CSEE5590-0005

IoT/ Robot Programming

(2018 Fall)

*Lab Assignment 3*

**Visualization of the IOT Smart Home**

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AUTHORS

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OBJECTIVE

The objective of the project can be listed as follows:

1. Create Arduino/ raspberry pie-based project which will be developed in MIT app inventor.
2. The app should have the ability to turn on the data transmission.
3. Connect any type of sensor with it and dynamically visualize the data in android.
4. For example, we connect light sensor with Arduino and develop app in MIT app inventor. The app should have the capability to turn on the sensor and turn off the sensor. If the sensor is turned on. The sensor should first send a notification “Data Transmission Started”. The app should show the data dynamically in form of graph for the slot of 2 hours. When turn off from app is invoked the data transmission should stop and notification will be received as “Sensor Data stopped”.
5. Finally, the Arduino should be connected via Wifi sensor rather than over the Bluetooth that was exercised in class.
6. Use appropriate use of LED’s, buzzer’s and alerting system as previously exercised. Connect any of the sensor (Light, pressure, temperature etc.) with node red and visualize the data on the dashboard. And post to social net apps.

INTRODUCTION

In the past three weeks of IoT/Robot Programming class, we learned how to communicate between Arduino and Raspberry Pi. We also used fingerprint sensor and firefighting robot with both of the platform. We learned how to view real time data through android app. The assignment #3 is a combination of all the previous three ICPs. The assignment can be subdivide into the following sections:

* Integrate a Light sensor and WIFI module with an Arduino Board.
* Transmit the data from the light sensor using WIFI module to thingspeak.
* From thingspeak, data is fetched to node-red firebase platform which is in Raspberry Pi.
* Show the real-time data of the sensors from the firebase into the android app developed in MIT app inventor.
* And observe the sensor data in chart form through developed app.

MATERIALS REQUIRED

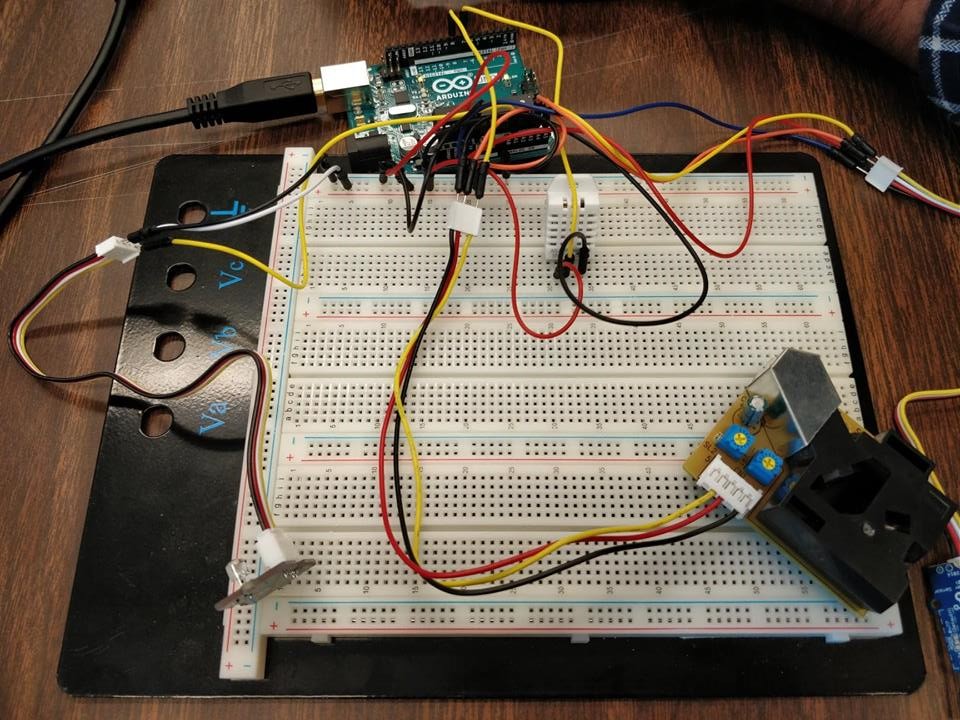
* Light Sensor
* Arduino Uno
* Raspberry Pi
* ESP8266
* Connectors

PLATFORM USED

* Node-red
* Arduino
* Raspberry
* MIT app inventor

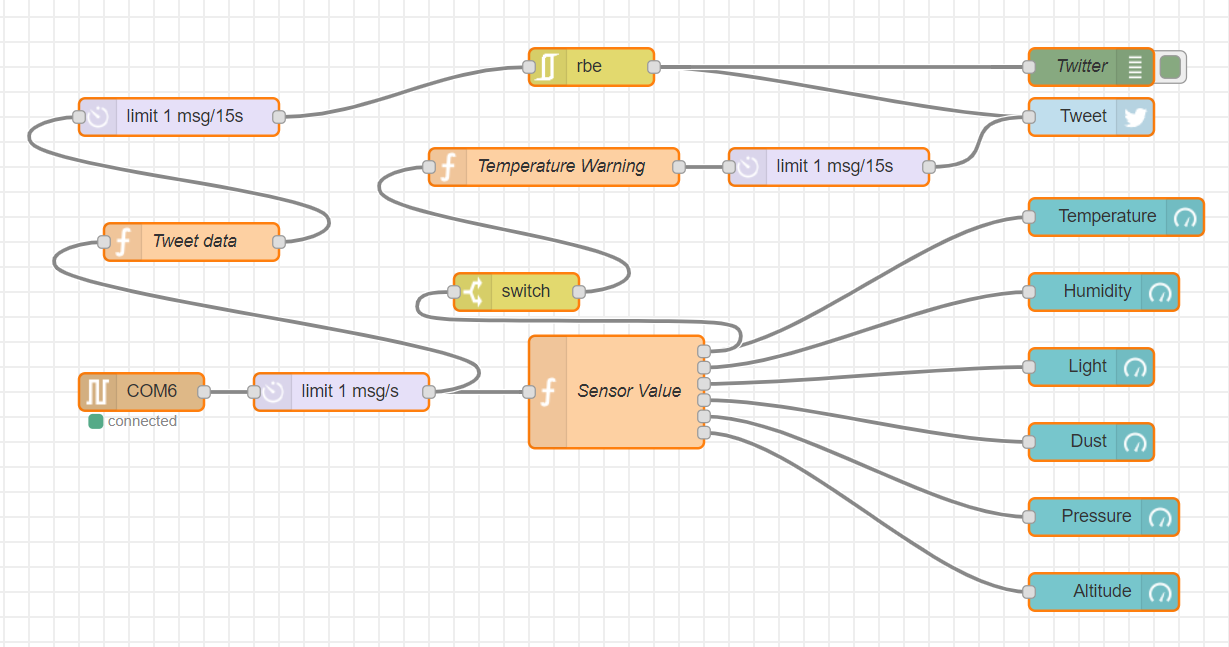
CIRCUIT CONNECTON

The circuit is connected as per figure:



NODE-RED FLOW

The flow is made in node-red. The flow consists of two separate branches, one for dashboard visualization and another is for twitter visualization:



METHODOLOGY

* At first, ESP8266 (WIFI module) and light sensor is connected to Arduino.
* Using Arduino code, the data is fetched from sensor and via WIFI module, it is sent to thingspeak.
* Node-red is then used to collect the data from thingspeak and send it to firebase database.
* The data is then extracted from firebase by using MIT app inventor.
* The result is visualized in chart form in MIT app companion from android device.

OUTPUT

**Dashboard Visualization:**

**Twitter Visualization:**

CONCLUSION

This assignment is a combination of all the ICPs done during the previous three weeks. During this assignment, we were able to create a flow to take all the sensor data from the Arduino board. The visualization was done using node-red dashboard visualization and twitter also. Threshold was set for the temperature sensor.

LINKS

GitHub Link:

https://github.com/farid7666/CS5690-IoT-Robot/tree/master/Assignment\_2

GitHub Wiki Link:

https://github.com/farid7666/CS5690-IoT-Robot/wiki/Lab-%232

Video link:

<https://www.youtube.com/watch?v=U96bU_tPtAE&feature=youtu.be>

Code Link:

<https://github.com/farid7666/CS5690-IoT-Robot/tree/master/Assignment_2/Codes>

Flow Link:

<https://github.com/farid7666/CS5690-IoT-Robot/blob/master/Assignment_2/Assignment_flow_2.txt>