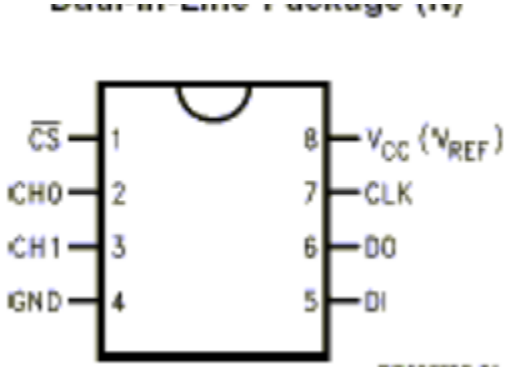
IOT Final project

The Required Hardware:

- DHT-11 sensor.
- Dc Motor with fan.
- Soil Moisture sensor.
- CM module.
- Photoresistor
- ADC0832
- Water pump
- GPIO board.
- LED
- Resistor 1kΩ
- Relay

The installation:

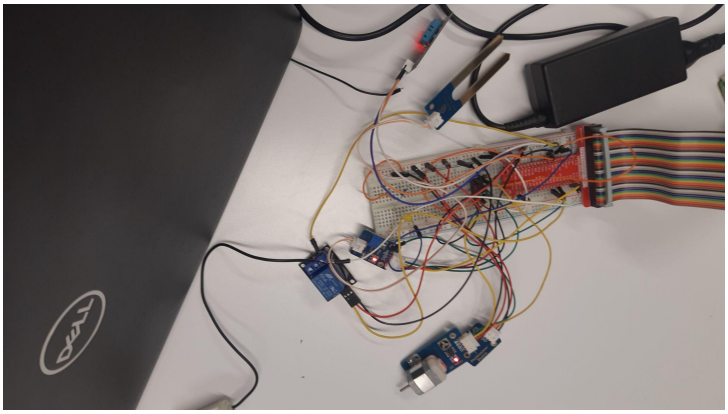
- **ADC0832:**

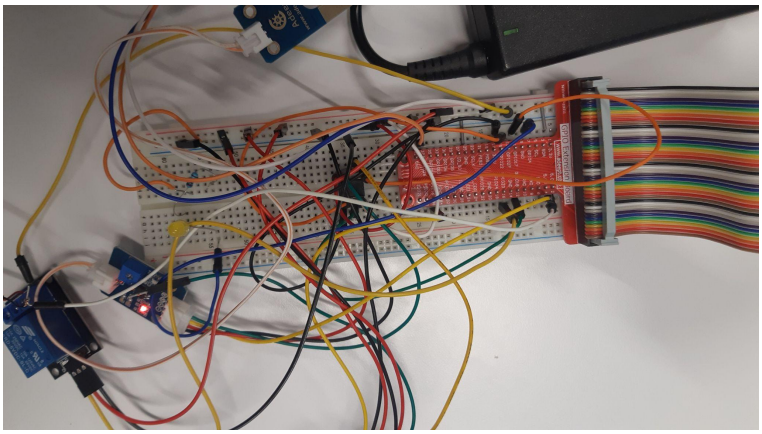


  - Vcc has to be connected to the power supply 3.3v
  - CLK has to be connected to the pin GPIO18
  - DO has to be connected to pin 27
  - DI has to be connected to the pin GPIO22
  - CS has to be connected to pin GPIO17

- **DHT-11:**
  - Connect the sensor to the GPIO board as following:
    - (-)pin has to be connected to the ground.
    - (+)pin has to be connected to the power supply (3.3v)
    - (s)pin has to be connected to GPIO26 pin.
- **DC Motor with fan:**
  - (-) has to be connected to the ground.
  - (+) has to be connected to the power supply(3.3v)
  - (A) has to be connected to pin GPIO16.

- **Soil moisture:**
    - To connect the soil moisture you have to connect it with the CM module.
    - Connect the **CM module** as following:
        - (-) has to be connected to the ground
        - (+) has to be connected to the power supply(3.3v)
        - (S) has to be connected to the power supply (5v)
        - (A) has to be connected to ch1 of the ADC0832
- **Phototresistor:**
    - (-) has to be connected to the ground
    - (+) has to be connected to the power supply 3.3v
    - (A) has to be connected to the ch0 of the ADC0832
- **Water pump** to connect the water pump you have to have a relay so you can connect the relay as following:
    - (-) has to be connected to the ground
    - (+) has to be connected to the power supply(3.3)
    - (s) has to be connected to the pin GPIO23
    - Then you can connect the pump with the relay as following:
        - The black wire has to connect to the power supply 5v
        - The red wire has to be connected to the COM pin in the relay
        - For the NO pin in the relay has to be connected to the ground
- **The LED:**
    - We connect the resistor one edge to the ground and the other to any pin in the board, then one edge of the led has to be connected to the resistor and the other edge of the LED is supposed to be connected to the GPIO4 pin.





The script:

After installation you can write the code for every sensor as a function and you have to install all the required libraries like:

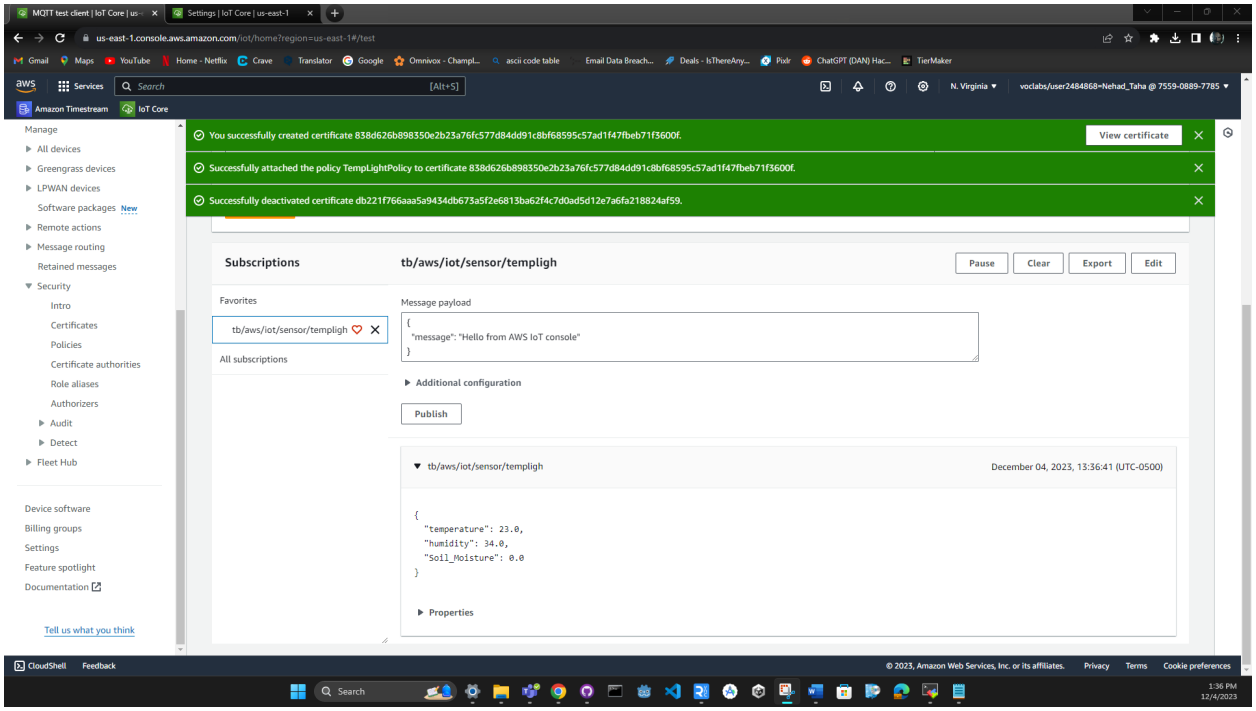
- Python pip install Adafruit : for the DHT.
- Python pip install AWSIoTPythonSDK.

For the script you can find it in our repository, and you can watch this video to see the results of every sensor.
Video of Working project

Documentation

Video of Working project
Dashboard Video #1
Dashboard Video #2

AWS Message:



AWS database:

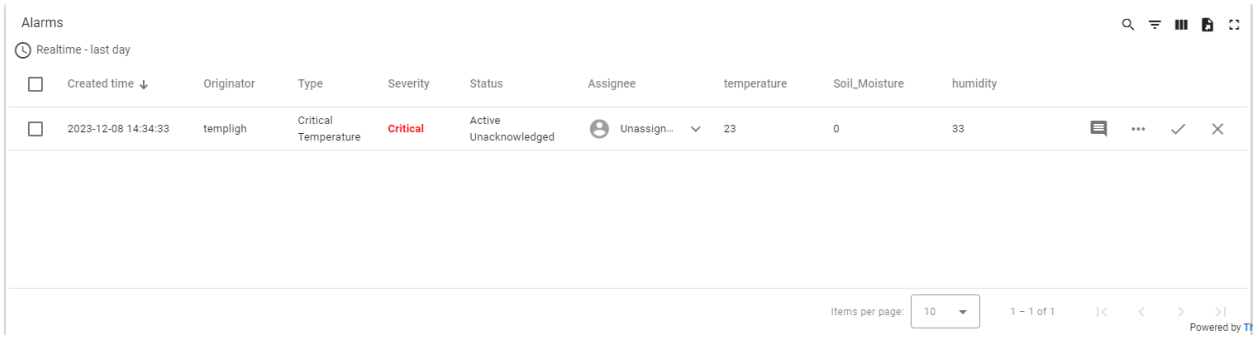
Table details | Query results | Output

Rows returned (10)

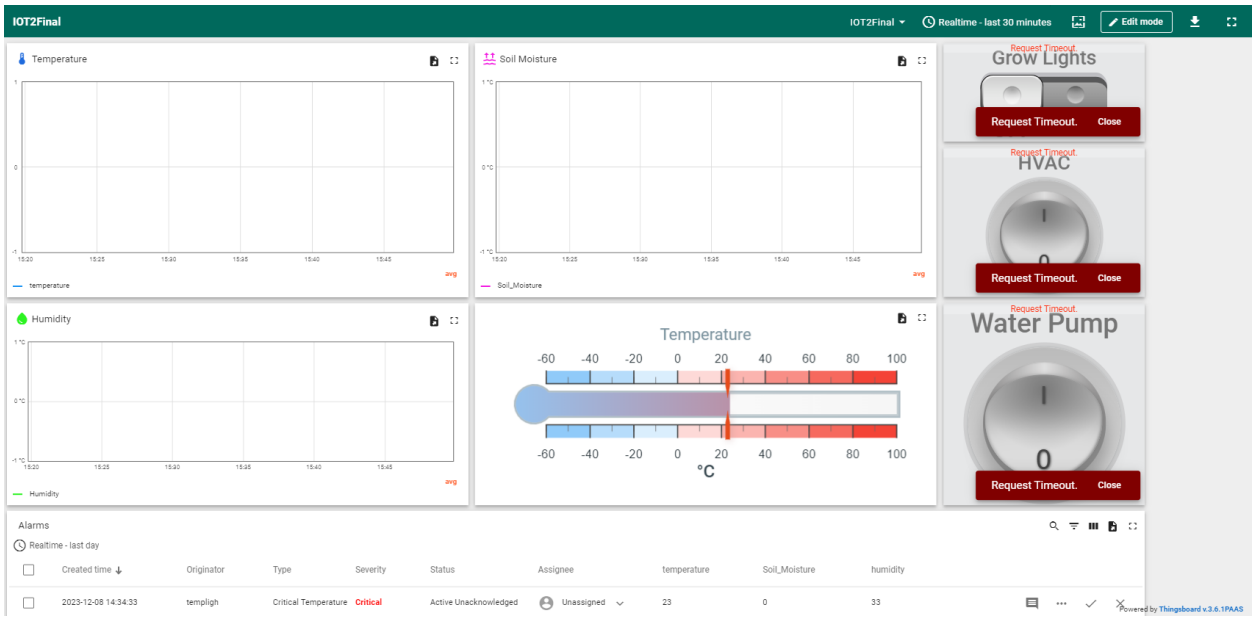
Filter

DeviceName	measure_name	time	measure_value::varchar	measure_value::double
Rpi4	Soil_Moisture	2023-12-04 01:32:49.789000000	-	41.41176470588235
Rpi4	humidity	2023-12-04 01:32:49.789000000	-	39.0
Rpi4	Soil_Moisture	2023-12-04 01:32:49.105000000	-	41.41176470588235
Rpi4	humidity	2023-12-04 01:32:49.105000000	-	39.0
Rpi4	Soil_Moisture	2023-12-04 01:32:48.672000000	-	41.41176470588235
Rpi4	humidity	2023-12-04 01:32:48.672000000	-	39.0
Rpi4	humidity	2023-12-04 01:32:48.042000000	-	39.0
Rpi4	Soil_Moisture	2023-12-04 01:32:48.042000000	-	40.1176470588235
Rpi4	humidity	2023-12-04 01:32:47.542000000	-	39.0
Rpi4	Soil_Moisture	2023-12-04 01:32:47.542000000	-	40.1176470588235

Alarm:



Dashboard look:



Contributions:

Elijah - Dashboard and AWS Integration

Nehad: The installation, python script, the connection with AWS, and the aws database.