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AlgoPedia

A PROJECT REPORT

Submitted by
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In Partial Fulfilment for the Award of the Degree of
Bachelor of Technology in Computer Science and Engineering

Under the Guidance of
Nitin Kumar Pandya

Department of Computer Science & Engineering
Parul University, Vadodara

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PARUL UNIVERSITY
CERTIFICATE

This is to Certify that Project - 3 Subject code 203105450 of 8th Semester entitled "**AlgoPedia**" of Group No. **PUCSE_223** has been successfully completed by

ROHIT SINGH - 190303105571

Under my guidance in partial fulfilment of the Bachelor of Technology (**B.TECH**) in Computer Science and Engineering of Parul University in Academic

Year 2022- 2023.

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Team member:
ROHIT SINGH - 190303105571

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ABSTRACT

Data visualisation entails presenting information in a graphical or pictorial format that is easy to understand. It aids in the explanation of facts and the formulation of action plans. It will be useful in any field of study that requires novel approaches to presenting large amounts of complex information. The introduction of computer graphics shaped modern visualisation. This paper provides an overview of data visualisation. Data visualisation, information visualisation, scientific visualisation, and big data are all keywords. Information visualisation and scientific visualisation are other terms for data visualisation. Humans have always used visualisations to make messages or information last longer. What cannot be touched, smelled, or tasted can be visually represented.

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CHAPTER ONE
INTRODUCTION

➢ *Project Problem*

A Personal Tutor In Your Pocket To Master Data Structures And AlgorithmAll Features in One Mobile Application Topics From Beginner To Intermediate To Expert, All-In-One It Helps To Crack Any Placement Interview With A Strong Base Of Data Structures And Algorithms. To make and realize how important is DSA in future for every student who wants to pursue their career in CSE or IT field . So to make it easy for them we have come through the Idea of AlgoPedia which will cover all data structure algorithms and techniques with proper documentation and real time visual-aid performance because "When you see it clearly, You learn it effectively". It Will Also Help The IT- Companies To Improvise Their Employees With Concept Of Data Structures And Algorithms. A Groundbreaking Application For Learning, Playing, And Understanding Data Structures. Information visualisation and scientific visualisation are other terms for data visualisation. Humans have always used visualisations to make messages or information last longer. What cannot be touched, smelled, or tasted can be visually represented. It provides effective data representation of data from various sources. This allows decision-makers to see analytics in a visual format, making it easier for them to understand the data.

➢ *Features Included*

- **Visual AID:** Users Will Be Able To Listen To The Definitions And Hefty Theories And More Detailed Concepts Of The Data Structures And Algorithms.
- **Audio Learning:** Users Will Be Able To Listen To The Definitions And Hefty Theories And More Detailed Concepts Of The Data Structures And Algorithms.
- **Video Tutorials:** There Will Be An Attached YouTube Video View Of The Topic From Profound YouTuber Playlist Of Data Structures And Algorithm.
- **Multiple Languages Support:** Liberty Of Learning Every Algorithm In Multiple Programming Languages Like, C, C++, Java
- **Inbuilt Compiler:** Online Compiler To Compile The Code And Run And Execute The Code Properly. **Interview Questions:** A Special Section To Crack The Interview Process Which Contains The set Of IMPORTANT QUESTIONS Asked About DSA In MNC's

➢ *Tools and Technology*

- **VSCode(IDE):** Visual Studio Code also commonly referred to as VS Code, is a source-code editor made by Microsoft with the Electron Framework, for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.
- **Android Studio:** Built on JetBrains' IntelliJ IDEA software and designed specifically for Android development, Android Studio is the official integrated development environment for Google's Android operating system. It can be downloaded for Windows, macOS, and Linux-based operating systems.
- **Firebase:** FireBase is a set of hosting services for any type of application. It offers NoSQL and real- time hosting of databases, content, social authentication, and notifications, or services, such as a real-time communication server.
- **Adobe XD**: Adobe XD is a vector design tool for web and mobile applications, developed and published by Adobe Inc. It is available for macOS and Windows, and there are versions for iOS and Android to help preview the result of work directly on mobile devices
- **React JS:** React is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta and a community of individual developers and companies. We use this technology to create animated charts and sorting based on user input and sorting algorithms.
- **Flutter:** Google's Flutter is an open-source UI software development kit. It is used to create cross-platform applications from a single codebase for Android, iOS, Linux, macOS, Windows, Google Fuchsia, and the web. Flutter, which was first described in 2015, was released in May 2017.
- **Netlify:** It is a free static application hosting service and we host a react site for sorting and compiling of user entered data.
- **Android Development**: Google's Android Studio IDE Used To Develop The Mobile Application(Android). We use this for creating mobile based applications called alopecia.

➢ *Problem Statement*

Analyze and Visualize the Algorithms Data Flow in a Mobile Application By covering all the topics of DSA.

➢ *Aim and Objective*

To create an android application To full fill the above requirements , By creating a multiple purpose super tech robust platform where in which the user will be able to learn, view and play with data structures and algorithm, well Algopedia provide the using of multiple languages for compiler and also, the tutorial of the usage of app will also be embedded in the same and the

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user will be able to view the Visual of Every single Algorithms like bubble sort, merge-sort, quick sort etc and also can manipulate the inputs and flow for the better understanding. The Application provides the brief literature of the hefty definition of DSA and also help the user to understand via audio feature and also the user will be able to view the Youtube Video of the profound YouTube named code with harry in two different languages well this platform is a multipurpose platform for the user to understand DSA and to also crack any interview questions regarding DSA .

- *Scope of the Problem*

Industrialist and also in educational field the people require and also mandatory to have a brief knowledge about Data structures and algorithm in any particular programming language, well we are providing the source of learning and understanding DSA in more funnable way, our aim and scope is to provide and spread the platform and let the students and employees of IT background learned and excel in their career regarding the DSA .

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CHAPTER TWO
LITERATURE REVIEW

➢ *Development of Native Mobile Application Using Android Studio for Cabs and Some Glimpse of Cross Platform Apps*

- *Review*

The above mentioned research paper comprises The utility that's mentioned on this paper is Cab Application whose call is RS SHARING CAB. The platform used for improving the RS Sharing, Cab Application is 8.0, and the language used is JAVA and XML. On the backend, SQLite is used. The first step is to obtain the latest version of Android Studio 3.0, which includes the Android SDK and Android Virtual Device. API stage placement has been completed following the installation of the studio and its environment. The manner of placing the API stage is New click on on **file>new>New** undertaking to create a new undertaking. In the Create, click on the new undertaking window, and enter the underneath given values Application call: "Cab App" Company domain: ' infonex.com' In Android there may be a group of choice called 'Widgets' in which you could drag and drop things.

➢ *Android App Development: A Review*

- *Review*

The above mentioned research paper comprises the Android smartphones are with-inside the hype within-side the twenty first century. The scope of android **packages** is growing day via way of means of day. Its improvement has end up a crucial a part of today's programming curriculum. Its application and performance also are high. The society has no dearth of thoughts. These thoughts may be maximum efficaciously carried out via way of means of growing consumer-pleasant **android packages**. Android is a miles extra various running gadget then iOS and Windows Phone Mobile. Android has grown unexpectedly over the beyond four years turning into the maximum used phone running gadget within-side the world.

➢ *Challenges in Android Application Development: A Case Study*

- *Review*

The above mentioned research paper comprises the information that Smartphones have modified the lifestyles of everyone. Along with different features, an App in Smartphones permits you to do nearly everything, from gambling **video games to doing business**. The improvement of apps defined in gift paper has given a robust know-how of various demanding situations related to layout and improvement of apps. The enjoyment has been pretty challenging, motivating as nicely as satisfying. iquiz App may be utilized by college students without difficulty at the same time as getting ready for examination.

➢ *Mobile API for Linked Data*

- *Review*

The above mentioned research paper comprises the Involving **Android gadgets** within side the semantic web, each as customers and carriers of facts, is a thrilling challenge. As mentioned, it faces the problems of length of **packages** and URI dereferencing in mobility situations. A subsequent step is to offer a greater best grained and dependent right of entry to facts through **SPARQL** querying. Another extension whilst querying is using an alignment server in order to convert queries at the fly whilst specific ontologies are used within side the question and a corresponding content material provider. This guarantees to elevate the problem of computation, and for this reason energy, fee on cellular platforms.

➢ *Development of Mobile Educational Services Application to Improve Educational Outcomes Using Android Technology*

- *Review*

The above mentioned research paper presents instructional **offerings** the use of **wi-fi and cell technologies**, instructional establishments can potentially deliver extremely good comfort to the ones off-campus college students who now no longer continually have time to discover Internet enabled computer systems to get essential instructional data from their instructional establishments. Students and teachers can access resources whenever and wherever they want with the **M-instructional** offers applications. The Mobile Educational Services Application (MES app) for the Android platform has been improved as a result of the article.

➢ *Comparative Study of Data Visualization Tools*

- *Review*

The above mentioned research paper includes information regarding Data Visualization Tools like Microsoft Excel, D3, Chart.js etc. Two key goals of data visualization technology are Data Presentation and Data Exploration. Data that takes another data as input and processes it like in our cse user enter array and chart, take it and process for Visualization. Research **conducts knowledge on tools that are** open source or not, processing language, Formal output etc. Define the root functionality & use of tools for particular areas of interest. Selection of data visualization technique depends upon **several factors** such as purpose

of data visualization, availability of data i.e. offline or online data, target audience and what type of data is to be visualized etc. Different **chart designs** are meant for varied purposes. Some common applications of charts

➢ *Data Visualization*

- *Review*

The above mentioned research paper includes describing how we can represent **displaying massive amounts of data** in a way that is easily accessible and understandable. How visual data makes sense to the user and it's easy to understand. It contains research on Visualization techniques like Scatter plots, Bar charts, Line graphs, etc., and applications like Environmental Science, Renewal Energy, Public Health, etc. Challenges like speed, size, and diversity of data vary the time, accuracy, and final result. It's the process of representing data in a graphical or pictorial way in a clear and effective manner.

➢ *A Survey of Scholarly Data Visualization*

- *Review*

In this research, it was demonstrated that the use of scholarly big data presents both opportunities and difficulties for data analysis. How academics came to understand the science itself by using visualisation methods on various datasets, Consequently, scholarly data visualisation is crucial in solving issues brought on by massive amounts of diverse, high-value data. It seems logical to pay closer attention to this subject. For easier work, we need to replace some of the outdated solutions with modern technologies like AI/Ml. How to more effectively mix multiple visualisation techniques with the analysis processing presents another problem.

➢ *Data Visualization Using Google Data Studio*

- *Review*

In this paper it was shown how we can use google data studio along with cloud computing for free service that access from anywhere around global.Google Data Studio data visualization is an alternate tool business may use to view data. Google Data Studio supports a variety of data sources, making it easy to combine reports from a variety of sources. You may share reports using Google Data Studio without jeopardizing the confidentiality of the data you contribute. Research includes use of graphics, charts, cloud computing, database etc.

➢ *Supporting Corporate Communication with A Mobile App*

- *Review*

Nielsen is a global marketing research corporation founded in 1929. It provides reliable measurement and data analytics for marketers and sales specialists worldwide. The company is well-known for the Nielsen rating — audience measurement system for TV, radio, and newspapers. Today Nielsen operates in over 100 countries and is listed in the S & P 500 index.The app we built met all of the stakeholders' expectations. But what's more important to us, is that it's widely used within Nielsen. The team started with gathering all the existing requirements and limitations for building the app. With all the data in one place, we organised a workshop in the client's headquarters with all the application stakeholders.

➢ *The Art of Computer Programming Volume 1:Fundamental Algorithms*

- *Review*

The sorting problem has drawn a lot of attention since the dawn of computing, perhaps as a result of how difficult it is to efficiently solve it despite its straightforward and well-known formulation. About 1951, Betty Holberton, who worked on the ENIAC and UNIVAC, was one of the authors of the earliest sorting algorithms. [1] [2] Analysis of bubble sort dates back to 1956. [3] Since the middle of the 20th century, asymptotically optimal algorithms have been known; however, new algorithms are continually being developed. The widely used Timsort was developed in 2002, and the library sort was introduced in 2006.

A fundamental criterion for comparison sorting algorithms is (n log n) comparisons (some input sequences will require a multiple of n log n comparisons, where n is the number of elements in the array to be sorted).

➢ *Online Learning App*

- *Review*

Accelerate Time-To-Market With Our Now, Next, And Later Model Working closely with Groups Media TFO, we designed and developed a minimum viable product (MVP), with a prioritised product roadmap set for phased delivery using our now, next, later model. This process enabled us to focus our resources on refining only the product's core functionalities, which helped us accelerate our time-to-market and deliver a fully functional product on time while still allowing for future product growth. 2. Utilise Our Design Thinking Approach To Empathise With, And Create A User Experience For All Key User Personas Even

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though 90 percent of IDÉLLO content is made available through family accounts, the existing online experience was not optimised for that key user persona. They would interact with the same UI as an educator, despite having different needs. For the new mobile experience, we leveraged insights from our intensive Design Thinking sessions to identify improvement areas and recommend mobile best practices.

➢ *Supporting Corporate Communication with A Mobile App*

- *Review*

Nielsen is a global marketing research corporation founded in 1929. It provides reliable measurement and data analytics for marketers and sales specialists worldwide. The company is well-known for the Nielsen rating — audience measurement system for TV, radio, and newspapers. Today Nielsen operates in over 100 countries and is listed in the S & P 500 index.The app we built met all of the stakeholders' expectations. But what's more important to us, is that it's widely used within Nielsen. The team started with gathering all the existing requirements and limitations for building the app. With all the data in one place, we organized a workshop in the client's headquarters with all the application stakeholders. The main objective of the meeting was to determine priorities, draw first wireframes, set-up the roadmap and project's organisational structure.The app precisely maps the company's structure.

➢ *Android Chief on why JAVA was Picked for Android*

- *Review*

When asked if there were any other programming languages that might have worked for Android by Google attorney Robert Van Nest, Rubin said yes. Rubin confirmed that he oversaw conversations with Sun over the integration of Java for Android, beginning with early discussions in 2005. We viewed this as a chance to open up Java, so we requested Sun to give back to the open source community, according to Rubin. According to Rubin, who cited the July 26, 2005 Android GPS presentation, the early strategy for Android was collaborating with software and mobile OEM partners to integrate the open source platform (Android) onto their cellphones. Van Nest drew attention to a September 2005 email thread between Rubin and Leo Cizek, Sun's account manager for Java licencing. It appears that there are no obstacles in the way of us obtaining a licence and subsequently open sourcing our implementation. On the witness stand, Rubin argued that Sun had to make a moral choice to work with Google and abandon the standard licence because Google desired a different approach to its open source strategy. We are fine with releasing our work without using the name Java if Sun doesn't want to collaborate with us to support this endeavour.

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CHAPTER THREE
EXPERIMENTAL SETUP AND METHODOLOGY

➢ *Project Flow*

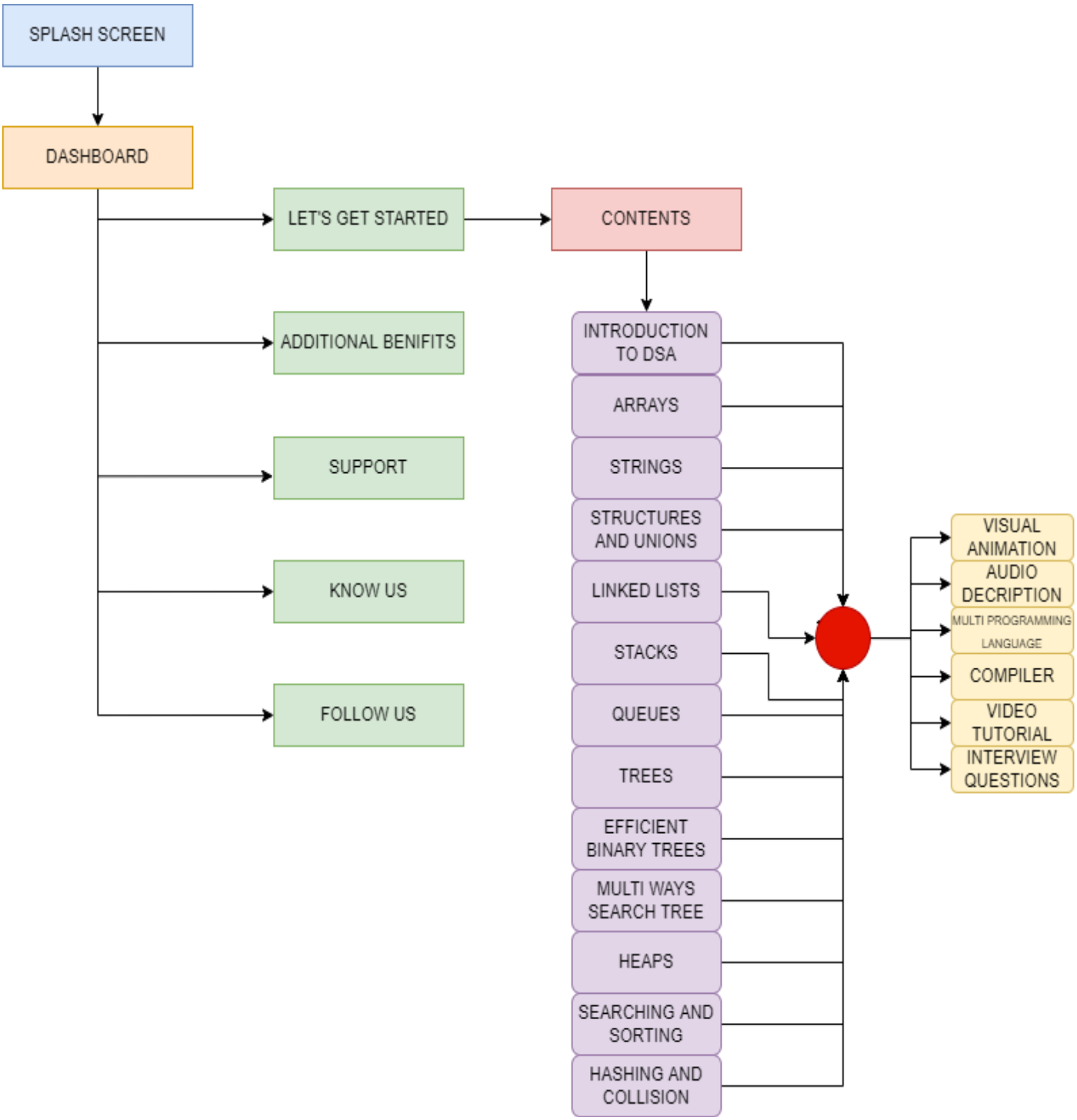

Fig 1 Workflow of Application

➢ *Methodology*

Our project clearly adheres to the Waterfall Methodology. First, consider why our AlgoPedia employs the Waterfall Model. The Waterfall methodology, also known as the Waterfall model, is a sequential development process that flows like a waterfall through all phases of a project (for example, analysis, design, development, and testing), with each phase completely wrapping up before moving on to the next. The Waterfall methodology is said to adhere to the adage "measure twice, cut once." The Waterfall method's success is determined by the amount and quality of work done on the front end, including the user interface, user stories, and all feature variations and outcomes.

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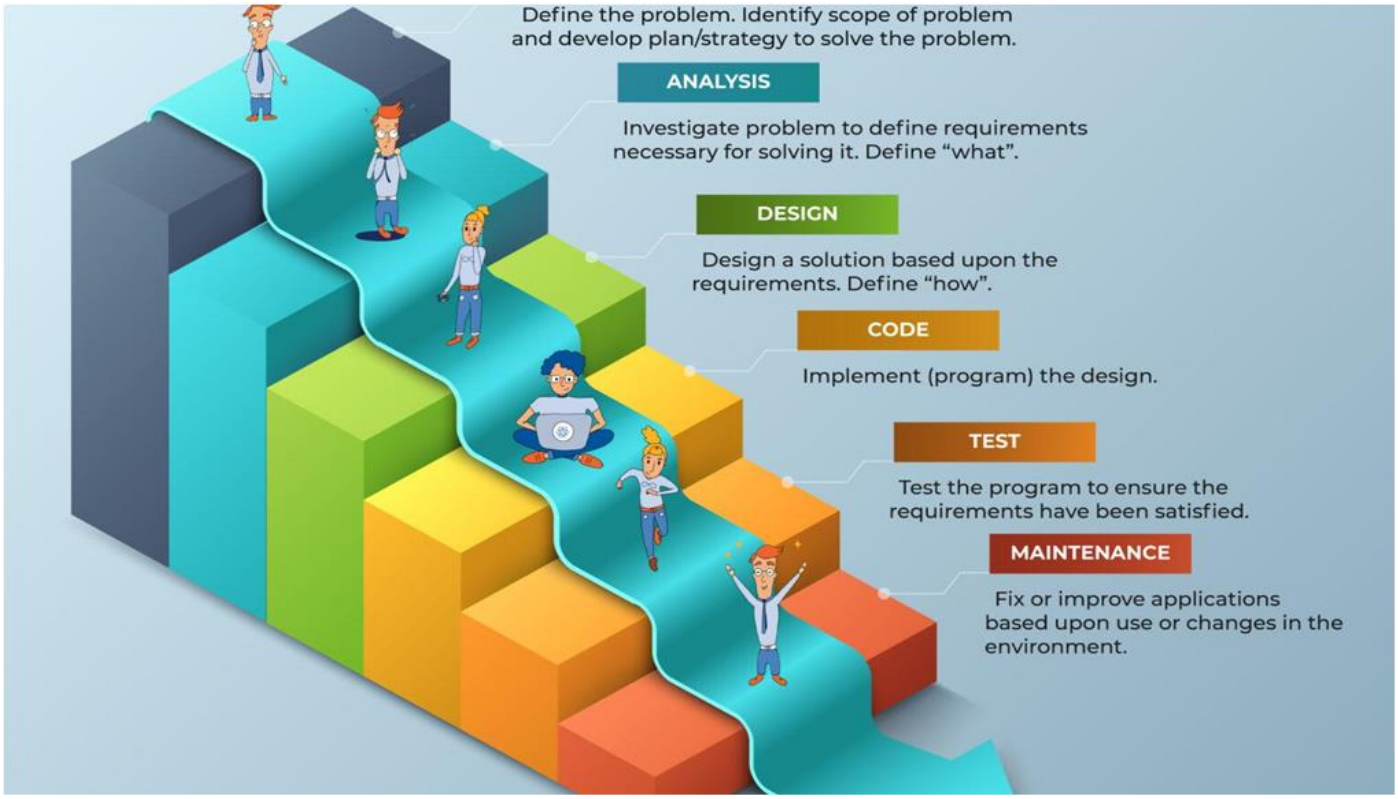

Fig 2 Waterfall Methodology [16]

➢ *Benefits of the Waterfall's Organized Structure*

While the Waterfall methodology may appear to be overly restrictive for some projects, it can be an excellent way to keep a well-defined, predictable project from exceeding time and budget constraints. Clear and detailed organisation can also be beneficial during complex projects involving a large number of people working towards a clearly defined goal.

➢ *Characteristics of Algorithm*

The following are the characteristics of an algorithm:

- *Input: An algorithm requires some input values. An algorithm can be given either 0 or a value.*
- *Output: At the end of an algorithm, we will have one or more outputs.*
- *Unambiguous: An algorithm must be unambiguous, which means that its instructions must be clear and simple.*
- *Finiteness: An algorithm must be finite. Finiteness in this context means that the algorithm should have a finite number of instructions, i.e. the instructions should be countable.*
- *Effectiveness: Because each instruction in an algorithm affects the overall process, it should be effective.*
- *Language independent: An algorithm must be language independent in order for its instructions to be implemented in any language and produce the same results.*

➢ *Visualization Technique*

The use of computer-aided, visual data representation is known as visualisation. In contrast to static data visualisation, interactive data visualisation allows users to specify the format in which data is displayed. Techniques for visualising:

- *Line graph: A line graph depicts the relationship between items. It is useful for comparing changes over time.*
- *Bar chart: A bar chart is used to compare the quantities of various categories.*
- *Scatter plot: A two-dimensional plot that depicts variations of two items.*
- *Pie chart: A pie chart is used to compare the components of a whole.*

Thus, graphs and charts can be in the form of bar charts, pie charts, line graphs, and so on. It is critical to know which chart or graph to use for your data.

Data visualisation employs computer graphics to depict patterns, trends, and relationships among data elements. With simple pull-down menus and mouse clicks, it can generate pie charts, bar charts, scatter plots, and other types of data graphs. Colors are carefully chosen for specific types of visualisation. When using colour to represent data, we must choose effective colours to distinguish between data elements.

➢ *Approach of Algorithm*

Following consideration of both the theoretical and practical importance of designing an algorithm, the following approaches were used:

- *Brute Force Algorithm*

The brute force algorithm uses the general logic structure to design an algorithm. It is also known as an exhaustive search algorithm because it exhausts all possibilities in order to provide the required solution. There are two kinds of such algorithms.

- *Optimizing*

Finding all possible solutions to a problem and then selecting the best solution or terminating if the value of the best solution is known. if the bes solution is known then it will terminate if the best solution is known.

- *Sacrificing*: It will stop as soon as the best solution is found.

- *Divide and Conquer*

This is an algorithm implementation. It enables you to design an algorithm in a step-by-step manner. It deconstructs the algorithm to solve the problem in various ways. It enables you to divide the problem into different methods, and valid output is generated for valid input. This valid output is then passed to another function.

- *Greedy Algorithm*

This is an algorithm paradigm that makes the best choice possible on each iteration in the hopes of finding the best solution. It is simple to implement and takes less time to complete. However, there are very few cases where it is the best solution.

- *Dynamic Programming*

Dynamic programming improves algorithm efficiency by storing intermediate results. It goes through five steps to find the best solution to the problem:

✓ *It divides the problem into subproblems in order to find the best solution.*
✓ *It finds the best solution out of these subproblems after breaking down the problem.*
✓ *Memorisation is the process of storing the results of subproblems.*
✓ *Reuse the result to prevent it from being recomputed for the same subproblems.*
✓ *Finally, it computes the complex program's output*

- *Branch And Bound Algorithm*

Only integer programming problems can be solved using the branch and bound algorithm. This method divides all feasible solution sets into smaller subsets. These subsets are then evaluated further to determine the best solution.

- *Randomised Algorithm*

As with a regular algorithm, we have predefined input and output. Deterministic algorithms are those that have a predefined set of inputs and outputs and follow a predefined set of steps. What happens when a random variable is added to the randomised algorithm? In a randomised algorithm, the algorithm introduces some random bits and adds them to the input to produce a random output. Randomized algorithms are simpler and efficient than the deterministic algorithm.

- *Backtracking*

Backtracking is an algorithmic technique that solves a problem recursively and discards the solution if it does not meet the constraints of the problem.

➢ *Factors that we Need to Consider for Designing an Algorithm*

- *Modularity*

If we are given a problem and can break it down into small-small modules or small-small steps, which is a basic definition of an algorithm, it means that this feature was perfectly designed for the algorithm.

- *Correctness*

An algorithm's correctness is defined as when the given inputs produce the desired output, indicating that the algorithm was designed correctly. The algorithm analysis was completed correctly.

- *Maintainability*

In this context, maintainability means that the algorithm should be designed in a very simple structured manner so that when we redefine the algorithm, no major changes are made.

- *Functionality*: It takes into account various logical steps to solve a real-world problem.
- *Robustness*: It takes into account various logical steps to solve a real-world problem.
- *User-friendly***:** If the algorithm is difficult to understand, the designer will be unable to explain it to the programmer.
- *Simplicity*: If an algorithm is simple, it is simple to understand.
- *Extensible*: Your algorithm should be extensible if another algorithm designer or programmer wants to use it.

➢ *Understanding the Importance of Data Visualization*

Understanding the importance of data visualization is crucial in today's data-driven world, where businesses and organisations rely on data to make informed decisions. Here are some reasons why understanding the importance of data visualization is critical:

- *Communicate Insights*

Data visualization is an effective way to communicate complex data insights in a clear and concise manner. By using visualizations, you can turn large sets of data into easily digestible insights, making it easier for decision-makers to understand and act on.

- *Spot Trends and Patterns*

Data visualizations make it easier to identify trends, patterns, and anomalies in data sets. Visualization allows you to see relationships and correlations that may be difficult to identify in raw data, making it easier to gain insights into your data.

- *Make Informed Decisions*

With the help of data visualization, decision-makers can make informed decisions based on data insights. Visualization can help them understand the impact of their decisions and identify areas that need improvement.

- *Identify Areas for Improvement*

Data visualization can help you identify areas for improvement in your business. By visualizing data, you can see where your business is excelling and where it is falling behind. This information can be used to make data-driven decisions to improve performance.

- *Enhance Storytelling*

Data visualization can enhance storytelling by presenting data in a compelling way. When presenting data in a visual form, you can create a narrative that engages the audience and communicates important insights effectively.

In conclusion, understanding the importance of data visualization is essential in today's data-driven world. Data visualization can help businesses and organisations communicate insights, identify trends and patterns, make informed decisions, identify areas for improvement, and enhance storytelling. By using data visualization effectively, you can gain a competitive advantage and improve the performance of your business.

➢ *Data Structures Importance*

Data structures are an essential part of computer science and software engineering, and having a good understanding of them can help you crack technical interviews. Here are some ways in which knowledge of data structures can help you during job interviews:

- *Solving Technical Problems*

During interviews, you are likely to be asked technical questions that involve data structures. Having a good understanding of data structures will enable you to solve these problems quickly and efficiently, demonstrating your technical ability.

- *Analyzing Algorithms*

Understanding Data structures is essential for analyzing algorithms, which is a key skill required for many technical roles. Being able to analyze and optimize algorithms can demonstrate your ability to think critically and solve complex problems.

- *Implementing Efficient Code*

Knowledge of data structures can help you write more efficient code, which is a highly valued skill in software engineering. By choosing the right data structure for a particular problem, you can optimize the performance of your code, which is essential for building high-performance software.

- *Communicating Effectively*

Being able to explain your solutions and reasoning behind choosing a particular data structure can demonstrate your communication skills. During interviews, you are likely to be asked about your approach to problem-solving and your ability to explain your thinking can be a key factor in landing the job.

- *Preparing for Interviews*

Knowledge of data structures can help you prepare for technical interviews by allowing you to practice solving problems and implementing algorithms. There are many resources available, such as online coding challenges, where you can test your understanding of data structures and improve your problem-solving skills.

In summary, having a good understanding of data structures is essential for cracking technical interviews. It can help you solve problems quickly and efficiently, analyse algorithms, implement efficient code, communicate effectively, and prepare for interviews. By developing your knowledge of data structures, you can increase your chances of landing a job in software engineering or related fields.

➢ *Data Structure and its Types*

Data Structures and Algorithms, which are the building blocks of computer programming. There are several types of data structures and algorithms, and each type serves a specific purpose. Here are some of the most common types of data structures:

- *Arrays*

An array is a collection of elements of the same data type that are stored in memory in contiguous locations. Arrays are used to efficiently store and access data.

- *Linked Lists*

Linked lists are data structures in which each element, known as a node, points to the next node in the list. Linked lists are used to store data that must be allocated dynamically.

- *Stacks*

A stack is a data structure that allows elements to be added and removed from the top of the stack. Stacks are used in applications where last-in, first-out (LIFO) data access is required.

- *Queues*

A queue is a data structure in which elements are added to the back of the queue and removed from the front. Queues are used in applications where first-in, first-out (FIFO) data access is required.

- *Trees*

A tree is a data structure that represents an element's hierarchical relationship. Trees are used in a variety of applications, including file systems, databases, and search engines.

- *Graphs*

Graphs are data structures that represent a collection of vertices and edges. Graphs are used in a variety of applications, including social networks, maps, and recommendation systems.

- *As for algorithms, some of the most common types are:*

✓ *Sorting Algorithms*

Sorting algorithms are used to arrange a collection of elements in a specific order, such as ascending or descending.

✓ *Searching Algorithms*

These algorithms are used to find a specific element within a collection of elements.

✓ *Greedy Algorithms*

These algorithms make locally optimal choices at each step, with the hope of finding a global optimum.

✓ *Divide and Conquer Algorithms*

These algorithms divide a problem into subproblems, solve each subproblem independently, and combine the results to obtain the final solution.

✓ *Dynamic Programming Algorithms*

These algorithms break a problem down into smaller subproblems and solve them in a way that avoids redundant calculations.

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CHAPTER FOUR
FUTURE WORKS

Our main goal is to give as many features as we give to our users. Currently, we completed the main layout of our application with different types of data types, data structure & data algorithms. We completed the visual effect on the bubble sort algorithm with user input, array range, and random array generator.

In the future we implement audio & video learning, different language and major compiler support, we also provide interview questions for preparation. We implement an easy to use user interface, high performance and quality learning platform.

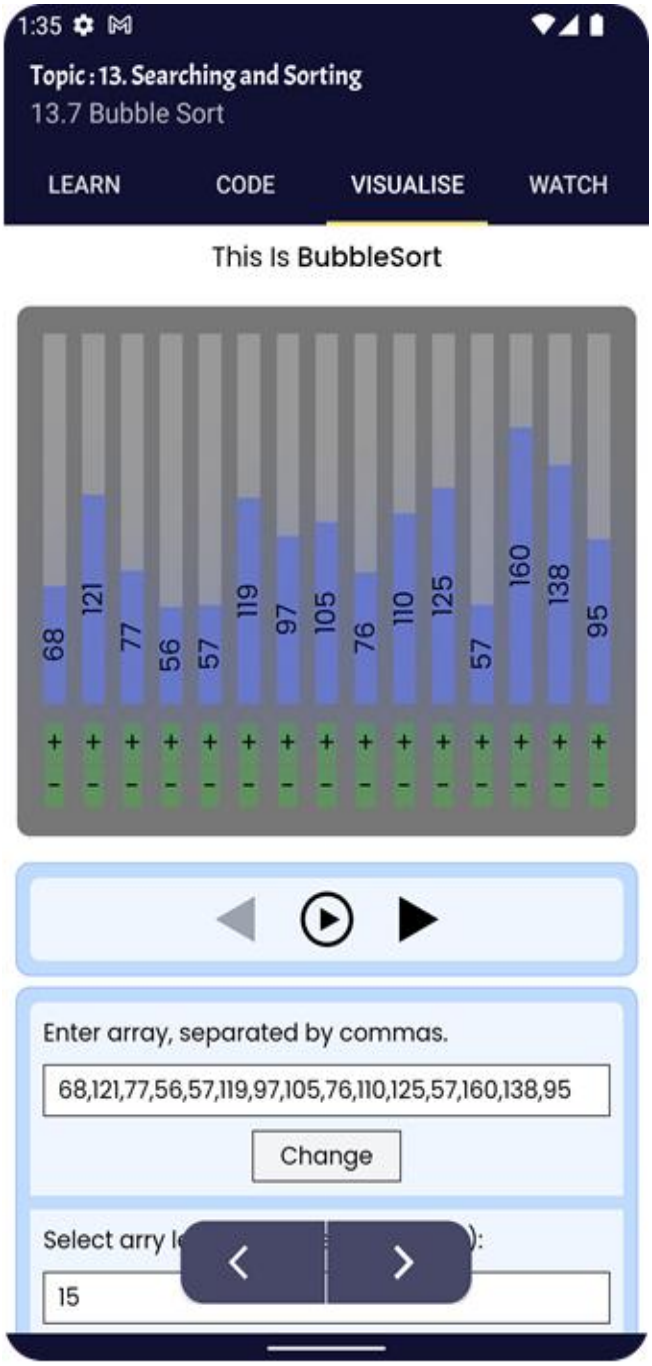

Fig 3 Visualization

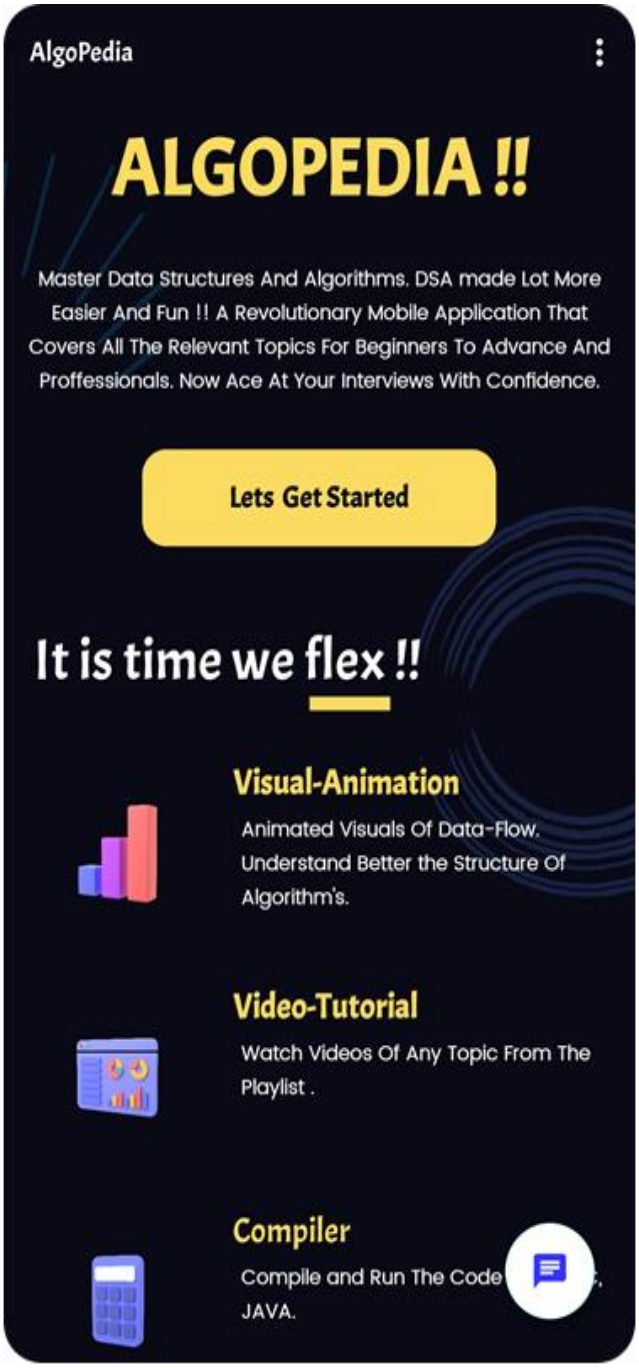

Fig 4 Dashboard

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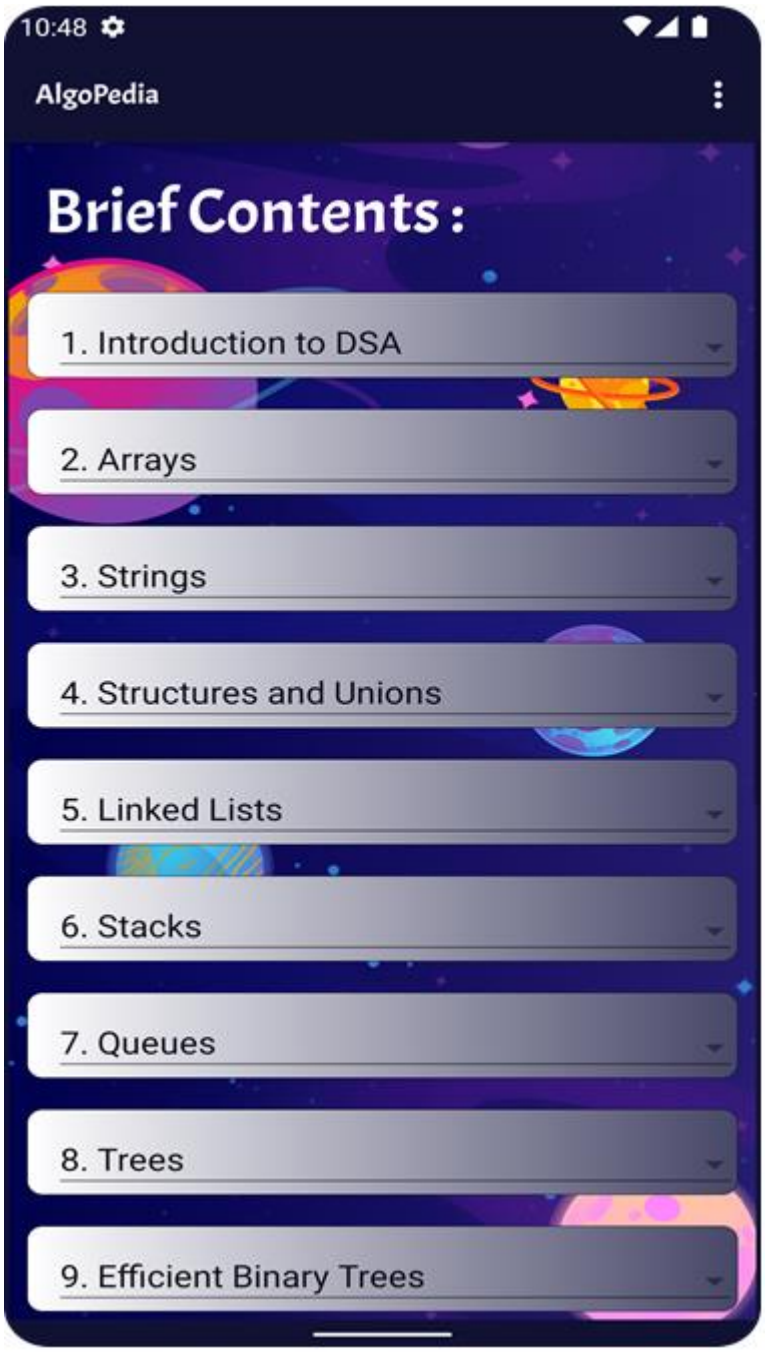

Fig 5 Index

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CHAPTER FIVE
CONCLUSION

In Conclusion, project on data visualization has been an enriching experience that has demonstrated the importance of data visualization in providing meaningful insights from complex data. Through the project, we have learned the importance of selecting appropriate visualization techniques for different types of data, as well as the key factors that make a visualization effective. The project has also highlighted the importance of considering the target audience when designing visualizations, as the intended audience can have a significant impact on the effectiveness of the visualization.

We believe that the insights and techniques gained from this project will be invaluable in future projects and in real-world applications where effective data visualization is critical for decision-making and communication. To make and realise how important is DSA in future for every student who want to pursue their career in CSE or it field.so to make it easy for them we have come through the idea of algopedia which will cover all data structure algorithm and techniques with proper documentation and real time visual-aid performance because when you see it clearly, you learn it effectively.

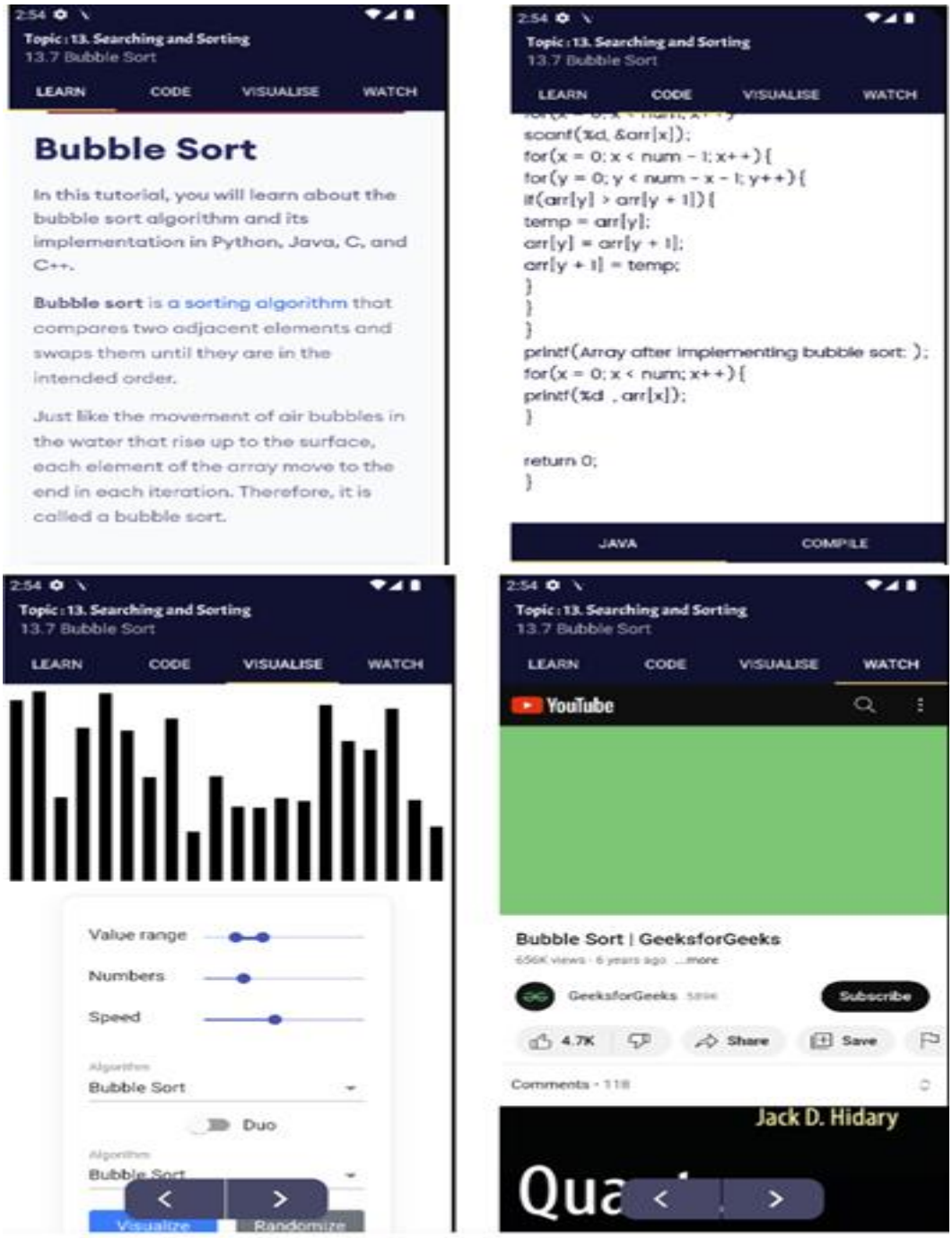

Fig 6 Bubble Sort

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