**Faculty of Engineering and Applied Science**

**Internet of Things SOFE 4610U**
**Project Proposal: Smart Thermostat with LCD Display**
**Due Date: Oct 20, 2021**

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**Project Description**

Our group project for this term will be to build a rudimentary smart thermostat using the Osoyoo kit. Our proposed system will rely on the following sensors: DHT11 Temperature and GL5516 Photoresistor. The photoresistor will be used to determine if users are at home, triggering the rules for the thermostat. The temperature sensor will be used determine current temperature which is used as basis of comparison against the client's required temperature.

We will be building a MQTT server and the client will be able to check the current temperature and interface with the sensors. Since we won't be interfacing with an actual thermostat, LEDs will be used to display if the temperature will be raised or lowered. Furthermore, we will incorporate the 4 LED module to display the current temperature to the user.

**Functional Requirements**:
1. System will detect the current temperature and send a signal to lower temperature if it is too high
2. System will detect the current temperature and send a signal raise the temperature if it is too low
3. System will detect if user is at home, and turn on thermostat if they are
4. System will detect if user is at home, and turn off thermostat if they are not
5. System will have a red light that indicates if the temperature is being raised
6. System will have a blue light that indicates if the temperature is being lowered
7. System will have an LCD display that displays the current temperature of the room

**Non-Functional:**
1. System will be running at all times for accurate readings from the temperature sensor.
2. System will take no longer than 3 seconds to turn on the led based on the temperature
3. System will take no longer than 3 seconds to display the current temperature on the LCD display once it has been checked.
4. System will be able to read the temperature range from 0 to 50 degrees Celsius for DHT11 temperature sensor.
5. System will be implemented over an MQ Telemetry Transport server to communicate if the temperature should be raised or lowered.
6. System will communicate the temperature reading every minute.
7. System will be able to detect correct temperature with 2 degrees accuracy