**Task 3 – Reflex Agents in Artificial Intelligence**

Name: Ayesha Sikandar  
Roll No.: 044  
Section: BSDS 3A

**1. Simple Reflex Agent**

**Code Explanation:**

The SimpleReflexAgent class simulates a basic AI agent that makes decisions based only on the current temperature:

* \_\_init\_\_ method: Stores the desired temperature.
* perceive method: Reads the current temperature.
* act method:
  + If the temperature is below the desired value → turn on the heater.
  + Otherwise → turn off the heater.

The program uses a dictionary rooms to store multiple rooms and their current temperatures.  
A for loop iterates through each room, calling the act() method and printing the agent’s decision.

**Why I Made This:**

I made this program to understand how Simple Reflex Agents operate in AI.  
It illustrates reactive behavior and demonstrates how rules can control real-world systems like heaters, air conditioners, or robots without using memory.

**How I Made It:**

* Created a class for the agent.
* Used if-else conditions for decision-making.
* Stored room temperatures in a dictionary.
* Used a loop to iterate through rooms and print actions.

**2. Model-Based Reflex Agent**

**Code Explanation:**

The ModelBasedReflexAgent class improves on the simple agent by remembering its previous action.

* \_\_init\_\_ method:
  + Stores the desired temperature.
  + Initializes prev\_action to remember the agent’s last decision.
* act method:
  + Compares current temperature with desired temperature:
    - Below desired → turn on heater
    - Above or equal → turn off heater
  + Checks if the current action is the same as the previous action:
    - If yes → outputs “No action (state unchanged)”
    - Otherwise → performs the new action
  + Updates prev\_action for the next iteration.

The program stores multiple temperature readings for each room in a dictionary.  
Nested loops iterate through each room and its temperature readings, printing the agent’s actions step by step.

**Why I Made This:**

I made this program to understand how Model-Based Reflex Agents work.  
Unlike the simple version, this agent uses memory to avoid repeating the same action unnecessarily.  
It demonstrates how real-world AI systems (like smart thermostats) make efficient decisions based on both current and past states.

**How I Made It:**

* Added a prev\_action variable to store previous decisions.
* Used if-else logic to decide actions based on temperature comparison and previous state.
* Used loops to simulate temperature changes in multiple rooms and display the agent’s behavior over time.

**Conclusion:**

Through this task, I learned:

* How Simple Reflex Agents react to the environment based on fixed rules.
* How Model-Based Reflex Agents improve efficiency using memory.
* How to implement intelligent agents in Python using classes, loops, dictionaries, and conditional statements.

This task demonstrates the core principles of perception, decision-making, and action in AI and highlights the differences between reactive and state-based agents.