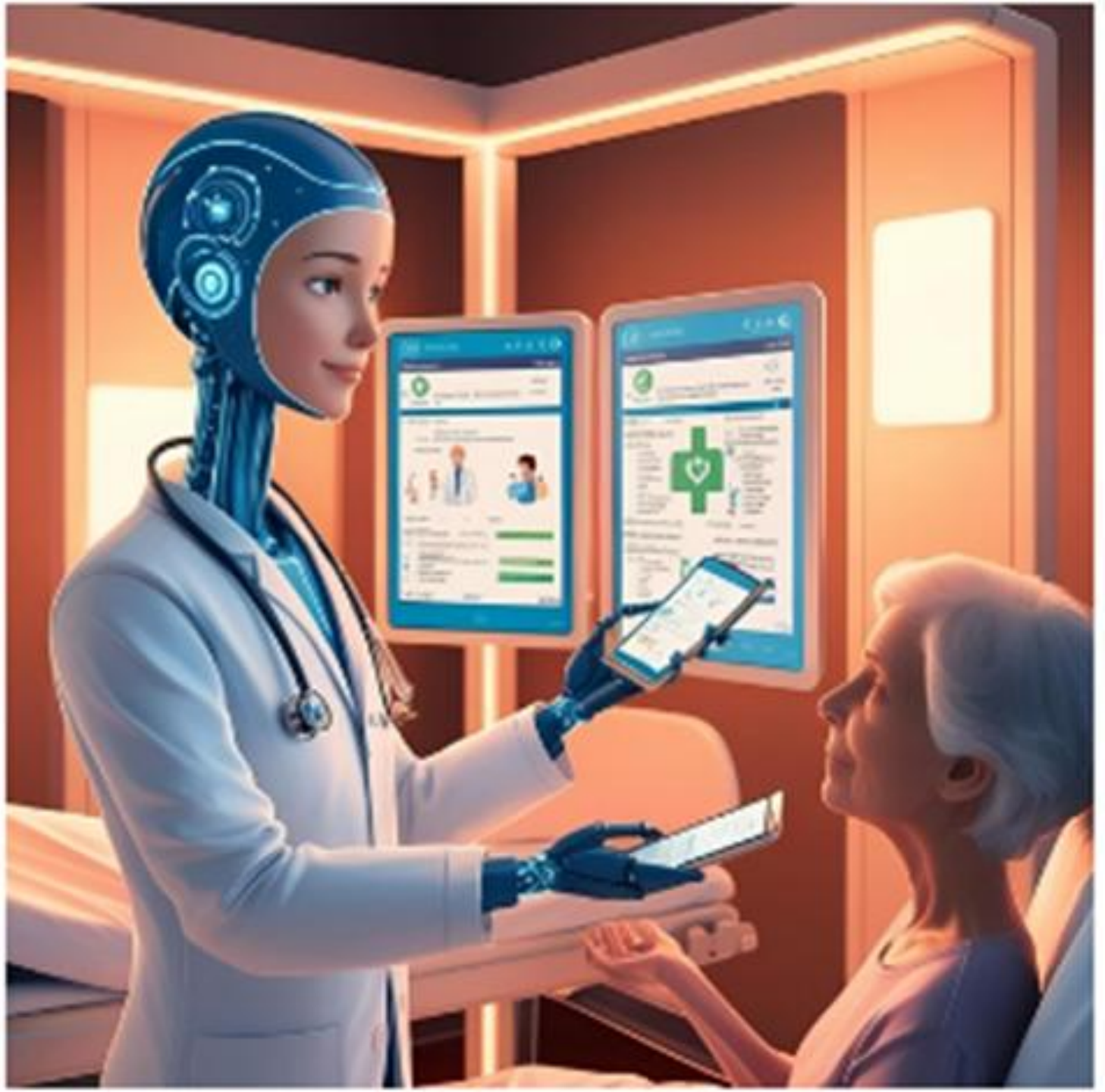
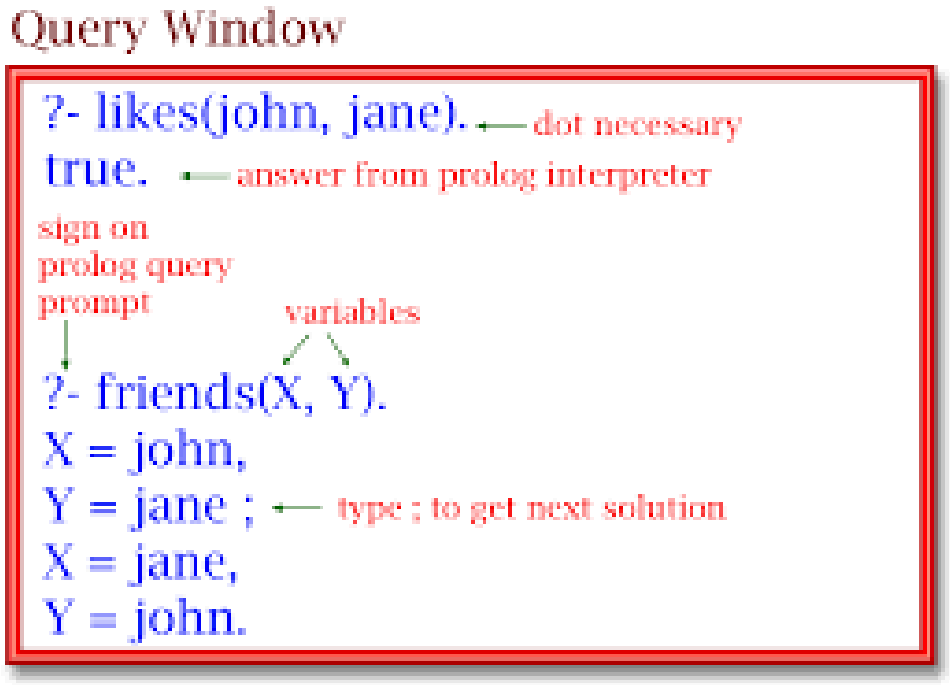
Welcome to the AI Doctor Challenge!

Get ready to become an AI doctor! Solve medical cases using Prolog!



What is Prolog?



"Prolog is a logic programming language used for AI and expert systems.

Let's learn it through a fun game!"

The Challenge Begins!

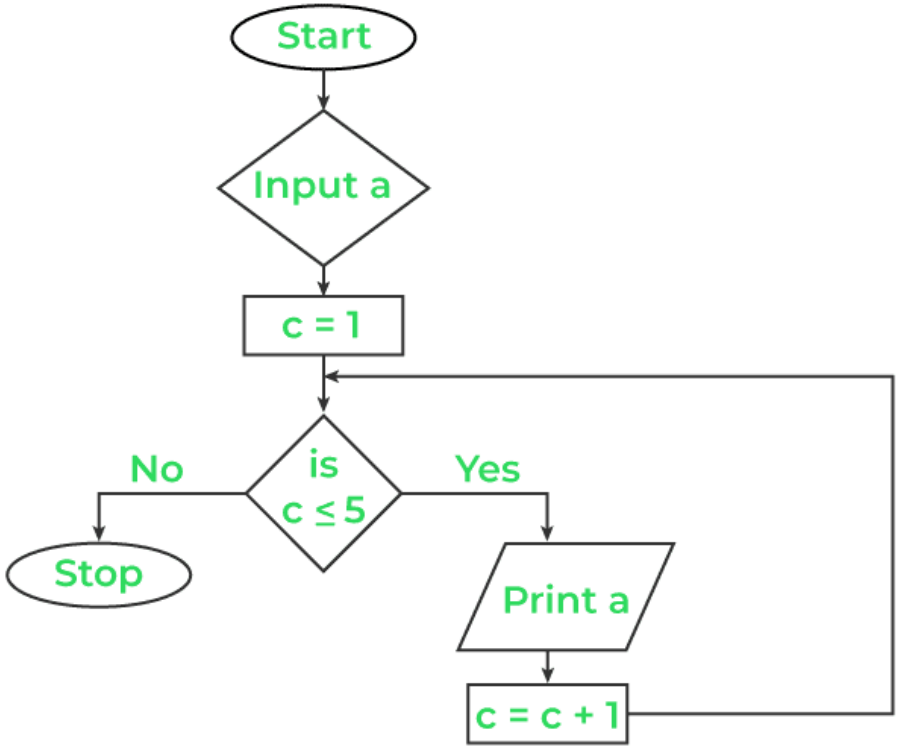
- Your first patient has arrived!
- Use Prolog to diagnose the disease!

Mini-Game: Diagnose the Disease

- Write a Prolog rule for a new disease based on given symptoms!"

Building the Medical Diagnosis System

- Step 1: Define symptoms as Prolog facts.
- Step 2: Write rules to determine diseases.
- Step 3: Use queries to diagnose.



Prolog code

- Facts: "A patient has a fever."
- Rules: "If a patient has a fever and cough, they might have flu."
- Queries: "Does the patient have flu?"

```
% Facts
fever(patient1).  % patient1 has a fever
fever(patient2).
cough(patient2).
% Rules
might_have_flu(Patient) :-
fever(Patient), cough(Patient).

?- might_have_flu(patient2).
true.

?- might_have_flu(patient1).
false.
```

More Complex Rules: You can create more complex rules. For example:

- might_have_cold(Patient) :- cough(Patient), sore_throat(Patient).

Diagnosis: Create more specific diagnoses:

- has_flu(Patient) :- fever(Patient), cough(Patient), headache(Patient).
  % More specific flu diagnosis

Level Up - Advanced Diagnosis!

- Introduce multiple conditions and probability-based diagnosis!

- % Facts (Symptoms)
- fever(patient1, 0.8). % patient1 has a fever with probability 0.8
- fever(patient2, 0.9).
- cough(patient1, 0.7). % patient1 has a cough with probability 0.7
- cough(patient2, 0.2).
- headache(patient1, 0.6). % patient1 has a headache with probability 0.6
- headache(patient2, 0.1).
- sore_throat(patient1, 0.3). % patient1 has a sore throat with probability 0.3
- % Rules (Diagnoses with probabilities)
- % Flu diagnosis (more specific, higher probability if all conditions met)
- has_flu(Patient, Probability) :-
- fever(Patient, FeverProb),
- cough(Patient, CoughProb),
- headache(Patient, HeadacheProb),
- CombinedProb is FeverProb * CoughProb * HeadacheProb, % Simple probability combination (can be improved)
- Probability is CombinedProb.
- % Cold diagnosis (different combination of symptoms)
- has_cold(Patient, Probability) :-
- cough(Patient, CoughProb),
- sore_throat(Patient, SoreThroatProb),
- CombinedProb is CoughProb * SoreThroatProb,
- Probability is CombinedProb.

% Queries

- % ?- has_flu(patient1, Probability). % Get the probability of having the flu

```
?- has_flu(patient1, Probability).
Probability = 0.3359999999999997.
```

- % ?- has_cold(patient1, Probability). % Get the probability of having a cold

```
?- has_cold(patient1, Probability).
Probability = 0.21.
```

Final Mission: Diagnose a Real Case!

- Use your Prolog knowledge to solve a complex case!

Conclusion & Rewards

- Great job! You are now an AI doctor