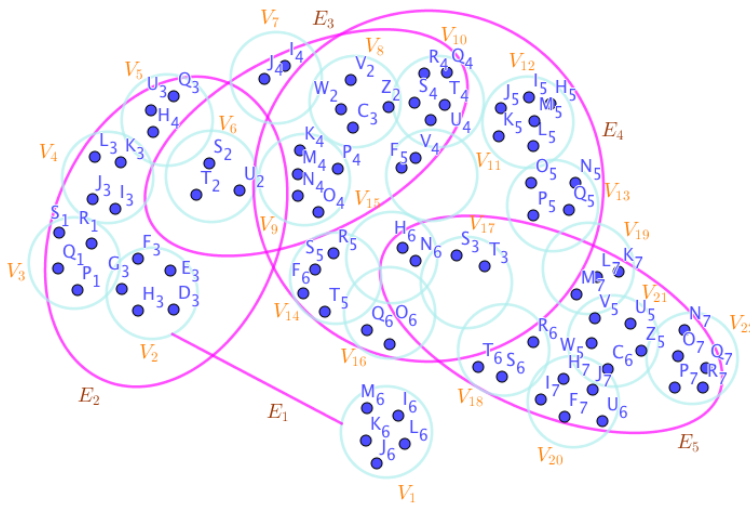


Figure 10.16: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG16

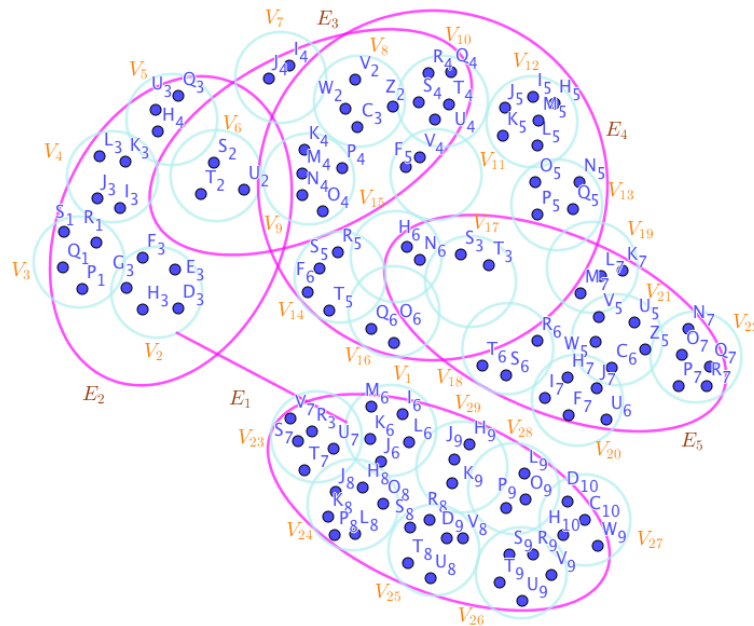


Figure 10.17: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG17

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 4 \times 3z^4. \end{aligned}$$

1443

- On the Figure (29.18), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward. 1444

1445

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 2 \times 4 \times 3z^4. \end{aligned}$$

1446

- On the Figure (29.19), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward. 1447

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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_{3i+1, i=0,3}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= 3z^4. \end{aligned}$$

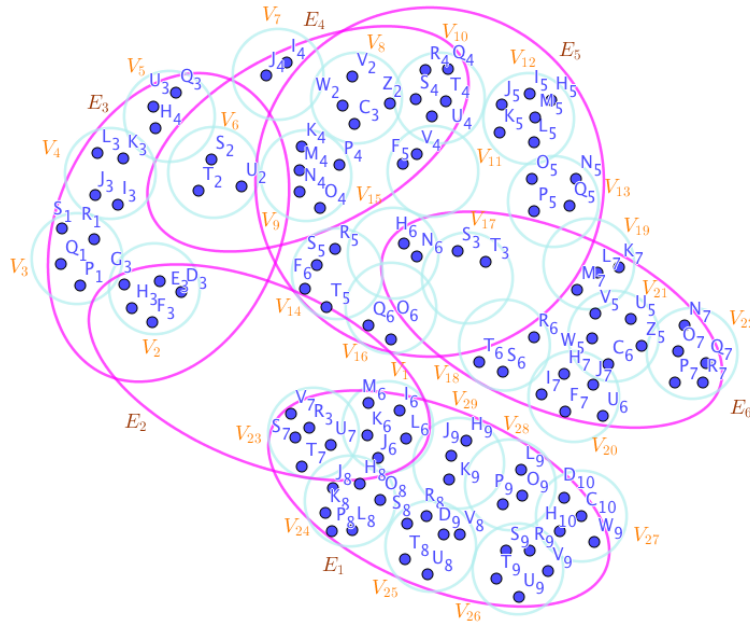


Figure 10.18: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG18

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} = \{V_{3i+1_{i=03}}\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} = 3^4.$$

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- On the Figure (29.20), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward. 1450  
1451

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} = \{E_6\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} = 10z.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} = \{V_1\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} = z.$$

1452

- On the Figure (29.21), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward. 1453  
1454

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} = \{E_2\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} = z.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} = \{V_1\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} = 10z.$$

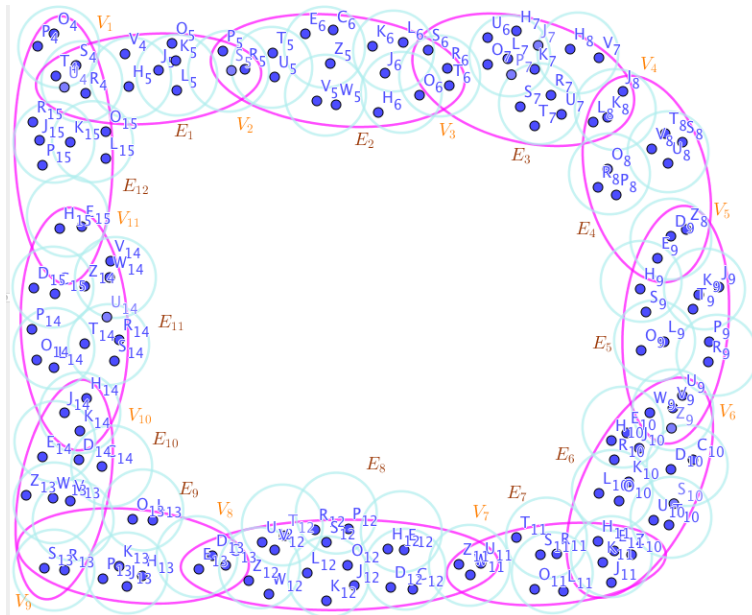


Figure 10.19: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG19

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- On the Figure (29.22), the Extreme SuperHyperNotion, namely, Extreme SuperHyperDominating, is up. The Extreme Algorithm is Extremely straightforward. 1456  
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$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} = \{E_3, E_4\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} = 4z^2.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} = \{V_3, V_6\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} = 5 \times 1z^2.$$

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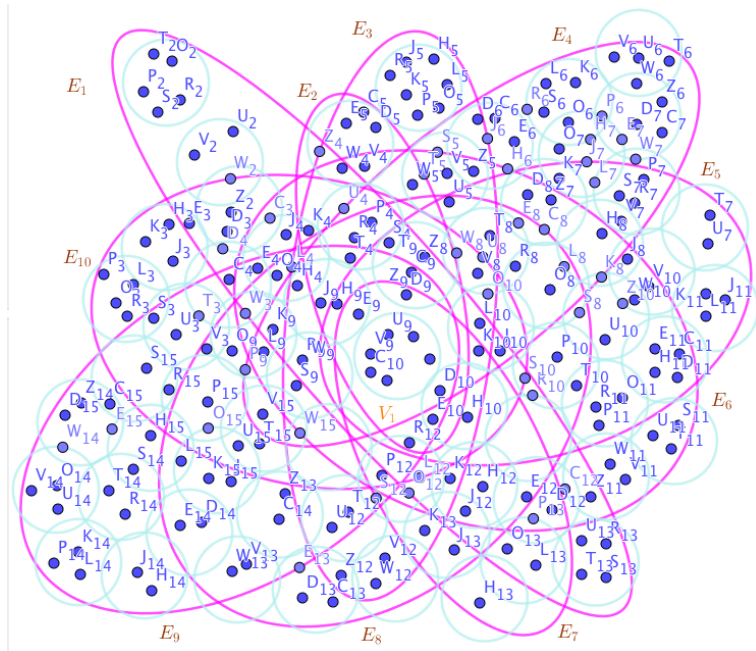


Figure 10.20: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

136NSHG20

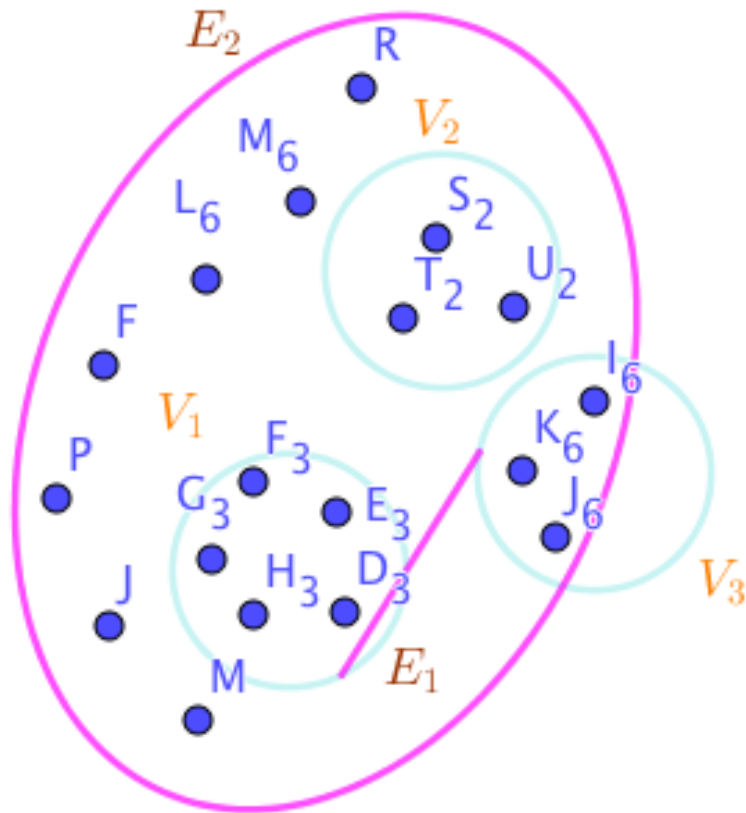


Figure 10.21: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)



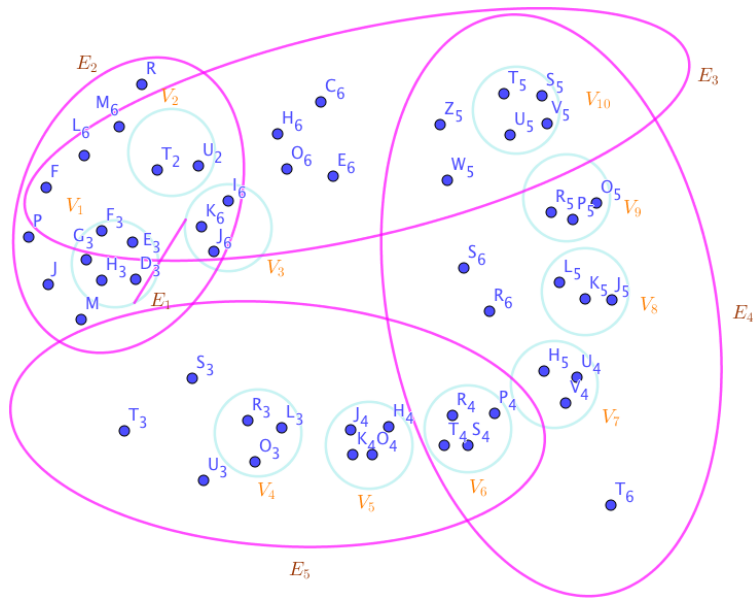


Figure 10.22: The Extreme SuperHyperGraphs Associated to the Extreme Notions of Extreme SuperHyperDominating in the Extreme Example (41.0.3)

95NHG2



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## The Extreme Departures on The Theoretical Results Toward Theoretical Motivations

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The previous Extreme approach apply on the upcoming Extreme results on Extreme SuperHyperClasses. 1463  
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**Proposition 11.0.1.** Assume a connected Extreme SuperHyperMultipartite ESHM : (V, E). Then 1465

$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} \\
 &= \{E_a \in E_{P_i^{ESHG:(V,E)}}, \\
 & \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} \\
 &= z^{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} \\
 &= \{V_a^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_b^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} \\
 &= \sum_{|V_{ESHG:(V,E)}^{EXTERNAL}|_{\text{Extreme Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let

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$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest SuperHyperDominating taken from a connected Extreme SuperHyperMultipartite 1467

$ESHM : (V, E)$ . There's a new way to redefine as

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$$\begin{aligned}
 &V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 &\exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\
 &\exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.
 \end{aligned}$$

The term "EXTERNAL" implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperDominating. The latter is straightforward. Then there's no at least one SuperHyperDominating. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperDominating could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

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$$\begin{aligned}
 &P : \\
 &V_1^{EXTERNAL}, E_1, \\
 &V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Extreme-of-SuperHyperPart SuperHyperEdges are attained in any solution

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$$\begin{aligned}
 &P : \\
 &V_1^{EXTERNAL}, E_1, \\
 &V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. ■

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**Example 11.0.2.** In the Figure (30.1), the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Extreme featured. The obtained Extreme SuperHyperSet, by the Algorithm in previous Extreme result, of the Extreme SuperHyperVertices of the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , in the Extreme SuperHyperModel (30.1), is the Extreme SuperHyperDominating.

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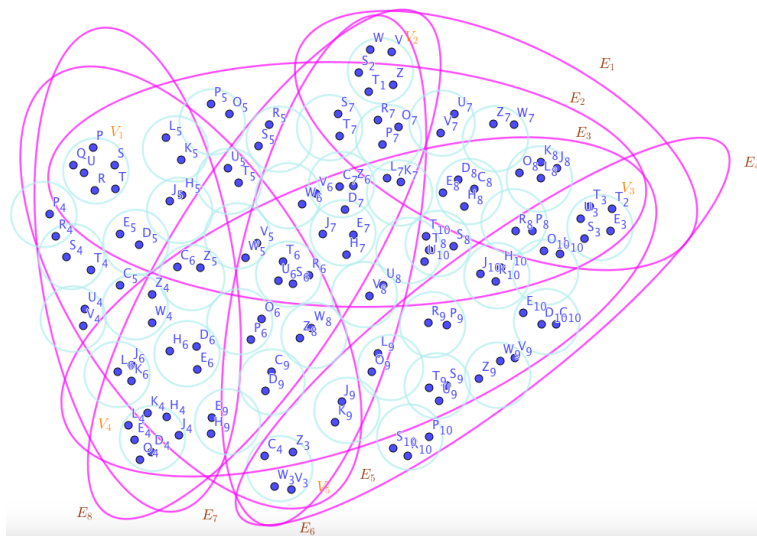


Figure 11.1: a Extreme SuperHyperMultipartite Associated to the Notions of Extreme SuperHyperDominating in the Example (41.0.5)

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## The Surveys of Mathematical Sets On The Results But As The Initial Motivation

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For the SuperHyperDominating, Extreme SuperHyperDominating, and the Extreme SuperHyper-Dominating, some general results are introduced. 1488  
1489

*Remark 12.0.1.* Let remind that the Extreme SuperHyperDominating is “redefined” on the positions of the alphabets. 1490  
1491

**Corollary 12.0.2.** *Assume Extreme SuperHyperDominating. Then* 1492

$$\begin{aligned} & \text{Extreme SuperHyperDominating} = \\ & \{ \text{the SuperHyperDominating of the SuperHyperVertices} \mid \\ & \max \{ \text{SuperHyperOffensive} \\ & \text{SuperHyperDominating} \\ & \mid \text{Extremecardinalityamidthose SuperHyperDominating.} \} \end{aligned}$$

plus one Extreme SuperHyperNeighbor to one. Where  $\sigma_i$  is the unary operation on the SuperHyperVertices of the SuperHyperGraph to assign the determinacy, the indeterminacy and the neutrality, for  $i = 1, 2, 3$ , respectively. 1493  
1494  
1495

**Corollary 12.0.3.** *Assume a Extreme SuperHyperGraph on the same identical letter of the alphabet. Then the notion of Extreme SuperHyperDominating and SuperHyperDominating coincide.* 1496  
1497

**Corollary 12.0.4.** *Assume a Extreme SuperHyperGraph on the same identical letter of the alphabet. Then a consecutive sequence of the SuperHyperVertices is a Extreme SuperHyperDominating if and only if it's a SuperHyperDominating.* 1498  
1499  
1500

**Corollary 12.0.5.** *Assume a Extreme SuperHyperGraph on the same identical letter of the alphabet. Then a consecutive sequence of the SuperHyperVertices is a strongest SuperHyperDominating if and only if it's a longest SuperHyperDominating.* 1501  
1502  
1503

**Corollary 12.0.6.** *Assume SuperHyperClasses of a Extreme SuperHyperGraph on the same identical letter of the alphabet. Then its Extreme SuperHyperDominating is its SuperHyper-Dominating and reversely.* 1504  
1505  
1506

**Corollary 12.0.7.** *Assume a Extreme SuperHyperPath(-/SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel) on the same identical letter* 1507  
1508



of the alphabet. Then its Extreme SuperHyperDominating is its SuperHyperDominating and  
reversely. 1509  
1510

**Corollary 12.0.8.** Assume a Extreme SuperHyperGraph. Then its Extreme SuperHyperDominating  
isn't well-defined if and only if its SuperHyperDominating isn't well-defined. 1511  
1512

**Corollary 12.0.9.** Assume SuperHyperClasses of a Extreme SuperHyperGraph. Then its Extreme  
SuperHyperDominating isn't well-defined if and only if its SuperHyperDominating isn't well-  
defined. 1513  
1514  
1515

**Corollary 12.0.10.** Assume a Extreme SuperHyperPath(-/SuperHyperDominating, SuperHyper-  
Star, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). Then its Extreme Super-  
HyperDominating isn't well-defined if and only if its SuperHyperDominating isn't well-defined. 1516  
1517  
1518

**Corollary 12.0.11.** Assume a Extreme SuperHyperGraph. Then its Extreme SuperHyperDominat-  
ing is well-defined if and only if its SuperHyperDominating is well-defined. 1519  
1520

**Corollary 12.0.12.** Assume SuperHyperClasses of a Extreme SuperHyperGraph. Then its Extreme  
SuperHyperDominating is well-defined if and only if its SuperHyperDominating is well-defined. 1521  
1522

**Corollary 12.0.13.** Assume a Extreme SuperHyperPath(-/SuperHyperDominating, SuperHyper-  
Star, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). Then its Extreme Super-  
HyperDominating is well-defined if and only if its SuperHyperDominating is well-defined. 1523  
1524  
1525

**Proposition 12.0.14.** Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph. Then  $V$  is 1526

(i) : the dual SuperHyperDefensive SuperHyperDominating; 1527

(ii) : the strong dual SuperHyperDefensive SuperHyperDominating; 1528

(iii) : the connected dual SuperHyperDefensive SuperHyperDominating; 1529

(iv) : the  $\delta$ -dual SuperHyperDefensive SuperHyperDominating; 1530

(v) : the strong  $\delta$ -dual SuperHyperDefensive SuperHyperDominating; 1531

(vi) : the connected  $\delta$ -dual SuperHyperDefensive SuperHyperDominating. 1532

**Proposition 12.0.15.** Let  $NTG : (V, E, \sigma, \mu)$  be a Extreme SuperHyperGraph. Then  $\emptyset$  is 1533

(i) : the SuperHyperDefensive SuperHyperDominating; 1534

(ii) : the strong SuperHyperDefensive SuperHyperDominating; 1535

(iii) : the connected defensive SuperHyperDefensive SuperHyperDominating; 1536

(iv) : the  $\delta$ -SuperHyperDefensive SuperHyperDominating; 1537

(v) : the strong  $\delta$ -SuperHyperDefensive SuperHyperDominating; 1538

(vi) : the connected  $\delta$ -SuperHyperDefensive SuperHyperDominating. 1539

**Proposition 12.0.16.** Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph. Then an independent  
SuperHyperSet is 1540  
1541

- (i) : the SuperHyperDefensive SuperHyperDominating; 1542
- (ii) : the strong SuperHyperDefensive SuperHyperDominating; 1543
- (iii) : the connected SuperHyperDefensive SuperHyperDominating; 1544
- (iv) : the  $\delta$ -SuperHyperDefensive SuperHyperDominating; 1545
- (v) : the strong  $\delta$ -SuperHyperDefensive SuperHyperDominating; 1546
- (vi) : the connected  $\delta$ -SuperHyperDefensive SuperHyperDominating. 1547

**Proposition 12.0.17.** Let  $ESHG : (V, E)$  be a Extreme SuperHyperUniform SuperHyperGraph which is a SuperHyperDominating/SuperHyperPath. Then  $V$  is a maximal 1548  
1549

- (i) : SuperHyperDefensive SuperHyperDominating; 1550
- (ii) : strong SuperHyperDefensive SuperHyperDominating; 1551
- (iii) : connected SuperHyperDefensive SuperHyperDominating; 1552
- (iv) :  $\mathcal{O}(ESHG)$ -SuperHyperDefensive SuperHyperDominating; 1553
- (v) : strong  $\mathcal{O}(ESHG)$ -SuperHyperDefensive SuperHyperDominating; 1554
- (vi) : connected  $\mathcal{O}(ESHG)$ -SuperHyperDefensive SuperHyperDominating; 1555

Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide. 1556

**Proposition 12.0.18.** Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph which is a SuperHyperUniform SuperHyperWheel. Then  $V$  is a maximal 1557  
1558

- (i) : dual SuperHyperDefensive SuperHyperDominating; 1559
- (ii) : strong dual SuperHyperDefensive SuperHyperDominating; 1560
- (iii) : connected dual SuperHyperDefensive SuperHyperDominating; 1561
- (iv) :  $\mathcal{O}(ESHG)$ -dual SuperHyperDefensive SuperHyperDominating; 1562
- (v) : strong  $\mathcal{O}(ESHG)$ -dual SuperHyperDefensive SuperHyperDominating; 1563
- (vi) : connected  $\mathcal{O}(ESHG)$ -dual SuperHyperDefensive SuperHyperDominating; 1564

Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide. 1565

**Proposition 12.0.19.** Let  $ESHG : (V, E)$  be a Extreme SuperHyperUniform SuperHyperGraph which is a SuperHyperDominating/SuperHyperPath. Then the number of 1566  
1567

- (i) : the SuperHyperDominating; 1568
- (ii) : the SuperHyperDominating; 1569
- (iii) : the connected SuperHyperDominating; 1570
- (iv) : the  $\mathcal{O}(ESHG)$ -SuperHyperDominating; 1571

(v) : the strong  $\mathcal{O}(ESHG)$ -SuperHyperDominating; 1572

(vi) : the connected  $\mathcal{O}(ESHG)$ -SuperHyperDominating. 1573

is one and it's only  $V$ . Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide. 1574  
1575

**Proposition 12.0.20.** Let  $ESHG : (V, E)$  be a Extreme SuperHyperUniform SuperHyperGraph which is a SuperHyperWheel. Then the number of 1576  
1577

(i) : the dual SuperHyperDominating; 1578

(ii) : the dual SuperHyperDominating; 1579

(iii) : the dual connected SuperHyperDominating; 1580

(iv) : the dual  $\mathcal{O}(ESHG)$ -SuperHyperDominating; 1581

(v) : the strong dual  $\mathcal{O}(ESHG)$ -SuperHyperDominating; 1582

(vi) : the connected dual  $\mathcal{O}(ESHG)$ -SuperHyperDominating. 1583

is one and it's only  $V$ . Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide. 1584  
1585

**Proposition 12.0.21.** Let  $ESHG : (V, E)$  be a Extreme SuperHyperUniform SuperHyperGraph which is a SuperHyperStar/SuperHyperComplete SuperHyperBipartite/SuperHyperComplete SuperHyperMultipartite. Then a SuperHyperSet contains [the SuperHyperCenter and] the half of multiplying  $r$  with the number of all the SuperHyperEdges plus one of all the SuperHyperVertices is a 1586  
1587  
1588  
1589  
1590

(i) : dual SuperHyperDefensive SuperHyperDominating; 1591

(ii) : strong dual SuperHyperDefensive SuperHyperDominating; 1592

(iii) : connected dual SuperHyperDefensive SuperHyperDominating; 1593

(iv) :  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating; 1594

(v) : strong  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating; 1595

(vi) : connected  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating. 1596

**Proposition 12.0.22.** Let  $ESHG : (V, E)$  be a Extreme SuperHyperUniform SuperHyperGraph which is a SuperHyperStar/SuperHyperComplete SuperHyperBipartite/SuperHyperComplete SuperHyperMultipartite. Then a SuperHyperSet contains the half of multiplying  $r$  with the number of all the SuperHyperEdges plus one of all the SuperHyperVertices in the biggest SuperHyperPart is a 1597  
1598  
1599  
1600  
1601

(i) : SuperHyperDefensive SuperHyperDominating; 1602

(ii) : strong SuperHyperDefensive SuperHyperDominating; 1603

- (iii) : *connected SuperHyperDefensive SuperHyperDominating;* 1604
- (iv) :  *$\delta$ -SuperHyperDefensive SuperHyperDominating;* 1605
- (v) : *strong  $\delta$ -SuperHyperDefensive SuperHyperDominating;* 1606
- (vi) : *connected  $\delta$ -SuperHyperDefensive SuperHyperDominating.* 1607

**Proposition 12.0.23.** *Let  $ESHG : (V, E)$  be a Extreme SuperHyperUniform SuperHyperGraph which is a SuperHyperStar/SuperHyperComplete SuperHyperBipartite/SuperHyperComplete SuperHyperMultipartite. Then Then the number of* 1608  
1609  
1610

- (i) : *dual SuperHyperDefensive SuperHyperDominating;* 1611
- (ii) : *strong dual SuperHyperDefensive SuperHyperDominating;* 1612
- (iii) : *connected dual SuperHyperDefensive SuperHyperDominating;* 1613
- (iv) :  *$\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating;* 1614
- (v) : *strong  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating;* 1615
- (vi) : *connected  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating.* 1616

*is one and it's only  $S$ , a SuperHyperSet contains [the SuperHyperCenter and] the half of multiplying  $r$  with the number of all the SuperHyperEdges plus one of all the SuperHyperVertices. Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide.* 1617  
1618  
1619

**Proposition 12.0.24.** *Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph. The number of connected component is  $|V - S|$  if there's a SuperHyperSet which is a dual* 1620  
1621

- (i) : *SuperHyperDefensive SuperHyperDominating;* 1622
- (ii) : *strong SuperHyperDefensive SuperHyperDominating;* 1623
- (iii) : *connected SuperHyperDefensive SuperHyperDominating;* 1624
- (iv) : *SuperHyperDominating;* 1625
- (v) : *strong 1-SuperHyperDefensive SuperHyperDominating;* 1626
- (vi) : *connected 1-SuperHyperDefensive SuperHyperDominating.* 1627

**Proposition 12.0.25.** *Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph. Then the number is at most  $\mathcal{O}(ESHG)$  and the Extreme number is at most  $\mathcal{O}_n(ESHG)$ .* 1628  
1629

**Proposition 12.0.26.** *Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph which is SuperHyperComplete. The number is  $\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1$  and the Extreme number is  $\min \sum_{v \in \{v_1, v_2, \dots, v_t\}} \frac{\mathcal{O}(ESHG:(V,E))}{2} \subseteq V \sigma(v)$ , in the setting of dual* 1630  
1631  
1632

- (i) : *SuperHyperDefensive SuperHyperDominating;* 1633
- (ii) : *strong SuperHyperDefensive SuperHyperDominating;* 1634

(iii) : *connected SuperHyperDefensive SuperHyperDominating;* 1635

(iv) :  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating;* 1636

(v) : *strong*  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating;* 1637

(vi) : *connected*  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating.* 1638

**Proposition 12.0.27.** *Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph which is  $\emptyset$ . The number is 0 and the Extreme number is 0, for an independent SuperHyperSet in the setting of dual* 1639  
 1640

(i) : *SuperHyperDefensive SuperHyperDominating;* 1641

(ii) : *strong SuperHyperDefensive SuperHyperDominating;* 1642

(iii) : *connected SuperHyperDefensive SuperHyperDominating;* 1643

(iv) : *0-SuperHyperDefensive SuperHyperDominating;* 1644

(v) : *strong 0-SuperHyperDefensive SuperHyperDominating;* 1645

(vi) : *connected 0-SuperHyperDefensive SuperHyperDominating.* 1646

**Proposition 12.0.28.** *Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph which is SuperHyper-Complete. Then there's no independent SuperHyperSet.* 1647  
 1648

**Proposition 12.0.29.** *Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph which is SuperHyperDominating/SuperHyperPath/SuperHyperWheel. The number is  $\mathcal{O}(ESHG : (V, E))$  and the Extreme number is  $\mathcal{O}_n(ESHG : (V, E))$ , in the setting of a dual* 1649  
 1650  
 1651

(i) : *SuperHyperDefensive SuperHyperDominating;* 1652

(ii) : *strong SuperHyperDefensive SuperHyperDominating;* 1653

(iii) : *connected SuperHyperDefensive SuperHyperDominating;* 1654

(iv) :  $\mathcal{O}(ESHG : (V, E))$ -*SuperHyperDefensive SuperHyperDominating;* 1655

(v) : *strong*  $\mathcal{O}(ESHG : (V, E))$ -*SuperHyperDefensive SuperHyperDominating;* 1656

(vi) : *connected*  $\mathcal{O}(ESHG : (V, E))$ -*SuperHyperDefensive SuperHyperDominating.* 1657

**Proposition 12.0.30.** *Let  $ESHG : (V, E)$  be a Extreme SuperHyperGraph which is SuperHyperStar/complete SuperHyperBipartite/complete SuperHyperMultiPartite. The number is  $\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1$  and the Extreme number is  $\min_{v \in \{v_1, v_2, \dots, v_t\}_{t > \frac{\mathcal{O}(ESHG:(V,E))}{2}}} \subseteq_V \sigma(v)$ , in the setting of a dual* 1658  
 1659  
 1660  
 1661

(i) : *SuperHyperDefensive SuperHyperDominating;* 1662

(ii) : *strong SuperHyperDefensive SuperHyperDominating;* 1663

(iii) : *connected SuperHyperDefensive SuperHyperDominating;* 1664

(iv) :  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -SuperHyperDefensive SuperHyperDominating; 1665

(v) : strong  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -SuperHyperDefensive SuperHyperDominating; 1666

(vi) : connected  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -SuperHyperDefensive SuperHyperDominating. 1667

**Proposition 12.0.31.** Let  $\mathcal{NSHF} : (V, E)$  be a SuperHyperFamily of the ESHGs :  $(V, E)$  Extreme SuperHyperGraphs which are from one-type SuperHyperClass which the result is obtained for the individuals. Then the results also hold for the SuperHyperFamily  $\mathcal{NSHF} : (V, E)$  of these specific SuperHyperClasses of the Extreme SuperHyperGraphs. 1668  
1669  
1670  
1671

**Proposition 12.0.32.** Let  $ESHG : (V, E)$  be a strong Extreme SuperHyperGraph. If  $S$  is a dual SuperHyperDefensive SuperHyperDominating, then  $\forall v \in V \setminus S, \exists x \in S$  such that 1672  
1673

(i)  $v \in N_s(x)$ ; 1674

(ii)  $vx \in E$ . 1675

**Proposition 12.0.33.** Let  $ESHG : (V, E)$  be a strong Extreme SuperHyperGraph. If  $S$  is a dual SuperHyperDefensive SuperHyperDominating, then 1676  
1677

(i)  $S$  is SuperHyperDominating set; 1678

(ii) there's  $S \subseteq S'$  such that  $|S'|$  is SuperHyperChromatic number. 1679

**Proposition 12.0.34.** Let  $ESHG : (V, E)$  be a strong Extreme SuperHyperGraph. Then 1680

(i)  $\Gamma \leq \mathcal{O}$ ; 1681

(ii)  $\Gamma_s \leq \mathcal{O}_n$ . 1682

**Proposition 12.0.35.** Let  $ESHG : (V, E)$  be a strong Extreme SuperHyperGraph which is connected. Then 1683  
1684

(i)  $\Gamma \leq \mathcal{O} - 1$ ; 1685

(ii)  $\Gamma_s \leq \mathcal{O}_n - \sum_{i=1}^3 \sigma_i(x)$ . 1686

**Proposition 12.0.36.** Let  $ESHG : (V, E)$  be an odd SuperHyperPath. Then 1687

(i) the SuperHyperSet  $S = \{v_2, v_4, \dots, v_{n-1}\}$  is a dual SuperHyperDefensive SuperHyperDominating; 1688  
1689

(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor + 1$  and corresponded SuperHyperSet is  $S = \{v_2, v_4, \dots, v_{n-1}\}$ ; 1690

(iii)  $\Gamma_s = \min\{\sum_{s \in S = \{v_2, v_4, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s), \sum_{s \in S = \{v_1, v_3, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s)\}$ ; 1691

(iv) the SuperHyperSets  $S_1 = \{v_2, v_4, \dots, v_{n-1}\}$  and  $S_2 = \{v_1, v_3, \dots, v_{n-1}\}$  are only a dual SuperHyperDominating. 1692  
1693

**Proposition 12.0.37.** Let  $ESHG : (V, E)$  be an even SuperHyperPath. Then 1694

(i) the set  $S = \{v_2, v_4, \dots, v_n\}$  is a dual SuperHyperDefensive SuperHyperDominating; 1695



(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor$  and corresponded SuperHyperSets are  $\{v_2, v_4, \dots, v_n\}$  and  $\{v_1, v_3, \dots, v_{n-1}\}$ ; 1696

(iii)  $\Gamma_s = \min\{\sum_{s \in S = \{v_2, v_4, \dots, v_n\}} \sum_{i=1}^3 \sigma_i(s), \sum_{s \in S = \{v_1, v_3, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s)\}$ ; 1697

(iv) the SuperHyperSets  $S_1 = \{v_2, v_4, \dots, v_n\}$  and  $S_2 = \{v_1, v_3, \dots, v_{n-1}\}$  are only dual SuperHyperDominating. 1698  
1699

**Proposition 12.0.38.** Let  $ESHG : (V, E)$  be an even SuperHyperDominating. Then 1700

(i) the SuperHyperSet  $S = \{v_2, v_4, \dots, v_n\}$  is a dual SuperHyperDefensive SuperHyperDominating; 1701  
1702

(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor$  and corresponded SuperHyperSets are  $\{v_2, v_4, \dots, v_n\}$  and  $\{v_1, v_3, \dots, v_{n-1}\}$ ; 1703

(iii)  $\Gamma_s = \min\{\sum_{s \in S = \{v_2, v_4, \dots, v_n\}} \sigma(s), \sum_{s \in S = \{v_1, v_3, \dots, v_{n-1}\}} \sigma(s)\}$ ; 1704

(iv) the SuperHyperSets  $S_1 = \{v_2, v_4, \dots, v_n\}$  and  $S_2 = \{v_1, v_3, \dots, v_{n-1}\}$  are only dual SuperHyperDominating. 1705  
1706

**Proposition 12.0.39.** Let  $ESHG : (V, E)$  be an odd SuperHyperDominating. Then 1707

(i) the SuperHyperSet  $S = \{v_2, v_4, \dots, v_{n-1}\}$  is a dual SuperHyperDefensive SuperHyperDominating; 1708  
1709

(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor + 1$  and corresponded SuperHyperSet is  $S = \{v_2, v_4, \dots, v_{n-1}\}$ ; 1710

(iii)  $\Gamma_s = \min\{\sum_{s \in S = \{v_2, v_4, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s), \sum_{s \in S = \{v_1, v_3, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s)\}$ ; 1711

(iv) the SuperHyperSets  $S_1 = \{v_2, v_4, \dots, v_{n-1}\}$  and  $S_2 = \{v_1, v_3, \dots, v_{n-1}\}$  are only dual SuperHyperDominating. 1712  
1713

**Proposition 12.0.40.** Let  $ESHG : (V, E)$  be SuperHyperStar. Then 1714

(i) the SuperHyperSet  $S = \{c\}$  is a dual maximal SuperHyperDominating; 1715

(ii)  $\Gamma = 1$ ; 1716

(iii)  $\Gamma_s = \sum_{i=1}^3 \sigma_i(c)$ ; 1717

(iv) the SuperHyperSets  $S = \{c\}$  and  $S \subset S'$  are only dual SuperHyperDominating. 1718

**Proposition 12.0.41.** Let  $ESHG : (V, E)$  be SuperHyperWheel. Then 1719

(i) the SuperHyperSet  $S = \{v_1, v_3\} \cup \{v_6, v_9 \dots, v_{i+6}, \dots, v_n\}_{i=1}^{6+3(i-1) \leq n}$  is a dual maximal SuperHyperDefensive SuperHyperDominating; 1720  
1721

(ii)  $\Gamma = |\{v_1, v_3\} \cup \{v_6, v_9 \dots, v_{i+6}, \dots, v_n\}_{i=1}^{6+3(i-1) \leq n}|$ ; 1722

(iii)  $\Gamma_s = \sum_{\{v_1, v_3\} \cup \{v_6, v_9 \dots, v_{i+6}, \dots, v_n\}_{i=1}^{6+3(i-1) \leq n}} \sum_{i=1}^3 \sigma_i(s)$ ; 1723

(iv) the SuperHyperSet  $\{v_1, v_3\} \cup \{v_6, v_9 \dots, v_{i+6}, \dots, v_n\}_{i=1}^{6+3(i-1) \leq n}$  is only a dual maximal SuperHyperDefensive SuperHyperDominating. 1724  
1725

**Proposition 12.0.42.** Let  $ESHG : (V, E)$  be an odd SuperHyperComplete. Then 1726



- (i) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}$  is a dual SuperHyperDefensive SuperHyperDominating; 1727
- (ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor + 1$ ; 1728
- (iii)  $\Gamma_s = \min\{\sum_{s \in S} \sum_{i=1}^3 \sigma_i(s)\}_{S=\{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}}$ ; 1729
- (iv) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}$  is only a dual SuperHyperDefensive SuperHyperDominating. 1730  
1731

**Proposition 12.0.43.** Let  $ESHG : (V, E)$  be an even SuperHyperComplete. Then 1732

- (i) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}$  is a dual SuperHyperDefensive SuperHyperDominating; 1733
- (ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor$ ; 1734
- (iii)  $\Gamma_s = \min\{\sum_{s \in S} \sum_{i=1}^3 \sigma_i(s)\}_{S=\{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}}$ ; 1735
- (iv) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}$  is only a dual maximal SuperHyperDefensive SuperHyperDominating. 1736  
1737

**Proposition 12.0.44.** Let  $\mathcal{NSHF} : (V, E)$  be a  $m$ -SuperHyperFamily of Extreme SuperHyperStars with common Extreme SuperHyperVertex SuperHyperSet. Then 1738  
1739

- (i) the SuperHyperSet  $S = \{c_1, c_2, \dots, c_m\}$  is a dual SuperHyperDefensive SuperHyperDominating for  $\mathcal{NSHF}$ ; 1740  
1741
- (ii)  $\Gamma = m$  for  $\mathcal{NSHF} : (V, E)$ ; 1742
- (iii)  $\Gamma_s = \sum_{i=1}^m \sum_{j=1}^3 \sigma_j(c_i)$  for  $\mathcal{NSHF} : (V, E)$ ; 1743
- (iv) the SuperHyperSets  $S = \{c_1, c_2, \dots, c_m\}$  and  $S \subset S'$  are only dual SuperHyperDominating for  $\mathcal{NSHF} : (V, E)$ . 1744  
1745

**Proposition 12.0.45.** Let  $\mathcal{NSHF} : (V, E)$  be an  $m$ -SuperHyperFamily of odd SuperHyperComplete SuperHyperGraphs with common Extreme SuperHyperVertex SuperHyperSet. Then 1746  
1747

- (i) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}$  is a dual maximal SuperHyperDefensive SuperHyperDominating for  $\mathcal{NSHF}$ ; 1748  
1749
- (ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor + 1$  for  $\mathcal{NSHF} : (V, E)$ ; 1750
- (iii)  $\Gamma_s = \min\{\sum_{s \in S} \sum_{i=1}^3 \sigma_i(s)\}_{S=\{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}}$  for  $\mathcal{NSHF} : (V, E)$ ; 1751
- (iv) the SuperHyperSets  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}$  are only a dual maximal SuperHyperDominating for  $\mathcal{NSHF} : (V, E)$ . 1752  
1753

**Proposition 12.0.46.** Let  $\mathcal{NSHF} : (V, E)$  be a  $m$ -SuperHyperFamily of even SuperHyperComplete SuperHyperGraphs with common Extreme SuperHyperVertex SuperHyperSet. Then 1754  
1755

- (i) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}$  is a dual SuperHyperDefensive SuperHyperDominating for  $\mathcal{NSHF} : (V, E)$ ; 1756  
1757

(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor$  for  $\mathcal{NSHF} : (V, E)$ ; 1758

(iii)  $\Gamma_s = \min\{\sum_{s \in S} \sum_{i=1}^3 \sigma_i(s)\}_{S=\{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}}$  for  $\mathcal{NSHF} : (V, E)$ ; 1759

(iv) the SuperHyperSets  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}$  are only dual maximal SuperHyperDominating for  $\mathcal{NSHF} : (V, E)$ . 1760  
1761

**Proposition 12.0.47.** Let  $ESHG : (V, E)$  be a strong Extreme SuperHyperGraph. Then following statements hold; 1762  
1763

(i) if  $s \geq t$  and a SuperHyperSet  $S$  of SuperHyperVertices is an  $t$ -SuperHyperDefensive SuperHyperDominating, then  $S$  is an  $s$ -SuperHyperDefensive SuperHyperDominating; 1764  
1765

(ii) if  $s \leq t$  and a SuperHyperSet  $S$  of SuperHyperVertices is a dual  $t$ -SuperHyperDefensive SuperHyperDominating, then  $S$  is a dual  $s$ -SuperHyperDefensive SuperHyperDominating. 1766  
1767

**Proposition 12.0.48.** Let  $ESHG : (V, E)$  be a strong Extreme SuperHyperGraph. Then following statements hold; 1768  
1769

(i) if  $s \geq t + 2$  and a SuperHyperSet  $S$  of SuperHyperVertices is an  $t$ -SuperHyperDefensive SuperHyperDominating, then  $S$  is an  $s$ -SuperHyperPowerful SuperHyperDominating; 1770  
1771

(ii) if  $s \leq t$  and a SuperHyperSet  $S$  of SuperHyperVertices is a dual  $t$ -SuperHyperDefensive SuperHyperDominating, then  $S$  is a dual  $s$ -SuperHyperPowerful SuperHyperDominating. 1772  
1773

**Proposition 12.0.49.** Let  $ESHG : (V, E)$  be a  $[an]$   $[V-]$ SuperHyperUniform-strong-Extreme SuperHyperGraph. Then following statements hold; 1774  
1775

(i) if  $\forall a \in S, |N_s(a) \cap S| < \lfloor \frac{r}{2} \rfloor + 1$ , then  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 1776  
1777

(ii) if  $\forall a \in V \setminus S, |N_s(a) \cap S| > \lfloor \frac{r}{2} \rfloor + 1$ , then  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 1778  
1779

(iii) if  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is an  $V$ -SuperHyperDefensive SuperHyperDominating; 1780  
1781

(iv) if  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is a dual  $V$ -SuperHyperDefensive SuperHyperDominating. 1782  
1783

**Proposition 12.0.50.** Let  $ESHG : (V, E)$  is a  $[an]$   $[V-]$ SuperHyperUniform-strong-Extreme SuperHyperGraph. Then following statements hold; 1784  
1785

(i)  $\forall a \in S, |N_s(a) \cap S| < \lfloor \frac{r}{2} \rfloor + 1$  if  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 1786  
1787

(ii)  $\forall a \in V \setminus S, |N_s(a) \cap S| > \lfloor \frac{r}{2} \rfloor + 1$  if  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 1788  
1789

(iii)  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is an  $V$ -SuperHyperDefensive SuperHyperDominating; 1790  
1791

(iv)  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is a dual  $V$ -SuperHyperDefensive SuperHyperDominating. 1792  
1793

**Proposition 12.0.51.** Let  $ESHG : (V, E)$  is a[an]  $[V]$ -SuperHyperUniform-strong-Extreme SuperHyperGraph which is a SuperHyperComplete. Then following statements hold; 1794  
1795

(i)  $\forall a \in S, |N_s(a) \cap S| < \lfloor \frac{\mathcal{O}-1}{2} \rfloor + 1$  if  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 1796  
1797

(ii)  $\forall a \in V \setminus S, |N_s(a) \cap S| > \lfloor \frac{\mathcal{O}-1}{2} \rfloor + 1$  if  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 1798  
1799

(iii)  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is an  $(\mathcal{O} - 1)$ -SuperHyperDefensive SuperHyperDominating; 1800  
1801

(iv)  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is a dual  $(\mathcal{O} - 1)$ -SuperHyperDefensive SuperHyperDominating. 1802  
1803

**Proposition 12.0.52.** Let  $ESHG : (V, E)$  is a[an]  $[V]$ -SuperHyperUniform-strong-Extreme SuperHyperGraph which is a SuperHyperComplete. Then following statements hold; 1804  
1805

(i) if  $\forall a \in S, |N_s(a) \cap S| < \lfloor \frac{\mathcal{O}-1}{2} \rfloor + 1$ , then  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 1806  
1807

(ii) if  $\forall a \in V \setminus S, |N_s(a) \cap S| > \lfloor \frac{\mathcal{O}-1}{2} \rfloor + 1$ , then  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 1808  
1809

(iii) if  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is  $(\mathcal{O} - 1)$ -SuperHyperDefensive SuperHyperDominating; 1810  
1811

(iv) if  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is a dual  $(\mathcal{O} - 1)$ -SuperHyperDefensive SuperHyperDominating. 1812  
1813

**Proposition 12.0.53.** Let  $ESHG : (V, E)$  is a[an]  $[V]$ -SuperHyperUniform-strong-Extreme SuperHyperGraph which is SuperHyperDominating. Then following statements hold; 1814  
1815

(i)  $\forall a \in S, |N_s(a) \cap S| < 2$  if  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 1816  
1817

(ii)  $\forall a \in V \setminus S, |N_s(a) \cap S| > 2$  if  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 1818  
1819

(iii)  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 1820  
1821

(iv)  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating. 1822  
1823

**Proposition 12.0.54.** Let  $ESHG : (V, E)$  is a[an]  $[V]$ -SuperHyperUniform-strong-Extreme SuperHyperGraph which is SuperHyperDominating. Then following statements hold; 1824  
1825

(i) if  $\forall a \in S, |N_s(a) \cap S| < 2$ , then  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 1826  
1827

- (ii) if  $\forall a \in V \setminus S$ ,  $|N_s(a) \cap S| > 2$ , then  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 1828  
1829
- (iii) if  $\forall a \in S$ ,  $|N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 1830  
1831
- (iv) if  $\forall a \in V \setminus S$ ,  $|N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating. 1832  
1833

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## Extreme Applications in Cancer's Extreme Recognition

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The cancer is the Extreme disease but the Extreme model is going to figure out what's going on this Extreme phenomenon. The special Extreme case of this Extreme disease is considered and as the consequences of the model, some parameters are used. The cells are under attack of this disease but the moves of the cancer in the special region are the matter of mind. The Extreme recognition of the cancer could help to find some Extreme treatments for this Extreme disease. In the following, some Extreme steps are Extreme devised on this disease.

**Step 1. (Extreme Definition)** The Extreme recognition of the cancer in the long-term Extreme function.

**Step 2. (Extreme Issue)** The specific region has been assigned by the Extreme model [it's called Extreme SuperHyperGraph] and the long Extreme cycle of the move from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily identified since there are some determinacy, indeterminacy and neutrality about the moves and the effects of the cancer on that region; this event leads us to choose another model [it's said to be Extreme SuperHyperGraph] to have convenient perception on what's happened and what's done.

**Step 3. (Extreme Model)** There are some specific Extreme models, which are well-known and they've got the names, and some general Extreme models. The moves and the Extreme traces of the cancer on the complex tracks and between complicated groups of cells could be fantasized by a Extreme SuperHyperPath(-/SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). The aim is to find either the Extreme SuperHyperDominating or the Extreme SuperHyperDominating in those Extreme Extreme SuperHyperModels.







Table 14.1: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges  
 Belong to The Extreme SuperHyperBipartite

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

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of the Extreme SuperHyperVertices of the connected Extreme SuperHyperBipartite  $ESHB$  : 1868  
 $(V, E)$ , in the Extreme SuperHyperModel (33.1), is the Extreme SuperHyperDominating. 1869

**Case 2: The Increasing Extreme Steps  
Toward Extreme  
SuperHyperMultipartite as Extreme  
SuperHyperModel**

1871

1872

1873

1874

**Step 4. (Extreme Solution)** In the Extreme Figure (34.1), the Extreme SuperHyperMultipartite is Extreme highlighted and Extreme featured.

1875

1876

By using the Extreme Figure (34.1) and the Table (34.1), the Extreme SuperHyperMultipartite is obtained.

1877

1878

The obtained Extreme SuperHyperSet, by the Extreme Algorithm in previous result,

1879

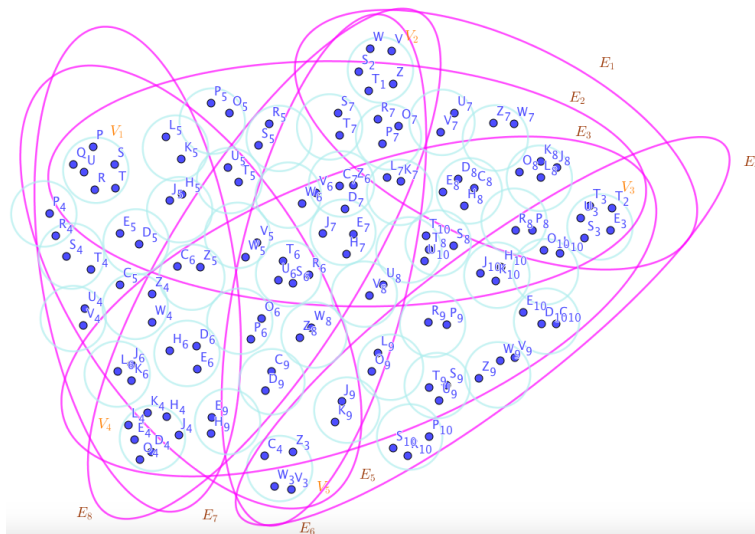


Figure 15.1: a Extreme SuperHyperMultipartite Associated to the Notions of Extreme SuperHyperDominating

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Table 15.1: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges  
 Belong to The Extreme SuperHyperMultipartite

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

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of the Extreme SuperHyperVertices of the connected Extreme SuperHyperMultipartite 1880  
*ESHM* :  $(V, E)$ , in the Extreme SuperHyperModel (34.1), is the Extreme SuperHyper- 1881  
 Dominating. 1882

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## Wondering Open Problems But As The Directions To Forming The Motivations

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1884

1885

In what follows, some “problems” and some “questions” are proposed. 1886

The SuperHyperDominating and the Extreme SuperHyperDominating are defined on a real-world application, titled “Cancer’s Recognitions”. 1887  
1888

**Question 16.0.1.** *Which the else SuperHyperModels could be defined based on Cancer’s recognitions?* 1889  
1890

**Question 16.0.2.** *Are there some SuperHyperNotions related to SuperHyperDominating and the Extreme SuperHyperDominating?* 1891  
1892

**Question 16.0.3.** *Are there some Algorithms to be defined on the SuperHyperModels to compute them?* 1893  
1894

**Question 16.0.4.** *Which the SuperHyperNotions are related to beyond the SuperHyperDominating and the Extreme SuperHyperDominating?* 1895  
1896

**Problem 16.0.5.** *The SuperHyperDominating and the Extreme SuperHyperDominating do a SuperHyperModel for the Cancer’s recognitions and they’re based on SuperHyperDominating, are there else?* 1897  
1898  
1899

**Problem 16.0.6.** *Which the fundamental SuperHyperNumbers are related to these SuperHyperNumbers types-results?* 1900  
1901

**Problem 16.0.7.** *What’s the independent research based on Cancer’s recognitions concerning the multiple types of SuperHyperNotions?* 1902  
1903



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## Conclusion and Closing Remarks

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In this section, concluding remarks and closing remarks are represented. The drawbacks of this research are illustrated. Some benefits and some advantages of this research are highlighted. This research uses some approaches to make Extreme SuperHyperGraphs more understandable. In this endeavor, two SuperHyperNotions are defined on the SuperHyperDominating. For that sake in the second definition, the main definition of the Extreme SuperHyperGraph is redefined on the position of the alphabets. Based on the new definition for the Extreme SuperHyperGraph, the new SuperHyperNotion, Extreme SuperHyperDominating, finds the convenient background to implement some results based on that. Some SuperHyperClasses and some Extreme SuperHyperClasses are the cases of this research on the modeling of the regions where are under the attacks of the cancer to recognize this disease as it's mentioned on the title "Cancer's Recognitions". To formalize the instances on the SuperHyperNotion, SuperHyperDominating, the new SuperHyperClasses and SuperHyperClasses, are introduced. Some general results are gathered in the section on the SuperHyperDominating and the Extreme SuperHyperDominating. The clarifications, instances and literature reviews have taken the whole way through. In this research, the literature reviews have fulfilled the lines containing the notions and the results. The SuperHyperGraph and Extreme SuperHyperGraph are the SuperHyperModels on the "Cancer's Recognitions" and both bases are the background of this research. Sometimes the cancer has been happened on the region, full of cells, groups of cells and embedded styles. In this segment, the SuperHyperModel proposes some SuperHyperNotions based on the connectivities of the moves of the cancer in the longest and strongest styles with the formation of the design and the architecture are formally called " SuperHyperDominating" in the themes of jargons and buzzwords. The prefix "SuperHyper" refers to the theme of the embedded styles to figure out the background for the SuperHyperNotions. In the Table (36.1), benefits and avenues for this research are, figured out, pointed out and spoken out.

Table 17.1: An Overlook On This Research And Beyond

136TBLTBL

Advantages	Limitations
1. Redefining Extreme SuperHyperGraph	1. General Results
2. SuperHyperDominating	
3. Extreme SuperHyperDominating	2. Other SuperHyperNumbers
4. Modeling of Cancer's Recognitions	
5. SuperHyperClasses	3. SuperHyperFamilies

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## ExtremeSuperHyperDuality But As The Extensions Excerpt From Dense And Super Forms

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1931

1932

1933

**Definition 18.0.1.** (Different ExtremeTypes of ExtremeSuperHyperDuality).

1934

Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an ExtremeSuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  or  $E'$  is called

1935

1936

1937

(i) **Extremee-SuperHyperDuality** if  $\forall E_i \in E', \exists E_j \in E_{ESHG:(V,E)} \setminus E'$  such that  $V_a \in E_i, E_j$ ;

1938

1939

(ii) **Extremere-SuperHyperDuality** if  $\forall E_i \in E', \exists E_j \in E_{ESHG:(V,E)} \setminus E'$  such that  $V_a \in E_i, E_j$  and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ;

1940

1941

(iii) **Extremev-SuperHyperDuality** if  $\forall V_i \in V', \exists V_j \in V_{ESHG:(V,E)} \setminus V'$  such that  $V_i, V_j \in E_a$ ;

1942

1943

(iv) **Extremerv-SuperHyperDuality** if  $\forall V_i \in V', \exists V_j \in V_{ESHG:(V,E)} \setminus V'$  such that  $V_i, V_j \in E_a$  and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ;

1944

1945

(v) **ExtremeSuperHyperDuality** if it's either of Extremee-SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and Extremerv-SuperHyperDuality.

1946

1947

**Definition 18.0.2.** ((Neutrosophic) SuperHyperDuality).

1948

Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an ExtremeSuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called

1949

1950

(i) an **Extreme SuperHyperDuality** if it's either of Extremee-SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and Extremerv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperEdges in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDuality;

1951

1952

1953

1954

1955

1956



- (ii) a **ExtremeSuperHyperDuality** if it's either of Extremee-SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and Extremerv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for a ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperDuality;
- (iii) an **Extreme SuperHyperDuality SuperHyperPolynomial** if it's either of Extremee-SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and Extremerv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDuality; and the Extreme power is corresponded to its Extreme coefficient;
- (iv) a **ExtremeSuperHyperDuality SuperHyperPolynomial** if it's either of Extremee-SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and Extremerv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperDuality; and the Extremepower is corresponded to its Extremecoefficient;
- (v) an **Extreme R-SuperHyperDuality** if it's either of Extremee-SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and Extremerv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDuality;
- (vi) a **ExtremeR-SuperHyperDuality** if it's either of Extremee-SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and Extremerv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperVertices of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperDuality;
- (vii) an **Extreme R-SuperHyperDuality SuperHyperPolynomial** if it's either of Extremee-SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and Extremerv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDuality; and the Extreme power is corresponded to its Extreme coefficient;

(viii) a **ExtremeSuperHyperDuality SuperHyperPolynomial** if it's either of Extreme-  
 SuperHyperDuality, Extremere-SuperHyperDuality, Extremev-SuperHyperDuality, and  
 Extremerv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG$  :  
 $(V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the  
 Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperVertices  
 of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyper-  
 HyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyper-  
 Duality; and the Extremepower is corresponded to its Extremecoefficient.

**Example 18.0.3.** Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$   
 in the mentioned ExtremeFigures in every Extremeitems.

- On the Figure (29.1), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality,  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward.  $E_1$  and  $E_3$  are some  
 empty Extreme SuperHyperEdges but  $E_2$  is a loop ExtremeSuperHyperEdge and  $E_4$   
 is an ExtremeSuperHyperEdge. Thus in the terms of ExtremeSuperHyperNeighbor,  
 there's only one ExtremeSuperHyperEdge, namely,  $E_4$ . The ExtremeSuperHyperVertex,  
 $V_3$  is Extremeisolated means that there's no ExtremeSuperHyperEdge has it as an  
 Extremeendpoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , **is** excluded in every given  
 ExtremeSuperHyperDuality.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.2), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality,  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward.  $E_1, E_2$  and  $E_3$  are some  
 empty ExtremeSuperHyperEdges but  $E_4$  is an ExtremeSuperHyperEdge. Thus in the terms  
 of ExtremeSuperHyperNeighbor, there's only one ExtremeSuperHyperEdge, namely,  $E_4$ .  
 The ExtremeSuperHyperVertex,  $V_3$  is Extremeisolated means that there's no ExtremeSuper-  
 rHyperEdge has it as an Extremeendpoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , **is**  
 excluded in every given ExtremeSuperHyperDuality.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.3), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality,  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.4), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, 2027  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2028

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_4, E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 15z^2.\end{aligned}$$

- On the Figure (29.5), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, 2029  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2030

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.6), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, 2031  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2032

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_{3i+1}_{i=0}^3, E_{3i+24}_{i=0}^3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 6z^8. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_{3i+1}_{i=0}^7\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 6z^8.\end{aligned}$$

- On the Figure (29.7), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, 2033  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2034

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_{15}, E_{16}, E_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= \\ &4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.8), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, 2035  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2036

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= \\ &4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.9), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2037  
2038

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_{3i+1}_{i=0}, E_{23}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 3z^5. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_{3i+1}_{i=0}, V_{15}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 3z^5.\end{aligned}$$

- On the Figure (29.10), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2039  
2040

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.11), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2041  
2042

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_1, E_3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_6, V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 3 \times 3z^2.\end{aligned}$$

- On the Figure (29.12), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2043  
2044

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1, V_{i=4}^{i \neq 5, 7, 8}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 5z^5.\end{aligned}$$

- On the Figure (29.13), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2045  
2046

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_5, E_9\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 3 \times 3z^2.\end{aligned}$$

- On the Figure (29.14), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2047  
2048

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.15), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2049  
2050

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.16), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2051  
2052

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= \\ &(2 \times 1 \times 2) + (2 \times 4 \times 5)z.\end{aligned}$$

- On the Figure (29.17), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2053  
2054

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= \\ &(1 \times 1 \times 2)z.\end{aligned}$$

- On the Figure (29.18), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2055  
2056

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= \\ &(2 \times 2 \times 2)z.\end{aligned}$$

- On the Figure (29.19), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2057  
2058

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_{3i+1_{i=0^3}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 3z^4. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_{2i+1_{i=0^5}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 2z^6.\end{aligned}$$

- On the Figure (29.20), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2059  
2060

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 10z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.21), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2061  
2062

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 10z.\end{aligned}$$

- On the Figure (29.22), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperDuality, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2063  
2064

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality}} &= \{E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperDuality SuperHyperPolynomial}} &= 4z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality}} &= \{V_3, V_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperDuality SuperHyperPolynomial}} &= 10 \times 9 + 10 \times 6 + 12 \times 9 + 12 \times 6z^2.\end{aligned}$$

The previous Extreme approach apply on the upcoming Extreme results on ExtremeSuperHyperClasses. 2065  
2066



SuperHyperEdges are attained in any solution

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$$\begin{aligned}
 &P : \\
 &V_1^{EXTERNAL}, E_1, \\
 &V_2^{EXTERNAL}, E_2, \\
 &\dots, \\
 &E_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|}, V_{\min_i |P_i^{EXTERNAL} \in P^{ESHG:(V,E)}|+1}
 \end{aligned}$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. 2079

■ 2080

136EXM22a

**Example 18.0.5.** In the Figure (30.1), the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Extreme featured. The obtained Extreme SuperHyperSet, by the Algorithm in previous Extreme result, of the Extreme SuperHyperVertices of the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , in the Extreme SuperHyperModel (30.1), is the Extreme SuperHyperDuality. 2081

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# ExtremeSuperHyperJoin But As The Extensions Excerpt From Dense And Super Forms

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**Definition 19.0.1.** (Different ExtremeTypes of ExtremeSuperHyperJoin). 2090  
 Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an 2091  
 ExtremeSuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  or  $E'$  2092  
 is called 2093

- (i) **Extremee-SuperHyperJoin** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that  $V_a \in E_i, E_j$ ; 2094  
 and  $\forall E_i, E_j \in E'$ , such that  $V_a \notin E_i, E_j$ ; 2095
- (ii) **Extremere-SuperHyperJoin** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that  $V_a \in$  2096  
 $E_i, E_j$ ;  $\forall E_i, E_j \in E'$ , such that  $V_a \notin E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} =$  2097  
 $|E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2098
- (iii) **Extremev-SuperHyperJoin** if  $\forall V_i \in E_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; 2099  
 and  $\forall V_i, V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; 2100
- (iv) **Extremerv-SuperHyperJoin** if  $\forall V_i \in E_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that 2101  
 $V_i, V_j \in E_a$ ;  $\forall V_i, V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} =$  2102  
 $|V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2103
- (v) **ExtremeSuperHyperJoin** if it's either of Extremee-SuperHyperJoin, Extremere- 2104  
 SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-SuperHyperJoin. 2105

**Definition 19.0.2.** ((Neutrosophic) SuperHyperJoin). 2106  
 Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an 2107  
 ExtremeSuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 2108

- (i) an **Extreme SuperHyperJoin** if it's either of Extremee-SuperHyperJoin, Extremere- 2109  
 SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-SuperHyperJoin and 2110  
 $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme 2111  
 cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme 2112  
 SuperHyperEdges in the consecutive Extreme sequence of Extreme SuperHyperEdges and 2113  
 Extreme SuperHyperVertices such that they form the Extreme SuperHyperJoin; 2114

- (ii) a **ExtremeSuperHyperJoin** if it's either of Extremee-SuperHyperJoin, Extremere-SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for a ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperJoin; 2115-2120
- (iii) an **Extreme SuperHyperJoin SuperHyperPolynomial** if it's either of Extremee-SuperHyperJoin, Extremere-SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperJoin; and the Extreme power is corresponded to its Extreme coefficient; 2121-2127
- (iv) a **ExtremeSuperHyperJoin SuperHyperPolynomial** if it's either of Extremee-SuperHyperJoin, Extremere-SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperJoin; and the Extremepower is corresponded to its Extremecoefficient; 2129-2136
- (v) an **Extreme R-SuperHyperJoin** if it's either of Extremee-SuperHyperJoin, Extremere-SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperJoin; 2137-2142
- (vi) a **ExtremeR-SuperHyperJoin** if it's either of Extremee-SuperHyperJoin, Extremere-SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperVertices of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperJoin; 2143-2148
- (vii) an **Extreme R-SuperHyperJoin SuperHyperPolynomial** if it's either of Extremee-SuperHyperJoin, Extremere-SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperJoin; and the Extreme power is corresponded to its Extreme coefficient; 2149-2156

(viii) a **ExtremeSuperHyperJoin SuperHyperPolynomial** if it's either of Extreme-  
SuperHyperJoin, Extremere-SuperHyperJoin, Extremev-SuperHyperJoin, and Extremerv-  
SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is  
the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the Ex-  
tremenumber of the maximum Extremecardinality of the ExtremeSuperHyperVertices of an  
ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges  
and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperJoin; and  
the Extremepower is corresponded to its Extremecoefficient.

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**Example 19.0.3.** Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$   
in the mentioned ExtremeFigures in every Extremeitems.

- On the Figure (29.1), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin,  
is up. The ExtremeAlgorithm is Neutrosophically straightforward.  $E_1$  and  $E_3$  are some  
empty Extreme SuperHyperEdges but  $E_2$  is a loop ExtremeSuperHyperEdge and  $E_4$   
is an ExtremeSuperHyperEdge. Thus in the terms of ExtremeSuperHyperNeighbor,  
there's only one ExtremeSuperHyperEdge, namely,  $E_4$ . The ExtremeSuperHyperVertex,  
 $V_3$  is Extremeisolated means that there's no ExtremeSuperHyperEdge has it as an  
Extremeendpoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , **is** excluded in every given  
ExtremeSuperHyperJoin.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.2), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin,  
is up. The ExtremeAlgorithm is Neutrosophically straightforward.  $E_1, E_2$  and  $E_3$  are some  
empty ExtremeSuperHyperEdges but  $E_4$  is an ExtremeSuperHyperEdge. Thus in the terms  
of ExtremeSuperHyperNeighbor, there's only one ExtremeSuperHyperEdge, namely,  $E_4$ .  
The ExtremeSuperHyperVertex,  $V_3$  is Extremeisolated means that there's no ExtremeSuper-  
rHyperEdge has it as an Extremeendpoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , **is**  
excluded in every given ExtremeSuperHyperJoin.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.3), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, is  
up. The ExtremeAlgorithm is Neutrosophically straightforward.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.4), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, is 2184  
 up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2185

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_4, E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 15z^2.\end{aligned}$$

- On the Figure (29.5), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, is 2186  
 up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2187

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.6), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, is 2188  
 up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2189

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_{3i+1_{i=0}^3}, E_{3i+24_{i=0}^3}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= 6z^8. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_{3i+1_{i=0}^7}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 6z^8.\end{aligned}$$

- On the Figure (29.7), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, is 2190  
 up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2191

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_{15}, E_{16}, E_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= \\ &4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.8), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, is 2192  
 up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2193

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= \\ &4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.9), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, is 2194  
is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2195

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_{3i+1}_{i=0}, E_{23}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= 3z^5. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_{3i+1}_{i=0}, V_{15}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 3z^5.\end{aligned}$$

- On the Figure (29.10), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2196  
is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2197

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= \\ &4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.11), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2198  
is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2199

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_1, E_3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_6, V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= \\ &3 \times 3z^2.\end{aligned}$$

- On the Figure (29.12), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2200  
is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2201

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_1, V_{i=4}^{i \neq 5,7,8}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 5z^5.\end{aligned}$$

- On the Figure (29.13), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2202  
is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2203

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_3, E_9\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= \\ &3 \times 3z^2.\end{aligned}$$

- On the Figure (29.14), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2204  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2205

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} \text{ SuperHyperPolynomial} &= 2z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} \text{ SuperHyperPolynomial} &= z.\end{aligned}$$

- On the Figure (29.15), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2206  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2207

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} \text{ SuperHyperPolynomial} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} \text{ SuperHyperPolynomial} &= z.\end{aligned}$$

- On the Figure (29.16), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2208  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2209

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} \text{ SuperHyperPolynomial} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} \text{ SuperHyperPolynomial} &= \\ (1 \times 5 \times 5) + (1 \times 2 + 1)z^3.\end{aligned}$$

- On the Figure (29.17), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2210  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2211

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} \text{ SuperHyperPolynomial} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_{27}, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} \text{ SuperHyperPolynomial} &= \\ (1 \times 1 \times 2 + 1)z^4.\end{aligned}$$

- On the Figure (29.18), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2212  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2213

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} \text{ SuperHyperPolynomial} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_{27}, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} \text{ SuperHyperPolynomial} &= \\ (1 \times 1 \times 2 + 1)z^4.\end{aligned}$$

- On the Figure (29.19), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2214  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2215

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_{3i+1_{i=0^3}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= 3z^4. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_{2i+1_{i=0^5}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 2z^6.\end{aligned}$$

- On the Figure (29.20), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2216  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2217

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= 10z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.21), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2218  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2219

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 10z.\end{aligned}$$

- On the Figure (29.22), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperJoin, 2220  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2221

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin}} &= \{E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperJoin SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin}} &= \{V_3, V_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperJoin SuperHyperPolynomial}} &= 10 \times 6 + 10 \times 6 + 12 \times 6 + 12 \times 6z^2.\end{aligned}$$

The previous Extreme approach apply on the upcoming Extreme results on ExtremeSuperHyperClasses. 2222  
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**Proposition 19.0.4.** Assume a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . Then 2224

$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperJoin}} \\
 & = (PERFECT MATCHING). \\
 & \{E_i \in E_{P_i^{ESHG:(V,E)}}, \\
 & \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperJoin}} \\
 & = (OTHERWISE). \\
 & \{\}, \\
 & \text{If } \exists P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \neq \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|. \\
 & \mathcal{C}(NSHG)_{\text{Extreme SuperHyperJoin SuperHyperPolynomial}} \\
 & = (PERFECT MATCHING). \\
 & = \left( \sum_{i=|P^{ESHG:(V,E)}|} (\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|) \text{choose } |P_i^{ESHG:(V,E)}| \right) \\
 & z_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 & = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme SuperHyperJoin SuperHyperPolynomial}} \\
 & = (OTHERWISE)0. \\
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperJoin}} \\
 & = \{V_i^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_j^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperJoin SuperHyperPolynomial}} \\
 & = \sum_{|V_{ESHG:(V,E)}^{EXTERNAL}|_{\text{Extreme Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let

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$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2, \\
 & \dots, \\
 & E_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|, V_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|+1}^{EXTERNAL}}
 \end{aligned}$$

is a longest SuperHyperJoin taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . There's a new way to redefine as 2226

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$$\begin{aligned}
 & V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.
 \end{aligned}$$

The term “EXTERNAL” implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperJoin. The latter is straightforward. Then there's no at least one SuperHyperJoin. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperJoin could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

$$\begin{aligned}
 &P : \\
 &V_1^{EXTERNAL}, E_1, \\
 &V_2^{EXTERNAL}, E_2, \\
 &\dots, \\
 &E_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|}, V_{\min_i |P_i^{EXTERNAL} \in PESHG:(V,E)|+1}^{EXTERNAL}
 \end{aligned}$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$$\begin{aligned}
 &P : \\
 &V_1^{EXTERNAL}, E_1, \\
 &V_2^{EXTERNAL}, E_2, \\
 &\dots, \\
 &E_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|}, V_{\min_i |P_i^{EXTERNAL} \in PESHG:(V,E)|+1}^{EXTERNAL}
 \end{aligned}$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. ■

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**Example 19.0.5.** In the Figure (30.1), the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Extreme featured. The obtained Extreme SuperHyperSet, by the Algorithm in previous Extreme result, of the Extreme SuperHyperVertices of the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , in the Extreme SuperHyperModel (30.1), is the Extreme SuperHyperJoin.



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## ExtremeSuperHyperPerfect But As The Extensions Excerpt From Dense And Super Forms

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**Definition 20.0.1.** (Different ExtremeTypes of ExtremeSuperHyperPerfect). 2247  
 Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an 2248  
 ExtremeSuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  or  $E'$  2249  
 is called 2250

(i) **Extremee-SuperHyperPerfect** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists! E_j \in E'$ , such that 2251  
 $V_a \in E_i, E_j$ ; 2252

(ii) **Extremere-SuperHyperPerfect** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists! E_j \in E'$ , such that 2253  
 $V_a \in E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2254

(iii) **Extremev-SuperHyperPerfect** if  $\forall V_i \in V_{ESHG:(V,E)} \setminus V', \exists! V_j \in V'$ , such that 2255  
 $V_i, V_j \in E_a$ ; 2256

(iv) **Extremerv-SuperHyperPerfect** if  $\forall V_i \in V_{ESHG:(V,E)} \setminus V', \exists! V_j \in V'$ , such that 2257  
 $V_i, V_j \in E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2258

(v) **ExtremeSuperHyperPerfect** if it's either of Extremee-SuperHyperPerfect, Extremere- 2259  
 SuperHyperPerfect, Extremev-SuperHyperPerfect, and Extremerv-SuperHyperPerfect. 2260

**Definition 20.0.2.** ((Neutrosophic) SuperHyperPerfect). 2261  
 Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an 2262  
 ExtremeSuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 2263

(i) an **Extreme SuperHyperPerfect** if it's either of Extremee-SuperHyperPerfect, 2264  
 Extremere-SuperHyperPerfect, Extremev-SuperHyperPerfect, and Extremerv-SuperHyperPerfect 2265  
 and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme 2266  
 cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme 2267  
 SuperHyperEdges in the consecutive Extreme sequence of Extreme SuperHyperEdges and 2268  
 Extreme SuperHyperVertices such that they form the Extreme SuperHyperPerfect; 2269

- (ii) a **ExtremeSuperHyperPerfect** if it's either of Extremee-SuperHyperPerfect, Extremere-SuperHyperPerfect, Extremev-SuperHyperPerfect, and Extremerv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for a ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperPerfect; 2270-2275
- (iii) an **Extreme SuperHyperPerfect SuperHyperPolynomial** if it's either of Extremee-SuperHyperPerfect, Extremere-SuperHyperPerfect, Extremev-SuperHyperPerfect, and Extremerv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperPerfect; and the Extreme power is corresponded to its Extreme coefficient; 2276-2283
- (iv) a **ExtremeSuperHyperPerfect SuperHyperPolynomial** if it's either of Extremee-SuperHyperPerfect, Extremere-SuperHyperPerfect, Extremev-SuperHyperPerfect, and Extremerv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperPerfect; and the Extremepower is corresponded to its Extremecoefficient; 2284-2291
- (v) an **Extreme R-SuperHyperPerfect** if it's either of Extremee-SuperHyperPerfect, Extremere-SuperHyperPerfect, Extremev-SuperHyperPerfect, and Extremerv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperPerfect; 2292-2297
- (vi) a **ExtremeR-SuperHyperPerfect** if it's either of Extremee-SuperHyperPerfect, Extremere-SuperHyperPerfect, Extremev-SuperHyperPerfect, and Extremerv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperVertices of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperPerfect; 2298-2303
- (vii) an **Extreme R-SuperHyperPerfect SuperHyperPolynomial** if it's either of Extremee-SuperHyperPerfect, Extremere-SuperHyperPerfect, Extremev-SuperHyperPerfect, and Extremerv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperPerfect; and the Extreme power is corresponded to its Extreme coefficient; 2304-2312

(viii) a **ExtremeSuperHyperPerfect SuperHyperPolynomial** if it's either of Extreme-  
 SuperHyperPerfect, Extremere-SuperHyperPerfect, Extremev-SuperHyperPerfect, and  
 Extremerv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG$  :  
 $(V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the  
 Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperVertices  
 of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyper-  
 hyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyper-  
 Perfect; and the Extremepower is corresponded to its Extremecoefficient.

**Example 20.0.3.** Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$   
 in the mentioned ExtremeFigures in every Extremeitems.

- On the Figure (29.1), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect,  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward.  $E_1$  and  $E_3$  are some  
 empty Extreme SuperHyperEdges but  $E_2$  is a loop ExtremeSuperHyperEdge and  $E_4$   
 is an ExtremeSuperHyperEdge. Thus in the terms of ExtremeSuperHyperNeighbor,  
 there's only one ExtremeSuperHyperEdge, namely,  $E_4$ . The ExtremeSuperHyperVertex,  
 $V_3$  is Extremeisolated means that there's no ExtremeSuperHyperEdge has it as an  
 Extremeendpoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , **is** excluded in every given  
 ExtremeSuperHyperPerfect.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.2), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect,  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward.  $E_1, E_2$  and  $E_3$  are some  
 empty ExtremeSuperHyperEdges but  $E_4$  is an ExtremeSuperHyperEdge. Thus in the terms  
 of ExtremeSuperHyperNeighbor, there's only one ExtremeSuperHyperEdge, namely,  $E_4$ .  
 The ExtremeSuperHyperVertex,  $V_3$  is Extremeisolated means that there's no ExtremeSuper-  
 rHyperEdge has it as an Extremeendpoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , **is**  
 excluded in every given ExtremeSuperHyperPerfect.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.3), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect,  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= 3z. \end{aligned}$$

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- On the Figure (29.4), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2340  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2341

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_4, E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= 15z^2.\end{aligned}$$

- On the Figure (29.5), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2342  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2343

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.6), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2344  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2345

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_{3i+1_{i=0}^3}, E_{3i+24_{i=0}^3}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 6z^8. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_{3i+1_{i=0}^7}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= 6z^8.\end{aligned}$$

- On the Figure (29.7), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2346  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2347

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_{15}, E_{16}, E_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_3, V_6, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &3 \times 4 \times 4z^3.\end{aligned}$$

- On the Figure (29.8), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2348  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2349

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_3, V_6, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &3 \times 4 \times 4z^3.\end{aligned}$$

- On the Figure (29.9), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2350  
2351

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperPerfect}} &= \{E_{3i+1_{i=0}^3}, E_{23}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperPerfect SuperHyperPolynomial}} &= 3z^5. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect}} &= \{V_{3i+1_{i=0}^3}, V_{15}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= 3z^5. \end{aligned}$$

- On the Figure (29.10), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2352  
2353

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_3, V_6, V_8\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &3 \times 4 \times 4z^3. \end{aligned}$$

- On the Figure (29.11), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2354  
2355

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_1, E_3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_6, V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &3 \times 2z^2. \end{aligned}$$

- On the Figure (29.12), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2356  
2357

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_1, V_{i=4}^{i \neq 5,7,8}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= 5z^5. \end{aligned}$$

- On the Figure (29.13), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2358  
2359

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_3, E_9\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &3 \times 3z^2. \end{aligned}$$



- On the Figure (29.14), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2360  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2361

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.15), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2362  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2363

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.16), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2364  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2365

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect}} &= \{V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &(1 \times 5 \times 5) + (1 \times 2 + 1)z^3.\end{aligned}$$

- On the Figure (29.17), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2366  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2367

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect}} &= \{V_{27}, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &(1 \times 1 \times 2 + 1)z^4.\end{aligned}$$

- On the Figure (29.18), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, 2368  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2369

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect}} &= \{V_{27}, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &(1 \times 1 \times 2 + 1)z^4.\end{aligned}$$

- On the Figure (29.19), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2370  
2371

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_{3i+1_{i=0^3}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 3z^4. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect}} &= \{V_{2i+1_{i=0^5}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= 2z^6.\end{aligned}$$

- On the Figure (29.20), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2372  
2373

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 10z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.21), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2374  
2375

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperPerfect SuperHyperPolynomial}} &= 10z.\end{aligned}$$

- On the Figure (29.22), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperPerfect, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2376  
2377

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperPerfect SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect}} &= \{V_3, V_6\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= 10 \times 6 + 10 \times 6 + 12 \times 6 + 12 \times 6z^2.\end{aligned}$$

The previous Extreme approach apply on the upcoming Extreme results on ExtremeSuperHyperClasses. 2378  
2379

**Proposition 20.0.4.** Assume a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . Then 2380

$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperPerfect}} \\
 &= (PERFECT MATCHING). \\
 & \{E_i \in E_{P_i^{ESHG:(V,E)}}, \\
 & \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperPerfect}} \\
 &= (OTHERWISE). \\
 & \{\}, \\
 & \text{If } \exists P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \neq \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|. \\
 & \mathcal{C}(NSHG)_{\text{Extreme SuperHyperPerfect SuperHyperPolynomial}} \\
 &= (PERFECT MATCHING). \\
 &= \left( \sum_{i=|P^{ESHG:(V,E)}|} (\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|) \text{choose } |P_i^{ESHG:(V,E)}| \right) \\
 & \quad z_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme SuperHyperPerfect SuperHyperPolynomial}} \\
 &= (OTHERWISE)0. \\
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperPerfect}} \\
 &= \{V_i^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_j^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperPerfect SuperHyperPolynomial}} \\
 &= \sum_{|V_{ESHG:(V,E)}^{EXTERNAL}|_{\text{Extreme Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let

2381

$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2, \\
 & \dots, \\
 & E_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|}, V_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|+1}^{EXTERNAL}
 \end{aligned}$$

is a longest SuperHyperPerfect taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . There's a new way to redefine as 2382

2383

$$\begin{aligned}
 & V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.
 \end{aligned}$$

The term “EXTERNAL” implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperPerfect. The latter is straightforward. Then there’s no at least one SuperHyperPerfect. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperPerfect could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

$$\begin{aligned}
 &P : \\
 &V_1^{EXTERNAL}, E_1, \\
 &V_2^{EXTERNAL}, E_2, \\
 &\dots, \\
 &E_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|}, V_{\min_i |P_i^{EXTERNAL} \in PESHG:(V,E)|+1}
 \end{aligned}$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$$\begin{aligned}
 &P : \\
 &V_1^{EXTERNAL}, E_1, \\
 &V_2^{EXTERNAL}, E_2, \\
 &\dots, \\
 &E_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|}, V_{\min_i |P_i^{EXTERNAL} \in PESHG:(V,E)|+1}
 \end{aligned}$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. ■

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**Example 20.0.5.** In the Figure (30.1), the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Extreme featured. The obtained Extreme SuperHyperSet, by the Algorithm in previous Extreme result, of the Extreme SuperHyperVertices of the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , in the Extreme SuperHyperModel (30.1), is the Extreme SuperHyperPerfect.



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# ExtremeSuperHyperTotal But As The Extensions Excerpt From Dense And Super Forms

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**Definition 21.0.1.** (Different ExtremeTypes of ExtremeSuperHyperTotal). 2403

Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an 2404

ExtremeSuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  or  $E'$  2405

is called 2406

(i) **Extremee-SuperHyperTotal** if  $\forall E_i \in E_{ESHG:(V,E)}, \exists! E_j \in E'$ , such that  $V_a \in E_i, E_j$ ; 2407

(ii) **Extremere-SuperHyperTotal** if  $\forall E_i \in E_{ESHG:(V,E)}, \exists! E_j \in E'$ , such that  $V_a \in E_i, E_j$ ; 2408

and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2409

(iii) **Extremev-SuperHyperTotal** if  $\forall V_i \in V_{ESHG:(V,E)}, \exists! V_j \in V'$ , such that  $V_i, V_j \in E_a$ ; 2410

(iv) **Extremerv-SuperHyperTotal** if  $\forall V_i \in V_{ESHG:(V,E)}, \exists! V_j \in V'$ , such that  $V_i, V_j \in E_a$ ; 2411

and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2412

(v) **ExtremeSuperHyperTotal** if it's either of Extremee-SuperHyperTotal, Extremere- 2413

SuperHyperTotal, Extremev-SuperHyperTotal, and Extremerv-SuperHyperTotal. 2414

**Definition 21.0.2.** ((Neutrosophic) SuperHyperTotal). 2415

Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an 2416

ExtremeSuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 2417

(i) an **Extreme SuperHyperTotal** if it's either of Extremee-SuperHyperTotal, Extremere- 2418

SuperHyperTotal, Extremev-SuperHyperTotal, and Extremerv-SuperHyperTotal and 2419

$\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme 2420

cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme 2421

SuperHyperEdges in the consecutive Extreme sequence of Extreme SuperHyperEdges and 2422

Extreme SuperHyperVertices such that they form the Extreme SuperHyperTotal; 2423

(ii) a **ExtremeSuperHyperTotal** if it's either of Extremee-SuperHyperTotal, Extremere- 2424

SuperHyperTotal, Extremev-SuperHyperTotal, and Extremerv-SuperHyperTotal and 2425

- $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperTotal; 2426-2429
- (iii) an **Extreme SuperHyperTotal SuperHyperPolynomial** if it's either of Extremee-SuperHyperTotal, Extremere-SuperHyperTotal, Extremev-SuperHyperTotal, and Extremerv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperTotal; and the Extreme power is corresponded to its Extreme coefficient; 2430-2437
- (iv) a **ExtremeSuperHyperTotal SuperHyperPolynomial** if it's either of Extremee-SuperHyperTotal, Extremere-SuperHyperTotal, Extremev-SuperHyperTotal, and Extremerv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperTotal; and the Extremepower is corresponded to its Extremecoefficient; 2438-2445
- (v) an **Extreme R-SuperHyperTotal** if it's either of Extremee-SuperHyperTotal, Extremere-SuperHyperTotal, Extremev-SuperHyperTotal, and Extremerv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperTotal; 2446-2453
- (vi) a **ExtremeR-SuperHyperTotal** if it's either of Extremee-SuperHyperTotal, Extremere-SuperHyperTotal, Extremev-SuperHyperTotal, and Extremerv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperVertices of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperTotal; 2454-2457
- (vii) an **Extreme R-SuperHyperTotal SuperHyperPolynomial** if it's either of Extremee-SuperHyperTotal, Extremere-SuperHyperTotal, Extremev-SuperHyperTotal, and Extremerv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperTotal; and the Extreme power is corresponded to its Extreme coefficient; 2458-2465
- (viii) a **ExtremeSuperHyperTotal SuperHyperPolynomial** if it's either of Extremee-SuperHyperTotal, Extremere-SuperHyperTotal, Extremev-SuperHyperTotal, and 2467-2468

Extremerv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperVertices of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperTotal; and the Extremepower is corresponded to its Extremecoefficient.

**Example 21.0.3.** Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$  in the mentioned ExtremeFigures in every Extremeitems.

- On the Figure (29.1), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, is up. The ExtremeAlgorithm is Neutrosophically straightforward.  $E_1$  and  $E_3$  are some empty Extreme SuperHyperEdges but  $E_2$  is a loop ExtremeSuperHyperEdge and  $E_4$  is an ExtremeSuperHyperEdge. Thus in the terms of ExtremeSuperHyperNeighbor, there's only one ExtremeSuperHyperEdge, namely,  $E_4$ . The ExtremeSuperHyperVertex,  $V_3$  is Extremeisolated means that there's no ExtremeSuperHyperEdge has it as an Extremepoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , **is** excluded in every given ExtremeSuperHyperTotal.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.2), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, is up. The ExtremeAlgorithm is Neutrosophically straightforward.  $E_1, E_2$  and  $E_3$  are some empty ExtremeSuperHyperEdges but  $E_4$  is an ExtremeSuperHyperEdge. Thus in the terms of ExtremeSuperHyperNeighbor, there's only one ExtremeSuperHyperEdge, namely,  $E_4$ . The ExtremeSuperHyperVertex,  $V_3$  is Extremeisolated means that there's no ExtremeSuperHyperEdge has it as an Extremepoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , **is** excluded in every given ExtremeSuperHyperTotal.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.3), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, is up. The ExtremeAlgorithm is Neutrosophically straightforward.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 3z.\end{aligned}$$

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- On the Figure (29.4), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2494  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2495

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeQuasi-}} &= \{E_4, E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 15z^2. \end{aligned}$$

- On the Figure (29.5), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2496  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2497

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperTotal SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.6), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2498  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2499

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperTotal}} &= \{E_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperTotal SuperHyperPolynomial}} &= 20z^{10}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperTotal}} &= \{V_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperTotal SuperHyperPolynomial}} &= 20z^{10}. \end{aligned}$$

- On the Figure (29.7), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2500  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2501

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_{12}, E_{13}, E_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_{12}, V_{13}, V_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= z^3. \end{aligned}$$

- On the Figure (29.8), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2502  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2503

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_{12}, V_{13}, V_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ &3 \times 4 \times 4z^3. \end{aligned}$$

- On the Figure (29.9), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2504  
 is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2505

$$\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperTotal}} = \{E_{i+1}_{i=0}^9\}.$$

$$\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperTotal SuperHyperPolynomial}} = 10z^{10}.$$

$$\mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperTotal}} = \{V_{i+1}_{i=0}^9\}.$$

$$\mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperTotal SuperHyperPolynomial}} = 20z^{10}.$$

- On the Figure (29.10), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2506  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2507

$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal}} = \{E_5\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal SuperHyperPolynomial}} = z.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} = \{V_{12}, V_{13}, V_{14}\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} = 3 \times 4 \times 4z^3.$$

- On the Figure (29.11), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2508  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2509

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} = \{E_1, E_6, E_7, E_8\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} = 2z^4.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} = \{V_1, V_5\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} = 3z^2.$$

- On the Figure (29.12), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2510  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2511

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} = \{E_1, E_2\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} = 5z^2.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} = \{V_1, V_{i=1}^{i \neq 4,5,6}\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} = z^5.$$

- On the Figure (29.13), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2512  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2513

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} = \{E_3, E_9, E_6\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} = 3z^3.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} = \{V_1, V_5\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} = 3z^2.$$

- On the Figure (29.14), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2514  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2515

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} = \{E_1, E_2\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} = z^2.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} = \{V_1, V_3\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} = 2z^2.$$

- On the Figure (29.15), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2516  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2517

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_2, V_3, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= z^3.\end{aligned}$$

- On the Figure (29.16), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2518  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2519

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ &4 \times 3z^3.\end{aligned}$$

- On the Figure (29.17), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2520  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2521

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ &4 \times 3z^4.\end{aligned}$$

- On the Figure (29.18), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2522  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2523

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ &2 \times 4 \times 3z^4.\end{aligned}$$

- On the Figure (29.19), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, 2524  
 is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2525

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperTotal}} &= \{E_{i+2_{i=011}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperTotal SuperHyperPolynomial}} &= 11z^{10}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal}} &= \{V_{i+2_{i=011}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 11z^{10}.\end{aligned}$$

- On the Figure (29.20), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2526  
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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_6, E_{10}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= 9z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= (|V| - 1)z^2. \end{aligned}$$

- On the Figure (29.21), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2528  
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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperTotal}} &= \{E_1, E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperTotal SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperTotal}} &= \{V_1, V_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperTotal SuperHyperPolynomial}} &= 9z^2. \end{aligned}$$

- On the Figure (29.22), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperTotal, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2530  
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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperTotal}} &= \{V_3, V_{10}, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 3 \times 6z^3. \end{aligned}$$

The previous Extreme approach apply on the upcoming Extreme results on ExtremeSuperHyperClasses. 2532  
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**Proposition 21.0.4.** Assume a connected Extreme SuperHyperMultipartite ESHM : (V, E). Then 2534

$$\begin{aligned} &\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} \\ &= \{E_a \in E_{P_i^{ESHG:(V,E)}}, \\ &\quad \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\ &\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} \\ &\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} \\ &= z^{\min |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\ &\text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\ &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\ &\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} \\ &= \{V_a^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_b^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \end{aligned}$$

$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal SuperHyperPolynomial}}$$

$$= \sum_{\substack{|V_i^{EXTERNAL}| \\ ESHG:(V,E) \text{ Extreme Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.$$

*Proof.* Let

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$$P : \\ V_1^{EXTERNAL}, E_1, \\ V_2^{EXTERNAL}, E_2$$

is a longest SuperHyperTotal taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . There's a new way to redefine as

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$$V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\ \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\ \exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.$$

The term "EXTERNAL" implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperTotal. The latter is straightforward. Then there's no at least one SuperHyperTotal. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperTotal could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

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$$P : \\ V_1^{EXTERNAL}, E_1, \\ V_2^{EXTERNAL}, E_2$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

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$$P : \\ V_1^{EXTERNAL}, E_1, \\ V_2^{EXTERNAL}, E_2$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. ■

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**Example 21.0.5.** In the Figure (30.1), the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Extreme featured. The obtained Extreme SuperHyperSet, by the Algorithm in previous Extreme result, of the Extreme SuperHyperVertices of the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , in the Extreme SuperHyperModel (30.1), is the Extreme SuperHyperTotal.

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# ExtremeSuperHyperConnected But As The Extensions Excerpt From Dense And Super Forms

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**Definition 22.0.1.** (Different ExtremeTypes of ExtremeSuperHyperConnected). 2557  
 Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an 2558  
 ExtremeSuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  or  $E'$  2559  
 is called 2560

- (i) **Extremee-SuperHyperConnected** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that 2561  
 $V_a \in E_i, E_j$ ; and  $\forall E_i, E_j \in E'$ , such that  $V_a \notin E_i, E_j$ ; 2562
- (ii) **Extremere-SuperHyperConnected** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that 2563  
 $V_a \in E_i, E_j$ ;  $\forall E_i, E_j \in E'$ , such that  $V_a \notin E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} =$  2564  
 $|E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2565
- (iii) **Extremev-SuperHyperConnected** if  $\forall V_i \in E_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that 2566  
 $V_i, V_j \notin E_a$ ; and  $\forall V_i, V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; 2567
- (iv) **Extremerv-SuperHyperConnected** if  $\forall V_i \in E_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that 2568  
 $V_i, V_j \in E_a$ ;  $\forall V_i, V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} =$  2569  
 $|V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2570
- (v) **ExtremeSuperHyperConnected** if it's either of Extremee-SuperHyperConnected, 2571  
 Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv- 2572  
 SuperHyperConnected. 2573

**Definition 22.0.2.** ((Neutrosophic) SuperHyperConnected). 2574  
 Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider an 2575  
 ExtremeSuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 2576

- (i) an **Extreme SuperHyperConnected** if it's either of Extremee-SuperHyperConnected, 2577  
 Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv- 2578  
 SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  2579  
 is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme 2580

- cardinality of the Extreme SuperHyperEdges in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperConnected; 2581-2583
- (ii) a **ExtremeSuperHyperConnected** if it's either of Extreme-SuperHyperConnected, Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for a ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperConnected; 2584-2589
- (iii) an **Extreme SuperHyperConnected SuperHyperPolynomial** if it's either of Extreme-SuperHyperConnected, Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extremecardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperConnected; and the Extreme power is corresponded to its Extreme coefficient; 2590-2598
- (iv) a **ExtremeSuperHyperConnected SuperHyperPolynomial** if it's either of Extreme-SuperHyperConnected, Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperEdges of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperConnected; and the Extremepower is corresponded to its Extremecoefficient; 2599-2607
- (v) an **Extreme R-SuperHyperConnected** if it's either of Extreme-SuperHyperConnected, Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperConnected; 2608-2614
- (vi) a **ExtremeR-SuperHyperConnected** if it's either of Extreme-SuperHyperConnected, Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the maximum Extremecardinality of the ExtremeSuperHyperVertices of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperConnected; 2615-2620
- (vii) an **Extreme R-SuperHyperConnected SuperHyperPolynomial** if it's either of Extreme-SuperHyperConnected, Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an 2621-2623



Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperConnected; and the Extreme power is corresponded to its Extreme coefficient;

- (viii) a **ExtremeSuperHyperConnected SuperHyperPolynomial** if it's either of Extreme-SuperHyperConnected, Extremere-SuperHyperConnected, Extremev-SuperHyperConnected, and Extremerv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an ExtremeSuperHyperGraph  $NSHG : (V, E)$  is the ExtremeSuperHyperPolynomial contains the Extremecoefficients defined as the Extremenumber of the maximum Extremecardinality of the ExtremeSuperHyperVertices of an ExtremeSuperHyperSet  $S$  of high Extremecardinality consecutive ExtremeSuperHyperEdges and ExtremeSuperHyperVertices such that they form the ExtremeSuperHyperConnected; and the Extremepower is corresponded to its Extremecoefficient.

**Example 22.0.3.** Assume an ExtremeSuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$  in the mentioned ExtremeFigures in every Extremeitems.

- On the Figure (29.1), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward.  $E_1$  and  $E_3$  are some empty Extreme SuperHyperEdges but  $E_2$  is a loop ExtremeSuperHyperEdge and  $E_4$  is an ExtremeSuperHyperEdge. Thus in the terms of ExtremeSuperHyperNeighbor, there's only one ExtremeSuperHyperEdge, namely,  $E_4$ . The ExtremeSuperHyperVertex,  $V_3$  is Extremeisolated means that there's no ExtremeSuperHyperEdge has it as an Extremeendpoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , is excluded in every given ExtremeSuperHyperConnected.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.2), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward.  $E_1, E_2$  and  $E_3$  are some empty ExtremeSuperHyperEdges but  $E_4$  is an ExtremeSuperHyperEdge. Thus in the terms of ExtremeSuperHyperNeighbor, there's only one ExtremeSuperHyperEdge, namely,  $E_4$ . The ExtremeSuperHyperVertex,  $V_3$  is Extremeisolated means that there's no ExtremeSuperHyperEdge has it as an Extremeendpoint. Thus the ExtremeSuperHyperVertex,  $V_3$ , is excluded in every given ExtremeSuperHyperConnected.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected SuperHyperPolynomial}} &= 3z. \end{aligned}$$



- On the Figure (29.3), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2656  
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$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.4), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2658  
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$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected}} &= \{E_1, E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperConnected}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 15z^2.\end{aligned}$$

- On the Figure (29.5), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2660  
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$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.6), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2662  
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$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperConnected}} &= \{E_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperConnected SuperHyperPolynomial}} &= 20z^{10}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperConnected}} &= \{V_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 20z^{10}.\end{aligned}$$

- On the Figure (29.7), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2664  
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$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_{12}, E_{13}, E_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_{12}, V_{13}, V_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= z^3.\end{aligned}$$

- On the Figure (29.8), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2666  
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$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} = \{E_4\}.$$

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_{12}, V_{13}, V_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= \\ 3 \times 4 \times 4z^3.\end{aligned}$$

- On the Figure (29.9), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2668  
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$$\begin{aligned}\mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperConnected}} &= \{E_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperConnected SuperHyperPolynomial}} &= 10z^{10}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected}} &= \{V_{i+1}_{i=11}^{19}, V_{22}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected SuperHyperPolynomial}} &= 20z^{10}.\end{aligned}$$

- On the Figure (29.10), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2670  
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$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_{12}, V_{13}, V_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= \\ 3 \times 4 \times 4z^3.\end{aligned}$$

- On the Figure (29.11), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2672  
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$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_1, E_6, E_7, E_8\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 2z^4. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_1, V_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 3z^2.\end{aligned}$$

- On the Figure (29.12), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2674  
2675

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_1, E_2\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= 5z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_1, V_{i=1}^{i \neq 4,5,6}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^5.\end{aligned}$$

- On the Figure (29.13), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperConnected, is up. The ExtremeAlgorithm is Neutrosophically straightforward. 2676  
2677

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_3, E_9, E_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 3z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_1, V_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= 3z^2.\end{aligned}$$

- On the Figure (29.14), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2678  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2679

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.15), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2680  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2681

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_2, V_3, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^3.\end{aligned}$$

- On the Figure (29.16), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2682  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2683

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= \\ &4 \times 3z^3.\end{aligned}$$

- On the Figure (29.17), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2684  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2685

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= \\ &4 \times 3z^4.\end{aligned}$$

- On the Figure (29.18), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2686  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2687

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= \\ &2 \times 4 \times 3z^4.\end{aligned}$$

- On the Figure (29.19), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2688  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2689

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperConnected}} &= \{E_{i+2_{i=011}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeQuasi-SuperHyperConnected SuperHyperPolynomial}} &= 11z^{10}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperConnected}} &= \{V_{i+2_{i=011}}\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 11z^{10}. \end{aligned}$$

- On the Figure (29.20), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2690  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2691

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= 10z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.21), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2692  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2693

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeSuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{ExtremeR-SuperHyperConnected SuperHyperPolynomial}} &= 10z. \end{aligned}$$

- On the Figure (29.22), the ExtremeSuperHyperNotion, namely, ExtremeSuperHyperCon- 2694  
 nected, is up. The ExtremeAlgorithm is Neutrosophicly straightforward. 2695

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_3, V_{10}, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 3 \times 6z^3. \end{aligned}$$

The previous Extreme approach apply on the upcoming Extreme results on ExtremeSuperHy- 2696  
 perClasses. 2697

**Proposition 22.0.4.** Assume a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . Then 2698

$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} \\
 &= \{E_a \in E_{P_i^{ESHG:(V,E)}}, \\
 & \quad \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} \\
 &= z^{\min_{|P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}}} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperConnected}} \\
 &= \{V_a^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_b^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperConnected SuperHyperPolynomial}} \\
 &= \sum_{\substack{|V_{ESHG:(V,E)}^{EXTERNAL}| \\ \text{Extreme Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let

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$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest SuperHyperConnected taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . There's a new way to redefine as 2700  
 2701

$$\begin{aligned}
 & V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.
 \end{aligned}$$

The term "EXTERNAL" implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperConnected. The latter is straightforward. Then there's no at least one SuperHyperConnected. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperConnected could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$$P :$$

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$$V_1^{EXTERNAL}, E_1,$$
$$V_2^{EXTERNAL}, E_2$$

is a longest path taken from a connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ . The 2711  
latter is straightforward. ■ 2712

136EXM22a

**Example 22.0.5.** In the Figure (30.1), the connected Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Extreme featured. The obtained Extreme SuperHyperSet, by the 2713  
Algorithm in previous Extreme result, of the Extreme SuperHyperVertices of the connected 2714  
Extreme SuperHyperMultipartite  $ESHM : (V, E)$ , in the Extreme SuperHyperModel (30.1), is 2715  
the Extreme SuperHyperConnected. 2716  
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CHAPTER 24

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<b>New Ideas In Cancer's Recognition And</b>	2888
<b>Neutrosophic SuperHyperGraph By</b>	2889
<b>SuperHyperDominating As Hyper Closing</b>	2890
<b>On Super Messy</b>	2891

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ABSTRACT

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In this scientific research, (Different Neutrosophic Types of Neutrosophic SuperHyperDominating). 2894  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 2895  
 Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  2896  
 or  $E'$  is called Neutrosophic e-SuperHyperDominating if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such 2897  
 that  $V_a \in E_i, E_j$ ; Neutrosophic re-SuperHyperDominating if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , 2898  
 such that  $V_a \in E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 2899  
 Neutrosophic v-SuperHyperDominating if  $\forall V_i \in V_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that  $V_i, V_j \in E_a$ ; 2900  
 and Neutrosophic rv-SuperHyperDominating if  $\forall V_i \in V_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that 2901  
 $V_i, V_j \in E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; Neutro- 2902  
 sophic SuperHyperDominating if it's either of Neutrosophic e-SuperHyperDominating, Neutro- 2903  
 sophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv- 2904  
 SuperHyperDominating. ((Neutrosophic) SuperHyperDominating). Assume a Neutrosophic Super- 2905  
 rHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a Neutrosophic SuperHyperEdge 2906  
 (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called an Extreme SuperHyperDominating if it's either of 2907  
 Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic 2908  
 v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an 2909  
 Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme 2910  
 SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperEdges in the consecutive 2911  
 Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they 2912  
 form the Extreme SuperHyperDominating; a Neutrosophic SuperHyperDominating if it's either of 2913  
 Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic 2914  
 v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a 2915  
 Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of 2916  
 the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic 2917  
 cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices 2918  
 such that they form the Neutrosophic SuperHyperDominating; an Extreme SuperHyperDom- 2919  
 inating SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperDominating, Neutro- 2920  
 sophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic 2921  
 rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  2922  
 is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Ex- 2923  
 treme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an 2924  
 Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges 2925  
 and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; 2926



and the Extreme power is corresponded to its Extreme coefficient; a Neutrosophic SuperHyperDominating SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; and the Neutrosophic power is corresponded to its Neutrosophic coefficient; an Extreme V-SuperHyperDominating if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; a Neutrosophic V-SuperHyperDominating if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; an Extreme V-SuperHyperDominating SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; and the Extreme power is corresponded to its Extreme coefficient; a Neutrosophic SuperHyperDominating SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; and the Neutrosophic power is corresponded to its Neutrosophic coefficient. In this scientific research, new setting is introduced for new SuperHyperNotions, namely, a SuperHyperDominating and Neutrosophic SuperHyperDominating. Two different types of SuperHyperDefinitions are debut for them but the research goes further and the SuperHyperNotion, SuperHyperUniform, and SuperHyperClass based on that are well-defined and well-reviewed. The literature review is implemented in the whole of this research. For shining the elegancy and the significance of this research, the comparison between this SuperHyperNotion with other SuperHyperNotions and fundamental SuperHyperNumbers are featured. The definitions are followed by the examples

and the instances thus the clarifications are driven with different tools. The applications are 2973  
figured out to make sense about the theoretical aspect of this ongoing research. The “Cancer’s 2974  
Recognition” are the under research to figure out the challenges make sense about ongoing and 2975  
upcoming research. The special case is up. The cells are viewed in the deemed ways. There are 2976  
different types of them. Some of them are individuals and some of them are well-modeled by 2977  
the group of cells. These types are all officially called “SuperHyperVertex” but the relations 2978  
amid them all officially called “SuperHyperEdge”. The frameworks “SuperHyperGraph” and 2979  
“Neutrosophic SuperHyperGraph” are chosen and elected to research about “Cancer’s Recog- 2980  
nition”. Thus these complex and dense SuperHyperModels open up some avenues to research 2981  
on theoretical segments and “Cancer’s Recognition”. Some avenues are posed to pursue this 2982  
research. It’s also officially collected in the form of some questions and some problems. As- 2983  
sume a SuperHyperGraph. Assume a SuperHyperGraph. Then  $\delta$ -SuperHyperDominating is 2984  
a maximal of SuperHyperVertices with a maximum cardinality such that either of the fol- 2985  
lowing expressions hold for the (Neutrosophic) cardinalities of SuperHyperNeighbors of  $s \in S$  : 2986  
there are  $|S \cap N(s)| > |S \cap (V \setminus N(s))| + \delta$ ; and  $|S \cap N(s)| < |S \cap (V \setminus N(s))| + \delta$ . The 2987  
first Expression, holds if  $S$  is an  $\delta$ -SuperHyperOffensive. And the second Expression, holds 2988  
if  $S$  is an  $\delta$ -SuperHyperDefensive; a Neutrosophic  $\delta$ -SuperHyperDominating is a maximal 2989  
Neutrosophic of SuperHyperVertices with maximum Neutrosophic cardinality such that 2990  
either of the following expressions hold for the Neutrosophic cardinalities of SuperHyper- 2991  
Neighbors of  $s \in S$  there are:  $|S \cap N(s)|_{Neutrosophic} > |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta$ ; 2992  
and  $|S \cap N(s)|_{Neutrosophic} < |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta$ . The first Expression, holds 2993  
if  $S$  is a Neutrosophic  $\delta$ -SuperHyperOffensive. And the second Expression, holds if  $S$  is a 2994  
Neutrosophic  $\delta$ -SuperHyperDefensive It’s useful to define a “Neutrosophic” version of a Super- 2995  
HyperDominating . Since there’s more ways to get type-results to make a SuperHyperDominating 2996  
more understandable. For the sake of having Neutrosophic SuperHyperDominating, there’s a 2997  
need to “redefine” the notion of a “SuperHyperDominating ”. The SuperHyperVertices and the 2998  
SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, 2999  
there’s the usage of the position of labels to assign to the values. Assume a SuperHyperDominating 3000  
. It’s redefined a Neutrosophic SuperHyperDominating if the mentioned Table holds, concerning, 3001  
“The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to 3002  
The Neutrosophic SuperHyperGraph” with the key points, “The Values of The Vertices & The 3003  
Number of Position in Alphabet”, “The Values of The SuperVertices&The maximum Values of Its 3004  
Vertices”, “The Values of The Edges&The maximum Values of Its Vertices”, “The Values of The 3005  
HyperEdges&The maximum Values of Its Vertices”, “The Values of The SuperHyperEdges&The 3006  
maximum Values of Its Endpoints”. To get structural examples and instances, I’m going to 3007  
introduce the next SuperHyperClass of SuperHyperGraph based on a SuperHyperDominating 3008  
. It’s the main. It’ll be disciplinary to have the foundation of previous definition in the kind 3009  
of SuperHyperClass. If there’s a need to have all SuperHyperDominating until the SuperHy- 3010  
perDominating, then it’s officially called a “SuperHyperDominating” but otherwise, it isn’t a 3011  
SuperHyperDominating . There are some instances about the clarifications for the main definition 3012  
titled a “SuperHyperDominating ”. These two examples get more scrutiny and discernment 3013  
since there are characterized in the disciplinary ways of the SuperHyperClass based on a Supe- 3014  
rHyperDominating . For the sake of having a Neutrosophic SuperHyperDominating, there’s a 3015  
need to “redefine” the notion of a “Neutrosophic SuperHyperDominating” and a “Neutrosophic 3016  
SuperHyperDominating ”. The SuperHyperVertices and the SuperHyperEdges are assigned by 3017  
the labels from the letters of the alphabets. In this procedure, there’s the usage of the position 3018

of labels to assign to the values. Assume a Neutrosophic SuperHyperGraph. It's redefined 3019  
"Neutrosophic SuperHyperGraph" if the intended Table holds. And a SuperHyperDominating are 3020  
redefined to a "Neutrosophic SuperHyperDominating" if the intended Table holds. It's useful to 3021  
define "Neutrosophic" version of SuperHyperClasses. Since there's more ways to get Neutrosophic 3022  
type-results to make a Neutrosophic SuperHyperDominating more understandable. Assume a 3023  
Neutrosophic SuperHyperGraph. There are some Neutrosophic SuperHyperClasses if the intended 3024  
Table holds. Thus SuperHyperPath, SuperHyperDominating, SuperHyperStar, SuperHyperBi- 3025  
partite, SuperHyperMultiPartite, and SuperHyperWheel, are "Neutrosophic SuperHyperPath", 3026  
"Neutrosophic SuperHyperDominating", "Neutrosophic SuperHyperStar", "Neutrosophic Super- 3027  
HyperBipartite", "Neutrosophic SuperHyperMultiPartite", and "Neutrosophic SuperHyperWheel" 3028  
if the intended Table holds. A SuperHyperGraph has a "Neutrosophic SuperHyperDominating" 3029  
where it's the strongest [the maximum Neutrosophic value from all the SuperHyperDominating 3030  
amid the maximum value amid all SuperHyperVertices from a SuperHyperDominating .] Super- 3031  
HyperDominating . A graph is a SuperHyperUniform if it's a SuperHyperGraph and the number 3032  
of elements of SuperHyperEdges are the same. Assume a Neutrosophic SuperHyperGraph. There 3033  
are some SuperHyperClasses as follows. It's SuperHyperPath if it's only one SuperVertex as 3034  
intersection amid two given SuperHyperEdges with two exceptions; it's SuperHyperDominating if 3035  
it's only one SuperVertex as intersection amid two given SuperHyperEdges; it's SuperHyperStar 3036  
it's only one SuperVertex as intersection amid all SuperHyperEdges; it's SuperHyperBipartite it's 3037  
only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, 3038  
forming two separate sets, has no SuperHyperEdge in common; it's SuperHyperMultiPartite it's 3039  
only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, 3040  
forming multi separate sets, has no SuperHyperEdge in common; it's a SuperHyperWheel if it's 3041  
only one SuperVertex as intersection amid two given SuperHyperEdges and one SuperVertex 3042  
has one SuperHyperEdge with any common SuperVertex. The SuperHyperModel proposes 3043  
the specific designs and the specific architectures. The SuperHyperModel is officially called 3044  
"SuperHyperGraph" and "Neutrosophic SuperHyperGraph". In this SuperHyperModel, The 3045  
"specific" cells and "specific group" of cells are SuperHyperModeled as "SuperHyperVertices" 3046  
and the common and intended properties between "specific" cells and "specific group" of cells 3047  
are SuperHyperModeled as "SuperHyperEdges". Sometimes, it's useful to have some degrees of 3048  
determinacy, indeterminacy, and neutrality to have more precise SuperHyperModel which in this 3049  
case the SuperHyperModel is called "Neutrosophic". In the future research, the foundation will 3050  
be based on the "Cancer's Recognition" and the results and the definitions will be introduced 3051  
in redeemed ways. The recognition of the cancer in the long-term function. The specific region 3052  
has been assigned by the model [it's called SuperHyperGraph] and the long cycle of the move 3053  
from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily 3054  
identified since there are some determinacy, indeterminacy and neutrality about the moves and 3055  
the effects of the cancer on that region; this event leads us to choose another model [it's said 3056  
to be Neutrosophic SuperHyperGraph] to have convenient perception on what's happened and 3057  
what's done. There are some specific models, which are well-known and they've got the names, 3058  
and some SuperHyperGeneral SuperHyperModels. The moves and the traces of the cancer on the 3059  
complex tracks and between complicated groups of cells could be fantasized by a Neutrosophic 3060  
SuperHyperPath(-/SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyper- 3061  
Multipartite, SuperHyperWheel). The aim is to find either the longest SuperHyperDominating 3062  
or the strongest SuperHyperDominating in those Neutrosophic SuperHyperModels. For the 3063  
longest SuperHyperDominating, called SuperHyperDominating, and the strongest SuperHyper- 3064

Dominating, called Neutrosophic SuperHyperDominating, some general results are introduced. 3065  
Beyond that in SuperHyperStar, all possible SuperHyperPaths have only two SuperHyperEdges 3066  
but it's not enough since it's essential to have at least three SuperHyperEdges to form any style of 3067  
a SuperHyperDominating. There isn't any formation of any SuperHyperDominating but literarily, 3068  
it's the deformation of any SuperHyperDominating. It, literarily, deforms and it doesn't form. 3069  
A basic familiarity with Neutrosophic SuperHyperDominating theory, SuperHyperGraphs, and 3070  
Neutrosophic SuperHyperGraphs theory are proposed. 3071

**Keywords:** Neutrosophic SuperHyperGraph, SuperHyperDominating, Cancer's Neutrosophic 3072

Recognition 3073

**AMS Subject Classification:** 05C17, 05C22, 05E45 3074



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## Background

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There are some scientific researches covering the topic of this research. In what follows, there are some discussion and literature reviews about them date back on January 22, 2023.

First article is titled “properties of SuperHyperGraph and neutrosophic SuperHyperGraph” in **Ref. [HG1]** by Henry Garrett (2022). It’s first step toward the research on neutrosophic SuperHyperGraphs. This research article is published on the journal “Neutrosophic Sets and Systems” in issue 49 and the pages 531-561. In this research article, different types of notions like dominating, resolving, coloring, Eulerian(Hamiltonian) neutrosophic path, n-Eulerian(Hamiltonian) neutrosophic path, zero forcing number, zero forcing neutrosophic- number, independent number, independent neutrosophic-number, clique number, clique neutrosophic-number, matching number, matching neutrosophic-number, girth, neutrosophic girth, 1-zero-forcing number, 1-zero- forcing neutrosophic-number, failed 1-zero-forcing number, failed 1-zero-forcing neutrosophic-number, global- offensive alliance, t-offensive alliance, t-defensive alliance, t-powerful alliance, and global- powerful alliance are defined in SuperHyperGraph and neutrosophic SuperHyperGraph. Some Classes of SuperHyperGraph and Neutrosophic SuperHyperGraph are cases of research. Some results are applied in family of SuperHyperGraph and neutrosophic SuperHyperGraph. Thus this research article has concentrated on the vast notions and introducing the majority of notions.

The seminal paper and groundbreaking article is titled “neutrosophic co-degree and neutrosophic degree alongside chromatic numbers in the setting of some classes related to neutrosophic hypergraphs” in **Ref. [HG2]** by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on general forms without using neutrosophic classes of neutrosophic SuperHyperGraph. It’s published in prestigious and fancy journal is entitled “Journal of Current Trends in Computer Science Research (JCTCSR)” with abbreviation “J Curr Trends Comp Sci Res” in volume 1 and issue 1 with pages 06-14. The research article studies deeply with choosing neutrosophic hypergraphs instead of neutrosophic SuperHyperGraph. It’s the breakthrough toward independent results based on initial background.

The seminal paper and groundbreaking article is titled “Super Hyper Dominating and Super Hyper Resolving on Neutrosophic Super Hyper Graphs and Their Directions in Game Theory and Neutrosophic Super Hyper Classes” in **Ref. [HG3]** by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on fundamental SuperHyperNumber and using neutrosophic SuperHyperClasses of neutrosophic SuperHyperGraph. It’s published in prestigious and fancy journal is entitled “Journal of Mathematical Techniques and Computational Mathematics(JMTCM)” with



abbreviation “J Math Techniques Comput Math” in volume 1 and issue 3 with pages 242-263. 3110  
The research article studies deeply with choosing directly neutrosophic SuperHyperGraph and 3111  
SuperHyperGraph. It’s the breakthrough toward independent results based on initial background 3112  
and fundamental SuperHyperNumbers. 3113  
In some articles are titled “0039 | Closing Numbers and SupeV-Closing Numbers as 3114  
(Dual)Resolving and (Dual)Coloring alongside (Dual)Dominating in (Neutrosophic)n- 3115  
SuperHyperGraph” in **Ref. [HG4]** by Henry Garrett (2022), “0049 | (Failed)1-Zero-Forcing 3116  
Number in Neutrosophic Graphs” in **Ref. [HG5]** by Henry Garrett (2022), “Extreme Super- 3117  
HyperClique as the Firm Scheme of Confrontation under Cancer’s Recognition as the Model in 3118  
The Setting of (Neutrosophic) SuperHyperGraphs” in **Ref. [HG6]** by Henry Garrett (2022), 3119  
“Uncertainty On The Act And Effect Of Cancer Alongside The Foggy Positions Of Cells Toward 3120  
Neutrosophic Failed SuperHyperClique inside Neutrosophic SuperHyperGraphs Titled Cancer’s 3121  
Recognition” in **Ref. [HG7]** by Henry Garrett (2022), “Neutrosophic Version Of Separates 3122  
Groups Of Cells In Cancer’s Recognition On Neutrosophic SuperHyperGraphs” in **Ref. [HG8]** 3123  
by Henry Garrett (2022), “The Shift Paradigm To Classify Separately The Cells and Affected 3124  
Cells Toward The Totality Under Cancer’s Recognition By New Multiple Definitions On the 3125  
Sets Polynomials Alongside Numbers In The (Neutrosophic) SuperHyperMatching Theory 3126  
Based on SuperHyperGraph and Neutrosophic SuperHyperGraph” in **Ref. [HG9]** by Henry 3127  
Garrett (2022), “Breaking the Continuity and Uniformity of Cancer In The Worst Case of 3128  
Full Connections With Extreme Failed SuperHyperClique In Cancer’s Recognition Applied in 3129  
(Neutrosophic) SuperHyperGraphs” in **Ref. [HG10]** by Henry Garrett (2022), “Neutrosophic 3130  
Failed SuperHyperStable as the Survivors on the Cancer’s Neutrosophic Recognition Based 3131  
on Uncertainty to All Modes in Neutrosophic SuperHyperGraphs” in **Ref. [HG11]** by Henry 3132  
Garrett (2022), “Extremism of the Attacked Body Under the Cancer’s Circumstances Where 3133  
Cancer’s Recognition Titled (Neutrosophic) SuperHyperGraphs” in **Ref. [HG12]** by Henry 3134  
Garrett (2022), “(Neutrosophic) 1-Failed SuperHyperForcing in Cancer’s Recognitions And 3135  
(Neutrosophic) SuperHyperGraphs” in **Ref. [HG13]** by Henry Garrett (2022), “Neutrosophic 3136  
Messy-Style SuperHyperGraphs To Form Neutrosophic SuperHyperStable To Act on Cancer’s 3137  
Neutrosophic Recognitions In Special ViewPoints” in **Ref. [HG14]** by Henry Garrett (2022), 3138  
“Neutrosophic 1-Failed SuperHyperForcing in the SuperHyperFunction To Use Neutrosophic 3139  
SuperHyperGraphs on Cancer’s Neutrosophic Recognition And Beyond” in **Ref. [HG15]** by 3140  
Henry Garrett (2022), “(Neutrosophic) SuperHyperStable on Cancer’s Recognition by Well- 3141  
SuperHyperModelled (Neutrosophic) SuperHyperGraphs ” in **Ref. [HG16]** by Henry Garrett 3142  
(2022), “Neutrosophic Messy-Style SuperHyperGraphs To Form Neutrosophic SuperHyperStable 3143  
To Act on Cancer’s Neutrosophic Recognitions In Special ViewPoints” in **Ref. [HG12]** by 3144  
Henry Garrett (2022), “Basic Notions on (Neutrosophic) SuperHyperForcing And (Neutrosophic) 3145  
SuperHyperModeling in Cancer’s Recognitions And (Neutrosophic) SuperHyperGraphs” in 3146  
**Ref. [HG17]** by Henry Garrett (2022), “Neutrosophic Messy-Style SuperHyperGraphs To 3147  
Form Neutrosophic SuperHyperStable To Act on Cancer’s Neutrosophic Recognitions In Special 3148  
ViewPoints” in **Ref. [HG18]** by Henry Garrett (2022),“(Neutrosophic) SuperHyperModeling of 3149  
Cancer’s Recognitions Featuring (Neutrosophic) SuperHyperDefensive SuperHyperAlliances” in 3150  
**Ref. [HG19]** by Henry Garrett (2022), “(Neutrosophic) SuperHyperAlliances With SuperHyper- 3151  
Defensive and SuperHyperOffensive Type-SuperHyperSet On (Neutrosophic) SuperHyperGraph 3152  
With (Neutrosophic) SuperHyperModeling of Cancer’s Recognitions And Related (Neutro- 3153  
sophic) SuperHyperClasses” in **Ref. [HG20]** by Henry Garrett (2022), “SuperHyperGirth on 3154  
SuperHyperGraph and Neutrosophic SuperHyperGraph With SuperHyperModeling of Cancer’s 3155

Recognitions” in **Ref. [HG21]** by Henry Garrett (2022), “Some SuperHyperDegrees and 3156  
Co-SuperHyperDegrees on Neutrosophic SuperHyperGraphs and SuperHyperGraphs Alongside 3157  
Applications in Cancer’s Treatments” in **Ref. [HG22]** by Henry Garrett (2022), “Super- 3158  
HyperDominating and SuperHyperResolving on Neutrosophic SuperHyperGraphs And Their 3159  
Directions in Game Theory and Neutrosophic SuperHyperClasses” in **Ref. [HG23]** by Henry 3160  
Garrett (2022), “SuperHyperMatching By (V-)Definitions And Polynomials To Monitor Cancer’s 3161  
Recognition In Neutrosophic SuperHyperGraphs” in **Ref. [HG24]** by Henry Garrett (2023), 3162  
“The Focus on The Partitions Obtained By Parallel Moves In The Cancer’s Extreme Recognition 3163  
With Different Types of Extreme SuperHyperMatching Set and Polynomial on (Neutrosophic) 3164  
SuperHyperGraphs” in **Ref. [HG25]** by Henry Garrett (2023), “Extreme Failed SuperHyper- 3165  
Clique Decides the Failures on the Cancer’s Recognition in the Perfect Connections of Cancer’s 3166  
Attacks By SuperHyperModels Named (Neutrosophic) SuperHyperGraphs” in **Ref. [HG26]** by 3167  
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Cancer’s Attacks In The Terms of Neutrosophic Failed SuperHyperClique on Cancer’s Recognition 3169  
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**[HG34]** by Henry Garrett (2022), “(Neutrosophic) 1-Failed SuperHyperForcing in Cancer’s 3186  
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Henry Garrett (2022), “Basic Neutrosophic Notions Concerning SuperHyperDominating and 3190  
Neutrosophic SuperHyperResolving in SuperHyperGraph” in **Ref. [HG37]** by Henry Garrett 3191  
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Based on Neutrosophic SuperHyperEdge (NSHE) in Neutrosophic SuperHyperGraph (NSHG)” 3193  
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SuperHyperNotions about neutrosophic SuperHyperGraph and SuperHyperGraph. 3195  
Some scientific studies and scientific researches about neutrosophic graphs, are proposed as book 3196  
in **Ref. [HG39]** by Henry Garrett (2022) which is indexed by Google Scholar and has more 3197  
than 3230 readers in Scribd. It’s titled “Beyond Neutrosophic Graphs” and published by Ohio: 3198  
E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United 3199  
State. This research book covers different types of notions and settings in neutrosophic graph 3200  
theory and neutrosophic SuperHyperGraph theory. 3201



Also, some scientific studies and scientific researches about neutrosophic graphs, are proposed 3202  
as book in **Ref. [HG40]** by Henry Garrett (2022) which is indexed by Google Scholar and has 3203  
more than 4117 readers in Scribd. It's titled "Neutrosophic Duality" and published by Florida: 3204  
GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 3205  
United States. This research book presents different types of notions SuperHyperResolving and 3206  
SuperHyperDominating in the setting of duality in neutrosophic graph theory and neutrosophic 3207  
SuperHyperGraph theory. This research book has scrutiny on the complement of the intended set 3208  
and the intended set, simultaneously. It's smart to consider a set but acting on its complement 3209  
that what's done in this research book which is popular in the terms of high readers in Scribd. 3210  
See the seminal scientific researches [**HG1; HG2; HG3**]. The formalization of the notions on 3211  
the framework of Extreme SuperHyperDominating theory, Neutrosophic SuperHyperDominating 3212  
theory, and (Neutrosophic) SuperHyperGraphs theory at [**HG4; HG5; HG6; HG7; HG8;** 3213  
**HG9; HG10; HG11; HG12; HG13; HG14; HG15; HG16; HG17; HG18; HG19; HG20;** 3214  
**HG21; HG22; HG23; HG24; HG25; HG26; HG27; HG28; HG29; HG30; HG31; HG32;** 3215  
**HG33; HG34; HG35; HG36; HG37; HG38**]. Two popular scientific research books in Scribd 3216  
in the terms of high readers, 3230 and 4117 respectively, on neutrosophic science is on [**HG39;** 3217  
**HG40**]. 3218

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## Applied Notions Under The Scrutiny Of The Motivation Of This Scientific Research

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In this scientific research, there are some ideas in the featured frameworks of motivations. I try to bring the motivations in the narrative ways. Some cells have been faced with some attacks from the situation which is caused by the cancer's attacks. In this case, there are some embedded analysis on the ongoing situations which in that, the cells could be labelled as some groups and some groups or individuals have excessive labels which all are raised from the behaviors to overcome the cancer's attacks. In the embedded situations, the individuals of cells and the groups of cells could be considered as "new groups". Thus it motivates us to find the proper SuperHyperModels for getting more proper analysis on this messy story. I've found the SuperHyperModels which are officially called "SuperHyperGraphs" and "Neutrosophic SuperHyperGraphs". In this SuperHyperModel, the cells and the groups of cells are defined as "SuperHyperVertices" and the relations between the individuals of cells and the groups of cells are defined as "SuperHyperEdges". Thus it's another motivation for us to do research on this SuperHyperModel based on the "Cancer's Recognition". Sometimes, the situations get worst. The situation is passed from the certainty and precise style. Thus it's the beyond them. There are three descriptions, namely, the degrees of determinacy, indeterminacy and neutrality, for any object based on vague forms, namely, incomplete data, imprecise data, and uncertain analysis. The latter model could be considered on the previous SuperHyperModel. It's SuperHyperModel. It's SuperHyperGraph but it's officially called "Neutrosophic SuperHyperGraphs". The cancer is the disease but the model is going to figure out what's going on this phenomenon. The special case of this disease is considered and as the consequences of the model, some parameters are used. The cells are under attack of this disease but the moves of the cancer in the special region are the matter of mind. The recognition of the cancer could help to find some treatments for this disease. The SuperHyperGraph and Neutrosophic SuperHyperGraph are the SuperHyperModels on the "Cancer's Recognition" and both bases are the background of this research. Sometimes the cancer has been happened on the region, full of cells, groups of cells and embedded styles. In this segment, the SuperHyperModel proposes some SuperHyperNotions based on the connectivities of the moves of the cancer in the forms of alliances' styles with the formation of the design and the architecture are formally called "SuperHyperDominating" in the themes of jargons and buzzwords. The prefix "SuperHyper" refers to the theme of the embedded styles to figure out the background for the SuperHyperNotions. The recognition of the cancer in the long-term function. The specific region has been assigned by the model [it's called SuperHyperGraph] and the long cycle of the move from the cancer is

identified by this research. Sometimes the move of the cancer hasn't be easily identified since 3253  
there are some determinacy, indeterminacy and neutrality about the moves and the effects of the 3254  
cancer on that region; this event leads us to choose another model [it's said to be Neutrosophic 3255  
SuperHyperGraph] to have convenient perception on what's happened and what's done. There 3256  
are some specific models, which are well-known and they've got the names, and some general 3257  
models. The moves and the traces of the cancer on the complex tracks and between complicated 3258  
groups of cells could be fantasized by a Neutrosophic SuperHyperPath (-/SuperHyperDominating, 3259  
SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). The aim is 3260  
to find either the optimal SuperHyperDominating or the Neutrosophic SuperHyperDominating 3261  
in those Neutrosophic SuperHyperModels. Some general results are introduced. Beyond that in 3262  
SuperHyperStar, all possible Neutrosophic SuperHyperPath s have only two SuperHyperEdges 3263  
but it's not enough since it's essential to have at least three SuperHyperEdges to form any style of 3264  
a SuperHyperDominating. There isn't any formation of any SuperHyperDominating but literarily, 3265  
it's the deformation of any SuperHyperDominating. It, literarily, deforms and it doesn't form. 3266

**Question 27.0.1.** *How to define the SuperHyperNotions and to do research on them to find the “ 3267  
amount of SuperHyperDominating” of either individual of cells or the groups of cells based on the 3268  
fixed cell or the fixed group of cells, extensively, the “amount of SuperHyperDominating” based 3269  
on the fixed groups of cells or the fixed groups of group of cells? 3270*

**Question 27.0.2.** *What are the best descriptions for the “Cancer's Recognition” in terms of these 3271  
messy and dense SuperHyperModels where embedded notions are illustrated? 3272*

It's motivation to find notions to use in this dense model is titled “SuperHyperGraphs”. 3273  
Thus it motivates us to define different types of “ SuperHyperDominating” and “Neutrosophic 3274  
SuperHyperDominating” on “SuperHyperGraph” and “Neutrosophic SuperHyperGraph”. Then 3275  
the research has taken more motivations to define SuperHyperClasses and to find some connections 3276  
amid this SuperHyperNotion with other SuperHyperNotions. It motivates us to get some instances 3277  
and examples to make clarifications about the framework of this research. The general results 3278  
and some results about some connections are some avenues to make key point of this research, 3279  
“Cancer's Recognition”, more understandable and more clear. 3280

The framework of this research is as follows. In the beginning, I introduce basic definitions 3281  
to clarify about preliminaries. In the subsection “Preliminaries”, initial definitions about 3282  
SuperHyperGraphs and Neutrosophic SuperHyperGraph are deeply-introduced and in-depth- 3283  
discussed. The elementary concepts are clarified and illustrated completely and sometimes 3284  
review literature are applied to make sense about what's going to figure out about the 3285  
upcoming sections. The main definitions and their clarifications alongside some results about 3286  
new notions, SuperHyperDominating and Neutrosophic SuperHyperDominating, are figured 3287  
out in sections “ SuperHyperDominating” and “Neutrosophic SuperHyperDominating”. In 3288  
the sense of tackling on getting results and in order to make sense about continuing the 3289  
research, the ideas of SuperHyperUniform and Neutrosophic SuperHyperUniform are introduced 3290  
and as their consequences, corresponded SuperHyperClasses are figured out to debut what's 3291  
done in this section, titled “Results on SuperHyperClasses” and “Results on Neutrosophic 3292  
SuperHyperClasses”. As going back to origin of the notions, there are some smart steps toward 3293  
the common notions to extend the new notions in new frameworks, SuperHyperGraph and 3294  
Neutrosophic SuperHyperGraph, in the sections “Results on SuperHyperClasses” and “Results on 3295  
Neutrosophic SuperHyperClasses”. The starter research about the general SuperHyperRelations 3296  
and as concluding and closing section of theoretical research are contained in the section 3297

“General Results”. Some general SuperHyperRelations are fundamental and they are well- 3298  
known as fundamental SuperHyperNotions as elicited and discussed in the sections, “General 3299  
Results”, “ SuperHyperDominating”, “Neutrosophic SuperHyperDominating”, “Results on 3300  
SuperHyperClasses” and “Results on Neutrosophic SuperHyperClasses”. There are curious 3301  
questions about what’s done about the SuperHyperNotions to make sense about excellency of this 3302  
research and going to figure out the word “best” as the description and adjective for this research 3303  
as presented in section, “ SuperHyperDominating”. The keyword of this research debut in the 3304  
section “Applications in Cancer’s Recognition” with two cases and subsections “Case 1: The 3305  
Initial Steps Toward SuperHyperBipartite as SuperHyperModel” and “Case 2: The Increasing 3306  
Steps Toward SuperHyperMultipartite as SuperHyperModel”. In the section, “Open Problems”, 3307  
there are some scrutiny and discernment on what’s done and what’s happened in this research in 3308  
the terms of “questions” and “problems” to make sense to figure out this research in featured 3309  
style. The advantages and the limitations of this research alongside about what’s done in this 3310  
research to make sense and to get sense about what’s figured out are included in the section, 3311  
“Conclusion and Closing Remarks”. 3312



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## Neutrosophic Preliminaries Of This Scientific Research On the Redeemed Ways

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In this section, the basic material in this scientific research, is referred to [Single Valued Neutrosophic Set](Ref.[HG38],Definition 2.2,p.2), [Neutrosophic Set](Ref.[HG38],Definition 2.1,p.1), [Neutrosophic SuperHyperGraph (NSHG)](Ref.[HG38],Definition 2.5,p.2), [Characterization of the Neutrosophic SuperHyperGraph (NSHG)](Ref.[HG38],Definition 2.7,p.3), [t-norm](Ref.[HG38], Definition 2.7, p.3), and [Characterization of the Neutrosophic SuperHyperGraph (NSHG)](Ref.[HG38],Definition 2.7,p.3), [Neutrosophic Strength of the Neutrosophic SuperHyperPaths] (Ref.[HG38],Definition 5.3,p.7), and [Different Neutrosophic Types of Neutrosophic SuperHyperEdges (NSHE)] (Ref.[HG38],Definition 5.4,p.7). Also, the new ideas and their clarifications are addressed to Ref.[HG38].

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In this subsection, the basic material which is used in this scientific research, is presented. Also, the new ideas and their clarifications are elicited.

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**Definition 28.0.1** (Neutrosophic Set). (Ref.[HG38],Definition 2.1,p.1).

Let  $X$  be a space of points (objects) with generic elements in  $X$  denoted by  $x$ ; then the **Neutrosophic set**  $A$  (NS  $A$ ) is an object having the form

$$A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$$

where the functions  $T, I, F : X \rightarrow ]-0, 1^+[$  define respectively the a **truth-membership function**, an **indeterminacy-membership function**, and a **falsity-membership function** of the element  $x \in X$  to the set  $A$  with the condition

$$-0 \leq T_A(x) + I_A(x) + F_A(x) \leq 3^+.$$

The functions  $T_A(x), I_A(x)$  and  $F_A(x)$  are real standard or nonstandard subsets of  $]-0, 1^+[$ .

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**Definition 28.0.2** (Single Valued Neutrosophic Set). (Ref.[HG38],Definition 2.2,p.2).

Let  $X$  be a space of points (objects) with generic elements in  $X$  denoted by  $x$ . A **single valued Neutrosophic set**  $A$  (SVNS  $A$ ) is characterized by truth-membership function  $T_A(x)$ , an indeterminacy-membership function  $I_A(x)$ , and a falsity-membership function  $F_A(x)$ . For each point  $x$  in  $X$ ,  $T_A(x), I_A(x), F_A(x) \in [0, 1]$ . A SVNS  $A$  can be written as

$$A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}.$$

**Definition 28.0.3.** The **degree of truth-membership, indeterminacy-membership and falsity-membership of the subset**  $X \subset A$  of the single valued Neutrosophic set  $A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$ :

$$T_A(X) = \min[T_A(v_i), T_A(v_j)]_{v_i, v_j \in X},$$

$$I_A(X) = \min[I_A(v_i), I_A(v_j)]_{v_i, v_j \in X},$$

and  $F_A(X) = \min[F_A(v_i), F_A(v_j)]_{v_i, v_j \in X}.$

**Definition 28.0.4.** The **support** of  $X \subset A$  of the single valued Neutrosophic set  $A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$ :

$$\text{supp}(X) = \{x \in X : T_A(x), I_A(x), F_A(x) > 0\}.$$

**Definition 28.0.5** (Neutrosophic SuperHyperGraph (NSHG)). (Ref.[HG38], Definition 2.5, p.2). 3329  
 Assume  $V'$  is a given set. a **Neutrosophic SuperHyperGraph** (NSHG)  $S$  is an ordered pair 3330  
 $S = (V, E)$ , where 3331

- (i)  $V = \{V_1, V_2, \dots, V_n\}$  a finite set of finite single valued Neutrosophic subsets of  $V'$ ; 3332
- (ii)  $V = \{(V_i, T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i)) : T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i) \geq 0\}$ ,  $(i = 1, 2, \dots, n)$ ; 3333
- (iii)  $E = \{E_1, E_2, \dots, E_{n'}\}$  a finite set of finite single valued Neutrosophic subsets of  $V$ ; 3334
- (iv)  $E = \{(E_{i'}, T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'})) : T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'}) \geq 0\}$ ,  $(i' = 1, 2, \dots, n')$ ; 3335
- (v)  $V_i \neq \emptyset$ ,  $(i = 1, 2, \dots, n)$ ; 3336
- (vi)  $E_{i'} \neq \emptyset$ ,  $(i' = 1, 2, \dots, n')$ ; 3337
- (vii)  $\sum_i \text{supp}(V_i) = V$ ,  $(i = 1, 2, \dots, n)$ ; 3338
- (viii)  $\sum_{i'} \text{supp}(E_{i'}) = V$ ,  $(i' = 1, 2, \dots, n')$ ; 3339
- (ix) and the following conditions hold:

$$T'_{V'}(E_{i'}) \leq \min[T_{V'}(V_i), T_{V'}(V_j)]_{V_i, V_j \in E_{i'}},$$

$$I'_{V'}(E_{i'}) \leq \min[I_{V'}(V_i), I_{V'}(V_j)]_{V_i, V_j \in E_{i'}},$$

and  $F'_{V'}(E_{i'}) \leq \min[F_{V'}(V_i), F_{V'}(V_j)]_{V_i, V_j \in E_{i'}}$

where  $i' = 1, 2, \dots, n'$ . 3340

Here the Neutrosophic SuperHyperEdges (NSHE)  $E_{j'}$  and the Neutrosophic SuperHyperVertices 3341  
 (NSHV)  $V_j$  are single valued Neutrosophic sets.  $T_{V'}(V_i), I_{V'}(V_i)$ , and  $F_{V'}(V_i)$  denote the 3342  
 degree of truth-membership, the degree of indeterminacy-membership and the degree of 3343  
 falsity-membership the Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to the Neutrosophic 3344  
 SuperHyperVertex (NSHV)  $V$ .  $T'_{V'}(E_{i'}), I'_{V'}(E_{i'})$ , and  $F'_{V'}(E_{i'})$  denote the degree of truth- 3345  
 membership, the degree of indeterminacy-membership and the degree of falsity-membership 3346  
 of the Neutrosophic SuperHyperEdge (NSHE)  $E_{i'}$  to the Neutrosophic SuperHyperEdge (NSHE) 3347  
 $E$ . Thus, the  $ii'$ th element of the **incidence matrix** of Neutrosophic SuperHyperGraph (NSHG) 3348  
 are of the form  $(V_i, T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'}))$ , the sets  $V$  and  $E$  are crisp sets. 3349

**Definition 28.0.6** (Characterization of the Neutrosophic SuperHyperGraph (NSHG)). (Ref.[HG38], Definition 2.7, p.3).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . The Neutrosophic SuperHyperEdges (NSHE)  $E_{i'}$  and the Neutrosophic SuperHyperVertices (NSHV)  $V_i$  of Neutrosophic SuperHyperGraph (NSHG)  $S = (V, E)$  could be characterized as follow-up items.

- (i) If  $|V_i| = 1$ , then  $V_i$  is called **vertex**;
- (ii) if  $|V_i| \geq 1$ , then  $V_i$  is called **SuperVertex**;
- (iii) if for all  $V_i$ s are incident in  $E_{i'}$ ,  $|V_i| = 1$ , and  $|E_{i'}| = 2$ , then  $E_{i'}$  is called **edge**;
- (iv) if for all  $V_i$ s are incident in  $E_{i'}$ ,  $|V_i| = 1$ , and  $|E_{i'}| \geq 2$ , then  $E_{i'}$  is called **HyperEdge**;
- (v) if there's a  $V_i$  is incident in  $E_{i'}$  such that  $|V_i| \geq 1$ , and  $|E_{i'}| = 2$ , then  $E_{i'}$  is called **SuperEdge**;
- (vi) if there's a  $V_i$  is incident in  $E_{i'}$  such that  $|V_i| \geq 1$ , and  $|E_{i'}| \geq 2$ , then  $E_{i'}$  is called **SuperHyperEdge**.

If we choose different types of binary operations, then we could get hugely diverse types of general forms of Neutrosophic SuperHyperGraph (NSHG).

**Definition 28.0.7** (t-norm). (Ref.[HG38], Definition 2.7, p.3).

A binary operation  $\otimes : [0, 1] \times [0, 1] \rightarrow [0, 1]$  is a **t-norm** if it satisfies the following for  $x, y, z, w \in [0, 1]$ :

- (i)  $1 \otimes x = x$ ;
- (ii)  $x \otimes y = y \otimes x$ ;
- (iii)  $x \otimes (y \otimes z) = (x \otimes y) \otimes z$ ;
- (iv) If  $w \leq x$  and  $y \leq z$  then  $w \otimes y \leq x \otimes z$ .

**Definition 28.0.8.** The **degree of truth-membership, indeterminacy-membership and falsity-membership of the subset**  $X \subset A$  of the single valued Neutrosophic set  $A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$  (with respect to t-norm  $T_{norm}$ ):

$$T_A(X) = T_{norm}[T_A(v_i), T_A(v_j)]_{v_i, v_j \in X},$$

$$I_A(X) = T_{norm}[I_A(v_i), I_A(v_j)]_{v_i, v_j \in X},$$

and  $F_A(X) = T_{norm}[F_A(v_i), F_A(v_j)]_{v_i, v_j \in X}$ .

**Definition 28.0.9.** The **support** of  $X \subset A$  of the single valued Neutrosophic set  $A = \{ \langle x : T_A(x), I_A(x), F_A(x) \rangle, x \in X \}$ :

$$supp(X) = \{ x \in X : T_A(x), I_A(x), F_A(x) > 0 \}.$$

**Definition 28.0.10.** (General Forms of Neutrosophic SuperHyperGraph (NSHG)).

Assume  $V'$  is a given set. a **Neutrosophic SuperHyperGraph** (NSHG)  $S$  is an ordered pair  $S = (V, E)$ , where



- (i)  $V = \{V_1, V_2, \dots, V_n\}$  a finite set of finite single valued Neutrosophic subsets of  $V'$ ; 3376
- (ii)  $V = \{(V_i, T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i)) : T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i) \geq 0\}$ ,  $(i = 1, 2, \dots, n)$ ; 3377
- (iii)  $E = \{E_1, E_2, \dots, E_{n'}\}$  a finite set of finite single valued Neutrosophic subsets of  $V$ ; 3378
- (iv)  $E = \{(E_{i'}, T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'})) : T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'}) \geq 0\}$ ,  $(i' = 1, 2, \dots, n')$ ; 3379
- (v)  $V_i \neq \emptyset$ ,  $(i = 1, 2, \dots, n)$ ; 3380
- (vi)  $E_{i'} \neq \emptyset$ ,  $(i' = 1, 2, \dots, n')$ ; 3381
- (vii)  $\sum_i \text{supp}(V_i) = V$ ,  $(i = 1, 2, \dots, n)$ ; 3382
- (viii)  $\sum_{i'} \text{supp}(E_{i'}) = V$ ,  $(i' = 1, 2, \dots, n')$ . 3383

Here the Neutrosophic SuperHyperEdges (NSHE)  $E_{j'}$  and the Neutrosophic SuperHyperVertices (NSHV)  $V_j$  are single valued Neutrosophic sets.  $T_{V'}(V_i), I_{V'}(V_i)$ , and  $F_{V'}(V_i)$  denote the degree of truth-membership, the degree of indeterminacy-membership and the degree of falsity-membership the Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to the Neutrosophic SuperHyperVertex (NSHV)  $V$ .  $T'_{V'}(E_{i'}), I'_{V'}(E_{i'})$ , and  $F'_{V'}(E_{i'})$  denote the degree of truth-membership, the degree of indeterminacy-membership and the degree of falsity-membership of the Neutrosophic SuperHyperEdge (NSHE)  $E_{i'}$  to the Neutrosophic SuperHyperEdge (NSHE)  $E$ . Thus, the  $ii'$ th element of the **incidence matrix** of Neutrosophic SuperHyperGraph (NSHG) are of the form  $(V_i, T'_{V'}(E_{i'}), I'_{V'}(E_{i'}), F'_{V'}(E_{i'}))$ , the sets  $V$  and  $E$  are crisp sets. 3384-3392

**Definition 28.0.11** (Characterization of the Neutrosophic SuperHyperGraph (NSHG)). (Ref.[HG38], Definition 2.7,p.3). 3393-3394

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . The Neutrosophic SuperHyperEdges (NSHE)  $E_{i'}$  and the Neutrosophic SuperHyperVertices (NSHV)  $V_i$  of Neutrosophic SuperHyperGraph (NSHG)  $S = (V, E)$  could be characterized as follow-up items. 3395-3398

- (i) If  $|V_i| = 1$ , then  $V_i$  is called **vertex**; 3399
- (ii) if  $|V_i| \geq 1$ , then  $V_i$  is called **SuperVertex**; 3400
- (iii) if for all  $V_i$ s are incident in  $E_{i'}$ ,  $|V_i| = 1$ , and  $|E_{i'}| = 2$ , then  $E_{i'}$  is called **edge**; 3401
- (iv) if for all  $V_i$ s are incident in  $E_{i'}$ ,  $|V_i| = 1$ , and  $|E_{i'}| \geq 2$ , then  $E_{i'}$  is called **HyperEdge**; 3402
- (v) if there's a  $V_i$  is incident in  $E_{i'}$  such that  $|V_i| \geq 1$ , and  $|E_{i'}| = 2$ , then  $E_{i'}$  is called **SuperEdge**; 3403-3404
- (vi) if there's a  $V_i$  is incident in  $E_{i'}$  such that  $|V_i| \geq 1$ , and  $|E_{i'}| \geq 2$ , then  $E_{i'}$  is called **SuperHyperEdge**. 3405-3406

This SuperHyperModel is too messy and too dense. Thus there's a need to have some restrictions and conditions on SuperHyperGraph. The special case of this SuperHyperGraph makes the patterns and regularities. 3407-3409

**Definition 28.0.12.** A graph is **SuperHyperUniform** if it's SuperHyperGraph and the number of elements of SuperHyperEdges are the same. 3410-3411

To get more visions on SuperHyperUniform, the some SuperHyperClasses are introduced. It makes to have SuperHyperUniform more understandable.

**Definition 28.0.13.** Assume a Neutrosophic SuperHyperGraph. There are some SuperHyperClasses as follows.

- (i). It's **Neutrosophic SuperHyperPath** if it's only one SuperVertex as intersection amid two given SuperHyperEdges with two exceptions;
- (ii). it's **SuperHyperCycle** if it's only one SuperVertex as intersection amid two given SuperHyperEdges;
- (iii). it's **SuperHyperStar** it's only one SuperVertex as intersection amid all SuperHyperEdges;
- (iv). it's **SuperHyperBipartite** it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming two separate sets, has no SuperHyperEdge in common;
- (v). it's **SuperHyperMultiPartite** it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming multi separate sets, has no SuperHyperEdge in common;
- (vi). it's **SuperHyperWheel** if it's only one SuperVertex as intersection amid two given SuperHyperEdges and one SuperVertex has one SuperHyperEdge with any common SuperVertex.

**Definition 28.0.14.** Let an ordered pair  $S = (V, E)$  be a Neutrosophic SuperHyperGraph (NSHG)  $S$ . Then a sequence of Neutrosophic SuperHyperVertices (NSHV) and Neutrosophic SuperHyperEdges (NSHE)

$$V_1, E_1, V_2, E_2, V_3, \dots, V_{s-1}, E_{s-1}, V_s$$

is called a **Neutrosophic SuperHyperPath** (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_1$  to Neutrosophic SuperHyperVertex (NSHV)  $V_s$  if either of following conditions hold:

- (i)  $V_i, V_{i+1} \in E_{i'}$ ;
- (ii) there's a vertex  $v_i \in V_i$  such that  $v_i, V_{i+1} \in E_{i'}$ ;
- (iii) there's a SuperVertex  $V'_i \in V_i$  such that  $V'_i, V_{i+1} \in E_{i'}$ ;
- (iv) there's a vertex  $v_{i+1} \in V_{i+1}$  such that  $V_i, v_{i+1} \in E_{i'}$ ;
- (v) there's a SuperVertex  $V'_{i+1} \in V_{i+1}$  such that  $V_i, V'_{i+1} \in E_{i'}$ ;
- (vi) there are a vertex  $v_i \in V_i$  and a vertex  $v_{i+1} \in V_{i+1}$  such that  $v_i, v_{i+1} \in E_{i'}$ ;
- (vii) there are a vertex  $v_i \in V_i$  and a SuperVertex  $V'_{i+1} \in V_{i+1}$  such that  $v_i, V'_{i+1} \in E_{i'}$ ;
- (viii) there are a SuperVertex  $V'_i \in V_i$  and a vertex  $v_{i+1} \in V_{i+1}$  such that  $V'_i, v_{i+1} \in E_{i'}$ ;
- (ix) there are a SuperVertex  $V'_i \in V_i$  and a SuperVertex  $V'_{i+1} \in V_{i+1}$  such that  $V'_i, V'_{i+1} \in E_{i'}$ .

**Definition 28.0.15.** (Characterization of the Neutrosophic SuperHyperPaths).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . a Neutrosophic SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_1$  to Neutrosophic SuperHyperVertex (NSHV)  $V_s$  is sequence of Neutrosophic SuperHyperVertices (NSHV) and Neutrosophic SuperHyperEdges (NSHE)

$$V_1, E_1, V_2, E_2, V_3, \dots, V_{s-1}, E_{s-1}, V_s,$$

could be characterized as follow-up items.

- (i) If for all  $V_i, E_{j'}, |V_i| = 1, |E_{j'}| = 2$ , then NSHP is called **path**;
- (ii) if for all  $E_{j'}, |E_{j'}| = 2$ , and there's  $V_i, |V_i| \geq 1$ , then NSHP is called **SuperPath**;
- (iii) if for all  $V_i, E_{j'}, |V_i| = 1, |E_{j'}| \geq 2$ , then NSHP is called **HyperPath**;
- (iv) if there are  $V_i, E_{j'}, |V_i| \geq 1, |E_{j'}| \geq 2$ , then NSHP is called **Neutrosophic SuperHyper-Path**.

**Definition 28.0.16** (Neutrosophic Strength of the Neutrosophic SuperHyperPaths). (Ref.[HG38],Definition 5.3,p.7).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . A Neutrosophic SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_1$  to Neutrosophic SuperHyperVertex (NSHV)  $V_s$  is sequence of Neutrosophic SuperHyperVertices (NSHV) and Neutrosophic SuperHyperEdges (NSHE)

$$V_1, E_1, V_2, E_2, V_3, \dots, V_{s-1}, E_{s-1}, V_s,$$

have

- (i) **Neutrosophic t-strength**  $(\min\{T(V_i)\}, m, n)_{i=1}^s$ ;
- (ii) **Neutrosophic i-strength**  $(m, \min\{I(V_i)\}, n)_{i=1}^s$ ;
- (iii) **Neutrosophic f-strength**  $(m, n, \min\{F(V_i)\})_{i=1}^s$ ;
- (iv) **Neutrosophic strength**  $(\min\{T(V_i)\}, \min\{I(V_i)\}, \min\{F(V_i)\})_{i=1}^s$ .

**Definition 28.0.17** (Different Neutrosophic Types of Neutrosophic SuperHyperEdges (NSHE)). (Ref.[HG38],Definition 5.4,p.7).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called

- (ix) **Neutrosophic t-connective** if  $T(E) \geq$  maximum number of Neutrosophic t-strength of SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to Neutrosophic SuperHyperVertex (NSHV)  $V_j$  where  $1 \leq i, j \leq s$ ;
- (x) **Neutrosophic i-connective** if  $I(E) \geq$  maximum number of Neutrosophic i-strength of SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to Neutrosophic SuperHyperVertex (NSHV)  $V_j$  where  $1 \leq i, j \leq s$ ;

(xi) **Neutrosophic f-connective** if  $F(E) \geq$  maximum number of Neutrosophic f-strength of SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to Neutrosophic SuperHyperVertex (NSHV)  $V_j$  where  $1 \leq i, j \leq s$ ;

(xii) **Neutrosophic connective** if  $(T(E), I(E), F(E)) \geq$  maximum number of Neutrosophic strength of SuperHyperPath (NSHP) from Neutrosophic SuperHyperVertex (NSHV)  $V_i$  to Neutrosophic SuperHyperVertex (NSHV)  $V_j$  where  $1 \leq i, j \leq s$ .

**Definition 28.0.18.** (Different Neutrosophic Types of Neutrosophic SuperHyperDominating).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  or  $E'$  is called

(i) **Neutrosophic e-SuperHyperDominating** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that  $V_a \in E_i, E_j$ ;

(ii) **Neutrosophic re-SuperHyperDominating** if  $\forall E_i \in E_{ESHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that  $V_a \in E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ;

(iii) **Neutrosophic v-SuperHyperDominating** if  $\forall V_i \in E_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ;

(iv) **Neutrosophic rv-SuperHyperDominating** if  $\forall V_i \in E_{ESHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that  $V_i, V_j \in E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ;

(v) **Neutrosophic SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating.

**Definition 28.0.19.** ((Neutrosophic) SuperHyperDominating).

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called

(i) an **Extreme SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperEdges in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating;

(ii) a **Neutrosophic SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating;

- (iii) an **Extreme SuperHyperDominating SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; and the Extreme power is corresponded to its Extreme coefficient;
- (iv) a **Neutrosophic SuperHyperDominating SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; and the Neutrosophic power is corresponded to its Neutrosophic coefficient;
- (v) an **Extreme V-SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating;
- (vi) a **Neutrosophic V-SuperHyperDominating** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating;
- (vii) an **Extreme V-SuperHyperDominating SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neutrosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDominating; and the Extreme power is corresponded to its Extreme coefficient;
- (viii) a **Neutrosophic SuperHyperDominating SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDominating, Neutrosophic re-SuperHyperDominating, Neut-

rosophic v-SuperHyperDominating, and Neutrosophic rv-SuperHyperDominating and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDominating; and the Neutrosophic power is corresponded to its Neutrosophic coefficient.

**Definition 28.0.20.** ((Extreme/Neutrosophic) $\delta$ -SuperHyperDominating). Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Then

- (i) an  $\delta$ -**SuperHyperDominating** is a Neutrosophic kind of Neutrosophic SuperHyperDominating such that either of the following expressions hold for the Neutrosophic cardinalities of SuperHyperNeighbors of  $s \in S$  :

$$|S \cap N(s)| > |S \cap (V \setminus N(s))| + \delta; \quad \boxed{136EQN1}$$

$$|S \cap N(s)| < |S \cap (V \setminus N(s))| + \delta. \quad \boxed{136EQN2}$$

The Expression (28.1), holds if  $S$  is an  $\delta$ -**SuperHyperOffensive**. And the Expression (28.1), holds if  $S$  is an  $\delta$ -**SuperHyperDefensive**;

- (ii) a **Neutrosophic  $\delta$ -SuperHyperDominating** is a Neutrosophic kind of Neutrosophic SuperHyperDominating such that either of the following Neutrosophic expressions hold for the Neutrosophic cardinalities of SuperHyperNeighbors of  $s \in S$  :

$$|S \cap N(s)|_{Neutrosophic} > |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta; \quad \boxed{136EQN3}$$

$$|S \cap N(s)|_{Neutrosophic} < |S \cap (V \setminus N(s))|_{Neutrosophic} + \delta. \quad \boxed{136EQN4}$$

The Expression (28.1), holds if  $S$  is a **Neutrosophic  $\delta$ -SuperHyperOffensive**. And the Expression (28.1), holds if  $S$  is a **Neutrosophic  $\delta$ -SuperHyperDefensive**.

For the sake of having a Neutrosophic SuperHyperDominating, there's a need to “**redefine**” the notion of “Neutrosophic SuperHyperGraph”. The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values.

**Definition 28.0.21.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . It's redefined **Neutrosophic SuperHyperGraph** if the Table (28.1) holds.

It's useful to define a “Neutrosophic” version of SuperHyperClasses. Since there's more ways to get Neutrosophic type-results to make a Neutrosophic more understandable.

**Definition 28.0.22.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . There are some **Neutrosophic SuperHyperClasses** if the Table (28.2) holds. Thus Neutrosophic SuperHyperPath, SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyperMultiPartite, and SuperHyperWheel, are **Neutrosophic SuperHyperPath**, **Neutrosophic SuperHyperCycle**, **Neutrosophic SuperHyperStar**, **Neutrosophic SuperHyperBipartite**, **Neutrosophic SuperHyperMultiPartite**, and **Neutrosophic SuperHyperWheel** if the Table (28.2) holds.

136DEF1

136DEF2



Table 28.1: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph Mentioned in the Definition (28.0.23)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

136TBL3

Table 28.2: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph, Mentioned in the Definition (28.0.22)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

136TBL4

Table 28.3: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph Mentioned in the Definition (28.0.23)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

136TBL1

It's useful to define a "Neutrosophic" version of a Neutrosophic SuperHyperDominating. Since there's more ways to get type-results to make a Neutrosophic SuperHyperDominating more Neutrosophicly understandable.

For the sake of having a Neutrosophic SuperHyperDominating, there's a need to "redefine" the Neutrosophic notion of "Neutrosophic SuperHyperDominating". The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values.

**Definition 28.0.23.** Assume a SuperHyperDominating. It's redefined a **Neutrosophic Super-HyperDominating** if the Table (28.3) holds.

136DEF1

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# Neutrosophic SuperHyperDominating But As The Extensions Excerpt From Dense And Super Forms

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136EXM1

**Example 29.0.1.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$  in the mentioned Neutrosophic Figures in every Neutrosophic items.

- On the Figure (29.1), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_2$  is a loop Neutrosophic SuperHyperEdge and  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , is excluded in every given Neutrosophic SuperHyperDominating.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= 3z. \end{aligned}$$

3602

- On the Figure (29.2), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1, E_2$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , is excluded in every



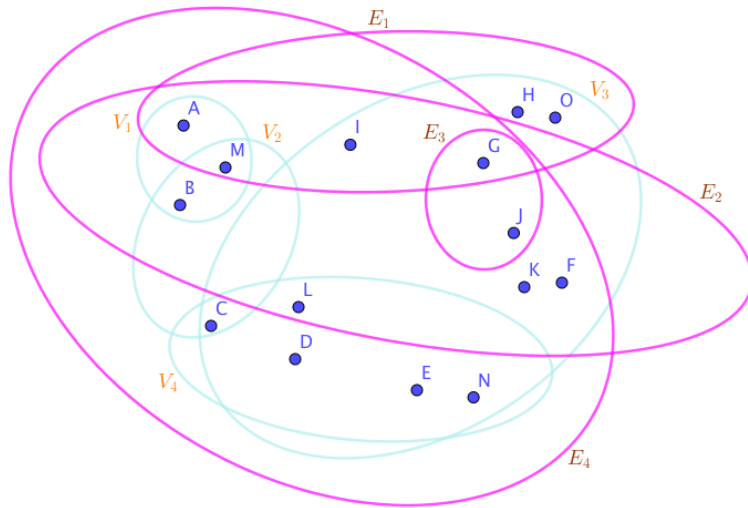


Figure 29.1: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG1

given Neutrosophic SuperHyperDominating.

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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= 3z. \end{aligned}$$

3611

- On the Figure (29.3), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= 3z. \end{aligned}$$

3614

- On the Figure (29.4), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_1, V_4\}. \end{aligned}$$

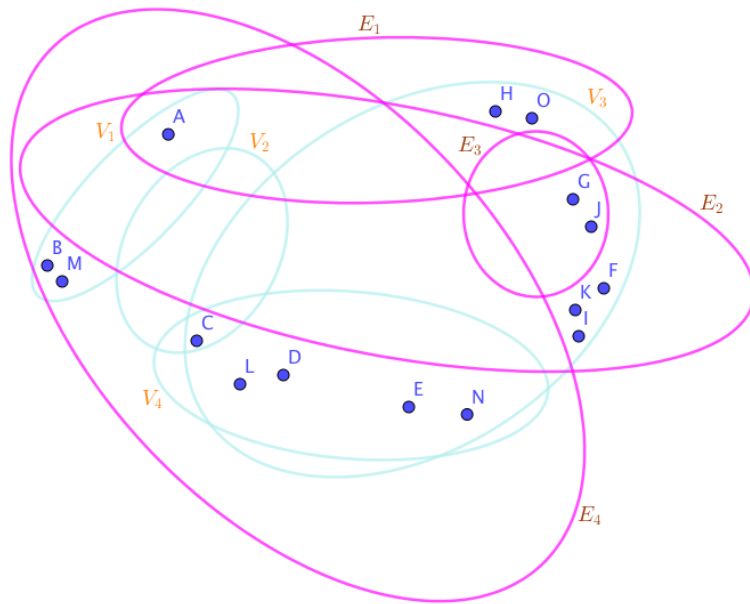


Figure 29.2: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG2

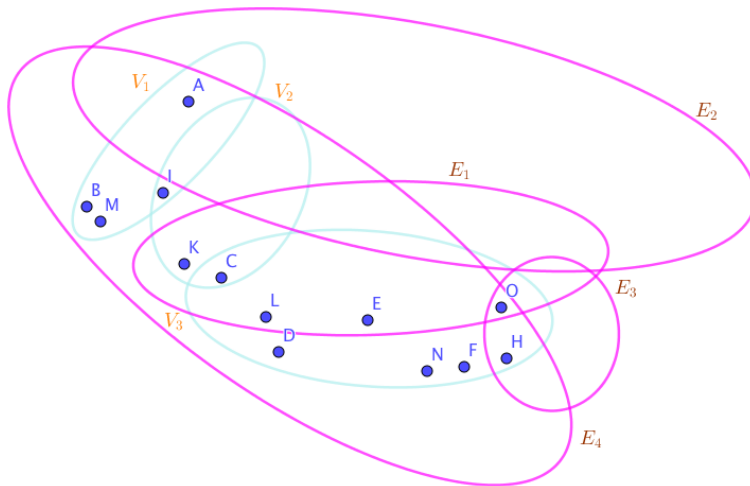


Figure 29.3: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG3

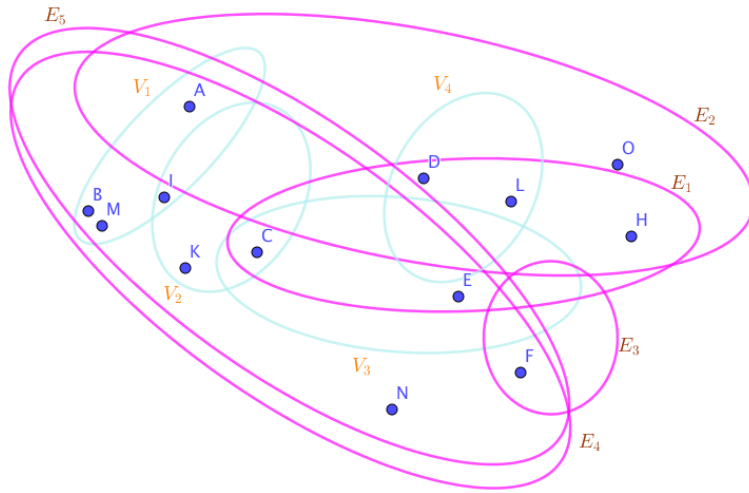


Figure 29.4: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG4

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= \\ 5 \times 3z^2. \end{aligned}$$

3617

- On the Figure (29.5), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 3618 3619

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= z. \end{aligned}$$

3620

- On the Figure (29.6), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 3621 3622

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} & \\ = \{E_{3i+1^3_{i=0}}, E_{3i+23^3_{i=0}}\}. & \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} & \\ = 3 \times 3z^8. & \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} & \\ = \{V_{3i+1^3_{i=0}}, V_{3i+11^3_{i=0}}\}. & \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-Quasi-SuperHyperDominating SuperHyperPolynomial}} & \end{aligned}$$

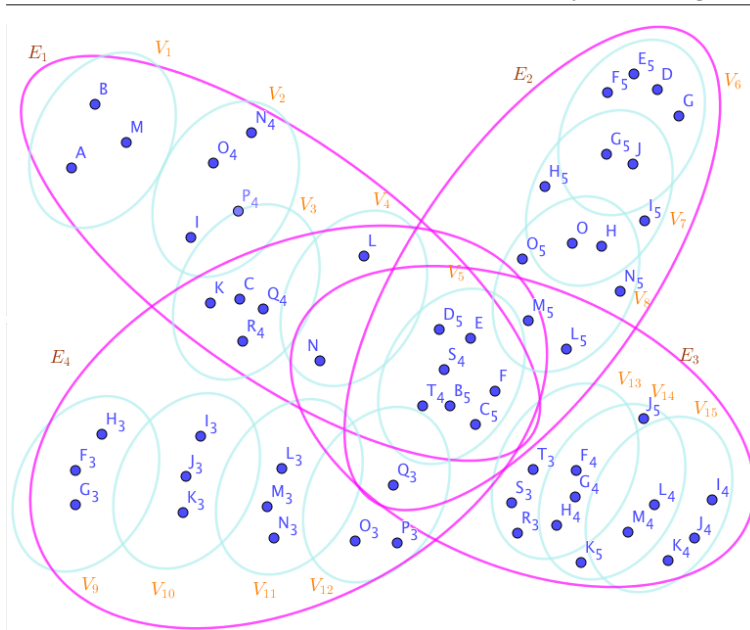


Figure 29.5: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG5

$$= 3 \times 3z^8.$$

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- On the Figure (29.7), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 3624 3625

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} = \{E_{15}, E_{16}, E_{17}\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} = 3 \times 3z^3.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} = \{V_3, V_6, V_8\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} = 4 \times 5 \times 5z^3.$$

3626

- On the Figure (29.8), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 3627 3628

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} = \{E_4\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} = z.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} = \{V_3, V_6, V_8\}.$$

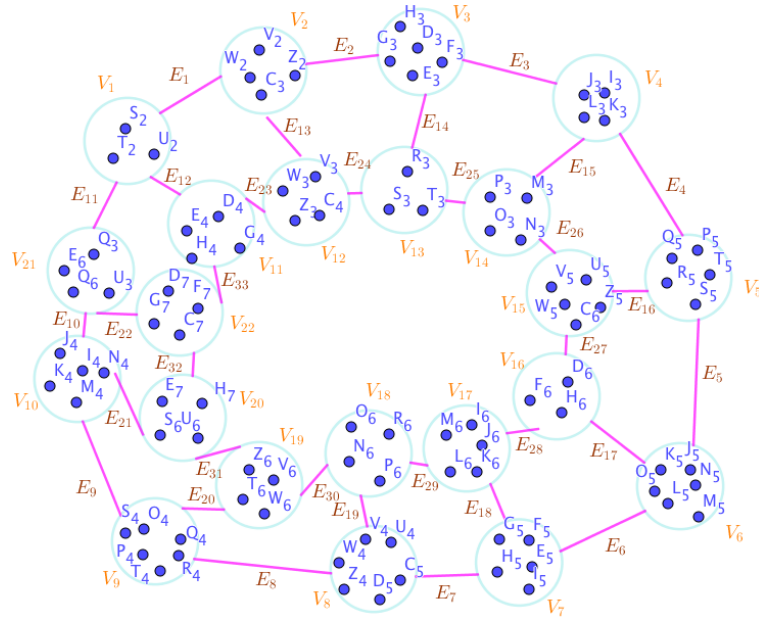


Figure 29.6: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG6

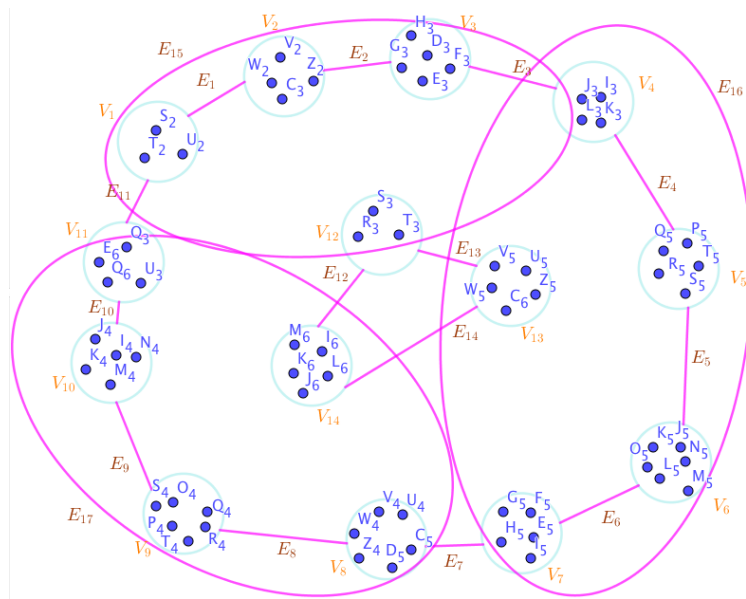


Figure 29.7: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG7

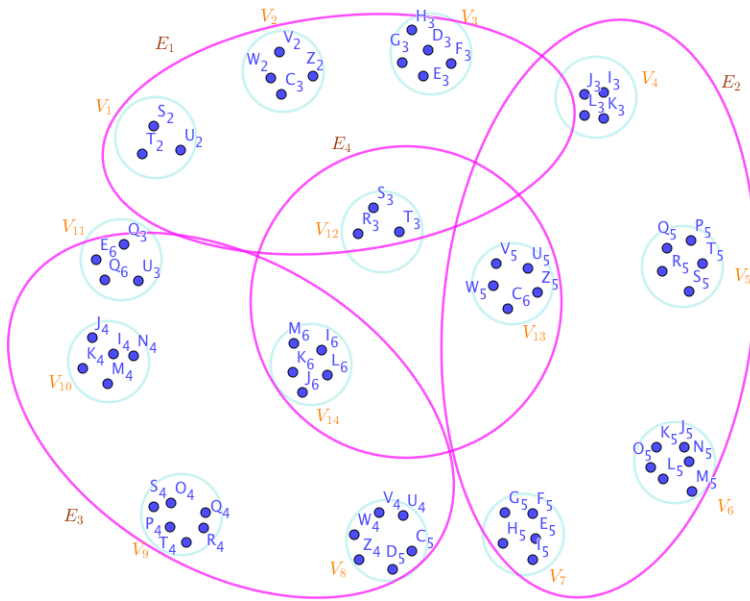


Figure 29.8: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG8

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= \\ &= 4 \times 5 \times 5z^3. \end{aligned}$$

3629

- On the Figure (29.9), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3630 3631

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_{3i+1}_{i=0}, E_{23}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= 3z^5. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_{3i+1}_{i=0}, V_{11}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-Quasi-SuperHyperDominating SuperHyperPolynomial}} &= 3 \times 11z^5. \end{aligned}$$

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- On the Figure (29.10), the Neutrosophic SuperHyperNotion, namely, Neutrosophic Super- 3633

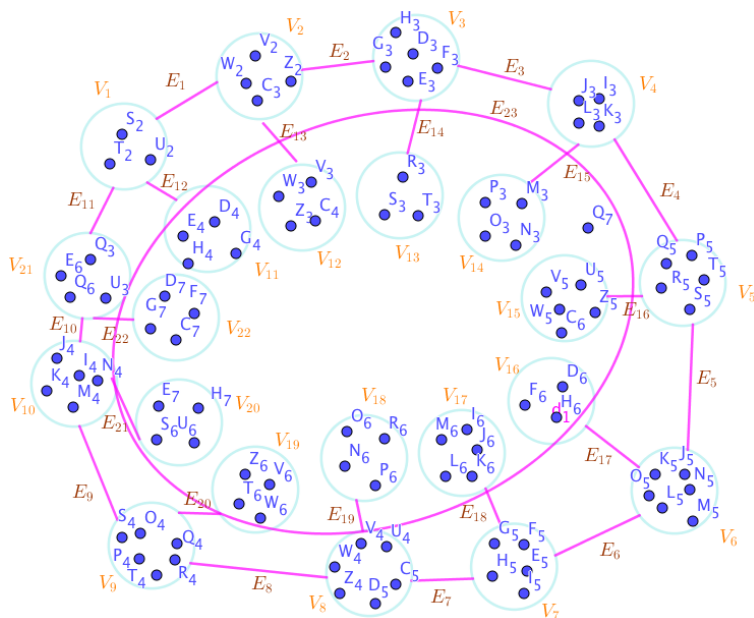


Figure 29.9: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

HyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3634

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_3, V_6, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= \\ &= 4 \times 5 \times 5z^3. \end{aligned}$$

3635

- On the Figure (29.11), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3636 3637

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_1, E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} &= \\ &= 3 \times 3z^3. \end{aligned}$$

3638

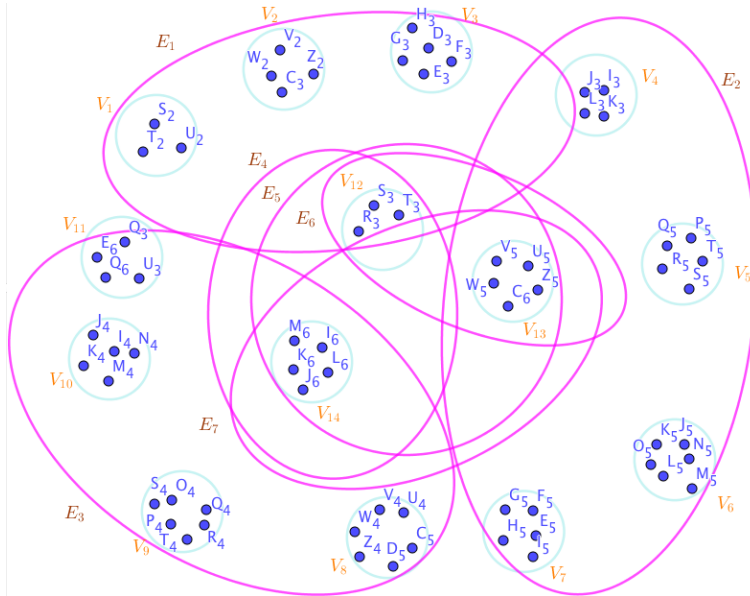


Figure 29.10: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG10

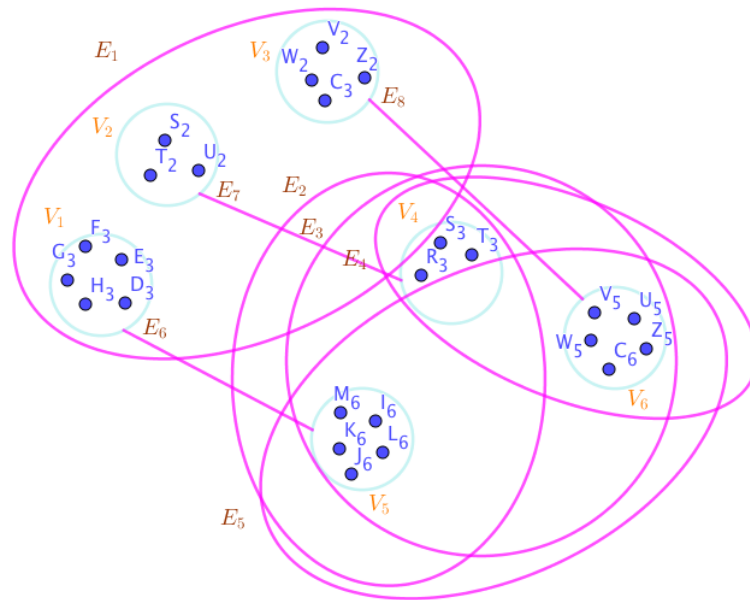


Figure 29.11: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG11



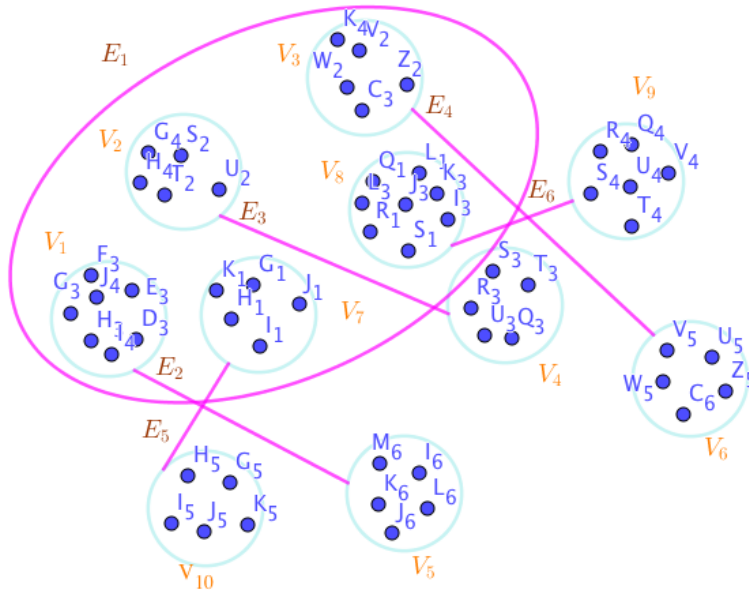


Figure 29.12: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

- On the Figure (29.12), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3639 3640

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_{i=1}^{i \neq 4,5,6}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= \\ &= 5 \times 5z^5. \end{aligned}$$

3641

- On the Figure (29.13), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3642 3643

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_3, E_9\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= \\ &= 3 \times 3z^2. \end{aligned}$$

3644

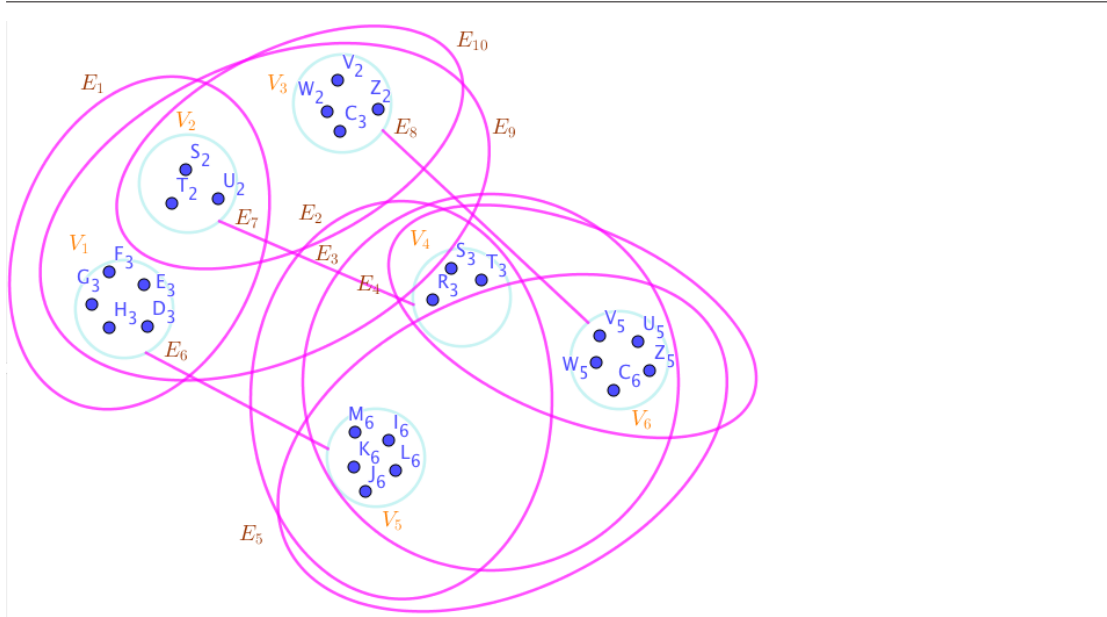


Figure 29.13: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG13

- On the Figure (29.14), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3645 3646

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= z. \end{aligned}$$

3647

- On the Figure (29.15), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3648 3649

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= 4z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= z^2. \end{aligned}$$

3650

- On the Figure (29.16), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. 3651

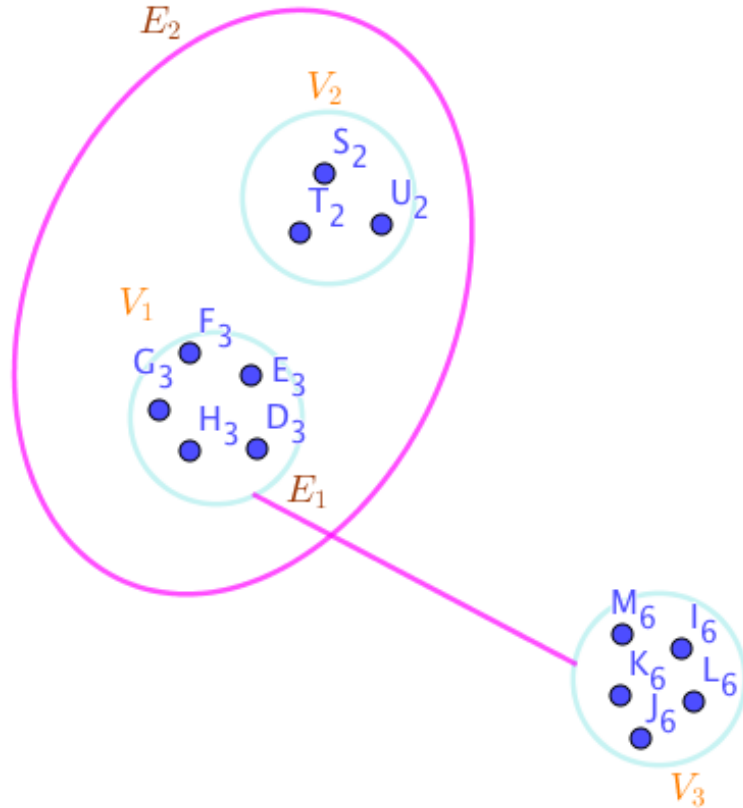


Figure 29.14: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG14

HyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3652

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= 4z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 4 \times 3z^3. \end{aligned}$$

3653

- On the Figure (29.17), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3654 3655

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= 4z^2. \end{aligned}$$

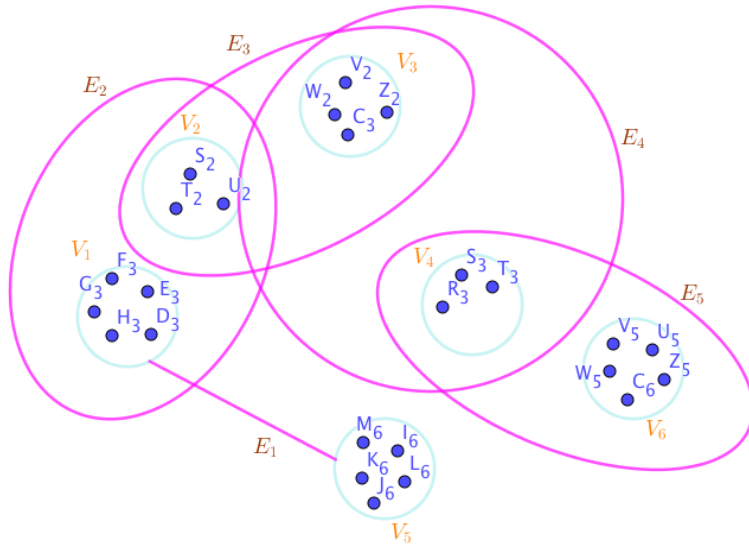


Figure 29.15: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG15

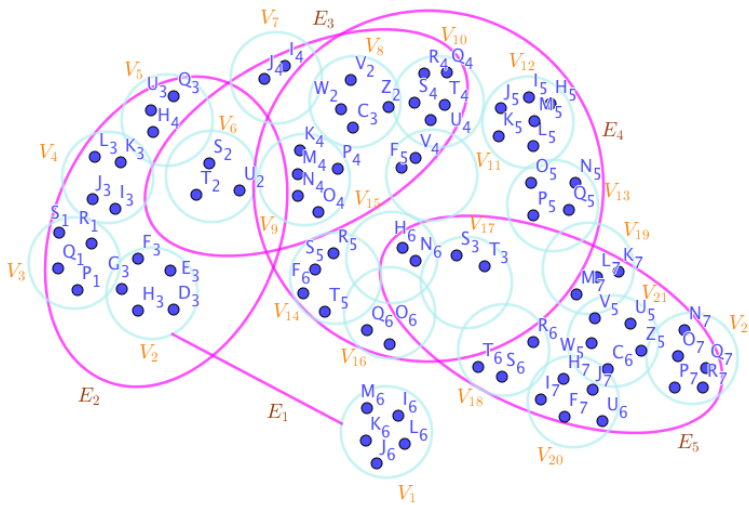


Figure 29.16: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG16

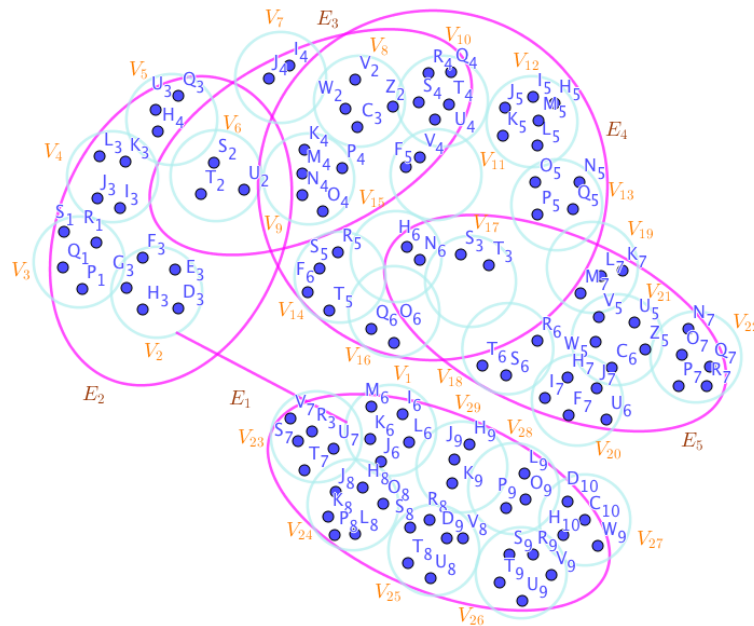


Figure 29.17: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 4 \times 3z^4. \end{aligned}$$

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- On the Figure (29.18), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3657 3658

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} &= 2 \times 4 \times 3z^4. \end{aligned}$$

3659

- On the Figure (29.19), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3660 3661

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} &= \{E_{3i+1_{i=0}^3}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} &= 3z^4. \end{aligned}$$

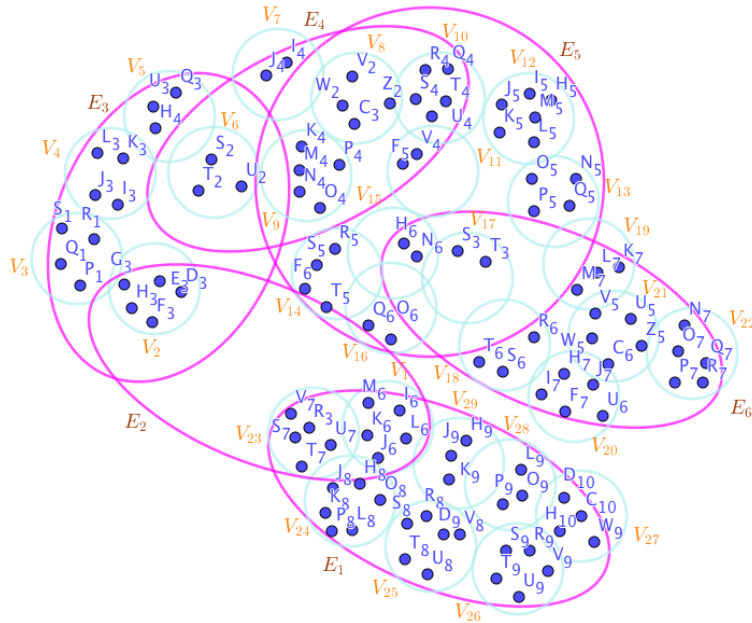


Figure 29.18: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG18

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} = \{V_{3i+1_{i=0^3}}\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} = 3z^4.$$

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- On the Figure (29.20), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3663 3664

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} = \{E_6\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} = 10z.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} = \{V_1\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} = z.$$

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- On the Figure (29.21), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3666 3667

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} = \{E_2\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} = z.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} = \{V_1\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} = 10z.$$

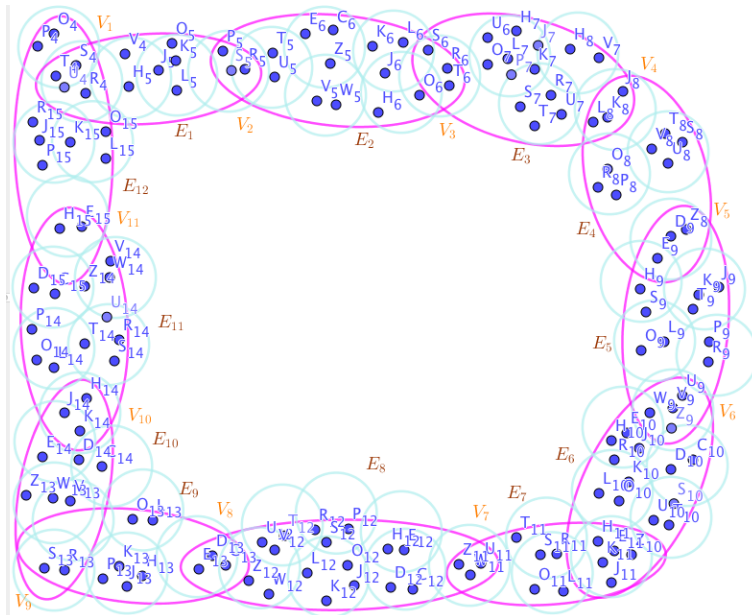


Figure 29.19: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG19

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- On the Figure (29.22), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDominating, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 3669 3670

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating}} = \{E_3, E_4\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperDominating SuperHyperPolynomial}} = 4z^2.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating}} = \{V_3, V_6\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme V-SuperHyperDominating SuperHyperPolynomial}} = 5 \times 1z^2.$$

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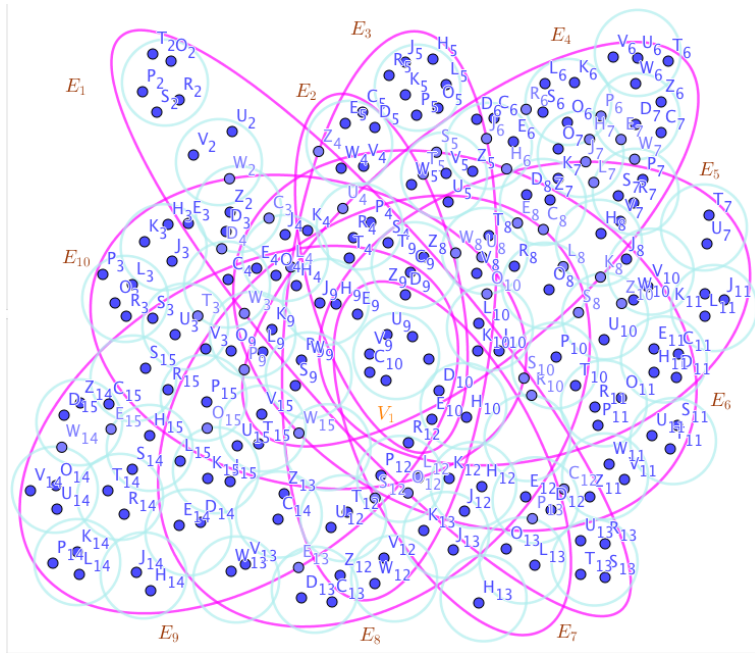


Figure 29.20: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)

136NSHG20



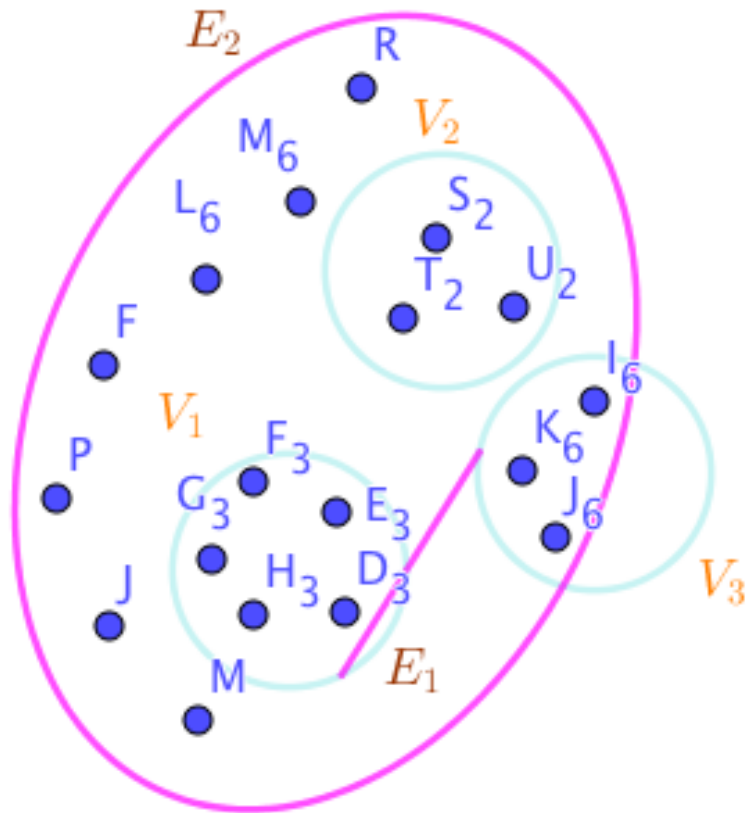


Figure 29.21: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperDominating in the Neutrosophic Example (41.0.3)





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# The Neutrosophic Departures on The Theoretical Results Toward Theoretical Motivations

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The previous Neutrosophic approach apply on the upcoming Neutrosophic results on Neutrosophic SuperHyperClasses. 3676  
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**Proposition 30.0.1.** Assume a connected Neutrosophic SuperHyperMultipartite ESHM : (V, E). 3678  
Then 3679

$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating}} \\
 &= \{E_a \in E_{P_i^{ESHG:(V,E)}}, \\
 & \quad \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDominating SuperHyperPolynomial}} \\
 &= z^{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating}} \\
 &= \{V_a^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_b^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperDominating SuperHyperPolynomial}} \\
 &= \sum_{|V_{ESHG:(V,E)}^{EXTERNAL}|_{\text{Neutrosophic Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{ choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let 3680

$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest SuperHyperDominating taken from a connected Neutrosophic SuperHyperMultipartite 3681

$ESHM : (V, E)$ . There's a new way to redefine as

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$$\begin{aligned} V_i^{EXTERNAL} &\sim V_j^{EXTERNAL} \equiv \\ \exists! E_z \in E_{ESHG:(V,E)}, & V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\ \exists! E_z \in E_{ESHG:(V,E)}, & \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z. \end{aligned}$$

The term “EXTERNAL” implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperDominating. The latter is straightforward. Then there's no at least one SuperHyperDominating. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperDominating could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

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$$\begin{aligned} P : \\ V_1^{EXTERNAL}, E_1, \\ V_2^{EXTERNAL}, E_2 \end{aligned}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

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$$\begin{aligned} P : \\ V_1^{EXTERNAL}, E_1, \\ V_2^{EXTERNAL}, E_2 \end{aligned}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. ■

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136EXM22a

**Example 30.0.2.** In the Figure (30.1), the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Neutrosophic featured. The obtained Neutrosophic SuperHyperSet, by the Algorithm in previous Neutrosophic result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , in the Neutrosophic SuperHyperModel (30.1), is the Neutrosophic SuperHyperDominating.

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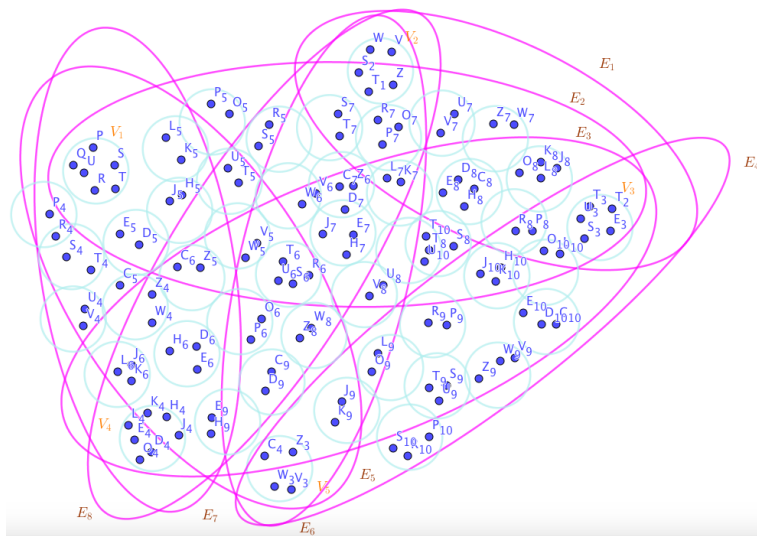


Figure 30.1: a Neutrosophic SuperHyperMultipartite Associated to the Notions of Neutrosophic SuperHyperDominating in the Example (41.0.5)

136NSHG22a



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# The Surveys of Mathematical Sets On The Results But As The Initial Motivation

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For the SuperHyperDominating, Neutrosophic SuperHyperDominating, and the Neutrosophic SuperHyperDominating, some general results are introduced.

*Remark 31.0.1.* Let remind that the Neutrosophic SuperHyperDominating is “redefined” on the positions of the alphabets.

**Corollary 31.0.2.** *Assume Neutrosophic SuperHyperDominating. Then*

$$\begin{aligned} & \text{Neutrosophic SuperHyperDominating} = \\ & \{ \text{the SuperHyperDominating of the SuperHyperVertices} \mid \\ & \max \{ \text{SuperHyperOffensive} \\ & \text{SuperHyperDominating} \\ & \mid \text{Neutrosophic cardinality amid those SuperHyperDominating.} \} \end{aligned}$$

*plus one Neutrosophic SuperHyperNeighbor to one. Where  $\sigma_i$  is the unary operation on the SuperHyperVertices of the SuperHyperGraph to assign the determinacy, the indeterminacy and the neutrality, for  $i = 1, 2, 3$ , respectively.*

**Corollary 31.0.3.** *Assume a Neutrosophic SuperHyperGraph on the same identical letter of the alphabet. Then the notion of Neutrosophic SuperHyperDominating and SuperHyperDominating coincide.*

**Corollary 31.0.4.** *Assume a Neutrosophic SuperHyperGraph on the same identical letter of the alphabet. Then a consecutive sequence of the SuperHyperVertices is a Neutrosophic SuperHyperDominating if and only if it's a SuperHyperDominating.*

**Corollary 31.0.5.** *Assume a Neutrosophic SuperHyperGraph on the same identical letter of the alphabet. Then a consecutive sequence of the SuperHyperVertices is a strongest SuperHyperDominating if and only if it's a longest SuperHyperDominating.*

**Corollary 31.0.6.** *Assume SuperHyperClasses of a Neutrosophic SuperHyperGraph on the same identical letter of the alphabet. Then its Neutrosophic SuperHyperDominating is its SuperHyperDominating and reversely.*



**Corollary 31.0.7.** Assume a Neutrosophic SuperHyperPath(-/SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel) on the same identical letter of the alphabet. Then its Neutrosophic SuperHyperDominating is its SuperHyperDominating and reversely. 3722-3725

**Corollary 31.0.8.** Assume a Neutrosophic SuperHyperGraph. Then its Neutrosophic SuperHyperDominating isn't well-defined if and only if its SuperHyperDominating isn't well-defined. 3726-3727

**Corollary 31.0.9.** Assume SuperHyperClasses of a Neutrosophic SuperHyperGraph. Then its Neutrosophic SuperHyperDominating isn't well-defined if and only if its SuperHyperDominating isn't well-defined. 3728-3730

**Corollary 31.0.10.** Assume a Neutrosophic SuperHyperPath(-/SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). Then its Neutrosophic SuperHyperDominating isn't well-defined if and only if its SuperHyperDominating isn't well-defined. 3731-3734

**Corollary 31.0.11.** Assume a Neutrosophic SuperHyperGraph. Then its Neutrosophic SuperHyperDominating is well-defined if and only if its SuperHyperDominating is well-defined. 3735-3736

**Corollary 31.0.12.** Assume SuperHyperClasses of a Neutrosophic SuperHyperGraph. Then its Neutrosophic SuperHyperDominating is well-defined if and only if its SuperHyperDominating is well-defined. 3737-3739

**Corollary 31.0.13.** Assume a Neutrosophic SuperHyperPath(-/SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). Then its Neutrosophic SuperHyperDominating is well-defined if and only if its SuperHyperDominating is well-defined. 3740-3742

**Proposition 31.0.14.** Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph. Then  $V$  is 3743

- (i) : the dual SuperHyperDefensive SuperHyperDominating; 3744
- (ii) : the strong dual SuperHyperDefensive SuperHyperDominating; 3745
- (iii) : the connected dual SuperHyperDefensive SuperHyperDominating; 3746
- (iv) : the  $\delta$ -dual SuperHyperDefensive SuperHyperDominating; 3747
- (v) : the strong  $\delta$ -dual SuperHyperDefensive SuperHyperDominating; 3748
- (vi) : the connected  $\delta$ -dual SuperHyperDefensive SuperHyperDominating. 3749

**Proposition 31.0.15.** Let  $NTG : (V, E, \sigma, \mu)$  be a Neutrosophic SuperHyperGraph. Then  $\emptyset$  is 3750

- (i) : the SuperHyperDefensive SuperHyperDominating; 3751
- (ii) : the strong SuperHyperDefensive SuperHyperDominating; 3752
- (iii) : the connected defensive SuperHyperDefensive SuperHyperDominating; 3753
- (iv) : the  $\delta$ -SuperHyperDefensive SuperHyperDominating; 3754
- (v) : the strong  $\delta$ -SuperHyperDefensive SuperHyperDominating; 3755

(vi) : the connected  $\delta$ -SuperHyperDefensive SuperHyperDominating. 3756

**Proposition 31.0.16.** Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph. Then an independent SuperHyperSet is 3757  
3758

(i) : the SuperHyperDefensive SuperHyperDominating; 3759

(ii) : the strong SuperHyperDefensive SuperHyperDominating; 3760

(iii) : the connected SuperHyperDefensive SuperHyperDominating; 3761

(iv) : the  $\delta$ -SuperHyperDefensive SuperHyperDominating; 3762

(v) : the strong  $\delta$ -SuperHyperDefensive SuperHyperDominating; 3763

(vi) : the connected  $\delta$ -SuperHyperDefensive SuperHyperDominating. 3764

**Proposition 31.0.17.** Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperUniform SuperHyper-Graph which is a SuperHyperDominating/SuperHyperPath. Then  $V$  is a maximal 3765  
3766

(i) : SuperHyperDefensive SuperHyperDominating; 3767

(ii) : strong SuperHyperDefensive SuperHyperDominating; 3768

(iii) : connected SuperHyperDefensive SuperHyperDominating; 3769

(iv) :  $\mathcal{O}(ESHG)$ -SuperHyperDefensive SuperHyperDominating; 3770

(v) : strong  $\mathcal{O}(ESHG)$ -SuperHyperDefensive SuperHyperDominating; 3771

(vi) : connected  $\mathcal{O}(ESHG)$ -SuperHyperDefensive SuperHyperDominating; 3772

Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide. 3773

**Proposition 31.0.18.** Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph which is a SuperHyperUniform SuperHyperWheel. Then  $V$  is a maximal 3774  
3775

(i) : dual SuperHyperDefensive SuperHyperDominating; 3776

(ii) : strong dual SuperHyperDefensive SuperHyperDominating; 3777

(iii) : connected dual SuperHyperDefensive SuperHyperDominating; 3778

(iv) :  $\mathcal{O}(ESHG)$ -dual SuperHyperDefensive SuperHyperDominating; 3779

(v) : strong  $\mathcal{O}(ESHG)$ -dual SuperHyperDefensive SuperHyperDominating; 3780

(vi) : connected  $\mathcal{O}(ESHG)$ -dual SuperHyperDefensive SuperHyperDominating; 3781

Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide. 3782

**Proposition 31.0.19.** Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperUniform SuperHyper-Graph which is a SuperHyperDominating/SuperHyperPath. Then the number of 3783  
3784

(i) : the SuperHyperDominating; 3785

- (ii) : the SuperHyperDominating; 3786
- (iii) : the connected SuperHyperDominating; 3787
- (iv) : the  $\mathcal{O}(ESHG)$ -SuperHyperDominating; 3788
- (v) : the strong  $\mathcal{O}(ESHG)$ -SuperHyperDominating; 3789
- (vi) : the connected  $\mathcal{O}(ESHG)$ -SuperHyperDominating. 3790

is one and it's only  $V$ . Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide. 3791  
3792

**Proposition 31.0.20.** Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperUniform SuperHyper-Graph which is a SuperHyperWheel. Then the number of 3793  
3794

- (i) : the dual SuperHyperDominating; 3795
- (ii) : the dual SuperHyperDominating; 3796
- (iii) : the dual connected SuperHyperDominating; 3797
- (iv) : the dual  $\mathcal{O}(ESHG)$ -SuperHyperDominating; 3798
- (v) : the strong dual  $\mathcal{O}(ESHG)$ -SuperHyperDominating; 3799
- (vi) : the connected dual  $\mathcal{O}(ESHG)$ -SuperHyperDominating. 3800

is one and it's only  $V$ . Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide. 3801  
3802

**Proposition 31.0.21.** Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperUniform SuperHyper-Graph which is a SuperHyperStar/SuperHyperComplete SuperHyperBipartite/SuperHyperComplete SuperHyperMultipartite. Then a SuperHyperSet contains [the SuperHyperCenter and] the half of multiplying  $r$  with the number of all the SuperHyperEdges plus one of all the SuperHyperVertices is a 3803  
3804  
3805  
3806  
3807

- (i) : dual SuperHyperDefensive SuperHyperDominating; 3808
- (ii) : strong dual SuperHyperDefensive SuperHyperDominating; 3809
- (iii) : connected dual SuperHyperDefensive SuperHyperDominating; 3810
- (iv) :  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating; 3811
- (v) : strong  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating; 3812
- (vi) : connected  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating. 3813

**Proposition 31.0.22.** Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperUniform SuperHyper-Graph which is a SuperHyperStar/SuperHyperComplete SuperHyperBipartite/SuperHyperComplete SuperHyperMultipartite. Then a SuperHyperSet contains the half of multiplying  $r$  with the number of all the SuperHyperEdges plus one of all the SuperHyperVertices in the biggest SuperHyperPart is a 3814  
3815  
3816  
3817  
3818

- (i) : *SuperHyperDefensive SuperHyperDominating;* 3819
- (ii) : *strong SuperHyperDefensive SuperHyperDominating;* 3820
- (iii) : *connected SuperHyperDefensive SuperHyperDominating;* 3821
- (iv) :  *$\delta$ -SuperHyperDefensive SuperHyperDominating;* 3822
- (v) : *strong  $\delta$ -SuperHyperDefensive SuperHyperDominating;* 3823
- (vi) : *connected  $\delta$ -SuperHyperDefensive SuperHyperDominating.* 3824

**Proposition 31.0.23.** *Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperUniform SuperHyper-Graph which is a SuperHyperStar/SuperHyperComplete SuperHyperBipartite/SuperHyperComplete SuperHyperMultipartite. Then Then the number of* 3825  
3826  
3827

- (i) : *dual SuperHyperDefensive SuperHyperDominating;* 3828
- (ii) : *strong dual SuperHyperDefensive SuperHyperDominating;* 3829
- (iii) : *connected dual SuperHyperDefensive SuperHyperDominating;* 3830
- (iv) :  *$\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating;* 3831
- (v) : *strong  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating;* 3832
- (vi) : *connected  $\frac{\mathcal{O}(ESHG)}{2} + 1$ -dual SuperHyperDefensive SuperHyperDominating.* 3833

*is one and it's only  $S$ , a SuperHyperSet contains [the SuperHyperCenter and] the half of multiplying  $r$  with the number of all the SuperHyperEdges plus one of all the SuperHyperVertices. Where the exterior SuperHyperVertices and the interior SuperHyperVertices coincide.* 3834  
3835  
3836

**Proposition 31.0.24.** *Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph. The number of connected component is  $|V - S|$  if there's a SuperHyperSet which is a dual* 3837  
3838

- (i) : *SuperHyperDefensive SuperHyperDominating;* 3839
- (ii) : *strong SuperHyperDefensive SuperHyperDominating;* 3840
- (iii) : *connected SuperHyperDefensive SuperHyperDominating;* 3841
- (iv) : *SuperHyperDominating;* 3842
- (v) : *strong 1-SuperHyperDefensive SuperHyperDominating;* 3843
- (vi) : *connected 1-SuperHyperDefensive SuperHyperDominating.* 3844

**Proposition 31.0.25.** *Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph. Then the number is at most  $\mathcal{O}(ESHG)$  and the Neutrosophic number is at most  $\mathcal{O}_n(ESHG)$ .* 3845  
3846

**Proposition 31.0.26.** *Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph which is SuperHyperComplete. The number is  $\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1$  and the Neutrosophic number is  $\min \sum_{v \in \{v_1, v_2, \dots, v_t\}} \frac{\mathcal{O}(ESHG:(V,E))}{2} \subseteq V \sigma(v)$ , in the setting of dual* 3847  
3848  
3849

- (i) : *SuperHyperDefensive SuperHyperDominating;* 3850
- (ii) : *strong SuperHyperDefensive SuperHyperDominating;* 3851
- (iii) : *connected SuperHyperDefensive SuperHyperDominating;* 3852
- (iv) :  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating;* 3853
- (v) : *strong*  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating;* 3854
- (vi) : *connected*  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating.* 3855

**Proposition 31.0.27.** *Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph which is  $\emptyset$ . The number is 0 and the Neutrosophic number is 0, for an independent SuperHyperSet in the setting of dual* 3856  
3857  
3858

- (i) : *SuperHyperDefensive SuperHyperDominating;* 3859
- (ii) : *strong SuperHyperDefensive SuperHyperDominating;* 3860
- (iii) : *connected SuperHyperDefensive SuperHyperDominating;* 3861
- (iv) : *0-SuperHyperDefensive SuperHyperDominating;* 3862
- (v) : *strong 0-SuperHyperDefensive SuperHyperDominating;* 3863
- (vi) : *connected 0-SuperHyperDefensive SuperHyperDominating.* 3864

**Proposition 31.0.28.** *Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph which is SuperHyperComplete. Then there's no independent SuperHyperSet.* 3865  
3866

**Proposition 31.0.29.** *Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph which is SuperHyperDominating/SuperHyperPath/SuperHyperWheel. The number is  $\mathcal{O}(ESHG : (V, E))$  and the Neutrosophic number is  $\mathcal{O}_n(ESHG : (V, E))$ , in the setting of a dual* 3867  
3868  
3869

- (i) : *SuperHyperDefensive SuperHyperDominating;* 3870
- (ii) : *strong SuperHyperDefensive SuperHyperDominating;* 3871
- (iii) : *connected SuperHyperDefensive SuperHyperDominating;* 3872
- (iv) :  $\mathcal{O}(ESHG : (V, E))$ -*SuperHyperDefensive SuperHyperDominating;* 3873
- (v) : *strong*  $\mathcal{O}(ESHG : (V, E))$ -*SuperHyperDefensive SuperHyperDominating;* 3874
- (vi) : *connected*  $\mathcal{O}(ESHG : (V, E))$ -*SuperHyperDefensive SuperHyperDominating.* 3875

**Proposition 31.0.30.** *Let  $ESHG : (V, E)$  be a Neutrosophic SuperHyperGraph which is SuperHyperStar/complete SuperHyperBipartite/complete SuperHyperMultiPartite. The number is  $\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1$  and the Neutrosophic number is  $\min_{v \in \{v_1, v_2, \dots, v_t\}} \sum_{t > \frac{\mathcal{O}(ESHG:(V,E))}{2}} \subseteq V \sigma(v)$ , in the setting of a dual* 3876  
3877  
3878  
3879

- (i) : *SuperHyperDefensive SuperHyperDominating;* 3880

(ii) : *strong SuperHyperDefensive SuperHyperDominating;* 3881

(iii) : *connected SuperHyperDefensive SuperHyperDominating;* 3882

(iv) :  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating;* 3883

(v) : *strong*  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating;* 3884

(vi) : *connected*  $(\frac{\mathcal{O}(ESHG:(V,E))}{2} + 1)$ -*SuperHyperDefensive SuperHyperDominating.* 3885

**Proposition 31.0.31.** *Let  $\mathcal{NSHF} : (V, E)$  be a SuperHyperFamily of the ESHGs :  $(V, E)$  Neutrosophic SuperHyperGraphs which are from one-type SuperHyperClass which the result is obtained for the individuals. Then the results also hold for the SuperHyperFamily  $\mathcal{NSHF} : (V, E)$  of these specific SuperHyperClasses of the Neutrosophic SuperHyperGraphs.* 3886  
3887  
3888  
3889

**Proposition 31.0.32.** *Let  $ESHG : (V, E)$  be a strong Neutrosophic SuperHyperGraph. If  $S$  is a dual SuperHyperDefensive SuperHyperDominating, then  $\forall v \in V \setminus S, \exists x \in S$  such that* 3890  
3891

(i)  $v \in N_s(x)$ ; 3892

(ii)  $vx \in E$ . 3893

**Proposition 31.0.33.** *Let  $ESHG : (V, E)$  be a strong Neutrosophic SuperHyperGraph. If  $S$  is a dual SuperHyperDefensive SuperHyperDominating, then* 3894  
3895

(i)  $S$  is SuperHyperDominating set; 3896

(ii) there's  $S \subseteq S'$  such that  $|S'|$  is SuperHyperChromatic number. 3897

**Proposition 31.0.34.** *Let  $ESHG : (V, E)$  be a strong Neutrosophic SuperHyperGraph. Then* 3898

(i)  $\Gamma \leq \mathcal{O}$ ; 3899

(ii)  $\Gamma_s \leq \mathcal{O}_n$ . 3900

**Proposition 31.0.35.** *Let  $ESHG : (V, E)$  be a strong Neutrosophic SuperHyperGraph which is connected. Then* 3901  
3902

(i)  $\Gamma \leq \mathcal{O} - 1$ ; 3903

(ii)  $\Gamma_s \leq \mathcal{O}_n - \sum_{i=1}^3 \sigma_i(x)$ . 3904

**Proposition 31.0.36.** *Let  $ESHG : (V, E)$  be an odd SuperHyperPath. Then* 3905

(i) the SuperHyperSet  $S = \{v_2, v_4, \dots, v_{n-1}\}$  is a dual SuperHyperDefensive SuperHyperDominating; 3906  
3907

(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor + 1$  and corresponded SuperHyperSet is  $S = \{v_2, v_4, \dots, v_{n-1}\}$ ; 3908

(iii)  $\Gamma_s = \min\{\sum_{s \in S = \{v_2, v_4, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s), \sum_{s \in S = \{v_1, v_3, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s)\}$ ; 3909

(iv) the SuperHyperSets  $S_1 = \{v_2, v_4, \dots, v_{n-1}\}$  and  $S_2 = \{v_1, v_3, \dots, v_{n-1}\}$  are only a dual SuperHyperDominating. 3910  
3911



**Proposition 31.0.37.** *Let  $ESHG : (V, E)$  be an even SuperHyperPath. Then* 3912

- (i) *the set  $S = \{v_2, v_4, \dots, v_n\}$  is a dual SuperHyperDefensive SuperHyperDominating;* 3913
- (ii)  *$\Gamma = \lfloor \frac{n}{2} \rfloor$  and corresponded SuperHyperSets are  $\{v_2, v_4, \dots, v_n\}$  and  $\{v_1, v_3, \dots, v_{n-1}\}$ ;* 3914
- (iii)  *$\Gamma_s = \min\{\sum_{s \in S = \{v_2, v_4, \dots, v_n\}} \sum_{i=1}^3 \sigma_i(s), \sum_{s \in S = \{v_1, v_3, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s)\}$ ;* 3915
- (iv) *the SuperHyperSets  $S_1 = \{v_2, v_4, \dots, v_n\}$  and  $S_2 = \{v_1, v_3, \dots, v_{n-1}\}$  are only dual SuperHyperDominating.* 3916  
3917

**Proposition 31.0.38.** *Let  $ESHG : (V, E)$  be an even SuperHyperDominating. Then* 3918

- (i) *the SuperHyperSet  $S = \{v_2, v_4, \dots, v_n\}$  is a dual SuperHyperDefensive SuperHyperDominating;* 3919  
3920
- (ii)  *$\Gamma = \lfloor \frac{n}{2} \rfloor$  and corresponded SuperHyperSets are  $\{v_2, v_4, \dots, v_n\}$  and  $\{v_1, v_3, \dots, v_{n-1}\}$ ;* 3921
- (iii)  *$\Gamma_s = \min\{\sum_{s \in S = \{v_2, v_4, \dots, v_n\}} \sigma(s), \sum_{s \in S = \{v_1, v_3, \dots, v_{n-1}\}} \sigma(s)\}$ ;* 3922
- (iv) *the SuperHyperSets  $S_1 = \{v_2, v_4, \dots, v_n\}$  and  $S_2 = \{v_1, v_3, \dots, v_{n-1}\}$  are only dual SuperHyperDominating.* 3923  
3924

**Proposition 31.0.39.** *Let  $ESHG : (V, E)$  be an odd SuperHyperDominating. Then* 3925

- (i) *the SuperHyperSet  $S = \{v_2, v_4, \dots, v_{n-1}\}$  is a dual SuperHyperDefensive SuperHyperDominating;* 3926  
3927
- (ii)  *$\Gamma = \lfloor \frac{n}{2} \rfloor + 1$  and corresponded SuperHyperSet is  $S = \{v_2, v_4, \dots, v_{n-1}\}$ ;* 3928
- (iii)  *$\Gamma_s = \min\{\sum_{s \in S = \{v_2, v_4, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s), \sum_{s \in S = \{v_1, v_3, \dots, v_{n-1}\}} \sum_{i=1}^3 \sigma_i(s)\}$ ;* 3929
- (iv) *the SuperHyperSets  $S_1 = \{v_2, v_4, \dots, v_{n-1}\}$  and  $S_2 = \{v_1, v_3, \dots, v_{n-1}\}$  are only dual SuperHyperDominating.* 3930  
3931

**Proposition 31.0.40.** *Let  $ESHG : (V, E)$  be SuperHyperStar. Then* 3932

- (i) *the SuperHyperSet  $S = \{c\}$  is a dual maximal SuperHyperDominating;* 3933
- (ii)  *$\Gamma = 1$ ;* 3934
- (iii)  *$\Gamma_s = \sum_{i=1}^3 \sigma_i(c)$ ;* 3935
- (iv) *the SuperHyperSets  $S = \{c\}$  and  $S \subset S'$  are only dual SuperHyperDominating.* 3936

**Proposition 31.0.41.** *Let  $ESHG : (V, E)$  be SuperHyperWheel. Then* 3937

- (i) *the SuperHyperSet  $S = \{v_1, v_3\} \cup \{v_6, v_9, \dots, v_{i+6}, \dots, v_n\}_{i=1}^{6+3(i-1) \leq n}$  is a dual maximal SuperHyperDefensive SuperHyperDominating;* 3938  
3939
- (ii)  *$\Gamma = |\{v_1, v_3\} \cup \{v_6, v_9, \dots, v_{i+6}, \dots, v_n\}_{i=1}^{6+3(i-1) \leq n}|$ ;* 3940
- (iii)  *$\Gamma_s = \sum_{\{v_1, v_3\} \cup \{v_6, v_9, \dots, v_{i+6}, \dots, v_n\}_{i=1}^{6+3(i-1) \leq n}} \sum_{i=1}^3 \sigma_i(s)$ ;* 3941

(iv) the SuperHyperSet  $\{v_1, v_3\} \cup \{v_6, v_9, \dots, v_{i+6}, \dots, v_n\}_{i=1}^{6+3(i-1) \leq n}$  is only a dual maximal SuperHyperDefensive SuperHyperDominating. 3942  
3943

**Proposition 31.0.42.** Let  $ESHG : (V, E)$  be an odd SuperHyperComplete. Then 3944

(i) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}$  is a dual SuperHyperDefensive SuperHyperDominating; 3945

(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor + 1$ ; 3946

(iii)  $\Gamma_s = \min\{\sum_{s \in S} \sum_{i=1}^3 \sigma_i(s)\}_{S=\{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}}$ ; 3947

(iv) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}$  is only a dual SuperHyperDefensive SuperHyperDominating. 3948  
3949

**Proposition 31.0.43.** Let  $ESHG : (V, E)$  be an even SuperHyperComplete. Then 3950

(i) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}$  is a dual SuperHyperDefensive SuperHyperDominating; 3951

(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor$ ; 3952

(iii)  $\Gamma_s = \min\{\sum_{s \in S} \sum_{i=1}^3 \sigma_i(s)\}_{S=\{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}}$ ; 3953

(iv) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}$  is only a dual maximal SuperHyperDefensive SuperHyperDominating. 3954  
3955

**Proposition 31.0.44.** Let  $\mathcal{NSHF} : (V, E)$  be a  $m$ -SuperHyperFamily of Neutrosophic SuperHyperStars with common Neutrosophic SuperHyperVertex SuperHyperSet. Then 3956  
3957

(i) the SuperHyperSet  $S = \{c_1, c_2, \dots, c_m\}$  is a dual SuperHyperDefensive SuperHyperDominating for  $\mathcal{NSHF}$ ; 3958  
3959

(ii)  $\Gamma = m$  for  $\mathcal{NSHF} : (V, E)$ ; 3960

(iii)  $\Gamma_s = \sum_{i=1}^m \sum_{j=1}^3 \sigma_j(c_i)$  for  $\mathcal{NSHF} : (V, E)$ ; 3961

(iv) the SuperHyperSets  $S = \{c_1, c_2, \dots, c_m\}$  and  $S \subset S'$  are only dual SuperHyperDominating for  $\mathcal{NSHF} : (V, E)$ . 3962  
3963

**Proposition 31.0.45.** Let  $\mathcal{NSHF} : (V, E)$  be an  $m$ -SuperHyperFamily of odd SuperHyperComplete SuperHyperGraphs with common Neutrosophic SuperHyperVertex SuperHyperSet. Then 3964  
3965

(i) the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}$  is a dual maximal SuperHyperDefensive SuperHyperDominating for  $\mathcal{NSHF}$ ; 3966  
3967

(ii)  $\Gamma = \lfloor \frac{n}{2} \rfloor + 1$  for  $\mathcal{NSHF} : (V, E)$ ; 3968

(iii)  $\Gamma_s = \min\{\sum_{s \in S} \sum_{i=1}^3 \sigma_i(s)\}_{S=\{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}}$  for  $\mathcal{NSHF} : (V, E)$ ; 3969

(iv) the SuperHyperSets  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor + 1}$  are only a dual maximal SuperHyperDominating for  $\mathcal{NSHF} : (V, E)$ . 3970  
3971



**Proposition 31.0.46.** *Let  $\mathcal{NSHF} : (V, E)$  be a  $m$ -SuperHyperFamily of even SuperHyperComplete SuperHyperGraphs with common Neutrosophic SuperHyperVertex SuperHyperSet. Then* 3972  
 3973

- (i) *the SuperHyperSet  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}$  is a dual SuperHyperDefensive SuperHyperDominating for  $\mathcal{NSHF} : (V, E)$ ;* 3974  
 3975
- (ii)  *$\Gamma = \lfloor \frac{n}{2} \rfloor$  for  $\mathcal{NSHF} : (V, E)$ ;* 3976
- (iii)  *$\Gamma_s = \min\{\sum_{s \in S} \sum_{i=1}^3 \sigma_i(s)\}_{S=\{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}}$  for  $\mathcal{NSHF} : (V, E)$ ;* 3977
- (iv) *the SuperHyperSets  $S = \{v_i\}_{i=1}^{\lfloor \frac{n}{2} \rfloor}$  are only dual maximal SuperHyperDominating for  $\mathcal{NSHF} : (V, E)$ .* 3978  
 3979

**Proposition 31.0.47.** *Let  $ESHG : (V, E)$  be a strong Neutrosophic SuperHyperGraph. Then* 3980  
*following statements hold;* 3981

- (i) *if  $s \geq t$  and a SuperHyperSet  $S$  of SuperHyperVertices is an  $t$ -SuperHyperDefensive SuperHyperDominating, then  $S$  is an  $s$ -SuperHyperDefensive SuperHyperDominating;* 3982  
 3983
- (ii) *if  $s \leq t$  and a SuperHyperSet  $S$  of SuperHyperVertices is a dual  $t$ -SuperHyperDefensive SuperHyperDominating, then  $S$  is a dual  $s$ -SuperHyperDefensive SuperHyperDominating.* 3984  
 3985

**Proposition 31.0.48.** *Let  $ESHG : (V, E)$  be a strong Neutrosophic SuperHyperGraph. Then* 3986  
*following statements hold;* 3987

- (i) *if  $s \geq t + 2$  and a SuperHyperSet  $S$  of SuperHyperVertices is an  $t$ -SuperHyperDefensive SuperHyperDominating, then  $S$  is an  $s$ -SuperHyperPowerful SuperHyperDominating;* 3988  
 3989
- (ii) *if  $s \leq t$  and a SuperHyperSet  $S$  of SuperHyperVertices is a dual  $t$ -SuperHyperDefensive SuperHyperDominating, then  $S$  is a dual  $s$ -SuperHyperPowerful SuperHyperDominating.* 3990  
 3991

**Proposition 31.0.49.** *Let  $ESHG : (V, E)$  be a  $[an]$   $[V-]$ SuperHyperUniform-strong-Neutrosophic SuperHyperGraph. Then following statements hold;* 3992  
 3993

- (i) *if  $\forall a \in S, |N_s(a) \cap S| < \lfloor \frac{r}{2} \rfloor + 1$ , then  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating;* 3994  
 3995
- (ii) *if  $\forall a \in V \setminus S, |N_s(a) \cap S| > \lfloor \frac{r}{2} \rfloor + 1$ , then  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating;* 3996  
 3997
- (iii) *if  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is an  $V$ -SuperHyperDefensive SuperHyperDominating;* 3998  
 3999
- (iv) *if  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is a dual  $V$ -SuperHyperDefensive SuperHyperDominating.* 4000  
 4001

**Proposition 31.0.50.** *Let  $ESHG : (V, E)$  is a  $[an]$   $[V-]$ SuperHyperUniform-strong-Neutrosophic SuperHyperGraph. Then following statements hold;* 4002  
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- (i)  *$\forall a \in S, |N_s(a) \cap S| < \lfloor \frac{r}{2} \rfloor + 1$  if  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating;* 4004  
 4005

(ii)  $\forall a \in V \setminus S, |N_s(a) \cap S| > \lfloor \frac{r}{2} \rfloor + 1$  if  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 4006  
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(iii)  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is an  $V$ -SuperHyperDefensive SuperHyperDominating; 4008  
4009

(iv)  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is a dual  $V$ -SuperHyperDefensive SuperHyperDominating. 4010  
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**Proposition 31.0.51.** Let  $ESHG : (V, E)$  is a[an]  $[V-]$ SuperHyperUniform-strong-Neutrosophic SuperHyperGraph which is a SuperHyperComplete. Then following statements hold; 4012  
4013

(i)  $\forall a \in S, |N_s(a) \cap S| < \lfloor \frac{\mathcal{O}-1}{2} \rfloor + 1$  if  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 4014  
4015

(ii)  $\forall a \in V \setminus S, |N_s(a) \cap S| > \lfloor \frac{\mathcal{O}-1}{2} \rfloor + 1$  if  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 4016  
4017

(iii)  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is an  $(\mathcal{O} - 1)$ -SuperHyperDefensive SuperHyperDominating; 4018  
4019

(iv)  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is a dual  $(\mathcal{O} - 1)$ -SuperHyperDefensive SuperHyperDominating. 4020  
4021

**Proposition 31.0.52.** Let  $ESHG : (V, E)$  is a[an]  $[V-]$ SuperHyperUniform-strong-Neutrosophic SuperHyperGraph which is a SuperHyperComplete. Then following statements hold; 4022  
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(i) if  $\forall a \in S, |N_s(a) \cap S| < \lfloor \frac{\mathcal{O}-1}{2} \rfloor + 1$ , then  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 4024  
4025

(ii) if  $\forall a \in V \setminus S, |N_s(a) \cap S| > \lfloor \frac{\mathcal{O}-1}{2} \rfloor + 1$ , then  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 4026  
4027

(iii) if  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is  $(\mathcal{O} - 1)$ -SuperHyperDefensive SuperHyperDominating; 4028  
4029

(iv) if  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is a dual  $(\mathcal{O} - 1)$ -SuperHyperDefensive SuperHyperDominating. 4030  
4031

**Proposition 31.0.53.** Let  $ESHG : (V, E)$  is a[an]  $[V-]$ SuperHyperUniform-strong-Neutrosophic SuperHyperGraph which is SuperHyperDominating. Then following statements hold; 4032  
4033

(i)  $\forall a \in S, |N_s(a) \cap S| < 2$  if  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 4034  
4035

(ii)  $\forall a \in V \setminus S, |N_s(a) \cap S| > 2$  if  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating; 4036  
4037

(iii)  $\forall a \in S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating; 4038  
4039

(iv)  $\forall a \in V \setminus S, |N_s(a) \cap V \setminus S| = 0$  if  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating. 4040  
4041

**Proposition 31.0.54.** *Let  $ESHG : (V, E)$  is a[an] [V-]SuperHyperUniform-strong-Neutrosophic SuperHyperGraph which is SuperHyperDominating. Then following statements hold;* 4042  
4043

(i) *if  $\forall a \in S$ ,  $|N_s(a) \cap S| < 2$ , then  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating;* 4044  
4045

(ii) *if  $\forall a \in V \setminus S$ ,  $|N_s(a) \cap S| > 2$ , then  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating;* 4046  
4047

(iii) *if  $\forall a \in S$ ,  $|N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is an 2-SuperHyperDefensive SuperHyperDominating;* 4048  
4049

(iv) *if  $\forall a \in V \setminus S$ ,  $|N_s(a) \cap V \setminus S| = 0$ , then  $ESHG : (V, E)$  is a dual 2-SuperHyperDefensive SuperHyperDominating.* 4050  
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## Neutrosophic Applications in Cancer's Neutrosophic Recognition

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The cancer is the Neutrosophic disease but the Neutrosophic model is going to figure out what's going on this Neutrosophic phenomenon. The special Neutrosophic case of this Neutrosophic disease is considered and as the consequences of the model, some parameters are used. The cells are under attack of this disease but the moves of the cancer in the special region are the matter of mind. The Neutrosophic recognition of the cancer could help to find some Neutrosophic treatments for this Neutrosophic disease.

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In the following, some Neutrosophic steps are Neutrosophic devised on this disease.

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**Step 1. (Neutrosophic Definition)** The Neutrosophic recognition of the cancer in the long-term Neutrosophic function.

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**Step 2. (Neutrosophic Issue)** The specific region has been assigned by the Neutrosophic model [it's called Neutrosophic SuperHyperGraph] and the long Neutrosophic cycle of the move from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily identified since there are some determinacy, indeterminacy and neutrality about the moves and the effects of the cancer on that region; this event leads us to choose another model [it's said to be Neutrosophic SuperHyperGraph] to have convenient perception on what's happened and what's done.

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**Step 3. (Neutrosophic Model)** There are some specific Neutrosophic models, which are well-known and they've got the names, and some general Neutrosophic models. The moves and the Neutrosophic traces of the cancer on the complex tracks and between complicated groups of cells could be fantasized by a Neutrosophic SuperHyperPath(-/SuperHyperDominating, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). The aim is to find either the Neutrosophic SuperHyperDominating or the Neutrosophic SuperHyperDominating in those Neutrosophic Neutrosophic SuperHyperModels.

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**Case 1: The Initial Neutrosophic Steps  
Toward Neutrosophic  
SuperHyperBipartite as Neutrosophic  
SuperHyperModel**

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**Step 4. (Neutrosophic Solution)** In the Neutrosophic Figure (33.1), the Neutrosophic SuperHyperBipartite is Neutrosophic highlighted and Neutrosophic featured.

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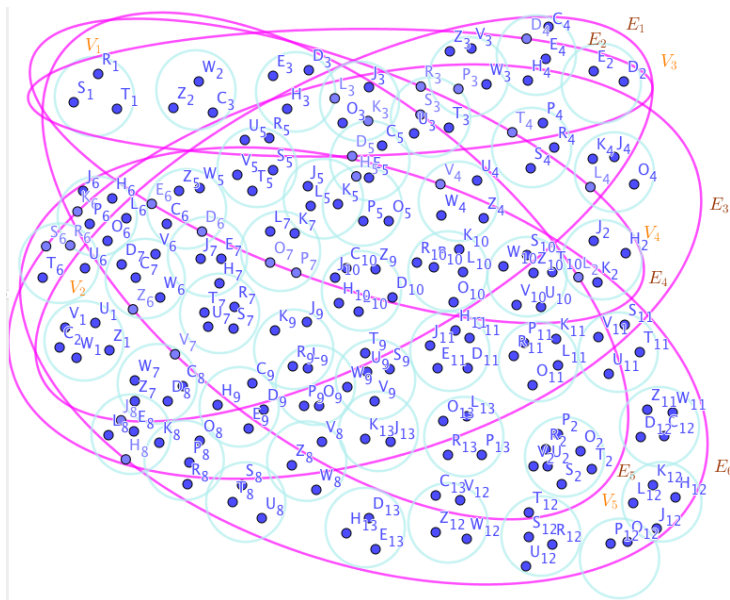


Figure 33.1: a Neutrosophic SuperHyperBipartite Associated to the Notions of Neutrosophic SuperHyperDominating

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Table 33.1: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperBipartite

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

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By using the Neutrosophic Figure (33.1) and the Table (33.1), the Neutrosophic SuperHyperBipartite is obtained. 4085  
4086

The obtained Neutrosophic SuperHyperSet, by the Neutrosophic Algorithm in previous Neutrosophic result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperBipartite  $ESH B : (V, E)$ , in the Neutrosophic SuperHyperModel (33.1), is the Neutrosophic SuperHyperDominating. 4087  
4088  
4089  
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**Case 2: The Increasing Neutrosophic Steps Toward Neutrosophic SuperHyperMultipartite as Neutrosophic SuperHyperModel**

**Step 4. (Neutrosophic Solution)** In the Neutrosophic Figure (34.1), the Neutrosophic SuperHyperMultipartite is Neutrosophic highlighted and Neutrosophic featured.

By using the Neutrosophic Figure (34.1) and the Table (34.1), the Neutrosophic SuperHyperMultipartite is obtained.

The obtained Neutrosophic SuperHyperSet, by the Neutrosophic Algorithm in previous

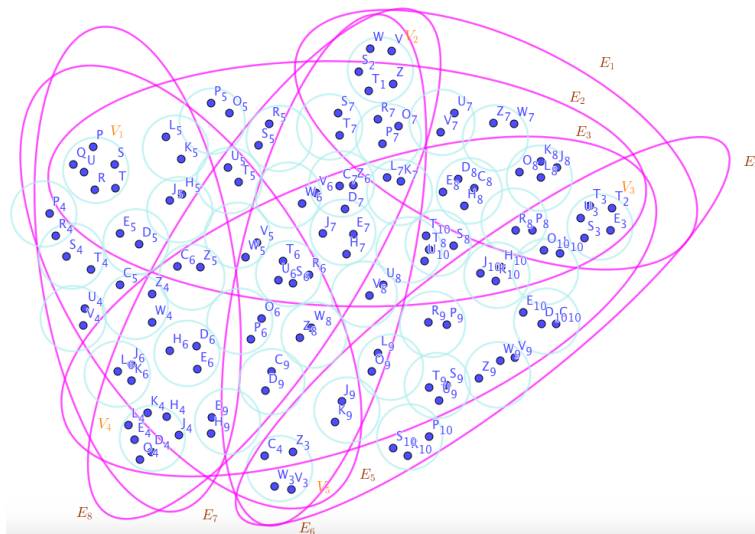


Figure 34.1: a Neutrosophic SuperHyperMultipartite Associated to the Notions of Neutrosophic SuperHyperDominating

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Table 34.1: The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperMultipartite

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The maximum Values of Its Vertices
The Values of The Edges	The maximum Values of Its Vertices
The Values of The HyperEdges	The maximum Values of Its Vertices
The Values of The SuperHyperEdges	The maximum Values of Its Endpoints

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result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , in the Neutrosophic SuperHyperModel (34.1), is the Neutrosophic SuperHyperDominating.

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## Wondering Open Problems But As The Directions To Forming The Motivations

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In what follows, some “problems” and some “questions” are proposed. 4107

The SuperHyperDominating and the Neutrosophic SuperHyperDominating are defined on a 4108  
real-world application, titled “Cancer’s Recognitions”. 4109

**Question 35.0.1.** *Which the else SuperHyperModels could be defined based on Cancer’s 4110  
recognitions?* 4111

**Question 35.0.2.** *Are there some SuperHyperNotions related to SuperHyperDominating and the 4112  
Neutrosophic SuperHyperDominating?* 4113

**Question 35.0.3.** *Are there some Algorithms to be defined on the SuperHyperModels to compute 4114  
them?* 4115

**Question 35.0.4.** *Which the SuperHyperNotions are related to beyond the SuperHyperDominating 4116  
and the Neutrosophic SuperHyperDominating?* 4117

**Problem 35.0.5.** *The SuperHyperDominating and the Neutrosophic SuperHyperDominating do a 4118  
SuperHyperModel for the Cancer’s recognitions and they’re based on SuperHyperDominating, are 4119  
there else?* 4120

**Problem 35.0.6.** *Which the fundamental SuperHyperNumbers are related to these SuperHyper- 4121  
Numbers types-results?* 4122

**Problem 35.0.7.** *What’s the independent research based on Cancer’s recognitions concerning the 4123  
multiple types of SuperHyperNotions?* 4124



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## Conclusion and Closing Remarks

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In this section, concluding remarks and closing remarks are represented. The drawbacks of this research are illustrated. Some benefits and some advantages of this research are highlighted. This research uses some approaches to make Neutrosophic SuperHyperGraphs more understandable. In this endeavor, two SuperHyperNotions are defined on the SuperHyperDominating. For that sake in the second definition, the main definition of the Neutrosophic SuperHyperGraph is redefined on the position of the alphabets. Based on the new definition for the Neutrosophic SuperHyperGraph, the new SuperHyperNotion, Neutrosophic SuperHyperDominating, finds the convenient background to implement some results based on that. Some SuperHyperClasses and some Neutrosophic SuperHyperClasses are the cases of this research on the modeling of the regions where are under the attacks of the cancer to recognize this disease as it's mentioned on the title "Cancer's Recognitions". To formalize the instances on the SuperHyperNotion, SuperHyperDominating, the new SuperHyperClasses and SuperHyperClasses, are introduced. Some general results are gathered in the section on the SuperHyperDominating and the Neutrosophic SuperHyperDominating. The clarifications, instances and literature reviews have taken the whole way through. In this research, the literature reviews have fulfilled the lines containing the notions and the results. The SuperHyperGraph and Neutrosophic SuperHyperGraph are the SuperHyperModels on the "Cancer's Recognitions" and both bases are the background of this research. Sometimes the cancer has been happened on the region, full of cells, groups of cells and embedded styles. In this segment, the SuperHyperModel proposes some SuperHyperNotions based on the connectivities of the moves of the cancer in the longest and strongest styles with the formation of the design and the architecture are formally called " SuperHyperDominating" in the themes of jargons and buzzwords. The prefix "SuperHyper" refers to the theme of the embedded styles to figure out the background for the SuperHyperNotions. In the Table (36.1), benefits and avenues for this research are, figured out, pointed out and spoken out.

Table 36.1: An Overlook On This Research And Beyond

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Advantages	Limitations
1. <b>Redefining Neutrosophic SuperHyperGraph</b>	1. <b>General Results</b>
2. <b>SuperHyperDominating</b>	
3. <b>Neutrosophic SuperHyperDominating</b>	2. <b>Other SuperHyperNumbers</b>
4. <b>Modeling of Cancer's Recognitions</b>	
5. <b>SuperHyperClasses</b>	3. <b>SuperHyperFamilies</b>

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# Neutrosophic SuperHyperDuality But As The Extensions Excerpt From Dense And Super Forms

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**Definition 37.0.1.** (Different Neutrosophic Types of Neutrosophic SuperHyperDuality). 4155  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4156  
 Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  4157  
 or  $E'$  is called 4158

- (i) **Neutrosophic e-SuperHyperDuality** if  $\forall E_i \in E', \exists E_j \in E_{ESHG:(V,E)} \setminus E'$  such that 4159  
 $V_a \in E_i, E_j$ ; 4160
- (ii) **Neutrosophic re-SuperHyperDuality** if  $\forall E_i \in E', \exists E_j \in E_{ESHG:(V,E)} \setminus E'$  such that 4161  
 $V_a \in E_i, E_j$  and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4162
- (iii) **Neutrosophic v-SuperHyperDuality** if  $\forall V_i \in V', \exists V_j \in V_{ESHG:(V,E)} \setminus V'$  such that 4163  
 $V_i, V_j \in E_a$ ; 4164
- (iv) **Neutrosophic rv-SuperHyperDuality** if  $\forall V_i \in V', \exists V_j \in V_{ESHG:(V,E)} \setminus V'$  such that 4165  
 $V_i, V_j \in E_a$  and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4166
- (v) **Neutrosophic SuperHyperDuality** if it's either of Neutrosophic e-SuperHyperDuality, 4167  
 Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic 4168  
 rv-SuperHyperDuality. 4169

**Definition 37.0.2.** ((Neutrosophic) SuperHyperDuality). 4170  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4171  
 Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 4172

- (i) an **Extreme SuperHyperDuality** if it's either of Neutrosophic e-SuperHyperDuality, 4173  
 Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic 4174  
 rv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  4175  
 is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme 4176  
 cardinality of the Extreme SuperHyperEdges in the consecutive Extreme sequence of 4177  
 Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the 4178  
 Extreme SuperHyperDuality; 4179

- (ii) a **Neutrosophic SuperHyperDuality** if it's either of Neutrosophic e-SuperHyperDuality, Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic rv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDuality;
- (iii) an **Extreme SuperHyperDuality SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDuality, Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic rv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDuality; and the Extreme power is corresponded to its Extreme coefficient;
- (iv) a **Neutrosophic SuperHyperDuality SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDuality, Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic rv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDuality; and the Neutrosophic power is corresponded to its Neutrosophic coefficient;
- (v) an **Extreme R-SuperHyperDuality** if it's either of Neutrosophic e-SuperHyperDuality, Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic rv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDuality;
- (vi) a **Neutrosophic R-SuperHyperDuality** if it's either of Neutrosophic e-SuperHyperDuality, Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic rv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDuality;
- (vii) an **Extreme R-SuperHyperDuality SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDuality, Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic rv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the

Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperDuality; and the Extreme power is corresponded to its Extreme coefficient;

- (viii) a **Neutrosophic SuperHyperDuality SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperDuality, Neutrosophic re-SuperHyperDuality, Neutrosophic v-SuperHyperDuality, and Neutrosophic rv-SuperHyperDuality and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperDuality; and the Neutrosophic power is corresponded to its Neutrosophic coefficient.

**Example 37.0.3.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$  in the mentioned Neutrosophic Figures in every Neutrosophic items.

- On the Figure (29.1), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1$  and  $E_3$  are some empty Extreme SuperHyperEdges but  $E_2$  is a loop Neutrosophic SuperHyperEdge and  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , **is** excluded in every given Neutrosophic SuperHyperDuality.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.2), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1, E_2$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , **is** excluded in every given Neutrosophic SuperHyperDuality.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 3z.\end{aligned}$$



- On the Figure (29.3), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4255 4256

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.4), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4257 4258

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_4, E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 15z^2.\end{aligned}$$

- On the Figure (29.5), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4259 4260

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.6), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4261 4262

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_{3i+1_{i=0}^3}, E_{3i+24_{i=0}^3}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 6z^8. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_{3i+1_{i=0}^7}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 6z^8.\end{aligned}$$

- On the Figure (29.7), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4263 4264

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_{15}, E_{16}, E_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.8), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4265 4266

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} = \{E_4\}.$$

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= \\ 4 \times 5 \times 5z^3. \end{aligned}$$

- On the Figure (29.9), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4267 4268

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_{3i+1}_{i=0}^3, E_{23}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 3z^5. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_{3i+1}_{i=0}^3, V_{15}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 3z^5. \end{aligned}$$

- On the Figure (29.10), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4269 4270

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= \\ 4 \times 5 \times 5z^3. \end{aligned}$$

- On the Figure (29.11), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4271 4272

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_1, E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_6, V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= \\ 3 \times 3z^2. \end{aligned}$$

- On the Figure (29.12), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4273 4274

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1, V_{i=4}^{i \neq 5,7,8}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 5z^5. \end{aligned}$$

- On the Figure (29.13), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4275 4276

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_5, E_9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= \\ &3 \times 3z^2. \end{aligned}$$

- On the Figure (29.14), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4277 4278

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.15), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4279 4280

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.16), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4281 4282

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= \\ &(2 \times 1 \times 2) + (2 \times 4 \times 5)z. \end{aligned}$$

- On the Figure (29.17), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4283 4284

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= \\ &(1 \times 1 \times 2)z. \end{aligned}$$

- On the Figure (29.18), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= \\ &(2 \times 2 \times 2)z. \end{aligned}$$

- On the Figure (29.19), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_{3i+1_{i=0^3}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 3z^4. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_{2i+1_{i=0^5}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 2z^6. \end{aligned}$$

- On the Figure (29.20), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 10z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.21), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= 10z. \end{aligned}$$

- On the Figure (29.22), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperDuality, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality}} &= \{E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperDuality SuperHyperPolynomial}} &= 4z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality}} &= \{V_3, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperDuality SuperHyperPolynomial}} &= \\ &= 10 \times 9 + 10 \times 6 + 12 \times 9 + 12 \times 6z^2. \end{aligned}$$

The previous Neutrosophic approach apply on the upcoming Neutrosophic results on Neutrosophic SuperHyperClasses.

**Proposition 37.0.4.** Assume a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . 4297  
 Then 4298

$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperDuality}} \\
 &= \{E_i \in E_{P_i^{ESHG:(V,E)}}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperDuality SuperHyperPolynomial}} \\
 &= \left( \sum_{i=|P^{ESHG:(V,E)}|} (\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|) \text{choose } |P_i^{ESHG:(V,E)}| \right) \\
 & \quad z^{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperDuality}} \\
 &= \{V_i^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_i^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperDuality SuperHyperPolynomial}} \\
 &= \sum_{|V_{ESHG:(V,E)}^{EXTERNAL}|_{\text{Neutrosophic Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let

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$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2, \\
 & \dots, \\
 & E_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|}, V_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|+1}^{EXTERNAL}
 \end{aligned}$$

is a longest SuperHyperDuality taken from a connected Neutrosophic SuperHyperMultipartite 4300  
 $ESHM : (V, E)$ . There's a new way to redefine as 4301

$$\begin{aligned}
 & V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.
 \end{aligned}$$

The term "EXTERNAL" implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to 4302  
 $V_i^{EXTERNAL}$  in the literatures of SuperHyperDuality. The latter is straightforward. Then there's 4303  
 at least one SuperHyperDuality. Thus the notion of quasi isn't up and the SuperHyperNotions 4304  
 based on SuperHyperDuality could be applied. There are only  $z'$  SuperHyperParts. Thus every 4305  
 SuperHyperPart could have one SuperHyperVertex as the representative in the 4306

$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2, \\
 & \dots, \\
 & E_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|}, V_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|+1}^{EXTERNAL}
 \end{aligned}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$$\begin{aligned}
 &P : \\
 &V_1^{EXTERNAL}, E_1, \\
 &V_2^{EXTERNAL}, E_2, \\
 &\dots, \\
 &E_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|}, V_{\min_i |P_i^{EXTERNAL} \in P^{ESHG:(V,E)}|+1}
 \end{aligned}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. ■

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**Example 37.0.5.** In the Figure (30.1), the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Neutrosophic featured. The obtained Neutrosophic SuperHyperSet, by the Algorithm in previous Neutrosophic result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , in the Neutrosophic SuperHyperModel (30.1), is the Neutrosophic SuperHyperDuality.



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# Neutrosophic SuperHyperJoin But As The Extensions Excerpt From Dense And Super Forms

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**Definition 38.0.1.** (Different Neutrosophic Types of Neutrosophic SuperHyperJoin). 4321  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4322  
 Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  4323  
 or  $E'$  is called 4324

- (i) **Neutrosophic e-SuperHyperJoin** if  $\forall E_i \in E_{NSHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that 4325  
 $V_a \in E_i, E_j$ ; and  $\forall E_i, E_j \in E'$ , such that  $V_a \notin E_i, E_j$ ; 4326
- (ii) **Neutrosophic re-SuperHyperJoin** if  $\forall E_i \in E_{NSHG:(V,E)} \setminus E', \exists E_j \in E'$ , such that 4327  
 $V_a \in E_i, E_j$ ;  $\forall E_i, E_j \in E'$ , such that  $V_a \notin E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} =$  4328  
 $|E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4329
- (iii) **Neutrosophic v-SuperHyperJoin** if  $\forall V_i \in E_{NSHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that 4330  
 $V_i, V_j \notin E_a$ ; and  $\forall V_i, V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; 4331
- (iv) **Neutrosophic rv-SuperHyperJoin** if  $\forall V_i \in E_{NSHG:(V,E)} \setminus V', \exists V_j \in V'$ , such that 4332  
 $V_i, V_j \in E_a$ ;  $\forall V_i, V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} =$  4333  
 $|V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4334
- (v) **Neutrosophic SuperHyperJoin** if it's either of Neutrosophic e-SuperHyperJoin, 4335  
 Neutrosophic re-SuperHyperJoin, Neutrosophic v-SuperHyperJoin, and Neutrosophic rv- 4336  
 SuperHyperJoin. 4337

**Definition 38.0.2.** ((Neutrosophic) SuperHyperJoin). 4338  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4339  
 Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 4340

- (i) an **Extreme SuperHyperJoin** if it's either of Neutrosophic e-SuperHyperJoin, Neutrosophic 4341  
 re-SuperHyperJoin, Neutrosophic v-SuperHyperJoin, and Neutrosophic rv- 4342  
 SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is 4343  
 the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme car- 4344  
 dinality of the Extreme SuperHyperEdges in the consecutive Extreme sequence of Extreme 4345



- SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperJoin; 4346  
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- (ii) a **Neutrosophic SuperHyperJoin** if it's either of Neutrosophic e-SuperHyperJoin, 4348  
Neutrosophic re-SuperHyperJoin, Neutrosophic v-SuperHyperJoin, and Neutrosophic 4349  
rv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  4350  
is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges 4351  
of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive 4352  
Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they 4353  
form the Neutrosophic SuperHyperJoin; 4354
- (iii) an **Extreme SuperHyperJoin SuperHyperPolynomial** if it's either of Neutrosophic 4355  
e-SuperHyperJoin, Neutrosophic re-SuperHyperJoin, Neutrosophic v-SuperHyperJoin, 4356  
and Neutrosophic rv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph 4357  
 $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients 4358  
defined as the Extreme number of the maximum Extreme cardinality of the Extreme 4359  
SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive 4360  
Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the 4361  
Extreme SuperHyperJoin; and the Extreme power is corresponded to its Extreme coefficient; 4362
- (iv) a **Neutrosophic SuperHyperJoin SuperHyperPolynomial** if it's either of 4363  
Neutrosophic e-SuperHyperJoin, Neutrosophic re-SuperHyperJoin, Neutrosophic v- 4364  
SuperHyperJoin, and Neutrosophic rv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for a Neutrosophic 4365  
SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the 4366  
Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic 4367  
cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of 4368  
high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutro- 4369  
sophic SuperHyperVertices such that they form the Neutrosophic SuperHyperJoin; and the 4370  
Neutrosophic power is corresponded to its Neutrosophic coefficient; 4371
- (v) an **Extreme R-SuperHyperJoin** if it's either of Neutrosophic e-SuperHyperJoin, 4372  
Neutrosophic re-SuperHyperJoin, Neutrosophic v-SuperHyperJoin, and Neutrosophic rv- 4373  
SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the 4374  
maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality 4375  
of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme 4376  
SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme 4377  
SuperHyperJoin; 4378
- (vi) a **Neutrosophic R-SuperHyperJoin** if it's either of Neutrosophic e-SuperHyperJoin, 4379  
Neutrosophic re-SuperHyperJoin, Neutrosophic v-SuperHyperJoin, and Neutrosophic rv- 4380  
SuperHyperJoin and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  4381  
is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices 4382  
of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive 4383  
Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they 4384  
form the Neutrosophic SuperHyperJoin; 4385
- (vii) an **Extreme R-SuperHyperJoin SuperHyperPolynomial** if it's either of Neutrosophic 4386  
e-SuperHyperJoin, Neutrosophic re-SuperHyperJoin, Neutrosophic v-SuperHyperJoin, 4387

and Neutrosophic rv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph 4388  
 $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients 4389  
 defined as the Extreme number of the maximum Extreme cardinality of the Extreme 4390  
 SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive 4391  
 Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the 4392  
 Extreme SuperHyperJoin; and the Extreme power is corresponded to its Extreme coefficient; 4393

(viii) a **Neutrosophic SuperHyperJoin SuperHyperPolynomial** if it's either of 4394  
 Neutrosophic e-SuperHyperJoin, Neutrosophic re-SuperHyperJoin, Neutrosophic v- 4395  
 SuperHyperJoin, and Neutrosophic rv-SuperHyperJoin and  $\mathcal{C}(NSHG)$  for a Neutrosophic 4396  
 SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the 4397  
 Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic 4398  
 cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  4399  
 of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutro- 4400  
 sophic SuperHyperVertices such that they form the Neutrosophic SuperHyperJoin; and the 4401  
 Neutrosophic power is corresponded to its Neutrosophic coefficient. 4402

**Example 38.0.3.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair 4403  
 $S = (V, E)$  in the mentioned Neutrosophic Figures in every Neutrosophic items. 4404

- On the Figure (29.1), the Neutrosophic SuperHyperNotion, namely, Neutrosophic 4405  
 SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4406  
 $E_1$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_2$  is a loop Neutrosophic 4407  
 SuperHyperEdge and  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of 4408  
 Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely, 4409  
 $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no 4410  
 Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic 4411  
 SuperHyperVertex,  $V_3$ , **is** excluded in every given Neutrosophic SuperHyperJoin. 4412

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.2), the Neutrosophic SuperHyperNotion, namely, Neutrosophic 4413  
 SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4414  
 $E_1, E_2$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_4$  is a Neutrosophic 4415  
 SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only 4416  
 one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  4417  
 is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a 4418  
 Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , **is** excluded in every 4419  
 given Neutrosophic SuperHyperJoin. 4420

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 3z. \end{aligned}$$

136EXM1

- On the Figure (29.3), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4421 4422

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.4), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4423 4424

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_4, E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 15z^2.\end{aligned}$$

- On the Figure (29.5), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4425 4426

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.6), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4427 4428

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_{3i+1_{i=0}^3}, E_{3i+24_{i=0}^3}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 6z^8. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_{3i+1_{i=0}^7}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 6z^8.\end{aligned}$$

- On the Figure (29.7), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4429 4430

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_{15}, E_{16}, E_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.8), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4431 4432

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} = \{E_4\}.$$

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= \\ 4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.9), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4433 4434

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_{3i+1}_{i=0}^3, E_{23}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 3z^5. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_{3i+1}_{i=0}^3, V_{15}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 3z^5.\end{aligned}$$

- On the Figure (29.10), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4435 4436

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_3, V_{13}, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= \\ 4 \times 5 \times 5z^3.\end{aligned}$$

- On the Figure (29.11), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4437 4438

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_1, E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_6, V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= \\ 3 \times 3z^2.\end{aligned}$$

- On the Figure (29.12), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4439 4440

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_1, V_{i=4}^{i \neq 5,7,8}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 5z^5.\end{aligned}$$

- On the Figure (29.13), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4441 4442

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_3, E_9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= \\ &3 \times 3z^2.\end{aligned}$$

- On the Figure (29.14), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4443 4444

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.15), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4445 4446

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.16), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4447 4448

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= \\ &(1 \times 5 \times 5) + (1 \times 2 + 1)z^3.\end{aligned}$$

- On the Figure (29.17), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4449 4450

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_{27}, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= \\ &(1 \times 1 \times 2 + 1)z^4.\end{aligned}$$

- On the Figure (29.18), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4451  
4452

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_{27}, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= \\ &= (1 \times 1 \times 2 + 1)z^4. \end{aligned}$$

- On the Figure (29.19), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4453  
4454

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_{3i+1_{i=0^3}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 3z^4. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_{2i+1_{i=0^5}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 2z^6. \end{aligned}$$

- On the Figure (29.20), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4455  
4456

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 10z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.21), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4457  
4458

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= 10z. \end{aligned}$$

- On the Figure (29.22), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperJoin, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4459  
4460

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin}} &= \{E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin}} &= \{V_3, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperJoin SuperHyperPolynomial}} &= \\ &= 10 \times 6 + 10 \times 6 + 12 \times 6 + 12 \times 6z^2. \end{aligned}$$

The previous Neutrosophic approach apply on the upcoming Neutrosophic results on Neutrosophic SuperHyperClasses. 4461  
4462

**Proposition 38.0.4.** Assume a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . 4463  
 Then 4464

$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperJoin}} \\
 &= (\text{PERFECT MATCHING}). \\
 & \{E_i \in E_{P_i^{ESHG:(V,E)}}, \\
 & \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperJoin}} \\
 &= (\text{OTHERWISE}). \\
 & \{\}, \\
 & \text{If } \exists P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \neq \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} \\
 &= (\text{PERFECT MATCHING}). \\
 &= \left( \sum_{i=|P^{ESHG:(V,E)}|} (\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|) \text{choose } |P_i^{ESHG:(V,E)}| \right) \\
 & z^{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperJoin SuperHyperPolynomial}} \\
 &= (\text{OTHERWISE})0. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperJoin}} \\
 &= \{V_i^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_j^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperJoin SuperHyperPolynomial}} \\
 &= \sum_{|V_{ESHG:(V,E)}^{EXTERNAL}|_{\text{Neutrosophic Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let

4465

$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2, \\
 & \dots, \\
 & E_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|}, V_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|+1}^{EXTERNAL}
 \end{aligned}$$

is a longest SuperHyperJoin taken from a connected Neutrosophic SuperHyperMultipartite 4466  
 $ESHM : (V, E)$ . There's a new way to redefine as 4467

$$\begin{aligned}
 & V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv
 \end{aligned}$$

$$\exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.$$

The term “EXTERNAL” implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperJoin. The latter is straightforward. Then there's no at least one SuperHyperJoin. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperJoin could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

$$P : \\
 V_1^{EXTERNAL}, E_1, \\
 V_2^{EXTERNAL}, E_2, \\
 \dots, \\
 E_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|}, V_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|+1}^{EXTERNAL}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$$P : \\
 V_1^{EXTERNAL}, E_1, \\
 V_2^{EXTERNAL}, E_2, \\
 \dots, \\
 E_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|}, V_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|+1}^{EXTERNAL}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. ■

136EXM22a

**Example 38.0.5.** In the Figure (30.1), the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Neutrosophic featured. The obtained Neutrosophic SuperHyperSet, by the Algorithm in previous Neutrosophic result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , in the Neutrosophic SuperHyperModel (30.1), is the Neutrosophic SuperHyperJoin.





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# Neutrosophic SuperHyperPerfect But As The Extensions Excerpt From Dense And Super Forms

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**Definition 39.0.1.** (Different Neutrosophic Types of Neutrosophic SuperHyperPerfect). 4487  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4488  
 Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  4489  
 or  $E'$  is called 4490

- (i) **Neutrosophic e-SuperHyperPerfect** if  $\forall E_i \in E_{NSHG:(V,E)} \setminus E', \exists! E_j \in E'$ , such that 4491  
 $V_a \in E_i, E_j$ ; 4492
- (ii) **Neutrosophic re-SuperHyperPerfect** if  $\forall E_i \in E_{NSHG:(V,E)} \setminus E', \exists! E_j \in E'$ , such that 4493  
 $V_a \in E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4494
- (iii) **Neutrosophic v-SuperHyperPerfect** if  $\forall V_i \in V_{NSHG:(V,E)} \setminus V', \exists! V_j \in V'$ , such that 4495  
 $V_i, V_j \in E_a$ ; 4496
- (iv) **Neutrosophic rv-SuperHyperPerfect** if  $\forall V_i \in V_{NSHG:(V,E)} \setminus V', \exists! V_j \in V'$ , such that 4497  
 $V_i, V_j \in E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4498
- (v) **Neutrosophic SuperHyperPerfect** if it's either of Neutrosophic e-SuperHyperPerfect, 4499  
 Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic 4500  
 rv-SuperHyperPerfect. 4501

**Definition 39.0.2.** ((Neutrosophic) SuperHyperPerfect). 4502  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4503  
 Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 4504

- (i) an **Extreme SuperHyperPerfect** if it's either of Neutrosophic e-SuperHyperPerfect, 4505  
 Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic 4506  
 rv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  4507  
 is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme 4508  
 cardinality of the Extreme SuperHyperEdges in the consecutive Extreme sequence of 4509  
 Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the 4510  
 Extreme SuperHyperPerfect; 4511

- (ii) a **Neutrosophic SuperHyperPerfect** if it's either of Neutrosophic e-SuperHyperPerfect, Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic rv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperPerfect;
- (iii) an **Extreme SuperHyperPerfect SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperPerfect, Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic rv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperPerfect; and the Extreme power is corresponded to its Extreme coefficient;
- (iv) a **Neutrosophic SuperHyperPerfect SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperPerfect, Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic rv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperPerfect; and the Neutrosophic power is corresponded to its Neutrosophic coefficient;
- (v) an **Extreme R-SuperHyperPerfect** if it's either of Neutrosophic e-SuperHyperPerfect, Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic rv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperPerfect;
- (vi) a **Neutrosophic R-SuperHyperPerfect** if it's either of Neutrosophic e-SuperHyperPerfect, Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic rv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperPerfect;
- (vii) an **Extreme R-SuperHyperPerfect SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperPerfect, Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic rv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the

Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperPerfect; and the Extreme power is corresponded to its Extreme coefficient;

(viii) a **Neutrosophic SuperHyperPerfect SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperPerfect, Neutrosophic re-SuperHyperPerfect, Neutrosophic v-SuperHyperPerfect, and Neutrosophic rv-SuperHyperPerfect and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperPerfect; and the Neutrosophic power is corresponded to its Neutrosophic coefficient.

**Example 39.0.3.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$  in the mentioned Neutrosophic Figures in every Neutrosophic items.

- On the Figure (29.1), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_2$  is a loop Neutrosophic SuperHyperEdge and  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , is excluded in every given Neutrosophic SuperHyperPerfect.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.2), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1, E_2$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , is excluded in every given Neutrosophic SuperHyperPerfect.

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.3), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4587 4588

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.4), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4589 4590

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_4, E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= 15z^2.\end{aligned}$$

- On the Figure (29.5), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4591 4592

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.6), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4593 4594

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_{3i+1^3_{i=0}}, E_{3i+24^3_{i=0}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 6z^8. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_{3i+1^7_{i=0}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= 6z^8.\end{aligned}$$

- On the Figure (29.7), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4595 4596

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_{15}, E_{16}, E_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_3, V_6, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &= 3 \times 4 \times 4z^3.\end{aligned}$$

- On the Figure (29.8), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4597 4598

$$\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} = \{E_4\}.$$

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_3, V_6, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= \\ 3 \times 4 \times 4z^3. \end{aligned}$$

- On the Figure (29.9), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperPerfect}} &= \{E_{3i+1^3_{i=0}}, E_{23}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= 3z^5. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect}} &= \{V_{3i+1^3_{i=0}}, V_{15}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= 3z^5. \end{aligned}$$

- On the Figure (29.10), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_3, V_6, V_8\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= \\ 3 \times 4 \times 4z^3. \end{aligned}$$

- On the Figure (29.11), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_1, E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_6, V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= \\ 3 \times 2z^2. \end{aligned}$$

- On the Figure (29.12), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_1, V_{i=4}^{i \neq 5,7,8}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= 5z^5. \end{aligned}$$

- On the Figure (29.13), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4607 4608

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_3, E_9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_1, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &3 \times 3z^2.\end{aligned}$$

- On the Figure (29.14), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4609 4610

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.15), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4611 4612

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.16), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4613 4614

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect}} &= \{V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &(1 \times 5 \times 5) + (1 \times 2 + 1)z^3.\end{aligned}$$

- On the Figure (29.17), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4615 4616

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect}} &= \{V_{27}, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= \\ &(1 \times 1 \times 2 + 1)z^4.\end{aligned}$$

- On the Figure (29.18), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4617 4618

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 3z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect}} &= \{V_{27}, V_2, V_7, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= (1 \times 1 \times 2 + 1)z^4. \end{aligned}$$

- On the Figure (29.19), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4619 4620

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_{3i+1_{i=0^3}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 3z^4. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect}} &= \{V_{2i+1_{i=0^5}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= 2z^6. \end{aligned}$$

- On the Figure (29.20), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4621 4622

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 10z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.21), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4623 4624

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= 2z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperPerfect SuperHyperPolynomial}} &= 10z. \end{aligned}$$

- On the Figure (29.22), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperPerfect, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4625 4626

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect}} &= \{E_2, E_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect}} &= \{V_3, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperPerfect SuperHyperPolynomial}} &= 10 \times 6 + 10 \times 6 + 12 \times 6 + 12 \times 6z^2. \end{aligned}$$

The previous Neutrosophic approach apply on the upcoming Neutrosophic results on Neutrosophic SuperHyperClasses. 4627 4628



**Proposition 39.0.4.** Assume a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ .  
 Then

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$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperPerfect}} \\
 &= (\text{PERFECT MATCHING}). \\
 & \{E_i \in E_{P_i^{ESHG:(V,E)}}, \\
 & \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperPerfect}} \\
 &= (\text{OTHERWISE}). \\
 & \{\}, \\
 & \text{If } \exists P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \neq \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} \\
 &= (\text{PERFECT MATCHING}). \\
 &= \left( \sum_{i=|P^{ESHG:(V,E)}|} (\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|) \text{choose } |P_i^{ESHG:(V,E)}| \right) \\
 & z^{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperPerfect SuperHyperPolynomial}} \\
 &= (\text{OTHERWISE})0. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperPerfect}} \\
 &= \{V_i^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_j^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperPerfect SuperHyperPolynomial}} \\
 &= \sum_{|V_{ESHG:(V,E)}^{EXTERNAL}|_{\text{Neutrosophic Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let

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$$\begin{aligned}
 & P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2, \\
 & \dots, \\
 & E_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|}, V_{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|+1}^{EXTERNAL}
 \end{aligned}$$

is a longest SuperHyperPerfect taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . There's a new way to redefine as

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$$\begin{aligned}
 & V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv
 \end{aligned}$$

$$\exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.$$

The term “EXTERNAL” implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperPerfect. The latter is straightforward. Then there's no at least one SuperHyperPerfect. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperPerfect could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

$$P : \\
 V_1^{EXTERNAL}, E_1, \\
 V_2^{EXTERNAL}, E_2, \\
 \dots, \\
 E_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|}, V_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|+1}^{EXTERNAL}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$$P : \\
 V_1^{EXTERNAL}, E_1, \\
 V_2^{EXTERNAL}, E_2, \\
 \dots, \\
 E_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|}, V_{\min_i |P_i^{ESHG:(V,E)} \in PESHG:(V,E)|+1}^{EXTERNAL}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . The latter is straightforward. ■

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**Example 39.0.5.** In the Figure (30.1), the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , is highlighted and Neutrosophic featured. The obtained Neutrosophic SuperHyperSet, by the Algorithm in previous Neutrosophic result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , in the Neutrosophic SuperHyperModel (30.1), is the Neutrosophic SuperHyperPerfect.



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# Neutrosophic SuperHyperTotal But As The Extensions Excerpt From Dense And Super Forms

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**Definition 40.0.1.** (Different Neutrosophic Types of Neutrosophic SuperHyperTotal). 4653  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4654  
 Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  4655  
 or  $E'$  is called 4656

- (i) **Neutrosophic e-SuperHyperTotal** if  $\forall E_i \in E_{ESHG:(V,E)}, \exists! E_j \in E'$ , such that 4657  
 $V_a \in E_i, E_j$ ; 4658
- (ii) **Neutrosophic re-SuperHyperTotal** if  $\forall E_i \in E_{ESHG:(V,E)}, \exists! E_j \in E'$ , such that 4659  
 $V_a \in E_i, E_j$ ; and  $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4660
- (iii) **Neutrosophic v-SuperHyperTotal** if  $\forall V_i \in V_{ESHG:(V,E)}, \exists! V_j \in V'$ , such that 4661  
 $V_i, V_j \in E_a$ ; 4662
- (iv) **Neutrosophic rv-SuperHyperTotal** if  $\forall V_i \in V_{ESHG:(V,E)}, \exists! V_j \in V'$ , such that 4663  
 $V_i, V_j \in E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4664
- (v) **Neutrosophic SuperHyperTotal** if it's either of Neutrosophic e-SuperHyperTotal, 4665  
 Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic 4666  
 rv-SuperHyperTotal. 4667

**Definition 40.0.2.** ((Neutrosophic) SuperHyperTotal). 4668  
 Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4669  
 Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 4670

- (i) an **Extreme SuperHyperTotal** if it's either of Neutrosophic e-SuperHyperTotal, 4671  
 Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic 4672  
 rv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  4673  
 is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme 4674  
 cardinality of the Extreme SuperHyperEdges in the consecutive Extreme sequence of 4675  
 Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the 4676  
 Extreme SuperHyperTotal; 4677

- (ii) a **Neutrosophic SuperHyperTotal** if it's either of Neutrosophic e-SuperHyperTotal, Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic rv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperTotal;
- (iii) an **Extreme SuperHyperTotal SuperHyperPolynomial** if it's either of e-SuperHyperTotal, Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic rv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperTotal; and the Extreme power is corresponded to its Extreme coefficient;
- (iv) a **Neutrosophic SuperHyperTotal SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperTotal, Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic rv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperTotal; and the Neutrosophic power is corresponded to its Neutrosophic coefficient;
- (v) an **Extreme R-SuperHyperTotal** if it's either of Neutrosophic e-SuperHyperTotal, Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic rv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperTotal;
- (vi) a **Neutrosophic R-SuperHyperTotal** if it's either of Neutrosophic e-SuperHyperTotal, Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic rv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperTotal;
- (vii) an **Extreme R-SuperHyperTotal SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperTotal, Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic rv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the

Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperTotal; and the Extreme power is corresponded to its Extreme coefficient;

- (viii) a **Neutrosophic SuperHyperTotal SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperTotal, Neutrosophic re-SuperHyperTotal, Neutrosophic v-SuperHyperTotal, and Neutrosophic rv-SuperHyperTotal and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperTotal; and the Neutrosophic power is corresponded to its Neutrosophic coefficient.

**Example 40.0.3.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$  in the mentioned Neutrosophic Figures in every Neutrosophic items.

- On the Figure (29.1), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_2$  is a loop Neutrosophic SuperHyperEdge and  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , **is** excluded in every given Neutrosophic SuperHyperTotal.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.2), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1, E_2$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , **is** excluded in every given Neutrosophic SuperHyperTotal.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.3), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4753 4754

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 3z.\end{aligned}$$

- On the Figure (29.4), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4755 4756

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-}} &= \{E_4, E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 15z^2.\end{aligned}$$

- On the Figure (29.5), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4757 4758

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.6), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4759 4760

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal}} &= \{E_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal SuperHyperPolynomial}} &= 20z^{10}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperTotal}} &= \{V_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperTotal SuperHyperPolynomial}} &= 20z^{10}.\end{aligned}$$

- On the Figure (29.7), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4761 4762

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_{12}, E_{13}, E_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_{12}, V_{13}, V_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= z^3.\end{aligned}$$

- On the Figure (29.8), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4763 4764

$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal}} = \{E_4\}.$$

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_{12}, V_{13}, V_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ 3 \times 4 \times 4z^3. \end{aligned}$$

- On the Figure (29.9), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal}} &= \{E_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal SuperHyperPolynomial}} &= 10z^{10}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperTotal}} &= \{V_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperTotal SuperHyperPolynomial}} &= 20z^{10}. \end{aligned}$$

- On the Figure (29.10), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal}} &= \{E_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperTotal SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_{12}, V_{13}, V_{14}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ 3 \times 4 \times 4z^3. \end{aligned}$$

- On the Figure (29.11), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_1, E_6, E_7, E_8\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= 2z^4. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= 3z^2. \end{aligned}$$

- On the Figure (29.12), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_1, E_2\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= 5z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V_{i=1}^{i \neq 4,5,6}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= z^5. \end{aligned}$$

- On the Figure (29.13), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_3, E_9, E_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= 3z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= 3z^2. \end{aligned}$$



- On the Figure (29.14), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4775 4776

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_1, E_2\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V_3\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= 2z^2.\end{aligned}$$

- On the Figure (29.15), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4777 4778

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_2, V_3, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= z^3.\end{aligned}$$

- On the Figure (29.16), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4779 4780

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ &4 \times 3z^3.\end{aligned}$$

- On the Figure (29.17), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4781 4782

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ &4 \times 3z^4.\end{aligned}$$

- On the Figure (29.18), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4783 4784

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= \\ &2 \times 4 \times 3z^4.\end{aligned}$$

- On the Figure (29.19), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4785  
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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal}} &= \{E_{i+2_{i=011}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal SuperHyperPolynomial}} &= 11z^{10}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal}} &= \{V_{i+2_{i=011}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 11z^{10}. \end{aligned}$$

- On the Figure (29.20), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4787  
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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_6, E_{10}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= 9z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal}} &= \{V_1, V\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperTotal SuperHyperPolynomial}} &= (|V| - 1)z^2. \end{aligned}$$

- On the Figure (29.21), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4789  
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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal}} &= \{E_1, E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal SuperHyperPolynomial}} &= 2z^2. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperTotal}} &= \{V_1, V_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperTotal SuperHyperPolynomial}} &= 9z^2. \end{aligned}$$

- On the Figure (29.22), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperTotal, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4791  
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$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal}} &= \{E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperTotal SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperTotal}} &= \{V_3, V_{10}, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperTotal SuperHyperPolynomial}} &= 3 \times 6z^3. \end{aligned}$$

The previous Neutrosophic approach apply on the upcoming Neutrosophic results on Neutrosophic SuperHyperClasses. 4793  
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**Proposition 40.0.4.** Assume a connected Neutrosophic SuperHyperMultipartite ESHM : (V, E). 4795

Then

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$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal}} \\
 &= \{E_a \in E_{P_i^{ESHG:(V,E)}}, \\
 & \quad \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal}} \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal SuperHyperPolynomial}} \\
 &= z^{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperTotal}} \\
 &= \{V_a^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}}^{EXTERNAL}, V_b^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}}^{EXTERNAL}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperTotal SuperHyperPolynomial}} \\
 &= \sum_{|V_{P_i^{ESHG:(V,E)}}^{EXTERNAL}|_{\text{Neutrosophic Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{ choose } 2) \right) = z^2.
 \end{aligned}$$

Proof. Let

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$$\begin{aligned}
 P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest SuperHyperTotal taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . There's a new way to redefine as

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$$\begin{aligned}
 & V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.
 \end{aligned}$$

The term "EXTERNAL" implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperTotal. The latter is straightforward. Then there's no at least one SuperHyperTotal. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperTotal could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

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$$\begin{aligned}
 P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

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$$P :$$

$$V_1^{EXTERNAL}, E_1,$$
$$V_2^{EXTERNAL}, E_2$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . 4808  
The latter is straightforward. ■ 4809

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**Example 40.0.5.** In the Figure (30.1), the connected Neutrosophic SuperHyperMultipartite 4810  
 $ESHM : (V, E)$ , is highlighted and Neutrosophic featured. The obtained Neutrosophic 4811  
SuperHyperSet, by the Algorithm in previous Neutrosophic result, of the Neutrosophic 4812  
SuperHyperVertices of the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , in 4813  
the Neutrosophic SuperHyperModel (30.1), is the Neutrosophic SuperHyperTotal. 4814



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## Neutrosophic SuperHyperConnected But As The Extensions Excerpt From Dense And Super Forms

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**Definition 41.0.1.** (Different Neutrosophic Types of Neutrosophic SuperHyperConnected). 4819

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4820

Neutrosophic SuperHyperSet  $V' = \{V_1, V_2, \dots, V_s\}$  and  $E' = \{E_1, E_2, \dots, E_z\}$ . Then either  $V'$  4821

or  $E'$  is called 4822

(i) **Neutrosophic e-SuperHyperConnected** if  $\forall E_i \in E_{NSHG:(V,E)} \setminus E', \exists E_j \in E'$ , such 4823  
that  $V_a \in E_i, E_j$ ; and  $\forall E_i, E_j \in E'$ , such that  $V_a \notin E_i, E_j$ ; 4824

(ii) **Neutrosophic re-SuperHyperConnected** if  $\forall E_i \in E_{NSHG:(V,E)} \setminus E', \exists E_j \in$  4825  
 $E'$ , such that  $V_a \in E_i, E_j$ ;  $\forall E_i, E_j \in E'$ , such that  $V_a \notin E_i, E_j$ ; and 4826  
 $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4827

(iii) **Neutrosophic v-SuperHyperConnected** if  $\forall V_i \in E_{NSHG:(V,E)} \setminus V', \exists V_j \in V'$ , such 4828  
that  $V_i, V_j \notin E_a$ ; and  $\forall V_i, V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; 4829

(iv) **Neutrosophic rv-SuperHyperConnected** if  $\forall V_i \in E_{NSHG:(V,E)} \setminus V', \exists V_j \in V'$ , such 4830  
that  $V_i, V_j \in E_a$ ;  $\forall V_i, V_j \in V'$ , such that  $V_i, V_j \notin E_a$ ; and  $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} =$  4831  
 $|V_j|_{\text{NEUTROSOPIC CARDINALITY}}$ ; 4832

(v) **Neutrosophic SuperHyperConnected** if it's either of Neutrosophic e-SuperHyperConnected, 4833  
Neutrosophic re-SuperHyperConnected, Neutrosophic v-SuperHyperConnected, and Neut- 4834  
rosophic rv-SuperHyperConnected. 4835

**Definition 41.0.2.** ((Neutrosophic) SuperHyperConnected). 4836

Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$ . Consider a 4837

Neutrosophic SuperHyperEdge (NSHE)  $E = \{V_1, V_2, \dots, V_s\}$ . Then  $E$  is called 4838

(i) an **Extreme SuperHyperConnected** if it's either of Neutrosophic e-SuperHyperConnected, 4839  
Neutrosophic re-SuperHyperConnected, Neutrosophic v-SuperHyperConnected, and Neut- 4840  
rosophic rv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph 4841  
 $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of 4842

- high Extreme cardinality of the Extreme SuperHyperEdges in the consecutive Extreme  
sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they  
form the Extreme SuperHyperConnected;
- (ii) a **Neutrosophic SuperHyperConnected** if it's either of Neutrosophic e-  
SuperHyperConnected, Neutrosophic re-SuperHyperConnected, Neutrosophic v-  
SuperHyperConnected, and Neutrosophic rv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for a  
Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardin-  
ality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet  $S$  of high  
Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic  
SuperHyperVertices such that they form the Neutrosophic SuperHyperConnected;
- (iii) an **Extreme SuperHyperConnected SuperHyperPolynomial** if it's either of Neut-  
rosophic e-SuperHyperConnected, Neutrosophic re-SuperHyperConnected, Neutrosophic  
v-SuperHyperConnected, and Neutrosophic rv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for  
an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial  
contains the Extreme coefficients defined as the Extreme number of the maximum Extreme  
cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet  $S$  of high  
Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVer-  
tices such that they form the Extreme SuperHyperConnected; and the Extreme power is  
corresponded to its Extreme coefficient;
- (iv) a **Neutrosophic SuperHyperConnected SuperHyperPolynomial** if it's either of  
Neutrosophic e-SuperHyperConnected, Neutrosophic re-SuperHyperConnected, Neutro-  
sophic v-SuperHyperConnected, and Neutrosophic rv-SuperHyperConnected and  $\mathcal{C}(NSHG)$   
for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPoly-  
nomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the  
maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic  
SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyper-  
edges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic  
SuperHyperConnected; and the Neutrosophic power is corresponded to its Neutrosophic  
coefficient;
- (v) an **Extreme R-SuperHyperConnected** if it's either of Neutrosophic e-SuperHyperConnected,  
Neutrosophic re-SuperHyperConnected, Neutrosophic v-SuperHyperConnected, and Neut-  
rosophic rv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  
 $NSHG : (V, E)$  is the maximum Extreme cardinality of an Extreme SuperHyperSet  $S$  of  
high Extreme cardinality of the Extreme SuperHyperVertices in the consecutive Extreme  
sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they  
form the Extreme SuperHyperConnected;
- (vi) a **Neutrosophic R-SuperHyperConnected** if it's either of Neutrosophic e-  
SuperHyperConnected, Neutrosophic re-SuperHyperConnected, Neutrosophic v-  
SuperHyperConnected, and Neutrosophic rv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for a  
Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the maximum Neutrosophic cardinality  
of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high  
Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic  
SuperHyperVertices such that they form the Neutrosophic SuperHyperConnected;

(vii) an **Extreme R-SuperHyperConnected SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperConnected, Neutrosophic re-SuperHyperConnected, Neutrosophic v-SuperHyperConnected, and Neutrosophic rv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for an Extreme SuperHyperGraph  $NSHG : (V, E)$  is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet  $S$  of high Extreme cardinality consecutive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperConnected; and the Extreme power is corresponded to its Extreme coefficient;

(viii) a **Neutrosophic SuperHyperConnected SuperHyperPolynomial** if it's either of Neutrosophic e-SuperHyperConnected, Neutrosophic re-SuperHyperConnected, Neutrosophic v-SuperHyperConnected, and Neutrosophic rv-SuperHyperConnected and  $\mathcal{C}(NSHG)$  for a Neutrosophic SuperHyperGraph  $NSHG : (V, E)$  is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet  $S$  of high Neutrosophic cardinality consecutive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperConnected; and the Neutrosophic power is corresponded to its Neutrosophic coefficient.

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**Example 41.0.3.** Assume a Neutrosophic SuperHyperGraph (NSHG)  $S$  is an ordered pair  $S = (V, E)$  in the mentioned Neutrosophic Figures in every Neutrosophic items.

- On the Figure (29.1), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_2$  is a loop Neutrosophic SuperHyperEdge and  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , **is** excluded in every given Neutrosophic SuperHyperConnected.

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.2), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward.  $E_1, E_2$  and  $E_3$  are some empty Neutrosophic SuperHyperEdges but  $E_4$  is a Neutrosophic SuperHyperEdge. Thus in the terms of Neutrosophic SuperHyperNeighbor, there's only one Neutrosophic SuperHyperEdge, namely,  $E_4$ . The Neutrosophic SuperHyperVertex,  $V_3$  is Neutrosophic isolated means that there's no Neutrosophic SuperHyperEdge has it as a Neutrosophic endpoint. Thus the Neutrosophic SuperHyperVertex,  $V_3$ , **is** excluded in every



given Neutrosophic SuperHyperConnected.

4922

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.3), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4923  
4924

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected}} &= \{E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected}} &= \{V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected SuperHyperPolynomial}} &= 3z. \end{aligned}$$

- On the Figure (29.4), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4925  
4926

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected}} &= \{E_1, E_2, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperConnected}} &= \{V_1, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 15z^2. \end{aligned}$$

- On the Figure (29.5), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4927  
4928

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected}} &= \{E_3\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected SuperHyperPolynomial}} &= 4z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected}} &= \{V_5\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.6), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4929  
4930

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperConnected}} &= \{E_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 20z^{10}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperConnected}} &= \{V_{i+1}_{i=0}^9\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 20z^{10}. \end{aligned}$$

- On the Figure (29.7), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4931  
4932

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} = \{E_{12}, E_{13}, E_{14}\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} = z^3.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} = \{V_{12}, V_{13}, V_{14}\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} = z^3.$$

- On the Figure (29.8), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4933  
4934

$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} = \{E_4\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} = z.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} = \{V_{12}, V_{13}, V_{14}\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} = 3 \times 4 \times 4z^3.$$

- On the Figure (29.9), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4935  
4936

$$\mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperConnected}} = \{E_{i+1}_{i=0}^9\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperConnected SuperHyperPolynomial}} 10z^{10}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected}} = \{V_{i+1}_{i=11}^{19}, V_{22}\}.$$

$$\mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected SuperHyperPolynomial}} = 20z^{10}.$$

- On the Figure (29.10), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4937  
4938

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} = \{E_5\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} = z.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} = \{V_{12}, V_{13}, V_{14}\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} = 3 \times 4 \times 4z^3.$$

- On the Figure (29.11), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4939  
4940

$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} = \{E_1, E_6, E_7, E_8\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} = 2z^4.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} = \{V_1, V_5\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} = 3z^2.$$

- On the Figure (29.12), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4941  
4942

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} = \{E_1, E_2\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} = 5z^2.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} = \{V_1, V_{i=1}^{i \neq 4,5,6}\}.$$

$$\mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} = z^5.$$

- On the Figure (29.13), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4943

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_3, E_9, E_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 3z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_1, V_5\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= 3z^2. \end{aligned}$$

- On the Figure (29.14), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4945

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= z. \end{aligned}$$

- On the Figure (29.15), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4947

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_2, V_3, V_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^3. \end{aligned}$$

- On the Figure (29.16), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4949

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= 4 \times 3z^3. \end{aligned}$$

- On the Figure (29.17), the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperConnected, is up. The Neutrosophic Algorithm is Neutrosophically straightforward. 4951

$$\begin{aligned} \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 4 \times 3z^4. \end{aligned}$$

- On the Figure (29.18), the Neutrosophic SuperHyperNotion, namely, Neutrosophic Super-HyperConnected, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 4953  
4954

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_2, E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^3. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_1, V_2, V_6, V_{17}\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= \\ &= 2 \times 4 \times 3z^4.\end{aligned}$$

- On the Figure (29.19), the Neutrosophic SuperHyperNotion, namely, Neutrosophic Super-HyperConnected, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 4955  
4956

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperConnected}} &= \{E_{i+2_{i=011}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 11z^{10}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperConnected}} &= \{V_{i+2_{i=011}}\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= 11z^{10}.\end{aligned}$$

- On the Figure (29.20), the Neutrosophic SuperHyperNotion, namely, Neutrosophic Super-HyperConnected, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 4957  
4958

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected}} &= \{E_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme SuperHyperConnected SuperHyperPolynomial}} &= 10z. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-SuperHyperConnected SuperHyperPolynomial}} &= z.\end{aligned}$$

- On the Figure (29.21), the Neutrosophic SuperHyperNotion, namely, Neutrosophic Super-HyperConnected, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 4959  
4960

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected}} &= \{E_2\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic SuperHyperConnected SuperHyperPolynomial}} &= z. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected}} &= \{V_1\}. \\ \mathcal{C}(NSHG)_{\text{Neutrosophic R-SuperHyperConnected SuperHyperPolynomial}} &= 10z.\end{aligned}$$

- On the Figure (29.22), the Neutrosophic SuperHyperNotion, namely, Neutrosophic Super-HyperConnected, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward. 4961  
4962

$$\begin{aligned}\mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected}} &= \{E_3, E_4\}. \\ \mathcal{C}(NSHG)_{\text{Extreme Quasi-SuperHyperConnected SuperHyperPolynomial}} &= z^2. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected}} &= \{V_3, V_{10}, V_6\}. \\ \mathcal{C}(NSHG)_{\text{Extreme R-Quasi-SuperHyperConnected SuperHyperPolynomial}} &= \\ &= 3 \times 6z^3.\end{aligned}$$

The previous Neutrosophic approach apply on the upcoming Neutrosophic results on Neutrosophic SuperHyperClasses. 4963  
4964

**Proposition 41.0.4.** Assume a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ .  
 Then

$$\begin{aligned}
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperConnected}} \\
 &= \{E_a \in E_{P_i^{ESHG:(V,E)}}, \\
 & \quad \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| = \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic Quasi-SuperHyperConnected SuperHyperPolynomial}} \\
 &= z^{\min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|} \\
 & \text{where } \forall P_i^{ESHG:(V,E)}, |P_i^{ESHG:(V,E)}| \\
 &= \min_i |P_i^{ESHG:(V,E)} \in P^{ESHG:(V,E)}|\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperConnected}} \\
 &= \{V_a^{EXTERNAL} \in V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}, V_b^{EXTERNAL} \in V_{P_j^{ESHG:(V,E)}^{EXTERNAL}}, i \neq j\}. \\
 & \mathcal{C}(NSHG)_{\text{Neutrosophic V-SuperHyperConnected SuperHyperPolynomial}} \\
 &= \sum_{|V_{P_i^{ESHG:(V,E)}^{EXTERNAL}}|_{\text{Neutrosophic Cardinality}}} = \left( \sum_{i=|P^{ESHG:(V,E)}|} (|P_i^{ESHG:(V,E)}| \text{choose } 2) \right) = z^2.
 \end{aligned}$$

*Proof.* Let

$$\begin{aligned}
 P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest SuperHyperConnected taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . There's a new way to redefine as

$$\begin{aligned}
 & V_i^{EXTERNAL} \sim V_j^{EXTERNAL} \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv \\
 & \exists! E_z \in E_{ESHG:(V,E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z.
 \end{aligned}$$

The term "EXTERNAL" implies  $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$  where  $V_j$  is corresponded to  $V_i^{EXTERNAL}$  in the literatures of SuperHyperConnected. The latter is straightforward. Then there's no at least one SuperHyperConnected. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperConnected could be applied. There are only  $z'$  SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

$$\begin{aligned}
 P : \\
 & V_1^{EXTERNAL}, E_1, \\
 & V_2^{EXTERNAL}, E_2
 \end{aligned}$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$$P :$$

$$V_1^{EXTERNAL}, E_1,$$
$$V_2^{EXTERNAL}, E_2$$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ . 4979  
The latter is straightforward. ■ 4980

136EXM22a

**Example 41.0.5.** In the Figure (30.1), the connected Neutrosophic SuperHyperMultipartite 4981  
 $ESHM : (V, E)$ , is highlighted and Neutrosophic featured. The obtained Neutrosophic 4982  
SuperHyperSet, by the Algorithm in previous Neutrosophic result, of the Neutrosophic 4983  
SuperHyperVertices of the connected Neutrosophic SuperHyperMultipartite  $ESHM : (V, E)$ , in 4984  
the Neutrosophic SuperHyperModel (30.1), is the Neutrosophic SuperHyperConnected. 4985



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| HG30 | [30] | Henry Garrett, “ <i>Different Neutrosophic Types of Neutrosophic Regions titled neutrosophic Failed SuperHyperStable in Cancer’s Neutrosophic Recognition modeled in the Form of Neutrosophic SuperHyperGraphs</i> ”, ResearchGate 2023, (doi: 10.13140/RG.2.2.17385.36968).            | 5087<br>5088<br>5089         |
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## CHAPTER 42

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# Books' Contributions

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“Books' Contributions”:   Featured Threads	5122
Book #113	5123
Title: SuperHyperMultipartite	5124
#Latest_Updates	5125
#The_Links	5126
Available at WordPress Preprints_org ResearchGate Scribd academia ZENODO_ORG Twitter	5127
LinkedIn Amazon googlebooks GooglePlay	5128
–	5129
	5130
#Latest_Updates	5131
	5132
#The_Links	5133
	5134
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	5136
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Publisher	5144
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(Kindle Edition): CC BY-NC-ND 4.0	5154

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Print length	5159
(Paperback): - pages	5160
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(E-Book): 362 pages	5163
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#Latest_Updates	5167
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#The_Links	5169
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ResearchGate: <a href="https://www.researchgate.net/publication/-">https://www.researchgate.net/publication/-</a>	5171
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WordPress: <a href="https://drhenrygarrett.wordpress.com/2023/02/19/SuperHyperMultipartite/">https://drhenrygarrett.wordpress.com/2023/02/19/SuperHyperMultipartite/</a>	5173
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GooglePlay: <a href="https://play.google.com/store/books/details?id=-">https://play.google.com/store/books/details?id=-</a>	5183
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## SuperHyperDominating

Book · February 2023

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Posted by Dr. Henry Garrett	5190
February 19, 2023	5191
Posted in 0113   SuperHyperMultipartite	5192
Tags:	5193
Applications, Applied Mathematics, Applied Research, Cancer, Cancer’s Recognitions, Combinatorics, Edge, Edges, Graph Theory, Graphs, Latest Research, Literature Reviews, Modeling, Neutrosophic Graph, Neutrosophic Graph Theory, Neutrosophic Science, Neutrosophic SuperHyperClasses, Neutrosophic SuperHyperGraph, Neutrosophic SuperHyperGraph Theory, neutrosophic SuperHyperGraphs, Neutrosophic SuperHyperMultipartite, Open Problems, Open Questions, Problems, Pure Math, Pure Mathematics, Questions, Real-World Applications, Recent Research, Recognitions, Research, scientific research Article, scientific research Articles, scientific research Book, scientific research Chapter, scientific research Chapters, Review, SuperHyperClasses, SuperHyperEdges, SuperHyperGraph, SuperHyperGraph Theory, SuperHyperGraphs, SuperHyperMultipartite, SuperHyperModeling, SuperHyperVertices, Theoretical Research, Vertex, Vertices.	5194
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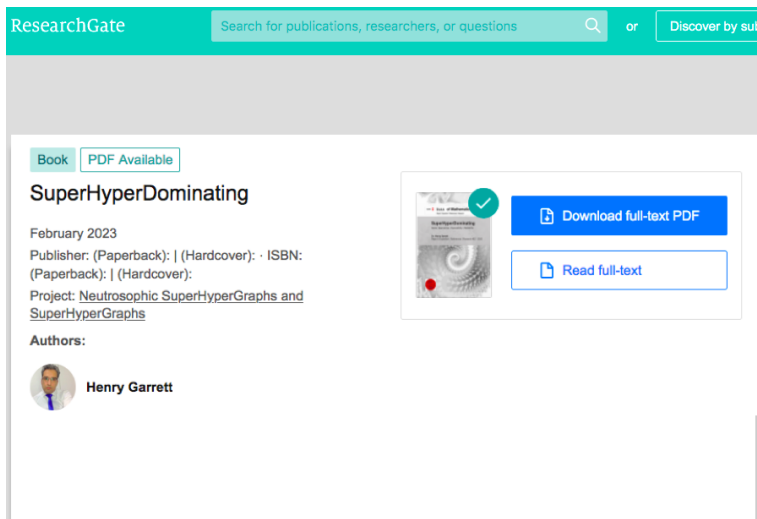


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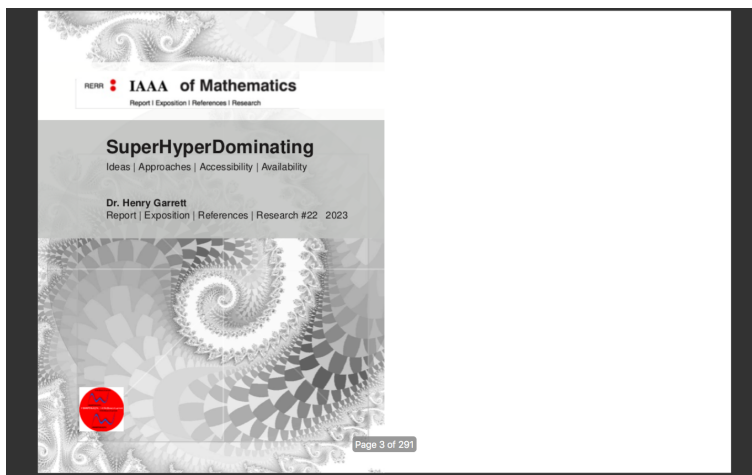


Figure 42.3: “#110th Book” || SuperHyperMultipartite February 2023 License: CC BY-NC-ND 4.0 Print length: 362 pages Project: Neutrosophic SuperHyperGraphs and SuperHyperGraphs

In this scientific research book, there are some scientific research chapters on “Extreme SuperHyperMultipartite” and “Neutrosophic SuperHyperMultipartite” about some researches on Extreme SuperHyperMultipartite and neutrosophic SuperHyperMultipartite.

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## CHAPTER 43

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### **“SuperHyperGraph-Based Books”: | Featured Tweets**

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“SuperHyperGraph-Based Books”: | Featured Tweets

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Project

ResearchGate

## Neutrosophic SuperHyperGraphs and SuperHyperGraphs

 Henry Garrett

Goal: The aim of this project is to contribute some research articles and some research books in that subject. Finding tools and notions to define in this structure to make this structure more understandable. Clarifications are presented in oversimplified ways. There are well-defined efforts to get more sensible results.

Sometimes, I post one part of book at my website. After that, I put that link in this project. Some research articles and some research books are excerpt from these posts.

Instance updates are on my accounts, simultaneously [Website, Scribd, Twitter, Amazon, Academia, LinkedIn, Twitter, ResearchGate].

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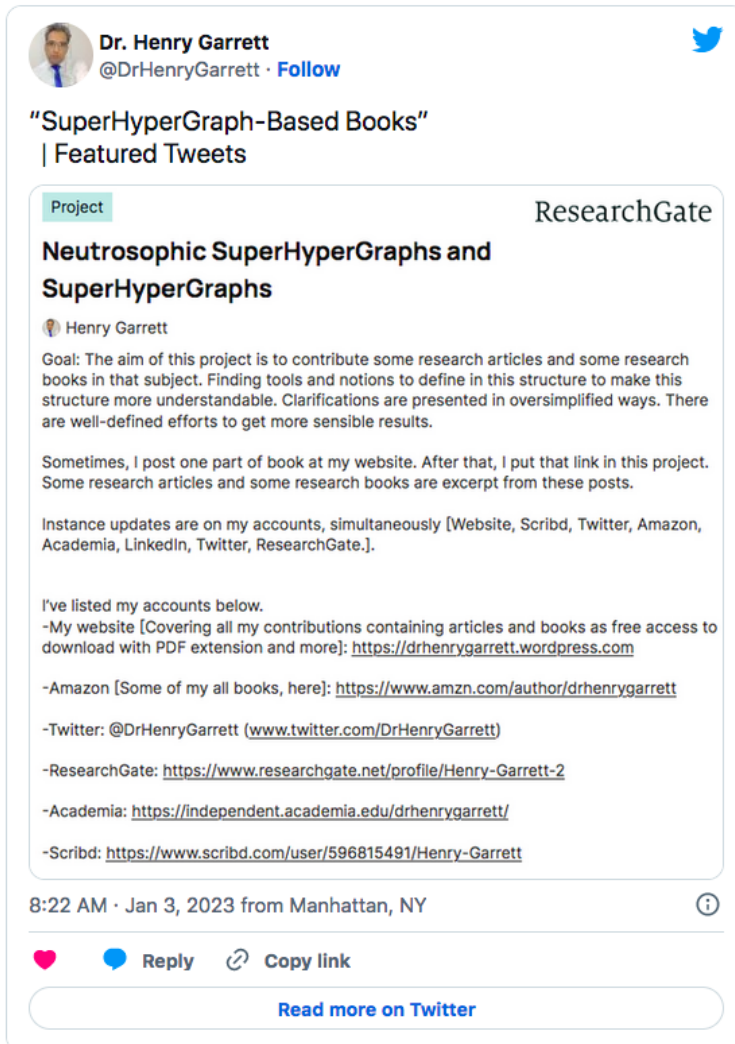
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Figure 43.1: “SuperHyperGraph-Based Books”: | Featured Tweets



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**“SuperHyperGraph-Based Books”**  
| Featured Tweets

Project ResearchGate

### Neutrosophic SuperHyperGraphs and SuperHyperGraphs

Henry Garrett

Goal: The aim of this project is to contribute some research articles and some research books in that subject. Finding tools and notions to define in this structure to make this structure more understandable. Clarifications are presented in oversimplified ways. There are well-defined efforts to get more sensible results.

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Figure 43.2: “SuperHyperGraph-Based Books”: | Featured Tweets



Figure 43.3: “SuperHyperGraph-Based Books”: | Featured Tweets #69



Figure 43.4: “SuperHyperGraph-Based Books”: | Featured Tweets #69

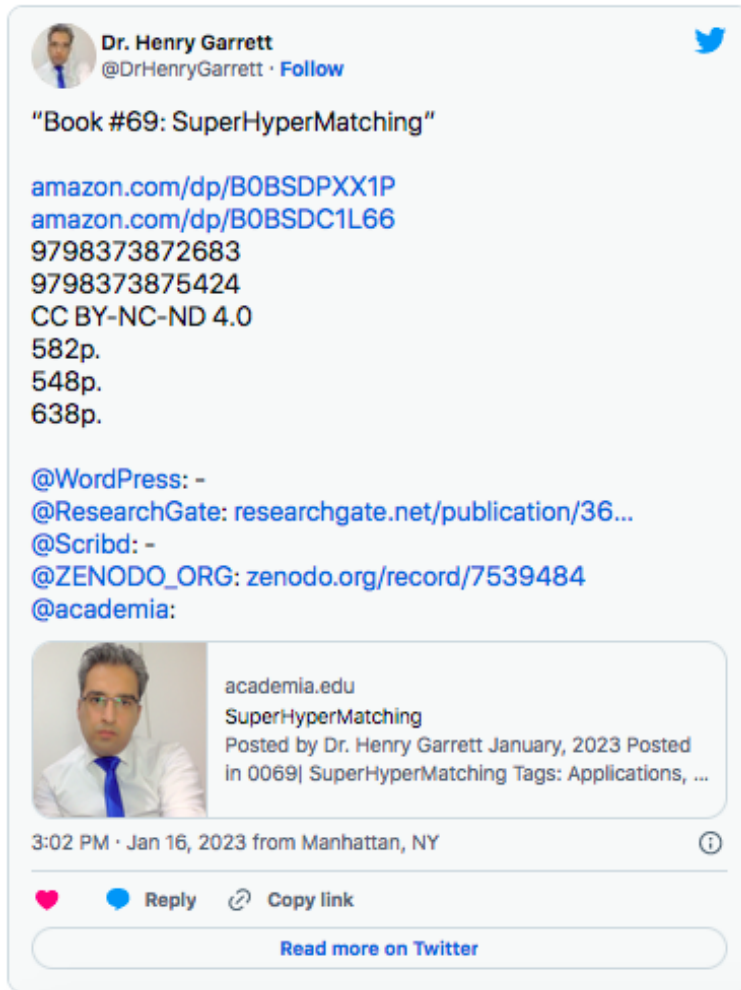


Figure 43.5: "SuperHyperGraph-Based Books": | Featured Tweets #69



Figure 43.6: “SuperHyperGraph-Based Books”: | Featured Tweets #68





Figure 43.7: “SuperHyperGraph-Based Books”: | Featured Tweets #68



**Dr. Henry Garrett**  
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Book #68

Failed SuperHyperClique

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The image shows the front and back covers of the book "Failed SuperHyperClique" by Henry Garrett. The front cover features a spiral pattern and the title "Failed SuperHyperClique" in a bold, sans-serif font. Below the title, it lists "Idea | Approach | Accessibility | Availability" and the author's name "Dr. Henry Garrett" with "Report | Exposition | References | Research #22 2023". The back cover contains a detailed synopsis of the book's content, including its focus on graph theory and hypergraphs, and lists various mathematical concepts and results. It also includes the author's name "Henry Garrett" and a barcode at the bottom.

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Figure 43.8: "SuperHyperGraph-Based Books": | Featured Tweets #68

Publications: Books

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- ▶ ASIN : B0BRZ67NYN Publisher : Independently published (January 10, 2023) Language : English Paperback : 454 pages ISBN-13 : 979-8373274227 Item Weight : 2.83 pounds Dimensions : 8.5 x 1.07 x 11 inches
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Figure 43.9: “SuperHyperGraph-Based Books”: | Featured Tweets #68

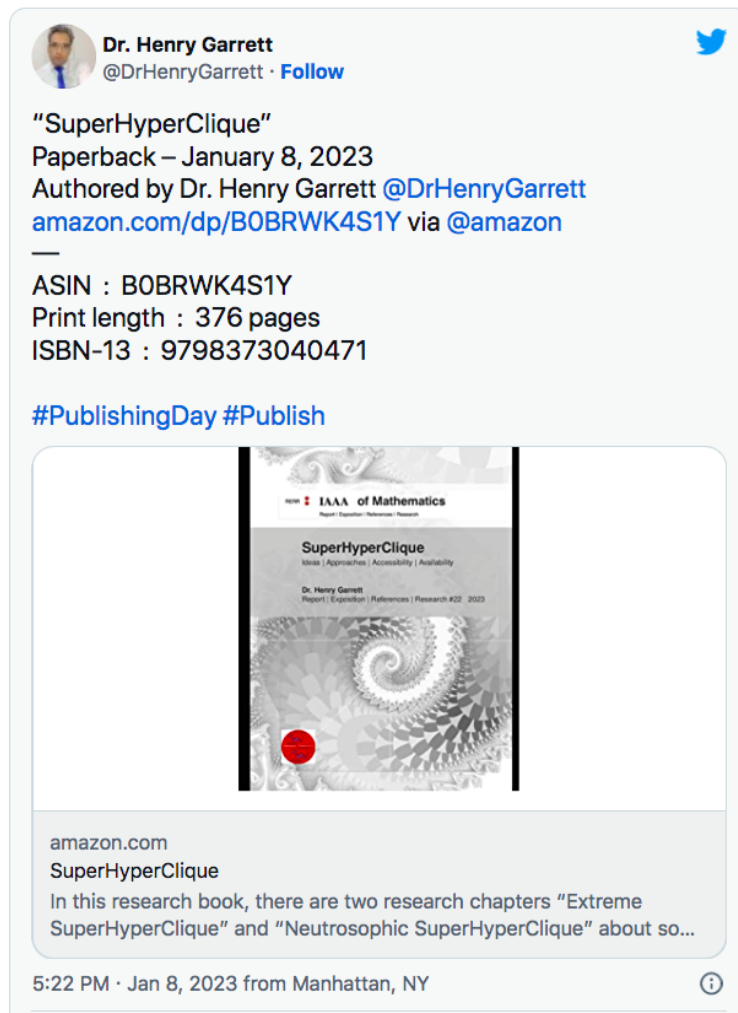


Figure 43.10: “SuperHyperGraph-Based Books”: | Featured Tweets #67



Figure 43.11: “SuperHyperGraph-Based Books”: | Featured Tweets #67



Publications: Books

2023 0067 | SuperHyperClique Amazon

» ASIN : B0BRWK4S1Y Publisher : Independently published (January 8, 2023) Language : English Paperback : 376 pages ISBN-13 : 979-8373040471 Item Weight : 2.36 pounds Dimensions : 8.5 x 0.89 x 11 inches

» ASIN : B0BRM24YJX Publisher : Independently published (January 8, 2023) Language : English Hardcover : 388 pages ISBN-13 : 979-8373041935 Item Weight : 2.36 pounds Dimensions : 8.25 x 1.1 x 11 inches

Figure 43.13: “SuperHyperGraph-Based Books”: | Featured Tweets #67



**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

“Failed SuperHyperStable”  
Paperback – January 4, 2023  
Authored by Dr. Henry Garrett @DrHenryGarrett  
[amazon.com/dp/B0BRNG7DC8](https://amazon.com/dp/B0BRNG7DC8) via @amazon

—

ASIN : B0BRNG7DC8  
Print length : 304 pages  
ISBN-13 : 9798372597976

#PublishingDay #Publish



amazon.com  
Failed SuperHyperStable  
In this research book, there are two research chapters “Extreme Failed SuperHyperStable” and “Neutrosophic Failed SuperHyperStable” ...

11:22 PM · Jan 5, 2023 from Manhattan, NY

Figure 43.14: “SuperHyperGraph-Based Books”: | Featured Tweets #66



Figure 43.15: "SuperHyperGraph-Based Books": | Featured Tweets #66

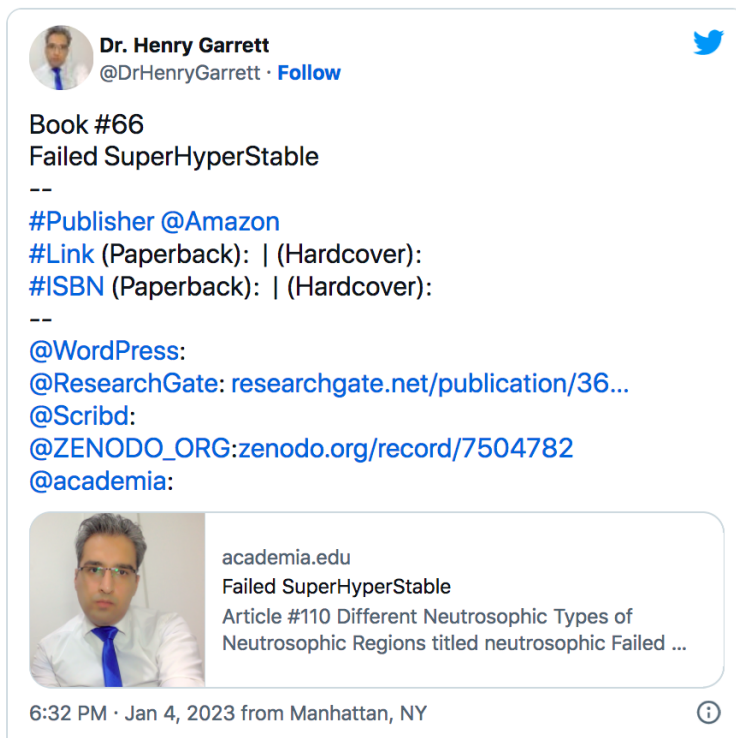


Figure 43.16: “SuperHyperGraph-Based Books”: | Featured Tweets #66



**Dr. Henry Garrett**  
 @DrHenryGarrett · Follow

**Book #66**  
**Failed SuperHyperStable**

[amazon.com/dp/B0BRNG7DC8](https://amazon.com/dp/B0BRNG7DC8)  
[amazon.com/dp/B0BRLVN39L](https://amazon.com/dp/B0BRLVN39L)  
 9798372597976  
 9798372599765

@ResearchGate: [researchgate.net/publication/36...](https://researchgate.net/publication/36...)  
 @Scribd: -  
 @academia: [academia.edu/94347021](https://academia.edu/94347021)  
 @ZENODO\_ORG: [zenodo.org/record/7504782](https://zenodo.org/record/7504782)  
 @WordPress:

drhenrygarrett.wordpress.com  
**Failed SuperHyperStable (Published Version)**  
 "Hardcover" ASIN : B0BRLVN39L | Print length : 306 pages |  
 ISBN-13 : 979-8372599765 | "Paperback" ASIN : B0BRLVN39L | ...

5:52 AM · Jan 6, 2023 from Manhattan, NY

Figure 43.17: “SuperHyperGraph-Based Books”: | Featured Tweets #66

Publications: Books

2023	0066   Failed SuperHyperStable	Amazon
» ASIN : B0BRNG7DC8 Publisher : Independently published (January 4, 2023) Language : English Paperback : 304 pages ISBN-13 : 979-8372597976 Item Weight : 1.93 pounds Dimensions : 8.5 x 0.72 x 11 inches		
» ASIN : B0BRLVN39L Publisher : Independently published (January 4, 2023) Language : English Hardcover : 306 pages ISBN-13 : 979-8372599765 Item Weight : 1.89 pounds Dimensions : 8.25 x 0.91 x 11 inches		

Figure 43.18: “SuperHyperGraph-Based Books”: | Featured Tweets #66

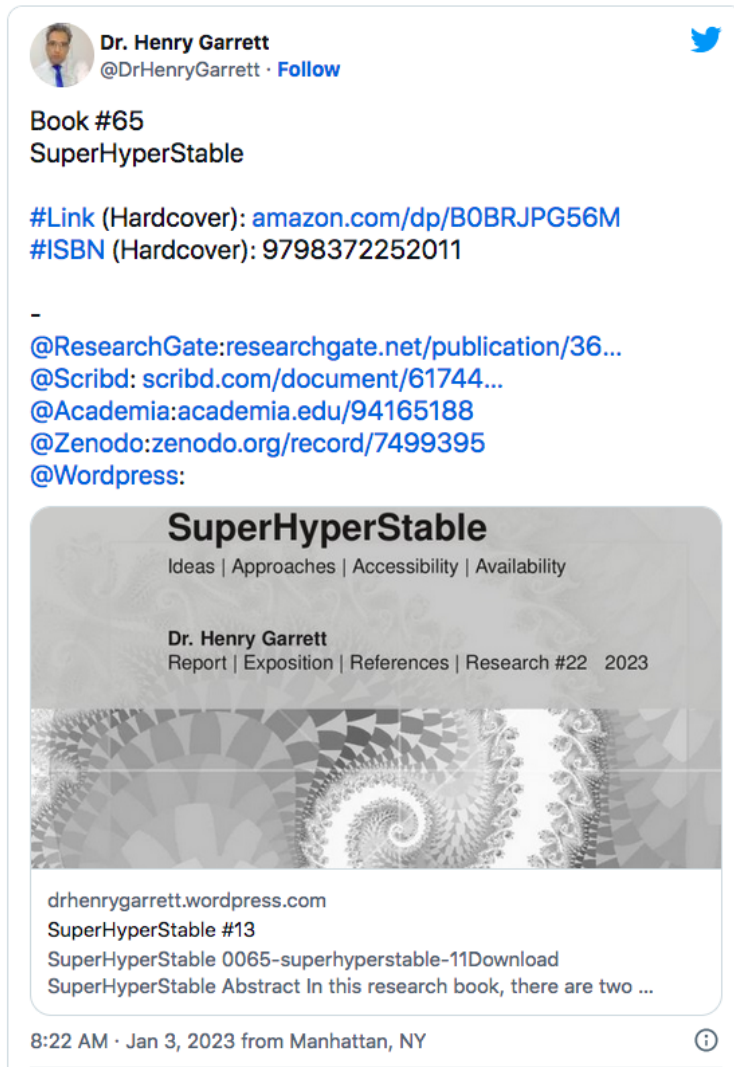


Figure 43.19: “SuperHyperGraph-Based Books”: | Featured Tweets #65

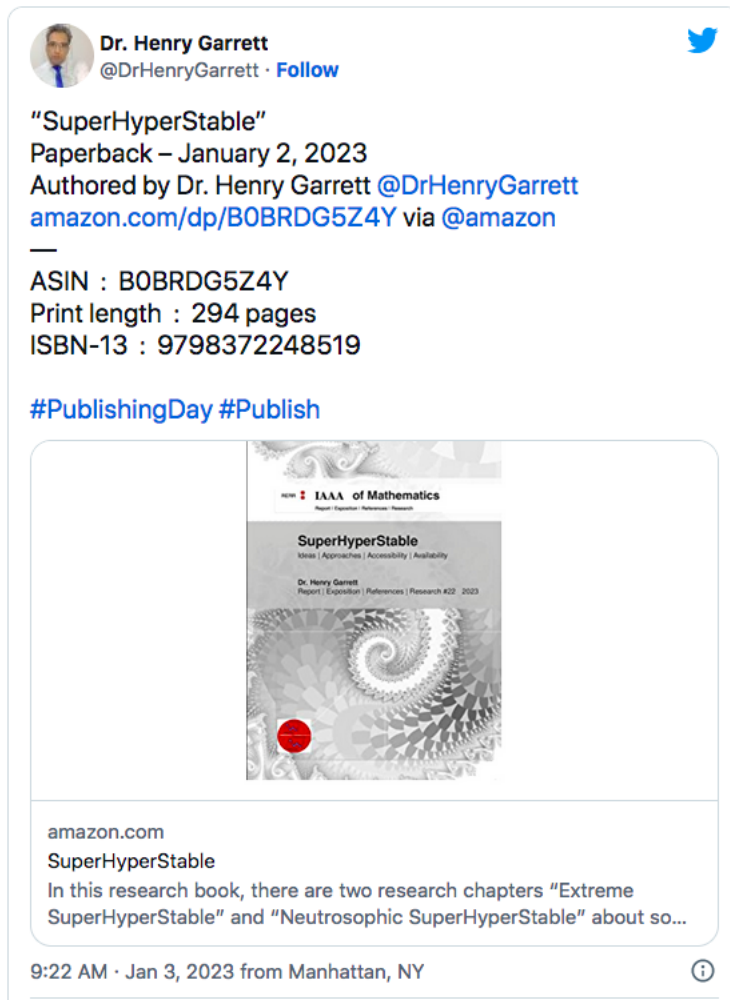


Figure 43.20: “SuperHyperGraph-Based Books”: | Featured Tweets #65

**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

**"SuperHyperStable"**  
Paperback – January 2, 2023  
Authored by Dr. Henry Garrett @DrHenryGarrett  
[amazon.com/dp/BOBRDG5Z4Y](https://amazon.com/dp/BOBRDG5Z4Y) via @amazon

—

ASIN : BOBRDG5Z4Y  
Print length : 294 pages  
ISBN-13 : 9798372248519

#PublishingDay #Publish

9:22 AM · Jan 3, 2023 from Manhattan, NY

Figure 43.21: “SuperHyperGraph-Based Books”: | Featured Tweets #65



Figure 43.22: “SuperHyperGraph-Based Books”: | Featured Tweets #65

**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

**"SuperHyperStable"**  
Hardcover – January 2, 2023  
Authored by Dr. Henry Garrett @DrHenryGarrett  
[amazon.com/dp/BOBRJPG56M](https://amazon.com/dp/BOBRJPG56M) via @amazon

ASIN : BOBRJPG56M  
Print length : 290 pages  
ISBN-13 : 9798372252011

#PublishingDay #Publish

6:52 AM · Jan 3, 2023 from Manhattan, NY

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Figure 43.23: “SuperHyperGraph-Based Books”: | Featured Tweets #65



**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

**Book #65**  
**SuperHyperStable**

[amazon.com/dp/BOBRDG5Z4Y](https://amazon.com/dp/BOBRDG5Z4Y)  
[amazon.com/dp/BOBRJPG56M](https://amazon.com/dp/BOBRJPG56M)  
9798372248519 | 9798372252011

[@ResearchGate:researchgate.net/publication/36...](https://researchgate.net/publication/36...)  
[@Scribd: scribd.com/document/61744...](https://scribd.com/document/61744...)  
[@Academia:academia.edu/94165188](https://academia.edu/94165188)  
[@Zenodo:zenodo.org/record/7499395](https://zenodo.org/record/7499395)  
[@Wordpress:](#)



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SuperHyperStable (Published Version)  
"Hardcover" ASIN : BOBRJPG56M | Print length : 290 pages |  
ISBN-13 : 9798372252011 | "Paperback" ASIN : BOBRDG5Z4Y | ...

10:22 AM · Jan 3, 2023 from Manhattan, NY

Figure 43.24: “SuperHyperGraph-Based Books”: | Featured Tweets #65

**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

#64  
Failed SuperHyperForcing

[amazon.com/dp/B0BRH5B4QM](https://amazon.com/dp/B0BRH5B4QM) | [amazon.com/dp/B0BRGX4DBJ](https://amazon.com/dp/B0BRGX4DBJ) 9798372123649 | 9798372124509

[@ResearchGate:researchgate.net/publication/36...](https://researchgate.net/publication/36...)  
[@Scribd:scribd.com/document/61724...](https://scribd.com/document/61724...)  
[@Academia:academia.edu/94069071](https://academia.edu/94069071)  
[@Zenodo:zenodo.org/record/7497450](https://zenodo.org/record/7497450)  
[@Wordpress:](#)

**Failed SuperHyperForcing**  
Henry Garrett

Failed SuperHyperForcing  
Ideas | Approaches | Accessibility | Availability

Dr. Henry Garrett  
Report | Exposition | References | Research #22 2022

drhenrygarrett.wordpress.com  
Failed SuperHyperForcing (Published Version)  
Hardcover : 337 pages | ASIN : B0BRGX4DBJ | ISBN-13 : 9798372124509 | Paperback : 337 pages | ASIN : B0BRH5B4QM | ...

8:22 AM · Jan 3, 2023 from Manhattan, NY

Figure 43.25: “SuperHyperGraph-Based Books”: | Featured Tweets #64



The image is a screenshot of a tweet from Dr. Henry Garrett (@DrHenryGarrett). The tweet is titled "Book #63 SuperHyperForcing" and includes several links to purchase the book on Amazon, ResearchGate, Scribd, Academia, Zenodo, and Wordpress. It also features two book covers: "SuperHyperForcing" by Henry Garrett, published by IAAA of Mathematics, and "SuperHyperForcing" by Henry Garrett, published by Global Knowledge. The tweet is dated 8:22 AM on Jan 3, 2023, from Manhattan, NY.

**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

**Book #63**  
**SuperHyperForcing**

[amazon.com/dp/B0BRDG1KN1](https://amazon.com/dp/B0BRDG1KN1) | [amazon.com/dp/B0BRDFFQMF](https://amazon.com/dp/B0BRDFFQMF)  
9798371873347 | 9798371874092

[@ResearchGate:researchgate.net/publication/36...](https://ResearchGate:researchgate.net/publication/36...)  
[@Scribd:scribd.com/document/61707...](https://Scribd:scribd.com/document/61707...)  
[@Academia:academia.edu/93995226](https://Academia:academia.edu/93995226)  
[@Zenodo:zenodo.org/record/7494862](https://Zenodo:zenodo.org/record/7494862)  
[@Wordpress:](https://Wordpress:@Wordpress:)

**SuperHyperForcing**  
Henry Garrett

**SuperHyperForcing**  
Ideas | Approaches | Accessibility | Availability  
Dr. Henry Garrett  
Report | Exposition | References | Research #22 2022

**SuperHyperForcing**  
Henry Garrett

[drhenrygarrett.wordpress.com](https://drhenrygarrett.wordpress.com)  
**SuperHyperForcing (Published Version)**  
|Hardcover| ASIN : B0BRDFFQMF | ISBN-13 : 9798371873347 |  
Paperback : 285 | |Paperback| ASIN : B0BRDG1KN1 | ISBN-13 : ...

8:22 AM · Jan 3, 2023 from Manhattan, NY

Figure 43.26: “SuperHyperGraph-Based Books”: | Featured Tweets #63

**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

Book#62  
SuperHyperAlliances  
[amazon.com/dp/B0BR6YC3HG](https://amazon.com/dp/B0BR6YC3HG) | [amazon.com/dp/B0BR7CBTC6](https://amazon.com/dp/B0BR7CBTC6)  
9798371488343 | 9798371494849

-

[@ResearchGate:researchgate.net/publication/36...](https://ResearchGate:researchgate.net/publication/36...)  
[@Scribd:scribd.com/document/61702...](https://Scribd:scribd.com/document/61702...)  
[@Academia:academia.edu/93968814](https://Academia:academia.edu/93968814)  
[@Zenodo:zenodo.org/record/7493845](https://Zenodo:zenodo.org/record/7493845)  
[@WordPress:](https://WordPress:drhenrygarrett.wordpress.com)

drhenrygarrett.wordpress.com  
SuperHyperAlliances (Published Version)  
Hardcover: ASIN : B0BR7CBTC6 | Hardcover : 189 pages | ISBN-13 : 979-8371494849 | Paperback: ASIN : B0BR6YC3HG | Paperback : ...

8:22 AM · Jan 3, 2023 from Manhattan, NY

Figure 43.27: “SuperHyperGraph-Based Books”: | Featured Tweets #62

The image is a screenshot of a tweet from Dr. Henry Garrett (@DrHenryGarrett). The tweet is titled "#61 SuperHyperGraphs" and contains several links to purchase the book on Amazon, ResearchGate, Scribd, Academia, and Zenodo, as well as a link to the book's WordPress page. The tweet also includes a preview of the book cover for "SuperHyperGraphs" published by IAAA of Mathematics. The book cover features a complex geometric pattern of overlapping triangles forming a spiral. The tweet is dated 8:22 AM on Jan 3, 2023, from Manhattan, NY.

**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

#61 SuperHyperGraphs

amazon.com/dp/BOBR1NH4Z | amazon.com/dp/BOBQXTHTXY  
9798371090133 | 9798371093240

@ResearchGate: researchgate.net/publication/36...  
@Scribd: scribd.com/document/61702...  
@Academia: academia.edu/93605376/Super...  
@Zenodo: zenodo.org/record/7480110  
@Wordpress:

Fields from the math to literature. He is passionate about writing and posting in both science and research fields.

Mathematician | Author | Scientist | Publisher | High Account is in Twitter: @DrHenryGarrett | Email: henrygarrett@gmail.com | Website: DrHenryGarrett.wordpress.com

In this research book, there are two research chapters: "Total Hyper" and "Total Hyper" about some research on SuperHyperGraphs and HyperHyperGraphs. Some studies and researches about mathematical graphs, are presented in book in the following by Henry Garrett (2022), which is related to Graph Theory, and the main part of the book is "Total Hyper" and "Total Hyper" and published by "Open Publishing Educational Publisher (OPEP) team for the conference program, since 2022 United States. This research book covers different types of vertices and settings in mathematical graph theory and hypergraphs. SuperHyperGraph Theory.

Dr. Henry Garrett, (2022), "SuperHyperGraphs", Ohio Publishing Educational Publisher (OPEP) team for the conference program, Ohio 43212 United States, ISBN: 978-1-50972-722-4. <http://www.omegaopen.com/superhypergraphs.pdf>

Also, some studies and researches about mathematical graphs, are presented in book in the following by Henry Garrett (2022), which is related to Graph Theory and also covers some other studies in graph theory. "Mathematical Quality" and published by Florida, CLICOM, March 2022. Publishing House: B0BQXTHTXY | ISBN-13: 979-8371093240 | ISBN-10: 1-50972-722-4. <http://www.omegaopen.com/mathematicalquality.pdf>

Also, some studies and researches about mathematical graphs, are presented in book in the following by Henry Garrett (2022), which is related to Graph Theory and also covers some other studies in graph theory. "Mathematical Quality" and published by Florida, CLICOM, March 2022. Publishing House: B0BQXTHTXY | ISBN-13: 979-8371093240 | ISBN-10: 1-50972-722-4. <http://www.omegaopen.com/mathematicalquality.pdf>

drhenrygarrett.wordpress.com  
SuperHyperGraphs (Published Version)  
Hardcover: ASIN : B0BQXTHTXY | Hardcover : 117 pages | ISBN-13 : 979-8371093240 | Paperback: ASIN : B0BR1NH4Z | Paperback : ...

8:22 AM · Jan 3, 2023 from Manhattan, NY

Figure 43.28: “SuperHyperGraph-Based Books”: | Featured Tweets #61

The image shows a tweet from Dr. Henry Garrett (@DrHenryGarrett) dated January 3, 2023. The tweet promotes his book "Neut. SuperHyperEdges" (Book #60). It includes several links to digital versions of the book: Scribd, Zenodo, Academia.edu, and ResearchGate. It also provides Amazon links for both paperback and hardcover editions, along with ISBN numbers 9798365922365 and 9798365923980. The tweet features two book covers: the left one is the front cover with a black background and white text, and the right one is the back cover with a white background and a fractal-like geometric pattern. The tweet text includes a detailed description of the book's content, mentioning its focus on neutrosophic superhyperedges and its publication by the International Association of Mathematics (IAAM).

**Dr. Henry Garrett**  
@DrHenryGarrett · Follow

Book #60  
Neut. SuperHyperEdges

[scribd.com/document/61115...](https://www.scribd.com/document/61115...)

[zenodo.org/record/7378758](https://zenodo.org/record/7378758)

[academia.edu/91877217/Neut\\_...](https://academia.edu/91877217/Neut_...)

[researchgate.net/publication/36...](https://researchgate.net/publication/36...)

—

Publisher: (Paperback): [amazon.com/dp/BOBNH11ZDY](https://amazon.com/dp/BOBNH11ZDY) |  
(Hardcover): [amazon.com/dp/BOBNGZGPP6](https://amazon.com/dp/BOBNGZGPP6)

9798365922365 | 9798365923980

--

drhenrygarrett.wordpress.com  
Neut. SuperHyperEdges (Published Version)  
Hardcover: Paperback: 0050-neut.-superhyperedges-18Download  
Book #60Neut. SuperHyperEdges @Wordpress: @Scribd: @Zenodo: ...

8:22 AM · Jan 3, 2023 from Manhattan, NY

Figure 43.29: “SuperHyperGraph-Based Books”: | Featured Tweets #60



## CHAPTER 44

5219

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## CV

---

5220

# Henry Garrett | CV

- » **Status:** Known As Henry Garrett With Highly Productive Style.
- » **Fields:** Combinatorics, Algebraic Structures, Algebraic Hyperstructures, Fuzzy Logic
- » **Prefers:** Graph Theory, Domination, Metric Dimension, Neutrosophic Graph Theory, Neutrosophic Domination, Lattice Theory, Groups and Hypergroups
- » **Activities:** Traveling, Painting, Writing, Reading books and Papers



## »»» Professional Experiences

- |                |   |     |
|----------------|---|-----|
| 2017 - Present | Continuous Member   | AMS |
|                | <ul style="list-style-type: none"> <li>» I tried to show them that Science is not only interesting, it's beautiful and exciting.</li> <li>» Participating in the academic space of the largest mathematical Society gave me valuable experiences. The use of Bulletin and Notice of the American Mathematical Society is another benefit of this presence.</li> </ul> |     |
| 2017 - 2019    | Continuous Member   | EMS |
|                | <ul style="list-style-type: none"> <li>» The use Newsletter of the European Mathematical Society is benefit of this membership.</li> <li>» I am interested in giving a small, though small, effect on math epidemic progress</li> </ul>   |     |

## »»» Awards and Achievements

- |              |  |  |
|--------------|--|--|
| Sep 2022     | Award: Selected as an Editorial Board Member to JMTCM  | JMTCM  |
|              | <ul style="list-style-type: none"> <li>» Award: Selected as an Editorial Board Member to Journal of Mathematical Techniques and Computational Mathematics(JMTCM)</li> <li>» Journal of Mathematical Techniques and Computational Mathematics(JMTCM)</li> </ul> |  |
| Jun 2022     | Award: Selected as an Editorial Board Member to JCTCSR   | JCTCSR   |
|              | <ul style="list-style-type: none"> <li>» Award: Selected as an Editorial Board Member to Journal of Current Trends in Computer Science Research(JCTCSR)</li> <li>» Journal of Current Trends in Computer Science Research(JCTCSR)</li> </ul>                   |  |
| Jan 23, 2022 | Award: Diploma By Neutrosophic Science International Association   | Neutrosophic Science International Association |
|              | <ul style="list-style-type: none"> <li>» Award: Distinguished Achievements</li> <li>» Honorary Memebrship</li> </ul>   |  |

## »»» Journal Referee

- |          |  |        |
|----------|--|--------|
| Sep 2022 | Editorial Board Member to JMTCM  | JMTCM  |
|          | <ul style="list-style-type: none"> <li>» Editorial Board Member to Journal of Mathematical Techniques and Computational Mathematics(JMTCM)</li> <li>» Journal of Mathematical Techniques and Computational Mathematics(JMTCM)</li> </ul> |        |
| Jun 2022 | Editorial Board Member to JCTCSR   | JCTCSR |
|          | <ul style="list-style-type: none"> <li>» Editorial Board Member to Journal of Current Trends in Computer Science Research(JCTCSR)</li> <li>» Journal of Current Trends in Computer Science Research(JCTCSR)</li> </ul>                   |        |

 Publications: Articles

2023	0126   Extreme SuperHyperClique as the Firm Scheme of Confrontation under Cancer's Recognition as the Model in The Setting of (Neutrosophic) SuperHyperGraphs	Manuscript
	<ul style="list-style-type: none"> <li>» Henry Garrett, "Extreme SuperHyperClique as the Firm Scheme of Confrontation under Cancer's Recognition as the Model in The Setting of (Neutrosophic) SuperHyperGraphs", Preprints 2023, 2023010308 (doi: 10.20944/preprints202301.0308.v1).</li> <li>» Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn</li> </ul>	
2023	0125   Uncertainty On The Act And Effect Of Cancer Alongside The Foggy Positions Of Cells Toward Neutrosophic Failed SuperHyperClique inside Neutrosophic SuperHyperGraphs Titled Cancer's Recognition	Manuscript
	<ul style="list-style-type: none"> <li>» Henry Garrett, "Uncertainty On The Act And Effect Of Cancer Alongside The Foggy Positions Of Cells Toward Neutrosophic Failed SuperHyperClique inside Neutrosophic SuperHyperGraphs Titled Cancer's Recognition", Preprints 2023, 2023010282 (doi: 10.20944/preprints202301.0282.v1).</li> <li>» Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn</li> </ul>	
2023	0124   Neutrosophic Version Of Separates Groups Of Cells In Cancer's Recognition On Neutrosophic SuperHyperGraphs	Manuscript
	<ul style="list-style-type: none"> <li>» Henry Garrett, "Neutrosophic Version Of Separates Groups Of Cells In Cancer's Recognition On Neutrosophic SuperHyperGraphs", Preprints 2023, 2023010267 (doi: 10.20944/preprints202301.0267.v1).</li> <li>» Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn</li> </ul>	
2023	0123   The Shift Paradigm To Classify Separately The Cells and Affected Cells Toward The Totality Under Cancer's Recognition By New Multiple Definitions On the Sets Polynomials Alongside Numbers In The (Neutrosophic) SuperHyperMatching Theory Based on SuperHyperGraph and Neutrosophic SuperHyperGraph	Manuscript
	<ul style="list-style-type: none"> <li>» Henry Garrett, "The Shift Paradigm To Classify Separately The Cells and Affected Cells Toward The Totality Under Cancer's Recognition By New Multiple Definitions On the Sets Polynomials Alongside Numbers In The (Neutrosophic) SuperHyperMatching Theory Based on SuperHyperGraph and Neutrosophic SuperHyperGraph", Preprints 2023, 2023010265 (doi: 10.20944/preprints202301.0265.v1).</li> <li>» Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn</li> </ul>	
2023	0122   Breaking the Continuity and Uniformity of Cancer In The Worst Case of Full Connections With Extreme Failed SuperHyperClique In Cancer's Recognition Applied in (Neutrosophic) SuperHyperGraphs	Manuscript
	<ul style="list-style-type: none"> <li>» Henry Garrett, "Breaking the Continuity and Uniformity of Cancer In The Worst Case of Full Connections With Extreme Failed SuperHyperClique In Cancer's Recognition Applied in (Neutrosophic) SuperHyperGraphs", Preprints 2023, 2023010262, (doi: 10.20944/preprints202301.0262.v1).</li> <li>» Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn</li> </ul>	
2023	0121   Neutrosophic Failed SuperHyperStable as the Survivors on the Cancer's Neutrosophic Recognition Based on Uncertainty to All Modes in Neutrosophic SuperHyperGraphs	Manuscript
	<ul style="list-style-type: none"> <li>» Henry Garrett, "Neutrosophic Failed SuperHyperStable as the Survivors on the Cancer's Neutrosophic Recognition Based on Uncertainty to All Modes in Neutrosophic SuperHyperGraphs", Preprints 2023, 2023010240 (doi: 10.20944/preprints202301.0240.v1).</li> <li>» Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn</li> </ul>	
2023	0120   Extremism of the Attacked Body Under the Cancer's Circumstances Where Cancer's Recognition Titled (Neutrosophic) SuperHyperGraphs	Manuscript
	<ul style="list-style-type: none"> <li>» Henry Garrett, "Extremism of the Attacked Body Under the Cancer's Circumstances Where Cancer's Recognition Titled (Neutrosophic) SuperHyperGraphs", Preprints 2023, 2023010224, (doi: 10.20944/preprints202301.0224.v1).</li> <li>» Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn</li> </ul>	
2023	0119   SuperHyperMatching By (R-)Definitions And Polynomials To Monitor Cancer's Recognition In Neutrosophic SuperHyperGraphs	Manuscript
	<ul style="list-style-type: none"> <li>» Henry Garrett, "SuperHyperMatching By (R-)Definitions And Polynomials To Monitor Cancer's Recognition In Neutrosophic SuperHyperGraphs", ResearchGate 2023, (doi: 10.13140/RG.2.2.35061.65767).</li> <li>» Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn</li> </ul>	



Henry Garrett · Independent Researcher · Department of Mathematics · [DrHenryGarrett@gmail.com](mailto:DrHenryGarrett@gmail.com) · Manhattan, NY, USA

- 2023 0118 | The Focus on The Partitions Obtained By Parallel Moves In The Cancer's Extreme Recognition With Different Types of Extreme SuperHyperMatching Set and Polynomial on (Neutrosophic) SuperHyperGraphs Manuscript
- » Henry Garrett, "The Focus on The Partitions Obtained By Parallel Moves In The Cancer's Extreme Recognition With Different Types of Extreme SuperHyperMatching Set and Polynomial on (Neutrosophic) SuperHyperGraphs", ResearchGate 2023, (doi: 10.13140/RG.2.2.18494.15680).
- » Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn
- 
- 2023 0117 | Indeterminacy On The All Possible Connections of Cells In Front of Cancer's Attacks In The Terms of Neutrosophic Failed SuperHyperClique on Cancer's Recognition called Neutrosophic SuperHyperGraphs Manuscript
- » Henry Garrett, "Extreme Failed SuperHyperClique Decides the Failures on the Cancer's Recognition in the Perfect Connections of Cancer's Attacks By SuperHyperModels Named (Neutrosophic) SuperHyperGraphs", ResearchGate 2023, (doi: 10.13140/RG.2.2.15897.70243).
- » Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn
- 
- 2023 0116 | Extreme Failed SuperHyperClique Decides the Failures on the Cancer's Recognition in the Perfect Connections of Cancer's Attacks By SuperHyperModels Named (Neutrosophic) SuperHyperGraphs Manuscript
- » Henry Garrett, "Extreme Failed SuperHyperClique Decides the Failures on the Cancer's Recognition in the Perfect Connections of Cancer's Attacks By SuperHyperModels Named (Neutrosophic) SuperHyperGraphs", ResearchGate 2023, (doi: 10.13140/RG.2.2.32530.73922).
- » Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn
- 
- 2023 0115 | (Neutrosophic) 1-Failed SuperHyperForcing in Cancer's Recognitions And (Neutrosophic) SuperHyperGraphs Manuscript
- » Henry Garrett, "(Neutrosophic) 1-Failed SuperHyperForcing in Cancer's Recognitions And (Neutrosophic) SuperHyperGraphs", Preprints 2023, 2023010105 (doi: 10.20944/preprints202301.0105.v1).
- » Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn
- 
- 2023 0114 | Perfect Directions Toward Idealism in Cancer's Neutrosophic Recognition Forwarding Neutrosophic SuperHyperClique on Neutrosophic SuperHyperGraphs Manuscript
- » Henry Garrett, "Perfect Directions Toward Idealism in Cancer's Neutrosophic Recognition Forwarding Neutrosophic SuperHyperClique on Neutrosophic SuperHyperGraphs", ResearchGate 2023, (doi: 10.13140/RG.2.2.30092.80004).
- » Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn
- 
- 2023 0113 | Demonstrating Complete Connections in Every Embedded Regions and Sub-Regions in the Terms of Cancer's Recognition and (Neutrosophic) SuperHyperGraphs With (Neutrosophic) SuperHyperClique Manuscript
- » Henry Garrett, "Demonstrating Complete Connections in Every Embedded Regions and Sub-Regions in the Terms of Cancer's Recognition and (Neutrosophic) SuperHyperGraphs With (Neutrosophic) SuperHyperClique", ResearchGate 2023, (doi: 10.13140/RG.2.2.23172.19849).
- » Available at Twitter, ResearchGate, Scribd, Academia, Zenodo, LinkedIn
- 
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- 2018      0002 | Vertex Domination in t-Norm Fuzzy Graphs      [Manuscript](#)
- » M. Nikfar, “Vertex Domination in t-Norm Fuzzy Graphs”, Preprints 2018, 2018040119 (doi: 10.20944/preprints201804.0119.v1).
- » Available at [Twitter](#), [ResearchGate](#), [Scribd](#), [Academia](#), [Zenodo](#), [LinkedIn](#)
- 
- 2018      0001 | The Results on Vertex Domination in Fuzzy Graphs      [Manuscript](#)
- » M. Nikfar, “The Results on Vertex Domination in Fuzzy Graphs”, Preprints 2018, 2018040085 (doi: 10.20944/preprints201804.0085.v1).
- » Available at [Twitter](#), [ResearchGate](#), [Scribd](#), [Academia](#), [Zenodo](#), [LinkedIn](#)

 Publications: Books

2023	0069   SuperHyperMatching	Amazon
	<ul style="list-style-type: none"> <li>» ASIN : B0BDPXX1P Publisher : Independently published (January 15, 2023) Language : English Paperback : 582 pages ISBN-13 : 979-8373872683 Item Weight : 3.6 pounds Dimensions : 8.5 x 1.37 x 11 inches</li> <li>» ASIN : B0BSDC1L66 Publisher : Independently published (January 16, 2023) Language : English Hardcover : 548 pages ISBN-13 : 979-8373875424 Item Weight : 3.3 pounds Dimensions : 8.25 x 1.48 x 11 inches</li> </ul>	
2023	0068   Failed SuperHyperClique	Amazon
	<ul style="list-style-type: none"> <li>» ASIN : B0BRZ67NYN Publisher : Independently published (January 10, 2023) Language : English Paperback : 454 pages ISBN-13 : 979-8373274227 Item Weight : 2.83 pounds Dimensions : 8.5 x 1.07 x 11 inches</li> <li>» ASIN : B0BRYZTK24 Publisher : Independently published (January 10, 2023) Language : English Hardcover : 460 pages ISBN-13 : 979-8373277273 Item Weight : 2.78 pounds Dimensions : 8.25 x 1.27 x 11 inches</li> </ul>	
2023	0067   SuperHyperClique	Amazon
	<ul style="list-style-type: none"> <li>» ASIN : B0BRWK4S1Y Publisher : Independently published (January 8, 2023) Language : English Paperback : 376 pages ISBN-13 : 979-8373040471 Item Weight : 2.36 pounds Dimensions : 8.5 x 0.89 x 11 inches</li> <li>» ASIN : B0BRM24YJX Publisher : Independently published (January 8, 2023) Language : English Hardcover : 388 pages ISBN-13 : 979-8373041935 Item Weight : 2.36 pounds Dimensions : 8.25 x 1.1 x 11 inches</li> </ul>	
2023	0066   Failed SuperHyperStable	Amazon
	<ul style="list-style-type: none"> <li>» ASIN : B0BRNG7DC8 Publisher : Independently published (January 4, 2023) Language : English Paperback : 304 pages ISBN-13 : 979-8372597976 Item Weight : 1.93 pounds Dimensions : 8.5 x 0.72 x 11 inches</li> <li>» ASIN : B0BRLVN39L Publisher : Independently published (January 4, 2023) Language : English Hardcover : 306 pages ISBN-13 : 979-8372599765 Item Weight : 1.89 pounds Dimensions : 8.25 x 0.91 x 11 inches</li> </ul>	
2023	0065   SuperHyperStable	Amazon
	<ul style="list-style-type: none"> <li>» ASIN : B0BRDG5Z4Y Publisher : Independently published (January 2, 2023) Language : English Paperback : 294 pages ISBN-13 : 979-8372248519 Item Weight : 1.93 pounds Dimensions : 8.27 x 0.7 x 11.69 inches</li> <li>» ASIN : B0BRJPG56M Publisher : Independently published (January 2, 2023) Language : English Hardcover : 290 pages ISBN-13 : 979-8372252011 Item Weight : 1.79 pounds Dimensions : 8.25 x 0.87 x 11 inches</li> </ul>	
2023	0064   Failed SuperHyperForcing	Amazon
	<ul style="list-style-type: none"> <li>» ASIN : B0BRH5B4QM Publisher : Independently published (January 1, 2023) Language : English Paperback : 337 pages ISBN-13 : 979-8372123649 Item Weight : 2.13 pounds Dimensions : 8.5 x 0.8 x 11 inches</li> <li>» ASIN : B0BRGX4DBJ Publisher : Independently published (January 1, 2023) Language : English Hardcover : 337 pages ISBN-13 : 979-8372124509 Item Weight : 2.07 pounds Dimensions : 8.25 x 0.98 x 11 inches</li> </ul>	
2022	0063   SuperHyperForcing	Amazon
	<ul style="list-style-type: none"> <li>» ASIN : B0BRDG1KN1 Publisher : Independently published (December 30, 2022) Language : English Paperback : 285 pages ISBN-13 : 979-8371873347 Item Weight : 1.82 pounds Dimensions : 8.5 x 0.67 x 11 inches</li> <li>» ASIN : B0BRDFFQMF Publisher : Independently published (December 30, 2022) Language : English Hardcover : 285 pages ISBN-13 : 979-8371874092 Item Weight : 1.77 pounds Dimensions : 8.25 x 0.86 x 11 inches</li> </ul>	

Henry Garrett · Independent Researcher · Department of Mathematics · <a href="mailto:DrHenryGarrett@gmail.com">DrHenryGarrett@gmail.com</a> · Manhattan, NY, USA		
2022	0062   SuperHyperAlliances	<a href="#">Amazon</a>
	<ul style="list-style-type: none"> <li>» ASIN : B0BR6YC3HG Publisher : Independently published (December 27, 2022) Language : English Paperback : 189 pages ISBN-13 : 979-8371488343 Item Weight : 1.24 pounds Dimensions : 8.5 x 0.45 x 11 inches</li> <li>» ASIN : B0BR7CBTC6 Publisher : Independently published (December 27, 2022) Language : English Hardcover : 189 pages ISBN-13 : 979-8371494849 Item Weight : 1.21 pounds Dimensions : 8.25 x 0.64 x 11 inches</li> </ul>	
2022	0061   SuperHyperGraphs	<a href="#">Amazon</a>
	<ul style="list-style-type: none"> <li>» ASIN : B0BR1NHYZ Publisher : Independently published (December 24, 2022) Language : English Paperback : 117 pages ISBN-13 : 979-8371090133 Item Weight : 13 ounces Dimensions : 8.5 x 0.28 x 11 inches</li> <li>» ASIN : B0BQXTHTXY Publisher : Independently published (December 24, 2022) Language : English Hardcover : 117 pages ISBN-13 : 979-8371093240 Item Weight : 12.6 ounces Dimensions : 8.25 x 0.47 x 11 inches</li> </ul>	
2022	0060   Neut. SuperHyperEdges	<a href="#">Amazon</a>
	<ul style="list-style-type: none"> <li>» ASIN : B0BNH11ZDY Publisher : Independently published (November 27, 2022) Language : English Paperback : 107 pages ISBN-13 : 979-8365922365 Item Weight : 12 ounces Dimensions : 8.5 x 0.26 x 11 inches</li> <li>» ASIN : B0BNGZGPP6 Publisher : Independently published (November 27, 2022) Language : English Hardcover : 107 pages ISBN-13 : 979-8365923980 Item Weight : 11.7 ounces Dimensions : 8.25 x 0.45 x 11 inches</li> </ul>	
2022	0059   Neutrosophic k-Number	<a href="#">Amazon</a>
	<ul style="list-style-type: none"> <li>» ASIN : B0BF3P5X4N Publisher : Independently published (September 14, 2022) Language : English Paperback : 159 pages ISBN-13 : 979-8352590843 Item Weight : 1.06 pounds Dimensions : 8.5 x 0.38 x 11 inches</li> <li>» ASIN : B0BF2XCDZM Publisher : Independently published (September 14, 2022) Language : English Hardcover : 159 pages ISBN-13 : 979-8352593394 Item Weight : 1.04 pounds Dimensions : 8.25 x 0.57 x 11 inches</li> </ul>	
2022	0058   Neutrosophic Schedule	<a href="#">Amazon</a>
	<ul style="list-style-type: none"> <li>» ASIN : B0BBJWJZJF Publisher : Independently published (August 22, 2022) Language : English Paperback : 493 pages ISBN-13 : 979-8847885256 Item Weight : 3.07 pounds Dimensions : 8.5 x 1.16 x 11 inches</li> <li>» ASIN : B0BBJLPWKH Publisher : Independently published (August 22, 2022) Language : English Hardcover : 493 pages ISBN-13 : 979-8847886055 Item Weight : 2.98 pounds Dimensions : 8.25 x 1.35 x 11 inches</li> </ul>	
2022	0057   Neutrosophic Wheel	<a href="#">Amazon</a>
	<ul style="list-style-type: none"> <li>» ASIN : B0BBJRHXG Publisher : Independently published (August 22, 2022) Language : English Paperback : 195 pages ISBN-13 : 979-8847865944 Item Weight : 1.28 pounds Dimensions : 8.5 x 0.46 x 11 inches</li> <li>» ASIN : B0BBK3KG82 Publisher : Independently published (August 22, 2022) Language : English Hardcover : 195 pages ISBN-13 : 979-8847867016 Item Weight : 1.25 pounds Dimensions : 8.25 x 0.65 x 11 inches</li> </ul>	
2022	0056   Neutrosophic t-partite	<a href="#">Amazon</a>
	<ul style="list-style-type: none"> <li>» ASIN : B0BBJLZCHS Publisher : Independently published (August 22, 2022) Language : English Paperback : 235 pages ISBN-13 : 979-8847834957 Item Weight : 1.52 pounds Dimensions : 8.5 x 0.56 x 11 inches</li> <li>» ASIN : B0BBJDFGJS Publisher : Independently published (August 22, 2022) Language : English Hardcover : 235 pages ISBN-13 : 979-8847838337 Item Weight : 1.48 pounds Dimensions : 8.25 x 0.75 x 11 inches</li> </ul>	
2022	0055   Neutrosophic Bipartite	<a href="#">Amazon</a>



	<p>» ASIN : B0BB5Z9GHW Publisher : Independently published (August 22, 2022) Language : English Paperback : 225 pages ISBN-13 : 979-8847820660 Item Weight : 1.46 pounds Dimensions : 8.5 x 0.53 x 11 inches</p> <p>» ASIN : B0BBGG9RDZ Publisher : Independently published (August 22, 2022) Language : English Hardcover : 225 pages ISBN-13 : 979-8847821667 Item Weight : 1.42 pounds Dimensions : 8.25 x 0.72 x 11 inches</p>	
2022	0054   Neutrosophic Star	<a href="#">Amazon</a>
	<p>» ASIN : B0BB5ZHSSZ Publisher : Independently published (August 22, 2022) Language : English Paperback : 215 pages ISBN-13 : 979-8847794374 Item Weight : 1.4 pounds Dimensions : 8.5 x 0.51 x 11 inches</p> <p>» ASIN : B0BBC4BL9P Publisher : Independently published (August 22, 2022) Language : English Hardcover : 215 pages ISBN-13 : 979-8847796941 Item Weight : 1.36 pounds Dimensions : 8.25 x 0.7 x 11 inches</p>	
2022	0053   Neutrosophic Cycle	<a href="#">Amazon</a>
	<p>» ASIN : B0BB62NZQK Publisher : Independently published (August 22, 2022) Language : English Paperback : 343 pages ISBN-13 : 979-8847780834 Item Weight : 2.17 pounds Dimensions : 8.5 x 0.81 x 11 inches</p> <p>» ASIN : B0BB65QMKQ Publisher : Independently published (August 22, 2022) Language : English Hardcover : 343 pages ISBN-13 : 979-8847782715 Item Weight : 2.11 pounds Dimensions : 8.25 x 1 x 11 inches</p>	
2022	0052   Neutrosophic Path	<a href="#">Amazon</a>
	<p>» ASIN : B0BB67WCXL Publisher : Independently published (August 8, 2022) Language : English Paperback : 315 pages ISBN-13 : 979-8847730570 Item Weight : 2 pounds Dimensions : 8.5 x 0.74 x 11 inches</p> <p>» ASIN : B0BB5Z9FXL Publisher : Independently published (August 8, 2022) Language : English Hardcover : 315 pages ISBN-13 : 979-8847731263 Item Weight : 1.95 pounds Dimensions : 8.25 x 0.93 x 11 inches</p>	
2022	0051   Neutrosophic Complete	<a href="#">Amazon</a>
	<p>» ASIN : B0BB6191KN Publisher : Independently published (August 8, 2022) Language : English Paperback : 227 pages ISBN-13 : 979-8847720878 Item Weight : 1.47 pounds Dimensions : 8.5 x 0.54 x 11 inches</p> <p>» ASIN : B0BB5RRQN7 Publisher : Independently published (August 8, 2022) Language : English Hardcover : 227 pages ISBN-13 : 979-8847721844 Item Weight : 1.43 pounds Dimensions : 8.25 x 0.73 x 11 inches</p>	
2022	0050   Neutrosophic Dominating	<a href="#">Amazon</a>
	<p>» ASIN : B0BB5QV8WT Publisher : Independently published (August 8, 2022) Language : English Paperback : 357 pages ISBN-13 : 979-8847592000 Item Weight : 2.25 pounds Dimensions : 8.5 x 0.84 x 11 inches</p> <p>» ASIN : B0BB61WL9M Publisher : Independently published (August 8, 2022) Language : English Hardcover : 357 pages ISBN-13 : 979-8847593755 Item Weight : 2.19 pounds Dimensions : 8.25 x 1.03 x 11 inches</p>	
2022	0049   Neutrosophic Resolving	<a href="#">Amazon</a>
	<p>» ASIN : B0BBCJMRH8 Publisher : Independently published (August 8, 2022) Language : English Paperback : 367 pages ISBN-13 : 979-8847587891 Item Weight : 2.31 pounds Dimensions : 8.5 x 0.87 x 11 inches</p> <p>» ASIN : B0BBCB6DFC Publisher : Independently published (August 8, 2022) Language : English Hardcover : 367 pages ISBN-13 : 979-8847589987 Item Weight : 2.25 pounds Dimensions : 8.25 x 1.06 x 11 inches</p>	
2022	0048   Neutrosophic Stable	<a href="#">Amazon</a>

		<p>» ASIN : B0B7QGTNFW Publisher : Independently published (July 28, 2022) Language : English Paperback : 133 pages ISBN-13 : 979-8842880348 Item Weight : 14.6 ounces Dimensions : 8.5 x 0.32 x 11 inches</p> <p>» ASIN : B0B7QJWQ35 Publisher : Independently published (July 28, 2022) Language : English Hardcover : 133 pages ISBN-13 : 979-8842881659 Item Weight : 14.2 ounces Dimensions : 8.25 x 0.51 x 11 inches</p>	
2022		0047   Neutrosophic Total	<a href="#">Amazon</a>
		<p>» ASIN : B0B7GLB23F Publisher : Independently published (July 25, 2022) Language : English Paperback : 137 pages ISBN-13 : 979-8842357741 Item Weight : 14.9 ounces Dimensions : 8.5 x 0.33 x 11 inches</p> <p>» ASIN : B0B6XVTDYC Publisher : Independently published (July 25, 2022) Language : English Hardcover : 137 pages ISBN-13 : 979-8842358915 Item Weight : 14.6 ounces Dimensions : 8.25 x 0.52 x 11 inches</p>	
2022		0046   Neutrosophic Perfect	<a href="#">Amazon</a>
		<p>» ASIN : B0B7CJHCYZ Publisher : Independently published (July 22, 2022) Language : English Paperback : 127 pages ISBN-13 : 979-8842027330 Item Weight : 13.9 ounces Dimensions : 8.5 x 0.3 x 11 inches</p> <p>» ASIN : B0B7C732Z1 Publisher : Independently published (July 22, 2022) Language : English Hardcover : 127 pages ISBN-13 : 979-8842028757 Item Weight : 13.6 ounces Dimensions : 8.25 x 0.49 x 11 inches</p>	
2022		0045   Neutrosophic Joint Set	<a href="#">Amazon</a>
		<p>» ASIN : B0B6L8WJ77 Publisher : Independently published (July 15, 2022) Language : English Paperback : 139 pages ISBN-13 : 979-8840802199 Item Weight : 15 ounces Dimensions : 8.5 x 0.33 x 11 inches</p> <p>» ASIN : B0B6L9GJWR Publisher : Independently published (July 15, 2022) Language : English Hardcover : 139 pages ISBN-13 : 979-8840803295 Item Weight : 14.7 ounces Dimensions : 8.25 x 0.52 x 11 inches</p>	
August 2022	30,	0044   Neutrosophic Duality	<a href="#">GLOBAL KNOWLEDGE - Publishing House&amp;Amazon&amp;Google Scholar&amp;UNM</a>
		<p>» Neutrosophic Duality, GLOBAL KNOWLEDGE - Publishing House: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. ISBN: 978-1-59973-743-0 Henry Garrett, (2022). "Neutrosophic Duality", Florida: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. ISBN: 978-1-59973-743-0 (<a href="http://fs.unm.edu/NeutrosophicDuality.pdf">http://fs.unm.edu/NeutrosophicDuality.pdf</a>).</p> <p>» ASIN : B0B4SJ8Y44 Publisher : Independently published (June 22, 2022) Language : English Paperback : 115 pages ISBN-13 : 979-8837647598 Item Weight : 12.8 ounces Dimensions : 8.5 x 0.27 x 11 inches</p> <p>ASIN : B0B46B4CXT Publisher : Independently published (June 22, 2022) Language : English Hardcover : 115 pages ISBN-13 : 979-8837649981 Item Weight : 12.5 ounces Dimensions : 8.25 x 0.46 x 11 inches</p>	
		<p>GLOBAL KNOWLEDGE - Publishing House: <a href="http://fs.unm.edu/NeutrosophicDuality.pdf">http://fs.unm.edu/NeutrosophicDuality.pdf</a> UNM: <a href="http://fs.unm.edu/NeutrosophicDuality.pdf">http://fs.unm.edu/NeutrosophicDuality.pdf</a> Google Scholar: <a href="https://books.google.com/books?id=dWWkEAAAQBAJ">https://books.google.com/books?id=dWWkEAAAQBAJ</a> Paperback: <a href="https://www.amazon.com/dp/B0B4SJ8Y44">https://www.amazon.com/dp/B0B4SJ8Y44</a> Hardcover: <a href="https://www.amazon.com/dp/B0B46B4CXT">https://www.amazon.com/dp/B0B46B4CXT</a></p>	
2022		0043   Neutrosophic Path-Coloring	<a href="#">Amazon</a>

	<p>» ASIN : B0B3F2BZC4 Publisher : Independently published (June 7, 2022) Language : English Paperback : 161 pages ISBN-13 : 979-8834894469 Item Weight : 1.08 pounds Dimensions : 8.5 x 0.38 x 11 inches</p> <p>» ASIN : B0B3FGPGQ3 Publisher : Independently published (June 7, 2022) Language : English Hardcover : 161 pages ISBN-13 : 979-8834895954 Item Weight : 1.05 pounds Dimensions : 8.25 x 0.57 x 11 inches</p>	
2022	0042   Neutrosophic Density	<a href="#">Amazon</a>
	<p>» ASIN : B0B19CDX7W Publisher : Independently published (May 15, 2022) Language : English Paperback : 145 pages ISBN-13 : 979-8827498285 Item Weight : 15.7 ounces Dimensions : 8.5 x 0.35 x 11 inches</p> <p>» ASIN : B0B14PLPGL Publisher : Independently published (May 15, 2022) Language : English Hardcover : 145 pages ISBN-13 : 979-8827502944 Item Weight : 15.4 ounces Dimensions : 8.25 x 0.53 x 11 inches</p>	
2022	0041   Properties of SuperHyperGraph and Neutrosophic SuperHyperGraph	<a href="#">Google Commerce Ltd</a>
	<p>» Publisher Infinite Study Seller Google Commerce Ltd Published on Apr 27, 2022 Pages 30 Features Original pages Best for web, tablet, phone, eReader Language English Genres Antiques &amp; Collectibles / Reference Content protection This content is DRM free GooglePlay</p> <p>» Properties of SuperHyperGraph and Neutrosophic SuperHyperGraph Front Cover Henry Garrett Infinite Study, 27 Apr 2022 - Antiques &amp; Collectibles - 30 pages GoogleBooks Henry Garrett, "Properties of SuperHyperGraph and Neutrosophic SuperHyperGraph", Neutrosophic Sets and Systems 49 (2022) 531-561 (doi: 893 10.5281/zenodo.6456413). (<a href="http://fs.unm.edu/NSS/NeutrosophicSuperHyperGraph34.pdf">http://fs.unm.edu/NSS/NeutrosophicSuperHyperGraph34.pdf</a>).</p>	
2022	0040   Neutrosophic Connectivity	<a href="#">Amazon</a>
	<p>» ASIN : B09YQJG2ZV Publisher : Independently published (April 26, 2022) Language : English Paperback : 121 pages ISBN-13 : 979-8811310968 Item Weight : 13.4 ounces Dimensions : 8.5 x 0.29 x 11 inches</p> <p>» ASIN : B09YQJG2DZ Publisher : Independently published (April 26, 2022) Language : English Hardcover : 121 pages ISBN-13 : 979-8811316304 Item Weight : 13.1 ounces Dimensions : 8.25 x 0.48 x 11 inches</p>	
2022	0039   Neutrosophic Cycles	<a href="#">Amazon</a>
	<p>» ASIN : B09X4KVLQG Publisher : Independently published (April 8, 2022) Language : English Paperback : 169 pages ISBN-13 : 979-8449137098 Item Weight : 1.12 pounds Dimensions : 8.5 x 0.4 x 11 inches</p> <p>» ASIN : B09X4LZ3HL Publisher : Independently published (April 8, 2022) Language : English Hardcover : 169 pages ISBN-13 : 979-8449144157 Item Weight : 1.09 pounds Dimensions : 8.25 x 0.59 x 11 inches</p>	
2022	0038   Girth in Neutrosophic Graphs	<a href="#">Amazon</a>
	<p>» ASIN : B09WQ5PFV8 Publisher : Independently published (March 29, 2022) Language : English Paperback : 163 pages ISBN-13 : 979-8442380538 Item Weight : 1.09 pounds Dimensions : 8.5 x 0.39 x 11 inches</p> <p>» ASIN : B09WQQGXPZ Publisher : Independently published (March 29, 2022) Language : English Hardcover : 163 pages ISBN-13 : 979-8442386592 Item Weight : 1.06 pounds Dimensions : 8.25 x 0.58 x 11 inches</p>	
2022	0037   Matching Number in Neutrosophic Graphs	<a href="#">Amazon</a>
	<p>» ASIN : B09W7FT8GM Publisher : Independently published (March 22, 2022) Language : English Paperback : 153 pages ISBN-13 : 979-8437529676 Item Weight : 1.03 pounds Dimensions : 8.5 x 0.36 x 11 inches</p> <p>» ASIN : B09W4HF99L Publisher : Independently published (March 22, 2022) Language : English Hardcover : 153 pages ISBN-13 : 979-8437539057 Item Weight : 1 pounds Dimensions : 8.25 x 0.55 x 11 inches</p>	

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2022 0036 | Clique Number in Neutrosophic Graph [Amazon](#)

» ASIN : B09TV82Q7T Publisher : Independently published (March 7, 2022) Language : English Paperback : 155 pages ISBN-13 : 979-8428585957 Item Weight : 1.04 pounds Dimensions : 8.5 x 0.37 x 11 inches

» ASIN : B09TZBPWJG Publisher : Independently published (March 7, 2022) Language : English Hardcover : 155 pages ISBN-13 : 979-8428590258 Item Weight : 1.01 pounds Dimensions : 8.25 x 0.56 x 11 inches

2022 0035 | Independence in Neutrosophic Graphs [Amazon](#)

» ASIN : B09TF227GG Publisher : Independently published (February 27, 2022) Language : English Paperback : 149 pages ISBN-13 : 979-8424231681 Item Weight : 1 pounds Dimensions : 8.5 x 0.35 x 11 inches

» ASIN : B09TL1LSKD Publisher : Independently published (February 27, 2022) Language : English Hardcover : 149 pages ISBN-13 : 979-8424234187 Item Weight : 15.7 ounces Dimensions : 8.25 x 0.54 x 11 inches

2022 0034 | Zero Forcing Number in Neutrosophic Graphs [Amazon](#)

» ASIN : B09SW2YVKB Publisher : Independently published (February 18, 2022) Language : English Paperback : 147 pages ISBN-13 : 979-8419302082 Item Weight : 15.8 ounces Dimensions : 8.5 x 0.35 x 11 inches

» ASIN : B09SWLK7BG Publisher : Independently published (February 18, 2022) Language : English Hardcover : 147 pages ISBN-13 : 979-8419313651 Item Weight : 15.5 ounces Dimensions : 8.25 x 0.54 x 11 inches

2022 0033 | Neutrosophic Quasi-Order [Amazon](#)

» ASIN : B09S3RXQ5C Publisher : Independently published (February 8, 2022) Language : English Paperback : 107 pages ISBN-13 : 979-8414541165 Item Weight : 12 ounces Dimensions : 8.5 x 0.26 x 11 inches

» ASIN : B09S232DQH Publisher : Independently published (February 8, 2022) Language : English Hardcover : 107 pages ISBN-13 : 979-8414545446 Item Weight : 11.7 ounces Dimensions : 8.25 x 0.43 x 11 inches

Jan 29, 2022 0032 | Beyond Neutrosophic Graphs [E-publishing&Amazon&Google Scholar&UNM](#)

» Beyond Neutrosophic Graphs, E-publishing:  
Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United States  
ISBN 978-1-59973-725-6

Henry Garrett, (2022). "Beyond Neutrosophic Graphs", Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United States. ISBN: 978-1-59973-725-6 (<http://fs.unm.edu/BeyondNeutrosophicGraphs.pdf>).

» ASIN : B0BBCQJQG5 Publisher : Independently published (August 8, 2022) Language : English Paperback : 257 pages ISBN-13 : 979-8847564885 Item Weight : 1.65 pounds Dimensions : 8.5 x 0.61 x 11 inches

ASIN : B0BBC4BJZ5 Publisher : Independently published (August 8, 2022) Language : English Hardcover : 257 pages ISBN-13 : 979-8847567497 Item Weight : 1.61 pounds Dimensions : 8.25 x 0.8 x 11 inches

E-publishing: Educational Publisher: <http://fs.unm.edu/BeyondNeutrosophicGraphs.pdf>

UNM: <http://fs.unm.edu/BeyondNeutrosophicGraphs.pdf>

Google Scholar: <https://books.google.com/books?id=cWWkEAAAQBAJ>

Paperback: <https://www.amazon.com/gp/product/B0BBCQJQG5>

Hardcover: <https://www.amazon.com/Beyond-Neutrosophic-Graphs-Henry-Garrett/dp/B0BBC4BJZ5>

2022 0031 | Neutrosophic Alliances [Amazon](#)

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» ASIN : B09RB5XLVB Publisher : Independently published (January 26, 2022) Language : English Paperback : 87 pages ISBN-13 : 979-8408627646 Item Weight : 10.1 ounces Dimensions : 8.5 x 0.21 x 11 inches

» ASIN : B09R39MTSW Publisher : Independently published (January 26, 2022) Language : English Hardcover : 87 pages ISBN-13 : 979-8408632459 Item Weight : 9.9 ounces Dimensions : 8.25 x 0.4 x 11 inches

2022 0030 | Neutrosophic Hypergraphs [Amazon](#)

» ASIN : B09PMBKVD4 Publisher : Independently published (January 7, 2022) Language : English Paperback : 79 pages ISBN-13 : 979-8797327974 Item Weight : 9.3 ounces Dimensions : 8.5 x 0.19 x 11 inches

» ASIN : B09PP8VZ3D Publisher : Independently published (January 7, 2022) Language : English Hardcover : 79 pages ISBN-13 : 979-8797331483 Item Weight : 9.1 ounces Dimensions : 8.25 x 0.38 x 11 inches

2022 0029 | Collections of Articles [Amazon](#)

» -

» ASIN : B09PHHDDQK Publisher : Independently published (January 2, 2022) Language : English Hardcover : 543 pages ISBN-13 : 979-8794267204 Item Weight : 3.27 pounds Dimensions : 8.25 x 1.47 x 11 inches

2022 0028 | Collections of Math [Amazon](#)

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» ASIN : B09PHBWT5D Publisher : Independently published (January 1, 2022) Language : English Hardcover : 461 pages ISBN-13 : 979-8793793339 Item Weight : 2.8 pounds Dimensions : 8.25 x 1.28 x 11 inches

2022 0027 | Collections of US [Amazon](#)

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» ASIN : B09PHBT924 Publisher : Independently published (December 31, 2021) Language : English Hardcover : 261 pages ISBN-13 : 979-8793629645 Item Weight : 1.63 pounds Dimensions : 8.25 x 0.81 x 11 inches

2021 0026 | Neutrosophic Chromatic Number [Amazon](#)

» ASIN : B09NRD25MG Publisher : Independently published (December 20, 2021) Language : English Paperback : 67 pages ISBN-13 : 979-8787858174 Item Weight : 8.2 ounces Dimensions : 8.5 x 0.16 x 11 inches Language : English

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2021 0025 | Simple Ideas [Amazon](#)

» ASIN : B09MYTN6NT Publisher : Independently published (December 9, 2021) Language : English Paperback : 45 pages ISBN-13 : 979-8782049430 Item Weight : 6.1 ounces Dimensions : 8.5 x 0.11 x 11 inches

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2021 0024 | Neutrosophic Graphs [Amazon](#)

» ASIN : B09MYXVNF9 Publisher : Independently published (December 7, 2021) Language : English Paperback : 55 pages ISBN-13 : 979-8780775652 Item Weight : 7 ounces Dimensions : 8.5 x 0.13 x 11 inches

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2021 0023 | List [Amazon](#)

» ASIN : B09M554XCL Publisher : Independently published (November 20, 2021) Language : English Paperback : 49 pages ISBN-13 : 979-8770762747 Item Weight : 6.4 ounces Dimensions : 8.5 x 0.12 x 11 inches

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2021	0022   Theorems	<a href="#">Amazon</a>
	<p>» ASIN : B09KDZXGPR Publisher : Independently published (October 28, 2021) Language : English Paperback : 51 pages ISBN-13 : 979-8755453592 Item Weight : 6.7 ounces Dimensions : 8.5 x 0.12 x 11 inches</p> <p>» -</p>	
2021	0021   Dimension	<a href="#">Amazon</a>
	<p>» ASIN : B09K2BBQG7 Publisher : Independently published (October 25, 2021) Language : English Paperback : 55 pages ISBN-13 : 979-8753577146 Item Weight : 7 ounces Dimensions : 8.5 x 0.13 x 11 inches</p> <p>» -</p>	
2021	0020   Beyond The Graph Theory	<a href="#">Amazon</a>
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2021	0018   Number Graphs And Numbers	<a href="#">Amazon</a>
	<p>» ASIN : B099BQRSF8 Publisher : Independently published (July 14, 2021) Language : English Paperback : 32 pages ISBN-13 : 979-8537474135 Item Weight : 4.8 ounces Dimensions : 8.5 x 0.08 x 11 inches</p> <p>» -</p>	
2021	0017   First Place Is Reserved	<a href="#">Amazon</a>
	<p>» ASIN : B098CWD5PT Publisher : Independently published (June 30, 2021) Language : English Paperback : 55 pages ISBN-13 : 979-8529508497 Item Weight : 7 ounces Dimensions : 8.5 x 0.13 x 11 inches</p> <p>» -</p>	
2021	0016   Detail-oriented Groups And Ideas	<a href="#">Amazon</a>
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2021	0014   Words And Their Directionss	<a href="#">Amazon</a>
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2021	0012   Metric Number In Dimension	<a href="#">Amazon</a>
	<p>» ASIN : B0913597TV Publication date : March 24, 2021 Language : English File size : 28445 KB Text-to-Speech : Enabled Enhanced typesetting : Enabled X-Ray : Not Enabled Word Wise : Not Enabled Print length : 48 pages Lending : Not Enabled Kindle</p> <p>» -</p>	
2021	0011   Domination Theory And Beyond	<a href="#">Amazon</a>
	<p>» ASIN : B098DMMZ87 Publisher : Independently published (June 30, 2021) Language : English Paperback : 188 pages ISBN-13 : 979-8728100775 Item Weight : 1.23 pounds Dimensions : 8.5 x 0.45 x 11 inches</p> <p>» -</p>	
2021	0010   Vital Glory	<a href="#">Amazon</a>
	<p>» ASIN : B08PVNJYRM Publication date : December 6, 2020 Language : English File size : 1544 KB Simultaneous device usage : Unlimited Text-to-Speech : Enabled Screen Reader : Supported Enhanced typesetting : Enabled X-Ray : Not Enabled Word Wise : Enabled Print length : 24 pages Lending : Enabled Kindle</p> <p>» -</p>	
2021	0009   Análisis de modelos y orientación más allá	<a href="#">AmazonUK&amp;MoreBooks</a>
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2021	0008   Анализ моделей и руководство за пределами	<a href="#">Amazon&amp;MoreBooks</a>

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» Анализ моделей и руководство за пределами: Подход и проблемы в двух моделях (Russian Edition) Publisher : Scienia Scripts (April 6, 2021) Language : Russian Paperback : 68 pages ISBN-10 : 6203599085 ISBN-13 : 978-6203599084 Item Weight : 5.3 ounces Dimensions : 5.91 x 0.16 x 8.66 inches

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0006 | Analizy modelowe i wytyczne wykraczające poza

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0004 | Analisi dei modelli e guida oltre

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0003 | Analyses de modèles et orientations au-delà

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I've participated in all virtual conferences which are listed below [Some of them without selective process].

-<https://web.math.princeton.edu/pds/onlinetalks/talks.html>

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Also, I've participated in following events [Some of them without selective process]:

-The Hidden NORMS seminar

-Talk Math With Your Friends (TMWYF)

-MATHEMATICS COLLOQUIUM: <https://www.csulb.edu/mathematics-statistics/mathematics-colloquium>

-Lathisms: Cafe Con Leche

-Big Math network

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I'm in mailing list in following [Some of them without selective process] organizations:

-[Algebraic-graph-theory] AGT Seminar ([lists-uwaterloo-ca](mailto:lists-uwaterloo-ca))

-Combinatorics Lectures Online (<https://web.math.princeton.edu/pds/onlinetalks/talks.html>)

-Women in Combinatorics

-CMSA-Seminar ([unsw-au](mailto:unsw-au))

-OURFA2M2 Online Undergraduate Resource Fair for the Advancement and Alliance of Marginalized Mathematicians

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### »» Social Accounts

I've listed my accounts below.

-My website [Covering all my contributions containing articles and books as free access to download with PDF extension and more]: <https://drhenrygarrett.wordpress.com>

-Amazon [Some of my all books, here]: <https://www.amzn.com/author/drhenrygarrett>

-Twitter: @DrHenryGarrett ([www.twitter.com/DrHenryGarrett](http://www.twitter.com/DrHenryGarrett))

- ResearchGate: <https://www.researchgate.net/profile/Henry-Garrett-2>

-Academia: <https://independent.academia.edu/drhenrygarrett/>

-Scribd: <https://www.scribd.com/user/596815491/Henry-Garrett>

-Scholar: [https://scholar.google.com/citations?hl=enuser=SUjFCmcAAAAJview\\_op=list\\_worksortby=pubdate](https://scholar.google.com/citations?hl=enuser=SUjFCmcAAAAJview_op=list_worksortby=pubdate)

- LinkedIn : <https://www.linkedin.com/in/drhenrygarrett/>

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### »»» References

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In this scientific research book, there are some scientific research chapters on "Extreme  $\lambda$ -SuperHyper( $\lambda$ )" and "Neutrosophic  $\lambda$ -SuperHyper( $\lambda$ )" about some scientific researches on  $\lambda$ -SuperHyper by two (Extreme/Neutrosophic) notions, namely, Extreme  $\lambda$ -SuperHyper( $\lambda$ ) and Neutrosophic  $\lambda$ -SuperHyper( $\lambda$ ). With scientific researches on the basic properties, the scientific research book starts to make Extreme  $\lambda$ -SuperHyper( $\lambda$ ) theory and Neutrosophic  $\lambda$ -SuperHyper( $\lambda$ ) theory more (Extremely/Neutrosophically) understandable.

Some scientific studies and scientific researches about neutrosophic graphs, are proposed as book in the following by Henry Garrett (2022) which is indexed by Google Scholar and has more than 3230 readers in Scribd. It's titled "Beyond Neutrosophic Graphs" and published by Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United State. This research book covers different types of notions and settings in neutrosophic graph theory and neutrosophic SuperHyperGraph theory.

[Ref] Henry Garrett, (2022). "Beyond Neutrosophic Graphs", Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United States. ISBN: 978-1-59973-725-6 (<http://fs.unm.edu/BeyondNeutrosophicGraphs.pdf>).

Also, some scientific studies and scientific researches about neutrosophic graphs, are proposed as book in the following by Henry Garrett (2022) which is indexed by Google Scholar and has more than 4117 readers in Scribd. It's titled "Neutrosophic Duality" and published by Florida: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. This research book presents different types of notions SuperHyperResolving and SuperHyperDominating in the setting of duality in neutrosophic graph theory and neutrosophic SuperHyperGraph theory. This research book has scrutiny on the complement of the intended set and the intended set, simultaneously. It's smart to consider a set but acting on its complement that what's done in this research book which is popular in the terms of high readers in Scribd.

[Ref] Henry Garrett, (2022). "Neutrosophic Duality", Florida: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. ISBN: 978-1-59973-743-0 (<http://fs.unm.edu/NeutrosophicDuality.pdf>).



