Lab Task – Model-Based Reflex Agent

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# 1. Objective

- To implement a Model-Based Reflex Agent in Python.  
- To understand the difference between Simple Reflex Agent and Model-Based Reflex Agent.  
- To use memory (previous state) to avoid unnecessary actions in an intelligent agent.

# 2. Task – Model-Based Reflex Agent

Description:

This program simulates a smart home temperature control system using a Model-Based Reflex Agent. The agent compares the current temperature of each room with a fixed target temperature. If the current action is the same as the previous one, the agent avoids repeating the same action, thereby preventing unnecessary switching of the heater.

Sample Code (Explained):

class ModelBasedReflexAgent:  
 def \_\_init\_\_(self, temp):  
 self.fixed\_temp = temp  
 self.previous\_action = None # memory of last action  
   
 def sensor(self, temp):  
 self.current\_temp = temp  
   
 def performance(self):  
 if self.current\_temp > self.fixed\_temp:  
 action = "Turn off the Heater"  
 else:  
 action = "Turn on the Heater"  
   
 # Avoid unnecessary switching  
 if action == self.previous\_action:  
 action = "No action needed"  
 else:  
 self.previous\_action = action  
   
 return action  
   
 def actuator(self):  
 action = self.performance()  
 print(self.current\_temp, "=> Action:", action)  
  
  
# Testing  
agent = ModelBasedReflexAgent(18)  
rooms = {  
 "Living Room" : 30,  
 "Drawing Room" : 24,  
 "Bed Room" : 16,  
 "Kitchen" : 34  
}  
for room, temp in rooms.items():  
 print(room, end=":\t")  
 agent.sensor(temp)  
 agent.actuator()

Sample Output (Explained):

- For Living Room (30°C): Heater will be turned OFF.  
- For Drawing Room (24°C): Since the heater is already OFF, the agent outputs 'No action needed'.  
- For Bed Room (16°C): Heater will be turned ON.  
- For Kitchen (34°C): Heater will be turned OFF again.

# 3. Conclusion

- Implemented a Model-Based Reflex Agent that avoids redundant actions.  
- Learned how memory (previous state) can improve decision-making.  
- Understood the practical difference between Simple Reflex and Model-Based Reflex Agents.