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**LAB TASK 3**

# Model-Based Reflex Agent

## Introduction

A Model-Based Reflex Agent is an intelligent system that makes decisions not only based on the current percent (temperature in this case) but also by considering the internal state (previous actions and memory). This prevents the system from taking unnecessary actions, such as repeatedly turning the heater ON and OFF when the temperature fluctuates slightly.

## Working Principle

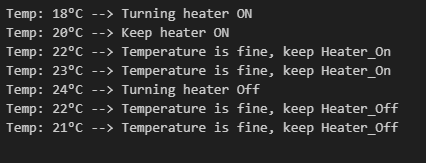
- The agent continuously monitors the temperature.  
- It uses a desired set temperature (default: 25°C) as the reference.  
- It remembers the last action taken (e.g., Heater ON or Heater OFF).  
- If the temperature is below the threshold, the heater turns ON.  
- If the temperature is above the threshold, the heater turns OFF.  
- If there is no significant change, the system keeps the heater in its previous state (to avoid unnecessary toggling).  
- Additionally, if the temperature goes above 30°C, the fan turns ON for cooling.  
- If the temperature goes below 15°C, the system shuts down for safety.

## Features

1. Remembers past actions – prevents rapid switching of heater/fan.  
2. Maintains stability – avoids frequent ON/OFF operations.  
3. Energy efficiency – saves electricity by making smarter decisions.  
4. Records history – logs all actions taken with corresponding temperatures.

## Disadvantages

1. Limited Memory – it only remembers the last action, not the complete environment state.  
2. No Prediction – cannot forecast future temperature trends, only reacts to current input.  
3. Rigid Thresholds – fixed values (like 25°C desired temperature) may not suit all environments.  
4. Not adaptive – cannot learn or improve performance over time without manual adjustments.  
5. No external factors considered – ignores humidity, weather conditions, or user preferences.

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