AI+ Prompt Engineer Level 1

Module-1

Hands-on-3

Title: AI Diagnosis Simulator: Using Decision Trees for Medical Diagnosis

Problem Statement (Scenario-based):
Participants will simulate how AI can assist in medical diagnosis using a logical decision tree. This hands-on exercise will help learners understand how AI systems use rule-based logic and data to make healthcare decisions. By following a patient's symptoms through a flowchart, participants will see how AI diagnoses conditions and suggests treatments, introducing them to decision trees in AI.

Steps to be followed (Precise manner):

1. Use a **basic flowchart tool** (or presentation slide or whiteboard) to create a simple AI diagnosis flowchart.
2. Introduce the **patient scenario**: A patient has a fever.
3. Walk the learners through the decision tree:
    - **Step 1**: Start by checking the symptoms.
    - **Step 2**: Run Test A based on fever presence.
    - **Step 3**: Follow the flowchart based on test results (positive or negative).
4. Ask learners to suggest different symptoms and observe how the AI system (decision tree) responds.
5. Explain how AI can evolve from a simple rule-based system to a machine learning model with more data.

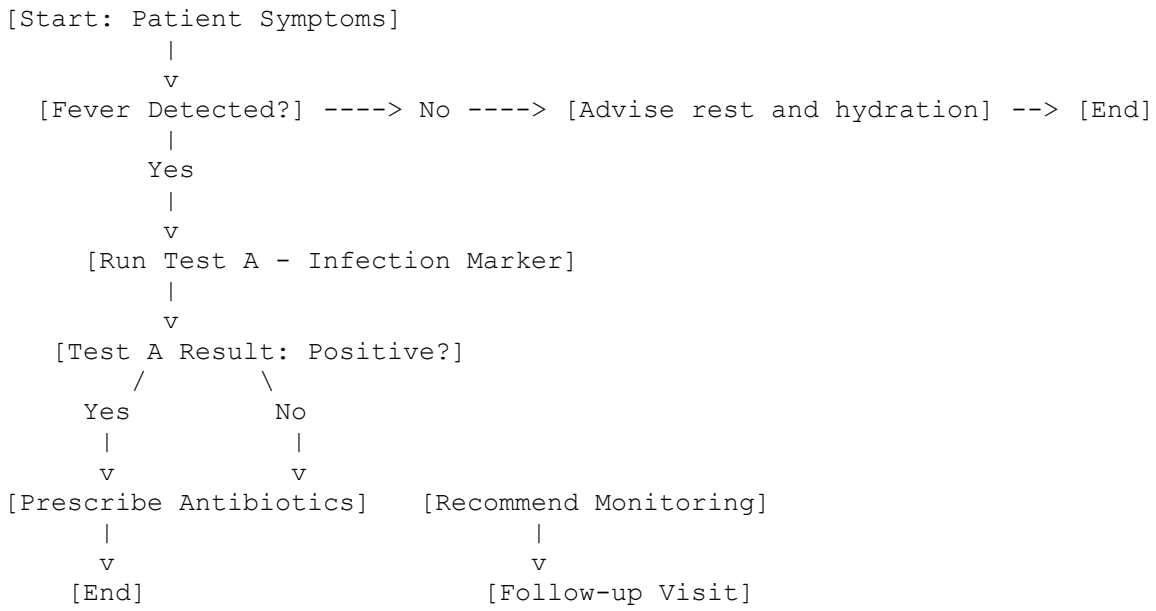
Steps in Detailed Manner:

1. **Create the Diagnosis Flowchart**:

- Use a **flowchart tool** or create a simple **presentation slide** to design a decision tree.
- Label each step logically:
  - **Start**: Patient Symptoms → **Fever Detected?** → If Yes, proceed to next decision point; If No, advise rest and hydration.

Scenario: Patient with Fever – Simulate AI Decision-Making

🔹 Flowchart:



2. **Scenario Introduction**:
   - Present a sample **patient data**:
     - Fever = Yes, Cough = No, Blood Pressure = Normal.
   - Ask participants to think through the first decision the AI needs to make using the flowchart:
     - "Is fever detected?"
3. **Walk Through the Decision Tree**:
   - **Scenario 1**: Fever → Run **Test A → Test Result: Positive → Prescribe Antibiotics**

    - **Scenario 2**: Fever → Run **Test A** → **Test Result: Negative** → **Recommend Monitoring**
    - **Scenario 3**: No Fever → **Advise Rest and Hydration**
4. **Interactive Learning**:
    - Ask participants to suggest different symptoms or conditions (e.g., cough, fatigue, chest pain) and see how the AI system reacts to changes in input.
    - Show how modifying the input data results in a different diagnosis or treatment decision.
5. **Explain the Concept of AI in Healthcare**:
    - Clarify that this is a **rule-based AI system** that uses predefined logic for decision-making, often used in early medical AI systems.
    - **Simplify the ML Angle**:
        - "In a more advanced system, this rule-based approach can be replaced by a **machine learning model** that learns from large datasets, improving diagnosis accuracy by recognizing patterns and trends over time."

Outcome:

- **Understanding of Rule-Based AI**: Participants will learn how **rule-based systems** in AI can simulate decision-making processes in healthcare. By using predefined rules, the system can choose the best possible treatment based on input data.
- **Hands-On Experience with Decision Trees**: The hands-on activity will give learners practical experience with how **decision trees** work in AI, making them a useful tool in medical diagnosis.
- **Interactive Exploration of Symptoms and Diagnosis**: Participants will observe how **input data** (symptoms) changes the **output decisions** (diagnosis and treatment), highlighting the dynamic nature of AI decision-making.
- **Awareness of AI's Evolution**: Learners will understand that while the exercise uses simple logic, real-world AI in healthcare would evolve into more advanced models that **learn from data**, improving accuracy and decision-making over time.