**Smart Home Temperature Control — Description**

**Scenario**

A smart home system is designed to maintain a comfortable room temperature (22°C). Each room has a thermostat and heating system. To control the heater, two types of agents are implemented:

• Basic Heater Agent (Simple Reflex Agent)

• Smart Heater Agent (Model-Based Reflex Agent)

**Basic Heater Agent**

The BasicHeaterAgent makes decisions only on the basis of the current temperature:

• If current\_temp < setpoint → Heater ON

• Otherwise → Heater OFF

It does not remember past actions, so the heater may toggle more frequently when temperature fluctuates near the setpoint.

**Smart Heater Agent**

The SmartHeaterAgent adds a memory component:

• It uses a margin (hysteresis) around the setpoint (default ±0.5°C).

• If current\_temp < (setpoint - margin) → Heater ON

• If current\_temp ≥ (setpoint + margin) → Heater OFF

• If temperature lies between these two, it remembers the previous action and continues it.

This prevents unnecessary toggling (the heater won’t switch ON/OFF repeatedly when temp is close to 22°C)