

# Recursive Diagnostic Algorithm with Infinite Operator Refinement

Recursive Diagnostic Algorithm Using the Recursive Infinite Operator

Concept:

This algorithm refines medical or system diagnostics by recursively applying a function over each new input.

It layers feedback, adjusts weighting, and optimizes predictions over time.

Structure:

$$D_{\infty}(\text{Input}) = ( \text{Product} \pm \text{Sum} \pm \text{Integral} ) * \text{Diagnosis}(\text{Input})$$

Where:

- Product = Combine multiple risk factors and history
- Sum = Accumulate previous diagnostic outcomes
- Integral = Measure trend over time (vital signs, labs, symptoms)
- +/- = Adjust based on new feedback (worsening/improving condition)

Each time new data is entered (e.g., blood pressure, symptoms, lab results), the algorithm:

1. Recalculates using all prior data.
2. Reweights importance of findings.
3. Predicts new outcomes or suggestions.
4. Refines its internal logic.

Example Cycle:

- Input 1: "Fever + Cough" -> Diagnosis: Possible viral infection
- Input 2: "High white blood cell count" -> Update: Bacterial probability up
- Input 3: "No improvement after antibiotics" -> Update: Consider alternative causes (e.g., autoimmune,

fungal)

Visual:

1. Initial Input  $\rightarrow f(x)$
2. Recursive Layer 1: Apply operator (Sum + Product + Integral)
3. Add Input 2  $\rightarrow f(x)$  becomes  $f(x)$
4. Apply again (now with deeper data)
5. Final output = most refined, context-aware diagnosis.

This creates a continuously evolving diagnostic engine learning from every patient input, and converging toward precision.

Applications:

- Personalized medicine
- AI triage systems
- Smart hospital monitoring
- Chronic illness management (adaptive refinement)