**Name: Saira Irshad**

**Roll no: SU92-BSAIM-f24\_121**

**Submitted To: Sir Rasik Ali**

**Section: BSAI-3b**

## Model-Based Reflex Agent in Artificial Intelligence

A Model-Based Reflex Agent is a type of intelligent agent in Artificial Intelligence (AI) that maintains an internal state or memory of the environment. Unlike simple reflex agents, which only react to current percepts, a model-based agent uses stored data to make better decisions.

# 1. How Model-Based Reflex Agent Works

1. \*\*Sensors\*\*: Collect input from the environment (e.g., current temperature, current room).  
2. \*\*Internal Model\*\*: Maintains environment data (e.g., stored room temperatures and heater states).  
3. \*\*Performance Function\*\*: Checks whether a similar state has been encountered before. If yes, it retrieves the decision from memory; otherwise, it makes a new decision based on rules.  
4. \*\*Memory (Knowledge Base)\*\*: Stores past experiences in a file (memory.txt) for future use.  
5. \*\*Actuators\*\*: Execute actions (e.g., turning the heater ON or OFF).

# 2. Characteristics of Model-Based Reflex Agent

* ✔ Maintains an internal state to keep track of the environment.
* ✔ Can use memory to improve performance over time.
* ✔ More powerful than simple reflex agents.
* ❌ Limitations:
* • Requires more memory for storing past experiences.
* • Slightly more complex to implement compared to simple reflex agents.

# 3. Applications of Model-Based Reflex Agent

* • Smart home temperature control systems.
* • Autonomous robots that need to remember past states.
* • AI assistants that adapt based on user history.

## Output:Capture

# Conclusion

The Model-Based Reflex Agent is an intelligent design in AI that combines perception, memory, and decision-making. By remembering past actions and environment states, it can take more reliable and efficient decisions compared to simple reflex agents.