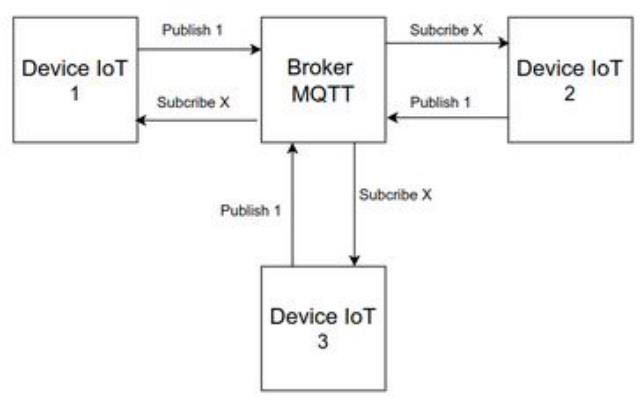
|  |  |  |
| --- | --- | --- |
| Nama | : Ludang Prasetyo Nugroho | [Teknik Komputer ( S1)](https://www.utdi.ac.id/) |
| Nim | 225510017 |  |
| Matkul | : Prak system IOT |  |

# # SOAL

# Buat Sistem kendali LED antar Device IoT dengan diagram sistem sebagai berikut



Masing-masing Device IoT menggunakan rangkaian Gambar 2. Device IoT 1 LED berkedip dikendalikan berdasar data dari Divice IoT 2 dan 3, Device IoT 2 LED berkedip dikendalikan berdasar data dari Divice IoT 1 dan 3, dan Device IoT 3 LED berkedip berdasar data dari Divice IoT 1 dan 2. Kedipnya LED dikendalikan dengan mengirim/publish data 0 dan 1 dari masingmasing Device IoT.

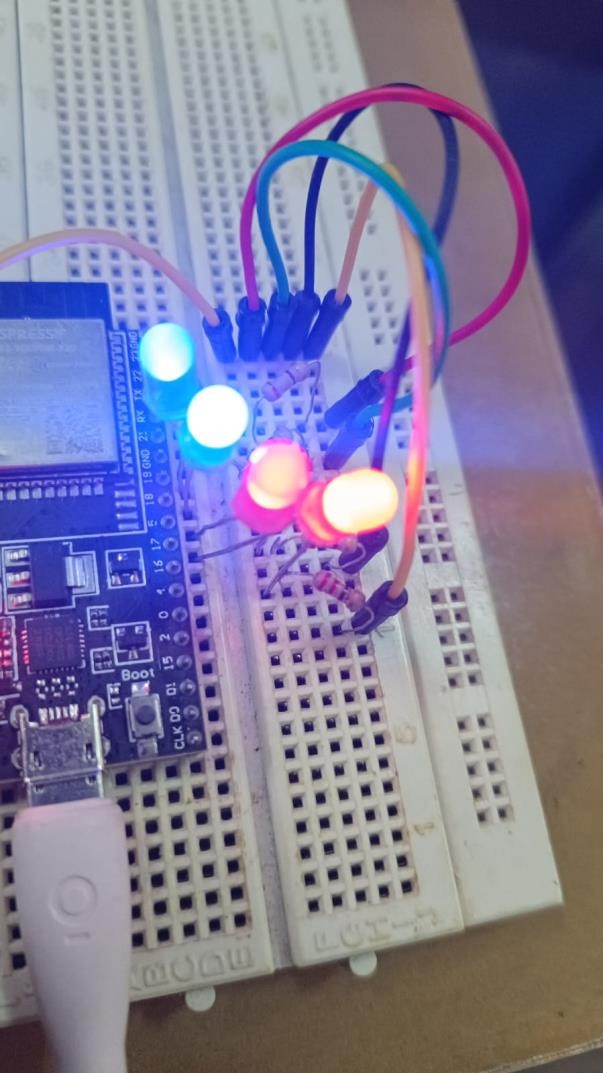
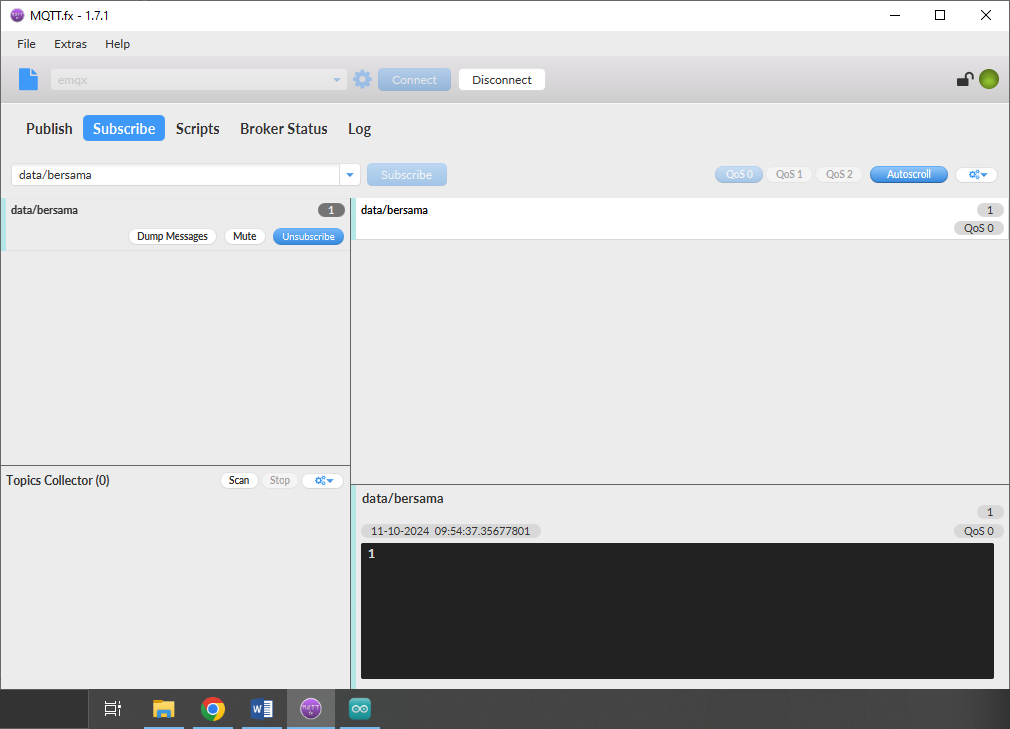
Buat struktur data yang dikirim untuk mengenali device IoT dan datanya.

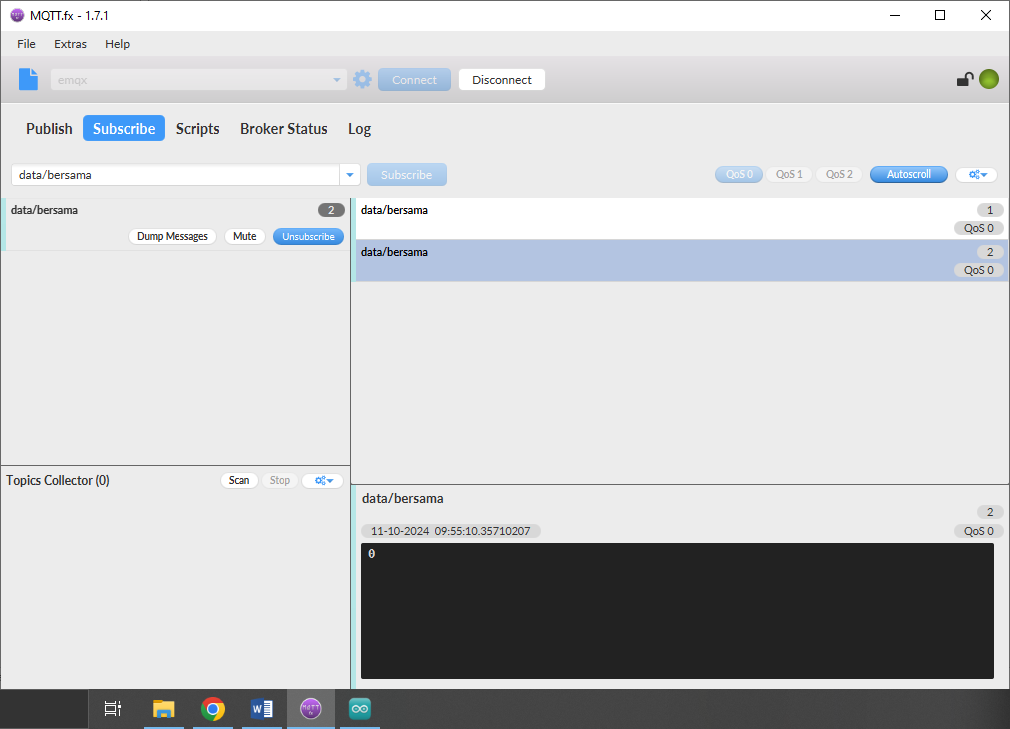
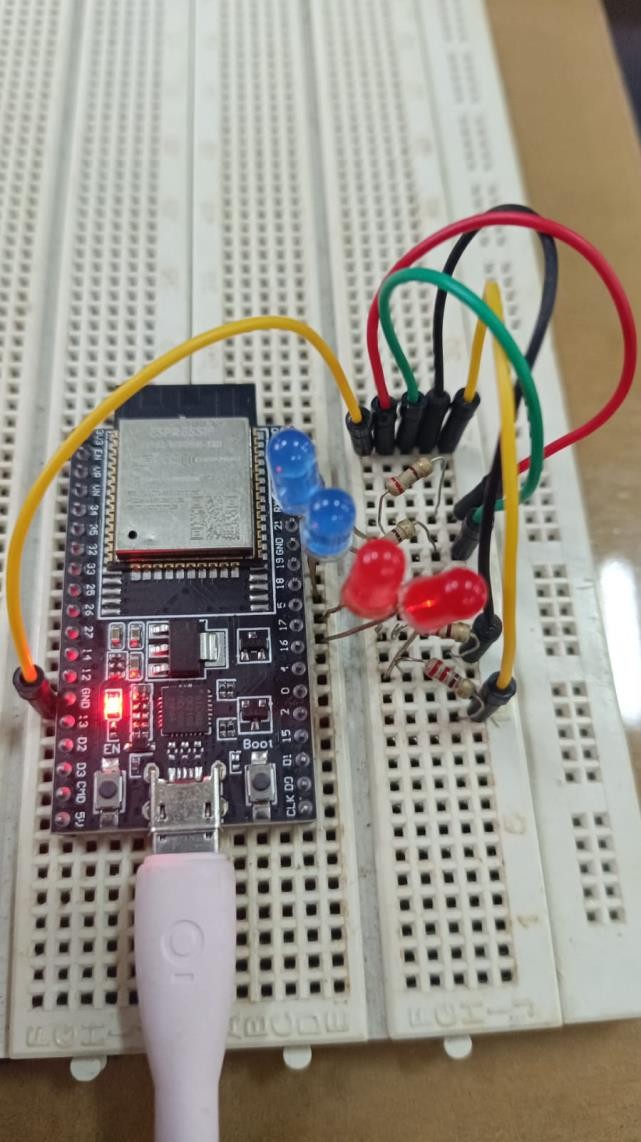
PRAKTEK & LATIHAN

**# PRAKTEK DI LEB**

Code program sat praktek di leb

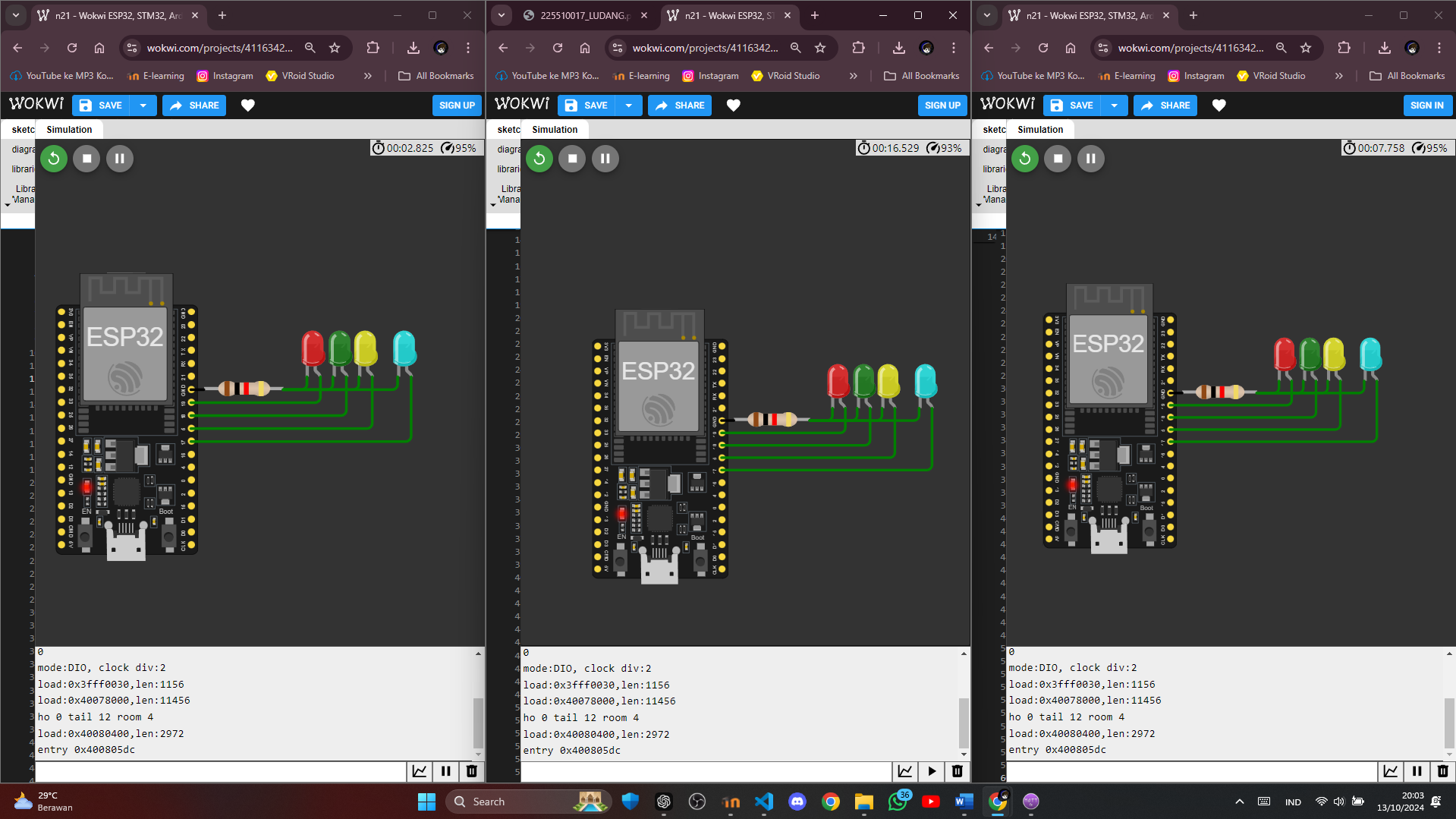
|  |
| --- |
| #include <WiFi.h> |
| #include <PubSubClient.h> |
|  |
| #define LED1 19 |
| #define LED2 18 |
| #define LED3 5 |
| #define LED4 17 |
|  |
| const char\* ssid = "RPLA\_2.4"; // Ganti dengan SSID WiFi Anda |
| const char\* password = "utdijogja"; // Ganti dengan password WiFi Anda |
| const char\* mqtt\_server = "broker.mqttdashboard.com"; // Alamat broker MQTT |
|  |
| WiFiClient espClient; |
| PubSubClient client(espClient); |
|  |
| void setup() { |
| Serial.begin(115200); |
|  |
| // Inisialisasi pin LED |
| pinMode(LED1, OUTPUT); |
| pinMode(LED2, OUTPUT); |
| pinMode(LED3, OUTPUT); |
| pinMode(LED4, OUTPUT); |
|  |
| // Matikan semua LED di awal |
| digitalWrite(LED1, LOW); |
| digitalWrite(LED2, LOW); |
| digitalWrite(LED3, LOW); |
| digitalWrite(LED4, LOW); |
|  |
| setupWiFi(); |
| client.setServer(mqtt\_server, 1883); |
| client.setCallback(callback); |
| } |
|  |
| void loop() { |
| if (!client.connected()) { |
| reconnect(); |
| } |
| client.loop(); |
| } |
|  |
| void setupWiFi() { |
| delay(10); |
| Serial.print("Menghubungkan ke "); |
| Serial.println(ssid); |
|  |
| WiFi.begin(ssid, password); |
| while (WiFi.status() != WL\_CONNECTED) { |
| delay(500); |
| Serial.print("."); |
| } |
|  |
| Serial.println(" Terhubung"); |
| Serial.print("IP address: "); |
| Serial.println(WiFi.localIP()); |
| } |
|  |
| void reconnect() { |
| while (!client.connected()) { |
| Serial.print("Menghubungkan ke MQTT..."); |
| if (client.connect("ESP32Client")) { |
| Serial.println("Terhubung"); |
| client.subscribe("data/bersama"); |
| } else { |
| Serial.print("Gagal, kode rc="); |
| Serial.print(client.state()); |
| delay(2000); |
| } |
| } |
| } |
|  |
| void callback(char\* topic, byte\* payload, unsigned int length) { |
| payload[length] = '\0'; // Menambahkan null terminator |
| String message = String((char\*)payload); |
|  |
| Serial.print("Pesan diterima: "); |
| Serial.println(message); |
|  |
| // Mengendalikan LED berdasarkan pesan |
| if (message.length() >= 4) { |
| digitalWrite(LED1, message[0] == '1' ? HIGH : LOW); |
| digitalWrite(LED2, message[1] == '1' ? HIGH : LOW); |
| digitalWrite(LED3, message[2] == '1' ? HIGH : LOW); |
| digitalWrite(LED4, message[3] == '1' ? HIGH : LOW); |
| } |
| } |





# PRAKTEK DI RUMAH

Rangkaian dengan wokwi



Kiri device 1 , tengah device 2 , kanan device 3

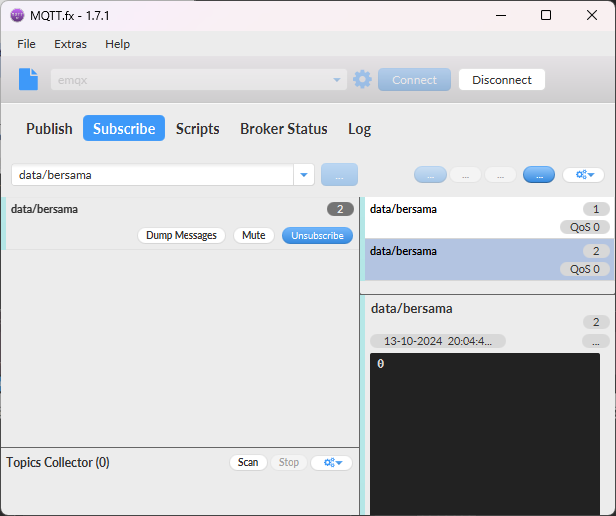
**# Code device 1 yang Subscribe dan public**

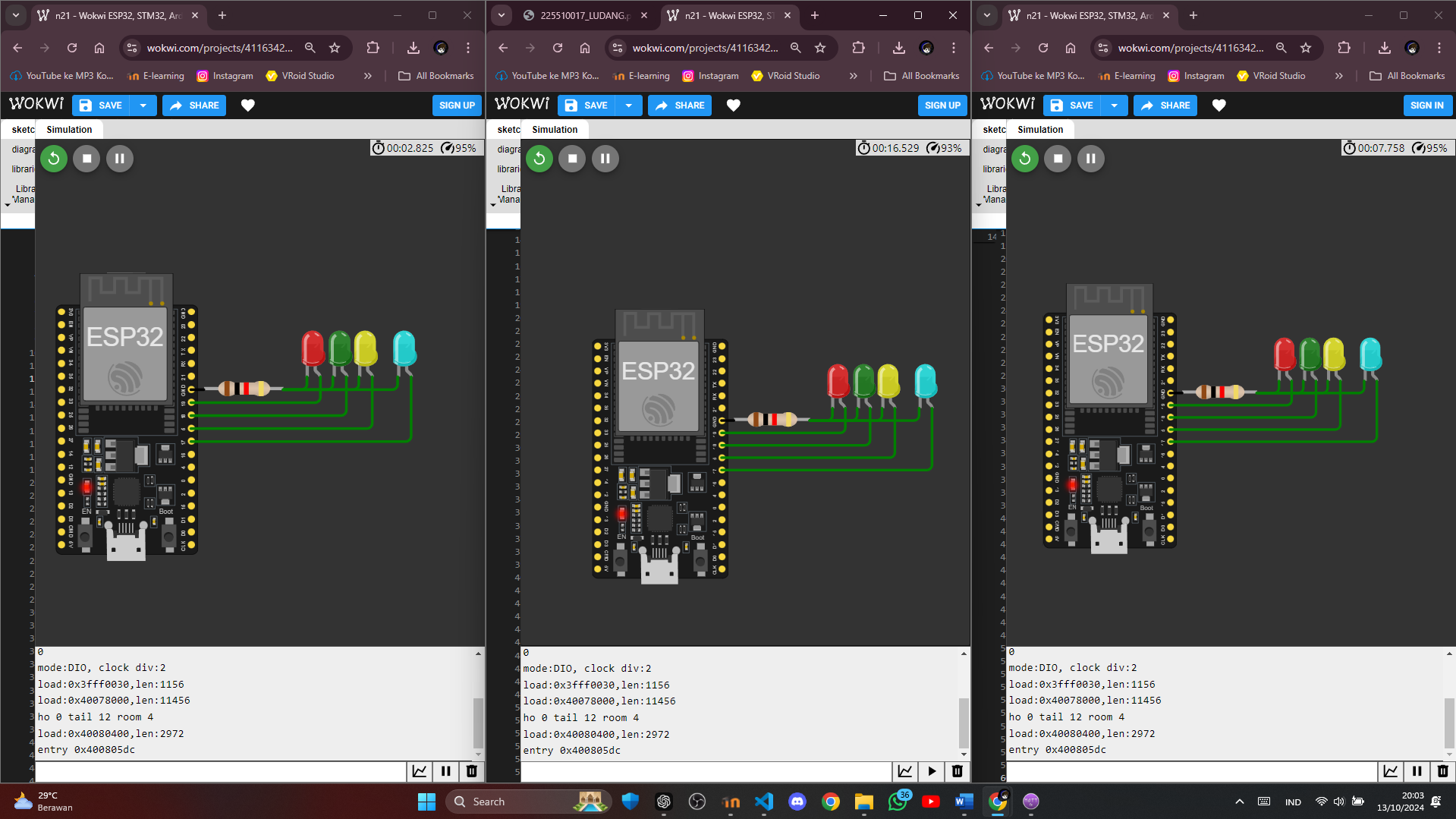
|  |
| --- |
| #include <WiFi.h> |
| #include <PubSubClient.h> |
| #define LED1 19 |
| #define LED2 18 |
| #define LED3 5 |
| #define LED4 17 |
|  |
| *const* *char*\* ssid = "N21\_WERE"; *// Ganti dengan SSID WiFi Anda* |
| *const* *char*\* password = "081328400060"; *// Ganti dengan password WiFi Anda* |
| *const* *char*\* mqtt\_server = "broker.mqttdashboard.com"; *// Alamat broker MQTT* |
|  |
| WiFiClient espClient; |
| PubSubClient client(espClient); |
|  |
| *void* setup() { |
| Serial.begin(115200); |
|  |
| *// Inisialisasi pin LED* |
| pinMode(LED1, OUTPUT); |
| pinMode(LED2, OUTPUT); |
| pinMode(LED3, OUTPUT); |
| pinMode(LED4, OUTPUT); |
|  |
| *// Matikan semua LED di awal* |
| digitalWrite(LED1, LOW); |
| digitalWrite(LED2, LOW); |
| digitalWrite(LED3, LOW); |
| digitalWrite(LED4, LOW); |
|  |
| setupWiFi(); |
| client.setServer(mqtt\_server, 1883); |
| client.setCallback(callback); |
| } |
|  |
| *void* loop() { |
| if (!client.connected()) { |
| reconnect(); |
| } |
| client.loop(); |
|  |
| *// Contoh publish data secara berkala* |
| *static* *unsigned* *long* lastMsg = 0; |
| if (millis() - lastMsg > 5000) { *// Publish setiap 5 detik* |
| lastMsg = millis(); |
| String payload = "1100"; *// Contoh pesan* |
| client.publish("data/bersama", payload.c\_str()); |
| } |
| } |
|  |
| *void* setupWiFi() { |
| delay(10); |
| Serial.print("Menghubungkan ke "); |
| Serial.println(ssid); |
| WiFi.begin(ssid, password); |
|  |
| while (WiFi.status() != WL\_CONNECTED) { |
| delay(500); |
| Serial.print("."); |
| } |
|  |
| Serial.println(" Terhubung"); |
| Serial.print("IP address: "); |
| Serial.println(WiFi.localIP()); |
| } |
|  |
| *void* reconnect() { |
| while (!client.connected()) { |
| Serial.print("Menghubungkan ke MQTT..."); |
| if (client.connect("ESP32Client")) { |
| Serial.println("Terhubung"); |
| client.subscribe("data/bersama"); |
| } else { |
| Serial.print("Gagal, kode rc="); |
| Serial.print(client.state()); |
| delay(2000); |
| } |
| } |
| } |
|  |
| *void* callback(*char\** *topic*, byte*\** *payload*, *unsigned* *int* *length*) { |
| payload[length] = '\0'; *// Menambahkan null terminator* |
| String message = String((*char*\*)payload); |
| Serial.print("Pesan diterima: "); |
| Serial.println(message); |
|  |
| *// Mengendalikan LED berdasarkan pesan* |
| if (message.length() >= 4) { |
| digitalWrite(LED1, message[0] == '1' ? HIGH : LOW); |
| digitalWrite(LED2, message[1] == '1' ? HIGH : LOW); |
| digitalWrite(LED3, message[2] == '1' ? HIGH : LOW); |
| digitalWrite(LED4, message[3] == '1' ? HIGH : LOW); |
| } |
| } |

**Code device 2 dan 3 yang menerima data dari subscribe devace 1**

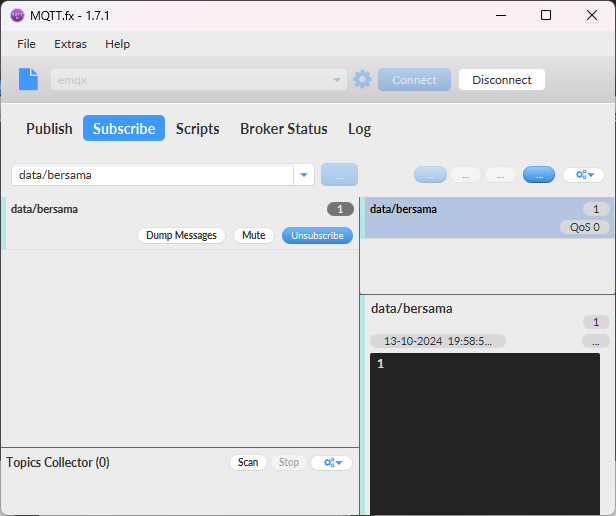
|  |
| --- |
| #include <WiFi.h> |
| #include <PubSubClient.h> |
| #define LED1 19 |
| #define LED2 18 |
| #define LED3 5 |
| #define LED4 17 |
|  |
| *const* *char*\* ssid = "N21\_WERE"; *// Ganti dengan SSID WiFi Anda* |
| *const* *char*\* password = "081328400060"; *// Ganti dengan password WiFi Anda* |
| *const* *char*\* mqtt\_server = "broker.mqttdashboard.com"; *// Alamat broker MQTT* |
|  |
| WiFiClient espClient; |
| PubSubClient client(espClient); |
|  |
| *void* setup() { |
| Serial.begin(115200); |
|  |
| *// Inisialisasi pin LED* |
| pinMode(LED1, OUTPUT); |
| pinMode(LED2, OUTPUT); |
| pinMode(LED3, OUTPUT); |
| pinMode(LED4, OUTPUT); |
|  |
| *// Matikan semua LED di awal* |
| digitalWrite(LED1, LOW); |
| digitalWrite(LED2, LOW); |
| digitalWrite(LED3, LOW); |
| digitalWrite(LED4, LOW); |
|  |
| setupWiFi(); |
| client.setServer(mqtt\_server, 1883); |
| client.setCallback(callback); |
| } |
|  |
| *void* loop() { |
| if (!client.connected()) { |
| reconnect(); |
| } |
| client.loop(); |
| } |
|  |
| *void* setupWiFi() { |
| delay(10); |
| Serial.print("Menghubungkan ke "); |
| Serial.println(ssid); |
| WiFi.begin(ssid, password); |
|  |
| while (WiFi.status() != WL\_CONNECTED) { |
| delay(500); |
| Serial.print("."); |
| } |
|  |
| Serial.println(" Terhubung"); |
| Serial.print("IP address: "); |
| Serial.println(WiFi.localIP()); |
| } |
|  |
| *void* reconnect() { |
| while (!client.connected()) { |
| Serial.print("Menghubungkan ke MQTT..."); |
| if (client.connect("ESP32Client")) { |
| Serial.println("Terhubung"); |
| client.subscribe("data/bersama"); *// Hanya subscribe, tidak publish* |
| } else { |
| Serial.print("Gagal, kode rc="); |
| Serial.print(client.state()); |
| delay(2000); |
| } |
| } |
| } |
|  |
| *void* callback(*char\** *topic*, byte*\** *payload*, *unsigned* *int* *length*) { |
| payload[length] = '\0'; *// Menambahkan null terminator* |
| String message = String((*char*\*)payload); |
| Serial.print("Pesan diterima: "); |
| Serial.println(message); |
|  |
| *// Mengendalikan LED berdasarkan pesan* |
| if (message.length() >= 4) { |
| digitalWrite(LED1, message[0] == '1' ? HIGH : LOW); |
| digitalWrite(LED2, message[1] == '1' ? HIGH : LOW); |
| digitalWrite(LED3, message[2] == '1' ? HIGH : LOW); |
| digitalWrite(LED4, message[3] == '1' ? HIGH : LOW); |
| } |
| } |

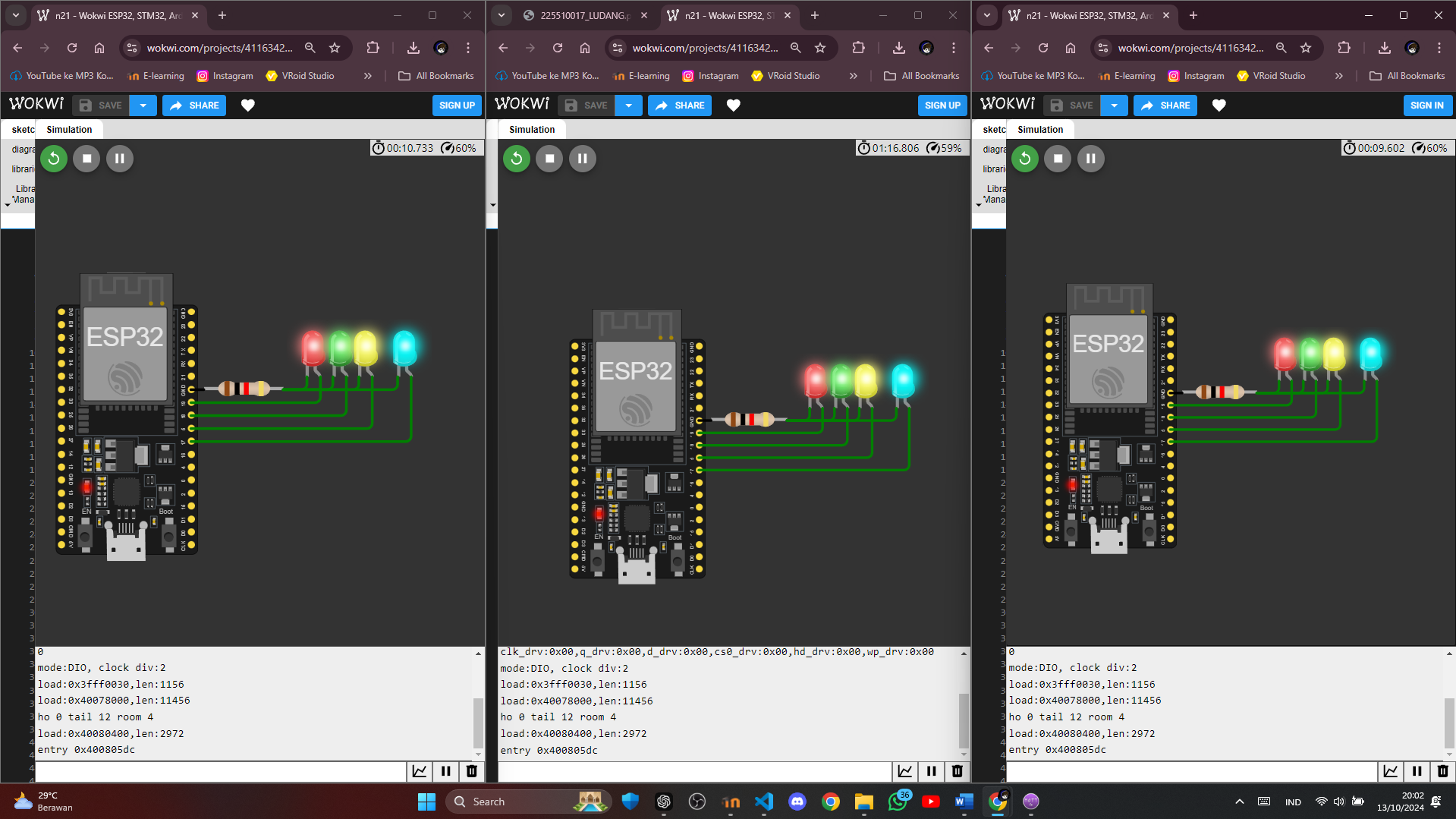
Saat memasukan ( 0 ) maka led akan mati dan yang lain juga ikut mati





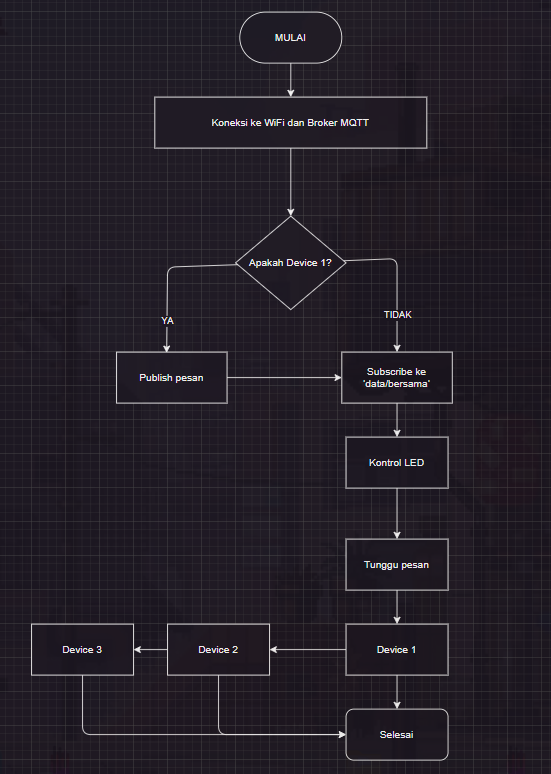
Saat memasukan ( 1 ) maka led akan Menyala dan yang lain juga ikut menyala karrena yang divace 2 dan 3 subscribe dari device 1 maka saat menerima data maka ke 3 device akan saling merespon





**# TUGAS**

**Diagram alir**

****