

CHAPTER 4

ANALYSIS AND DESIGN

4.1 Analysis

In completing this project, created the architecture of the house as shown below:

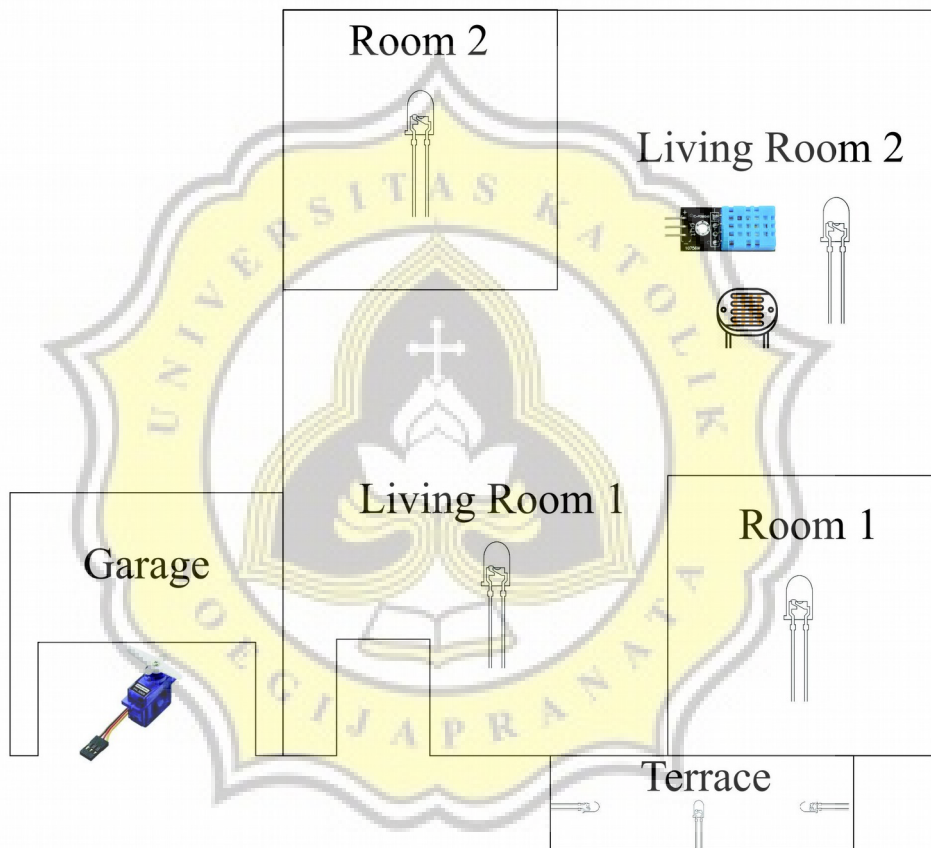


Illustration 4.1: Arsitektur House

The picture above illustrates the location, from the rooms used to apply the hardware used in this project, such as LED, DHT 11 sensor, LDR, and Motor Servo. Where each room is applied an LED is controlled through Node Red. While the DHT11 temperature sensor applied to the living room, where the DHT11 sensor is used to monitor the condition of the house temperature. As for

the garage space is applied a hardware servo that serves to open or close the garage door through Node Red.

4.1.1 Application of LED Room 1

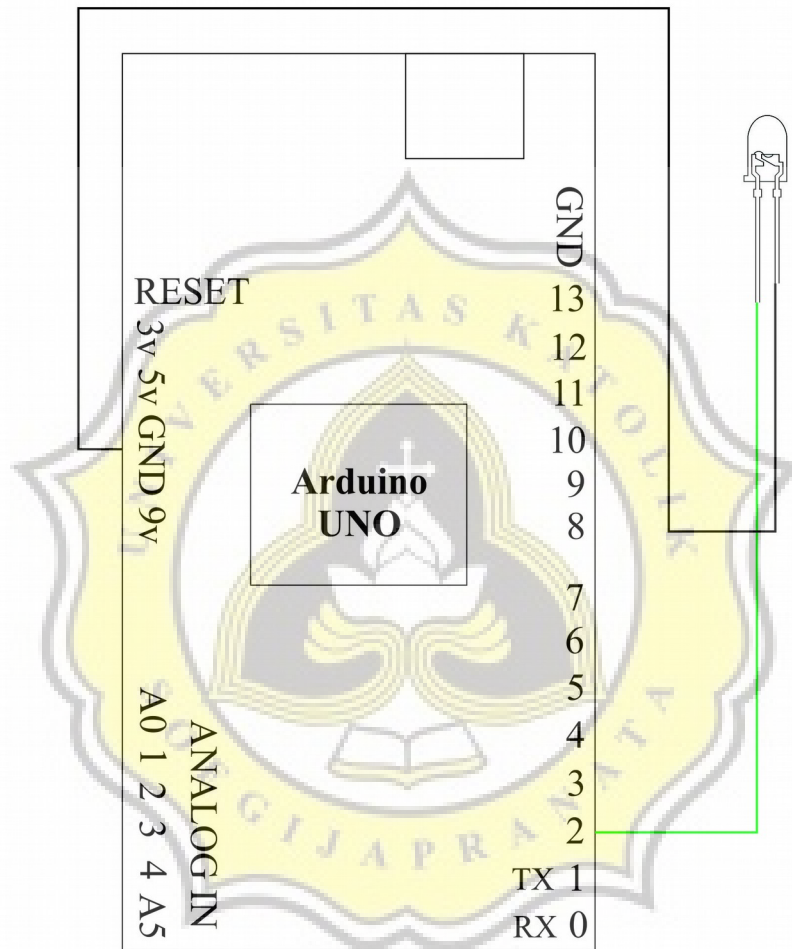


Illustration 4.2: Arsitekture LED Room 1

At the location of room 1 applied an LED, where the LED is working to be controlled on or off via Node Red. LED room 1 connected with Arduino UNO pin 2. The workings of LED room 1 is Arduino UNO will subscribe on the MQTT server to receive messages sent from Node Red.

4.1.2 Application of LED Room 2

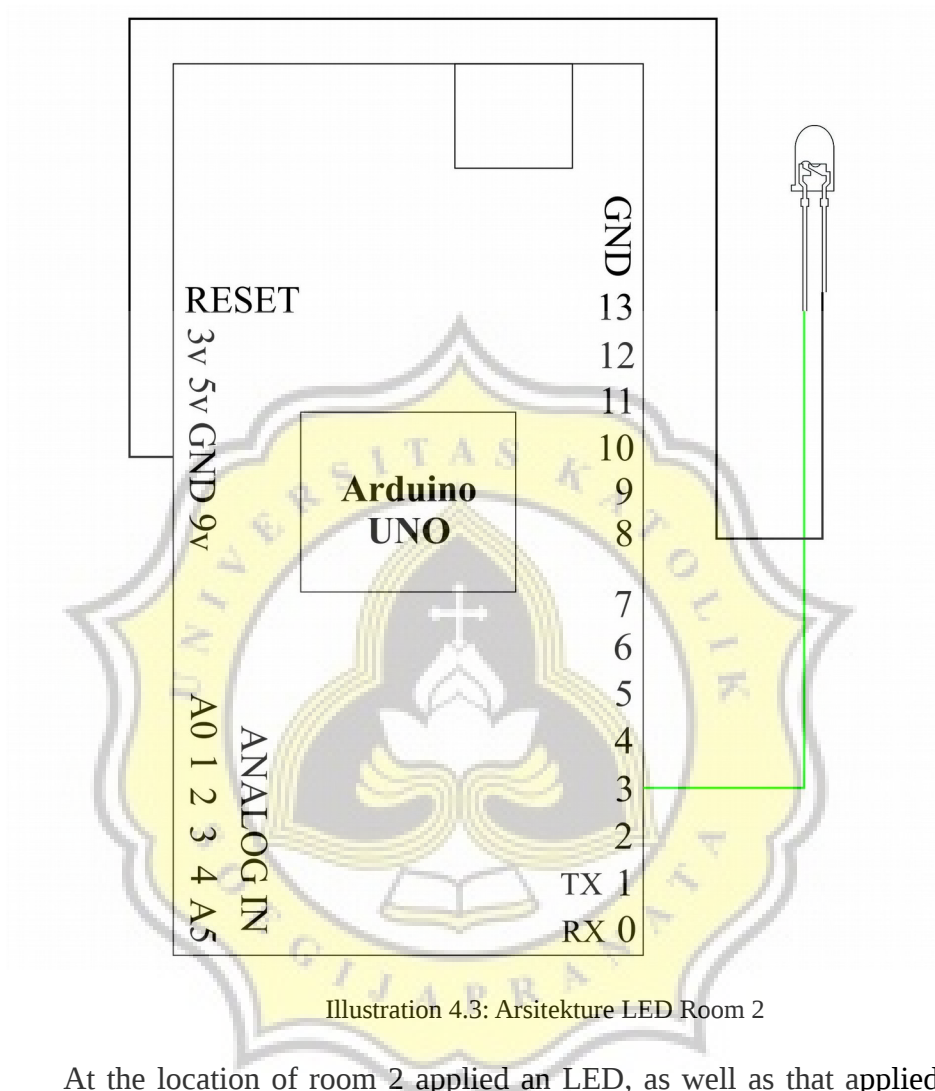


Illustration 4.3: Arsitektur LED Room 2

At the location of room 2 applied an LED, as well as that applied to the LED room 1. LED room 2 is connected to pin 3 Arduino UNO. The LEDs from room 2 also function to be controlled on or off via Node Red. The workings of LED room 2 is the same as room 1 ie Arduino UNO will subscribe on the MQTT server to receive messages sent from Node Red.

4.1.3 Application of LED, LDR and DHT11 Living Room 2

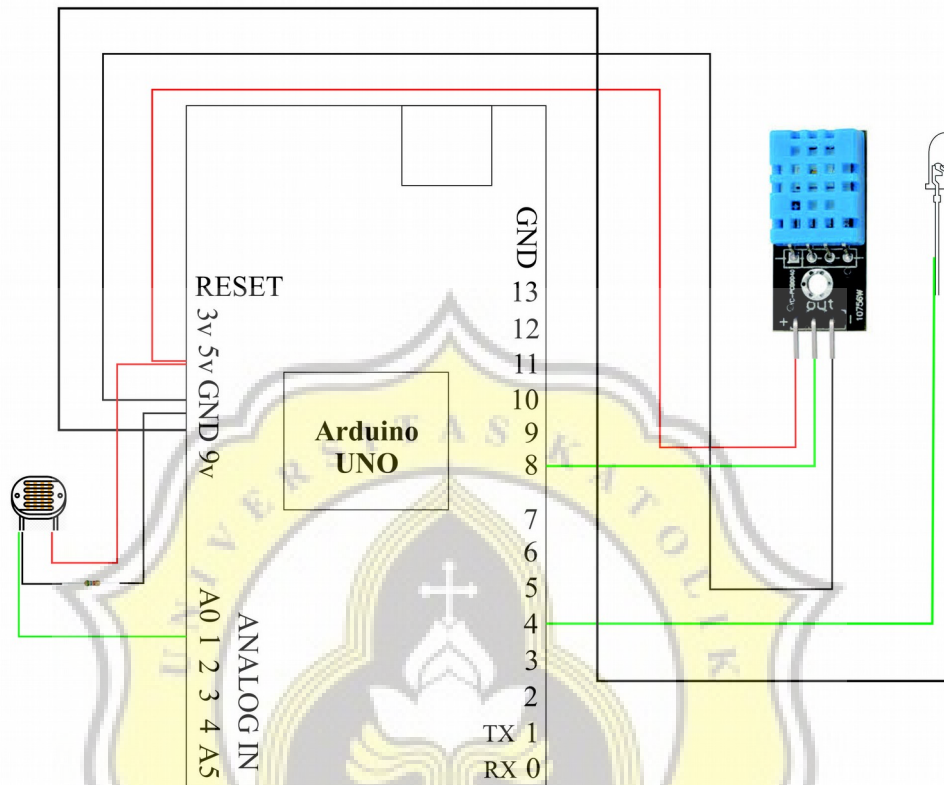


Illustration 4.4: Arsitektur LED, LDR dan DHT11 Living Room 2

At the location of the living room 2 applied an LED, LDR and DHT11 temperature sensor. LED connected with pin 4 Arduino UNO, functions to be controlled on or off via Node Red, while the DHT11 temperature sensor is connected with pin 8 of the Arduino UNO, serves to monitor the condition of the living room 2 temperature. While the LDR sensor is connected with pin A1, used to monitor on or off LED conditions in the living room 2. At the location of the living room 2, Arduino UNO will subscribe LED and Arduino UNO publish LDR and DHT11 to MQTT server.

4.1.4 Application of LED Living Room 1

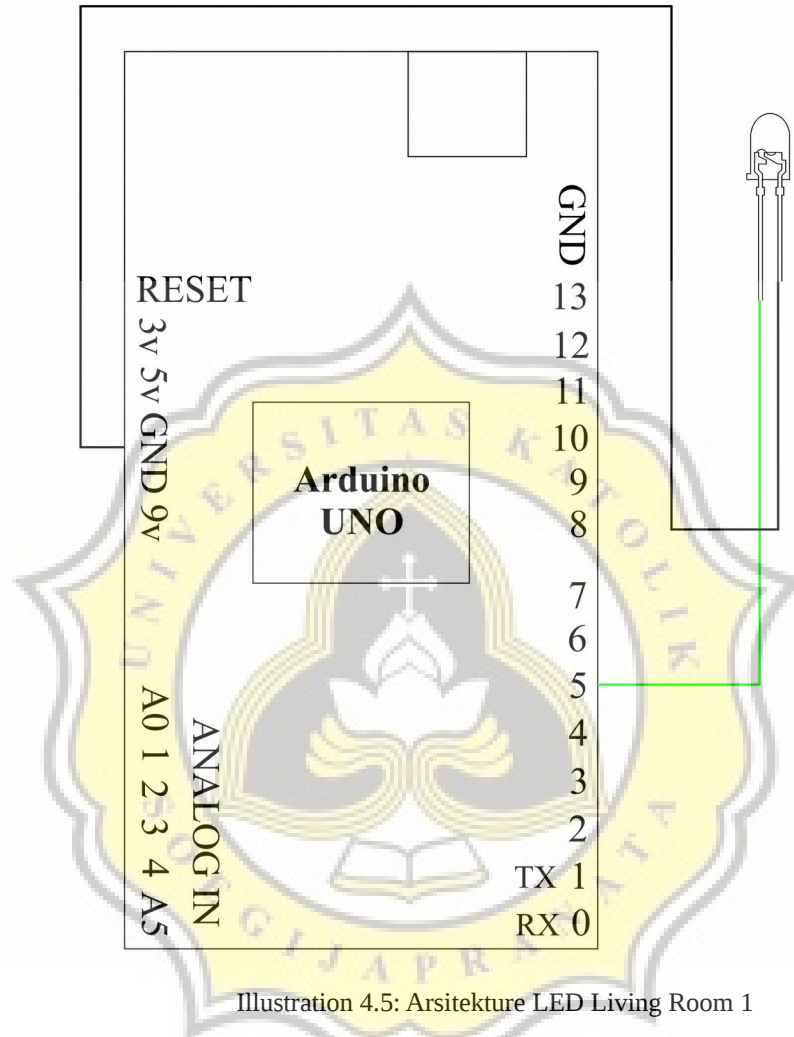


Illustration 4.5: Arsitektur LED Living Room 1

At the location of the living room 1, applied an LED, as well as those applied to LED room 1 and room 2. LED Living room 1 connected with pin 5 Arduino UNO. LEDs from living room 1 also work to be controlled on or off via Node Red. The workings of LED living room 1 is the same as room 1 and room 2, Arduino UNO will subscribe on the MQTT server to receive messages sent from the Red Node.

4.1.5 Application of LED Terrace

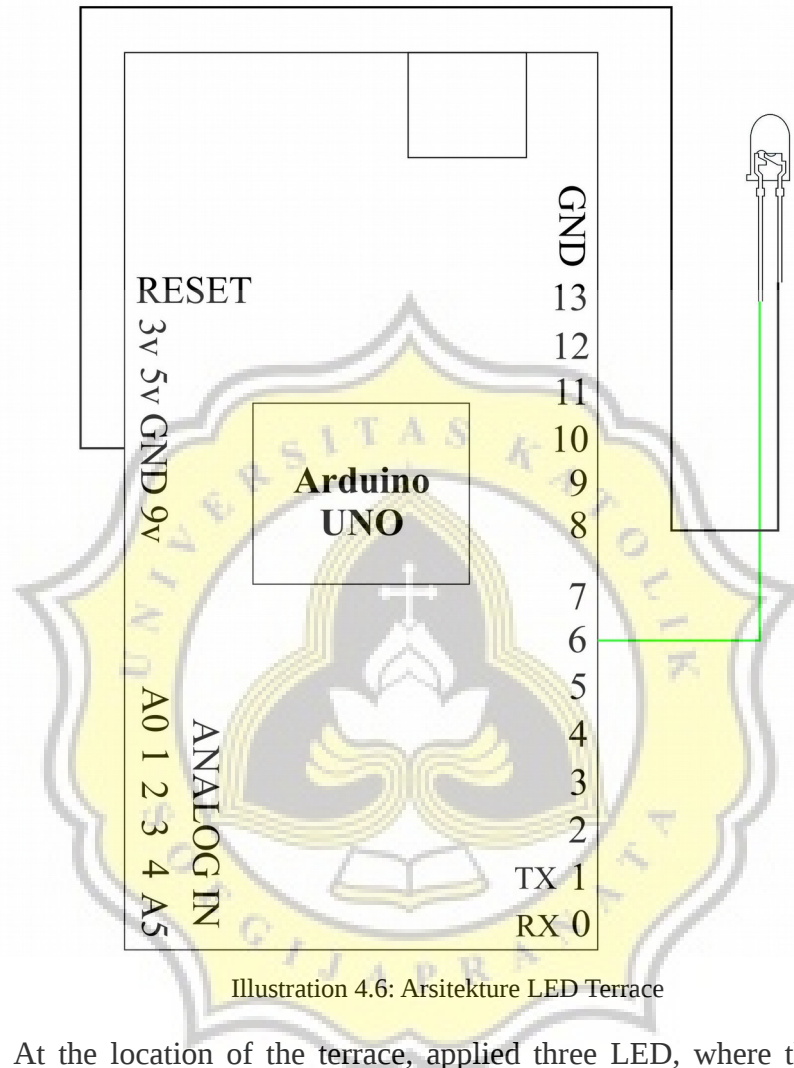


Illustration 4.6: Arsitekture LED Terrace

At the location of the terrace, applied three LED, where three LED are connected with pin 6 Arduino UNO. On LED Terrace concept or how it works the same as other LEDs. Arduino UNO subscribe on the MQTT server to receive messages sent through Node Red.

4.1.6 Application of Motor Servo Garage

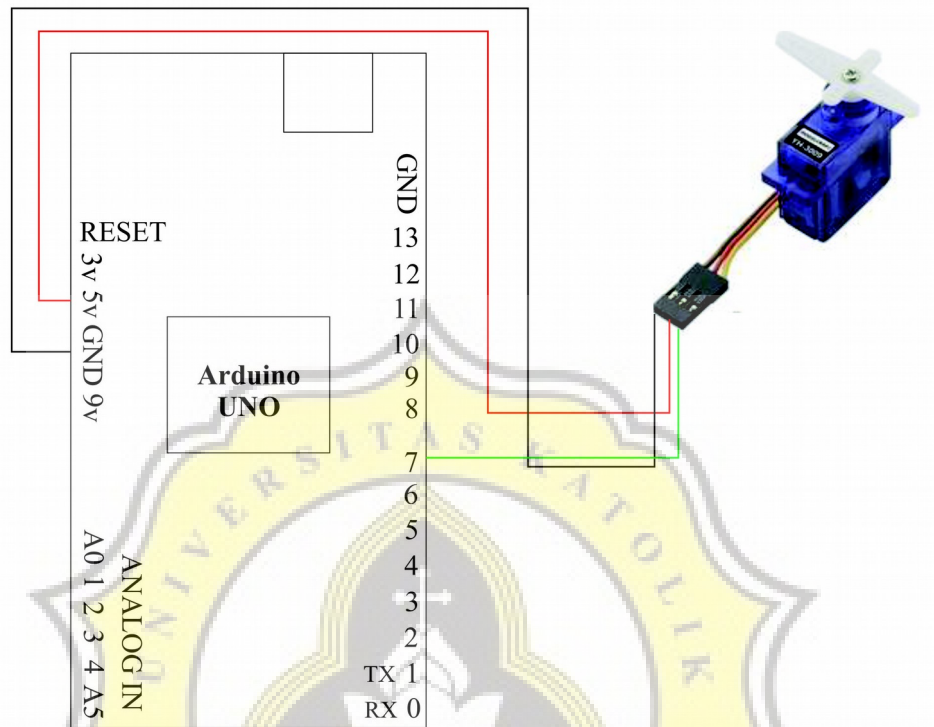


Illustration 4.7: Arsitekture Motor Servo

At the location of Garage applied a motor servo, where motor servo connected with pin 7 Arduino UNO. Motor servo serves to open or close the garage door, where motor servo is controlled using Node RED just like LED. The workings of this motor servo is that Arduino will subscribe on the MQTT server to receive messages sent from Node RED.

4.2 Desain

The design flowchart made in completing the project, as shown below:

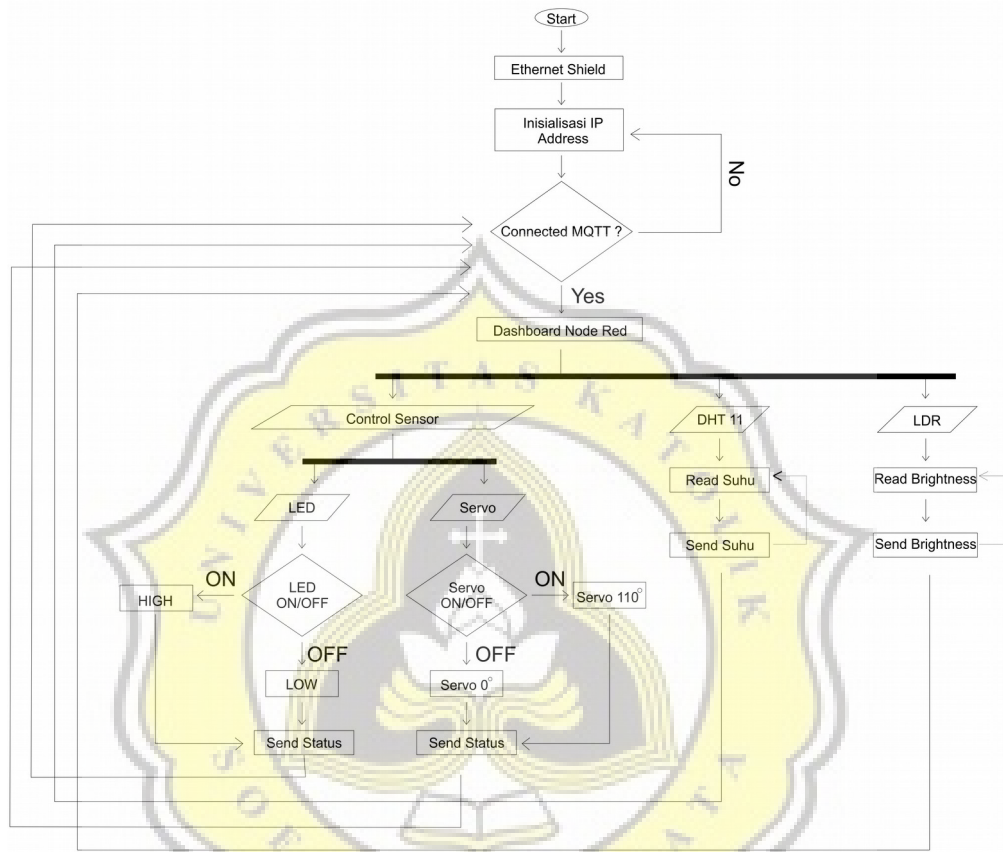


Illustration 4.8: Flowchart System

From the system Flowchart above, illustrated that the ethernet shield connected to the Arduino, connected to the Access Point or not. If the Ethernet shield is connected to the Internet and get ip address, then the components connected to the pin Arduino Uno or Ethernet shield will be active. And if the Ethernet Shield is not connected or does not obtain an IP Address, then Ethernet will reconnect until connected to the internet to be able to run the hardware component Arduino.

When Ethernet shield is connected or get IP Address, arduino hardware components can be run through Node Red. From the flowchart above, illustrated commands from Node Red are only done to control the LED and Servo, As for

DHT 11 and LDR Sensor only for temperature monitoring and monitoring of living room 2 LED.

The command for LED from Node Red, when Node Red publish message ON on MQTT server, then the LED that subscribe to the topic in publish will ON, and when Node Red publish message OFF on MQTT server, then the subscribe LED will OFF. As for the motor servo, the concept is the same as LED, when Node Red publish message ON on MQTT server, servo will rotate 110 degrees, and when Node Red publish message OFF on MQTT server, then the servo will return to the previous position of 0 degrees.

For arduino hardware DHT11 and LDR sensors, when the Ethernet shield is connected to the internet, then DHT11 and LDR sensor will directly read the temperature and read the brightness of LED light, and send or publish on the MQTT server. To monitor temperature and LEDs that have been sent on the MQTT server, on the Red Node will be updated automatically.

