MQTT LAB

Exercise 6:

Extend the existing system to allow for remote and manual control.

Specifically, add a third client that can publish to the /Junia/Userxx/com_heating and /Junia/Userxx/act_window topics. This third client should allow the user to set the desired temperature for the room and allow the user to manually turn on or off the heating and window. **We should have a temperature reading every 10 seconds.**

1. The third client should be able to publish to the /Junia/Userxx/com_heating topic to turn on or off the heating manually. The payload for this topic should be either "ON" or "OFF".

2. The third client should be able to publish to the /Junia/Userxx/act_window topic to manually open or close the window manually. The payload for this topic should be either "OPEN" or "CLOSE".

3. The third client should be able to set a desired temperature for the room. The payload should be a float representing the desired temperature in degrees Celsius.

4. The third client should be able to subscribe to the necessary topics to receive updates on the current temperatures.

5. The third client should implement a simple function while calling an external python module to automatically turn on or off the heating based on the difference between the current room temperature and the desired room temperature. Specifically, if the average room temperature for the last 60 seconds is more than 1 degree Celsius below the desired temperature, the heating should be turned on. If the current room temperature is more than 1 degree Celsius above the desired temperature, the heating should be turned off. If the difference is within 1 degree Celsius, the heating should be left in its current state.

6. You should write the necessary code in the client 3 to ask the user if he wants to manually command the heater and/or window or activate the automatic control. You should also allow the client 3 to set his desired temperature and change it whenever he wants.