IoT & Automation Lab. Record

**Lab#1**

**Blinking the InBuilt LED**

void setup() {

pinMode(LED\_BUILTIN, OUTPUT);

}

void loop() {

digitalWrite(LED\_BUILTIN, HIGH);

delay(500);

digitalWrite(LED\_BUILTIN, LOW);

delay(500);

****}

[**Wokwi Link #1.0**](https://wokwi.com/projects/406490864427470849)

**Lab#2**

**Blinking an External LED ( Red ) w/ Resistor**

#define light 12

void setup() {

  pinMode(light, OUTPUT);

}

void loop() {

  digitalWrite(light, HIGH);

  delay(200);

  digitalWrite(light, LOW);

  delay(500);

  }

****

[**Wokwi Link #1**](https://wokwi.com/projects/406483824958897153)

**Lab#3**

**Using a Digital Humidity & Temperature Sensor**

#include <DHT.h>

#define light 7

#define DHTTYPE DHT22

DHT dht(light, DHTTYPE);

float humid, temp;

void setup() {

  Serial.begin(9600);

  dht.begin();

}

void loop() {

  delay(200);

  humid = dht.readHumidity();

  temp = dht.readTemperature();

  Serial.print("Humidity: ");

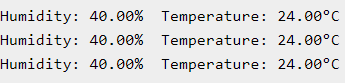
  Serial.print(humid);

  Serial.print(" %  Temperature: ");

  Serial.print(temp);

  Serial.println("°C");

  delay(1000);

}

[**Wokwi Link #2**](https://wokwi.com/projects/406487282785269761)

**Lab#4**

**Configuring MQTT Service in my Machine**

* **In SystemOS [ Windows11 ]:**

- Installed Mosquitto as a Service from Official Eclipse Page [ <https://mosquitto.org/download/> ].

- *This allows the MQTT Broker to run automatically in the background*.

- **Added** mosquittio.exe to the **System Environment Variables PATH** [ ' *C:\Program Files\mosquitto* ' ], which **allows** us to use **MQTT commands** directly in the *Command Prompt* or, *Terminal*.

* Starting @ boot byDefault:

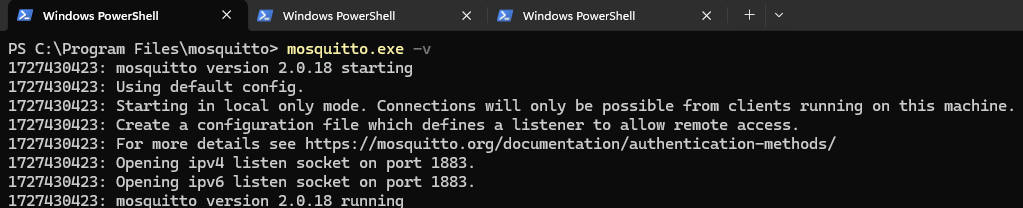
**net start mosquitto**

* Stopping:

In **Elevated** CMD > **net stop mosquitto**

* For Transmission: Navigate to [ **cd C:/Program Files/mosquitto** ]

**mosquitto.exe -v**

 *// -v is a Verbose Output flag, that enables us to see the backend processes, log messages, that'd help us to debug whenever necessary.*

* **In Linux [ WSL\*: Ubuntu 22.04 LTS ]:**

- In Terminal > **wsl --install -d Ubuntu-22.04** > \ E / N \ T / E \ R /

- Restart the machine, and Launch Ubuntu 22.04

- **$sudo apt update**

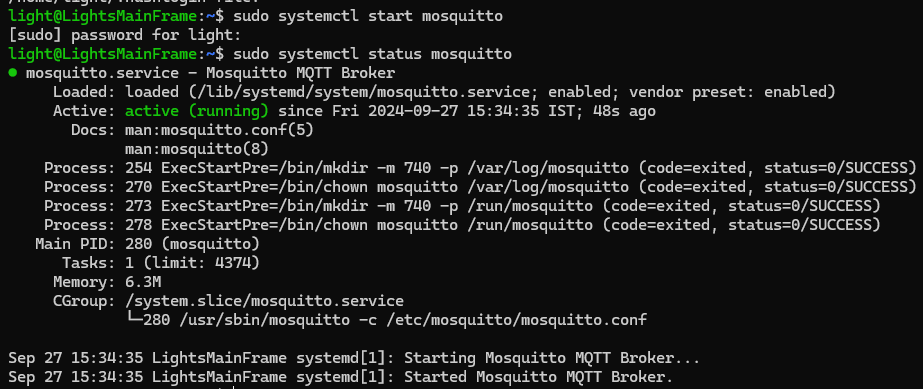
- **$sudo apt install mosquitto mosquitto-clients**

* Starting mosquitto services:

- **$sudo systemctl ( enable /start ) mosquitto**

* Mosquitto Broker Service Status can be checked here:

- **$sudo systemctl status mosquitto**



- Once verified service status, transmission can be carried on.

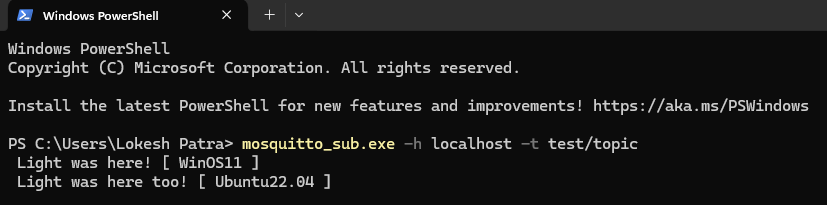
* Stopping mosquitto services:

- **$sudo systemctl stop mosquitto**

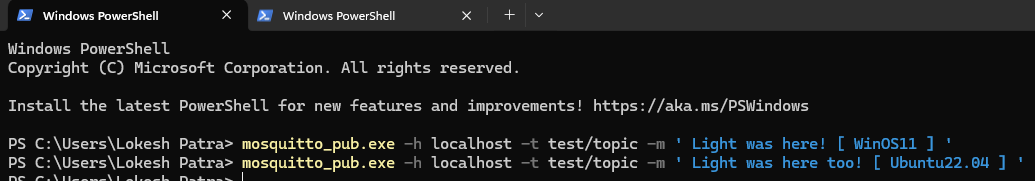
* **Testing MQTT Services [ Message Transmission: WinOS11 + Ubuntu 22.04 ]:**

- Open 2 Terminals:

# 1st: **mosquitto\_sub.exe -h localhost -t test/topic**



# 2nd: **mosquitto\_pub.exe -h localhost -t test/topic -m " Light was here! "**



\*Windows Subsystem for Linux