

การใช้งาน ThingsBoard IoTs Platform เพื่อสร้างและจัดการระบบอัจฉริยะ

ThingsBoard IoTs Platform for smart system

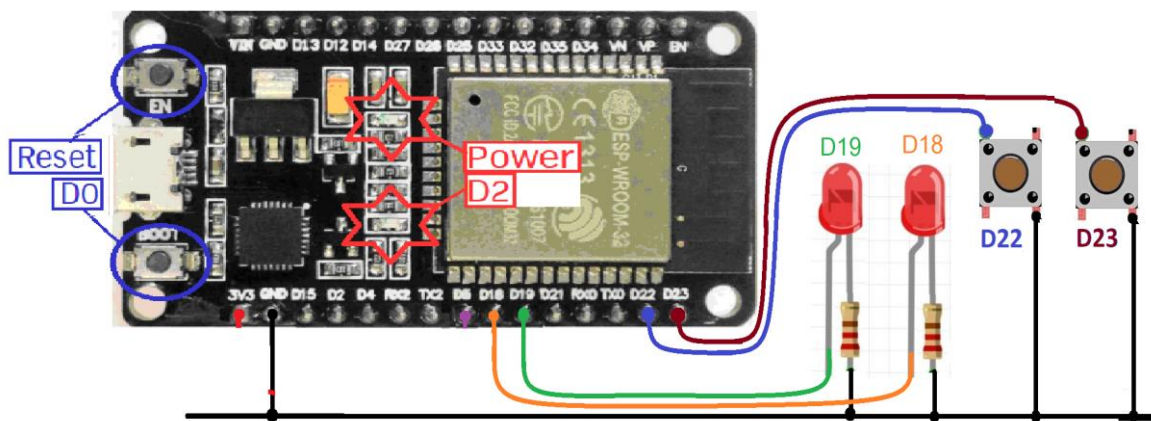
ชื่อ-สกุล : นางสาวเกษราภรณ์ เพชรนอก

รหัสนักศึกษา : B6216023

6/6 -- คำถามท้ายบทเพื่อทดสอบความเข้าใจ

Quiz_101 – กดติด กดดับ 2 ชุด

- หากต้องการให้ใช้ 1 สวิตช์ ควบคุม 1 LED แบบกดติด-กดดับ จำนวน 2 วงจรจะต้องวงจรและเขียนโปรแกรมอย่างไร {SW-D22 -- LED-D19, SW-D23 -- LED-D18}



โปรแกรมที่ใช้ทดสอบ : Arduino

```

EX01 | Arduino 1.8.19
File Edit Sketch Tools Help
EX01:1
#define pushButton1 22
#define LEDPin1 18
#define pushButton2 23
#define LEDPin2 19
int buttonState1 = 0;
int buttonState2 = 0;
void setup() {
  Serial.begin(115200);
  pinMode(pushButton1, INPUT_PULLUP);
  pinMode(LEDPin1, OUTPUT);
  pinMode(pushButton2, INPUT_PULLUP);
  pinMode(LEDPin2, OUTPUT);
}
void loop() {
  if (digitalRead(pushButton1) == LOW) {
    delay(20);
    buttonState1 = 1 - buttonState1;
    digitalWrite(LEDPin1, buttonState1);
    while (digitalRead(pushButton1) == LOW);
    delay(20);
  }
  if (digitalRead(pushButton2) == LOW) {
    delay(20);
    buttonState2 = 1 - buttonState2;
    digitalWrite(LEDPin2, buttonState2);
    while (digitalRead(pushButton2) == LOW);
    delay(20);
  }
}
}

Saving...
Hard resetting via RTS pin...

```

#define pushButton1 22

#define LEDPin1 18

#define pushButton2 23

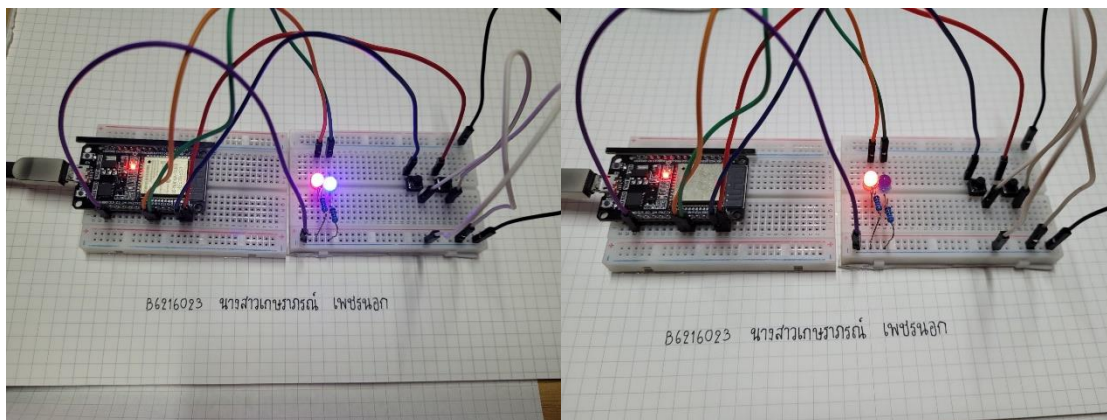
#define LEDPin2 19

```

int buttonState1 = 0;
int buttonState2 = 0;
void setup() {
  Serial.begin(115200);
  pinMode(pushButton1, INPUT_PULLUP);
  pinMode(LEDPin1, OUTPUT);
  pinMode(pushButton2, INPUT_PULLUP);
  pinMode(LEDPin2, OUTPUT);
}
void loop() {
  if (digitalRead(pushButton1) == LOW) {
    delay(20);
    buttonState1 = 1 - buttonState1;
    digitalWrite(LEDPin1, buttonState1);
    while (digitalRead(pushButton1) == LOW);
    delay(20);
  }
  if (digitalRead(pushButton2) == LOW) {
    delay(20);
    buttonState2 = 1 - buttonState2;
    digitalWrite(LEDPin2, buttonState2);
    while (digitalRead(pushButton2) == LOW);
    delay(20);
  }
}

```

รูปการทดสอบ



Quiz_102 – Web Control 4 LED and Monitor Humid/Temperature

- เพิ่มเติมจาก Q202 อยากได้ปุ่มสำหรับคุมปิด-เปิด หลอดไฟ LED 4 ดวง
- อยากมีกิด Link ไปที่หน้า FB ของตัวเอง
- https://www.colorhexa.com/008cba?fbclid=IwAR3dIZ_gRgDWmREmnzukuLbMxV3pOHY4YIPuLEz8-ZzTOX2VhWxcH2QjLGk



The ESP-32 Update web page without refresh

LED1 ON LED2 ON LED3 ON LED4 ON

LED1 OFF LED2 OFF LED3 OFF LED4 OFF

State of [LED1, LED2, LED3, LED4] is >> ON, OFF, OFF, ON

DHT-22 sensor : Temp = 28.10 C, Humidity = 43.90 %

By [Wichai Srisuruk](#)

โปรแกรมที่ใช้ทดสอบ

```

ESP31 Arduino IDE
File Edit Sketch Tools Help

ESP31

if (t_state == "40") {
  digitalWrite(testLED4, LOW); //Feedback parameter
  ledState4 = "OFF";
}
server.send(200, "text/plain", ledState1 + ", " + ledState2 + ", " + ledState3 + ", " +
  ledState4);
//Send web page
}

void setup(void) {
  Serial.begin(115200);
  dht.setup(DHT_Pin, DHTtype); // DHT_Pin D4, DHT22
  pinMode(testLED1, OUTPUT);
  pinMode(testLED2, OUTPUT);
  pinMode(testLED3, OUTPUT);
  pinMode(testLED4, OUTPUT);
  Serial.print("\n\nConnect to ");
  Serial.println(testId);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500); Serial.print(".");
  }
  Serial.print("\n\nConnected "); Serial.println(ssid);
  Serial.print("IP address: "); Serial.println(WiFi.localIP());
  server.on("/", handleRoot);
  server.on("/testLED", handleLED);
  server.on("/readDHT", handleDHT);
  server.begin();
  Serial.println("HTTP server started");
}

void loop(void) {
  server.handleClient(); //Handle client requests
}

```

uploading...

led running via SPI pin...

Code

```

#include <WiFi.h>
#include <WiFiClient.h>
#include <WebServer.h>

```

```

#include "DHTesp.h"
#include "index.h"
#define DHT_Pin 4
#define testLED1 18
#define testLED2 19
#define testLED3 22
#define testLED4 23
//SSID and Password of your WiFi router
const char* ssid = "ABC";
const char* password = "072152072152";
WebServer server(80); //Server on port 80
DHTesp dht;
String ledState1 = "NA";
String ledState2 = "NA";
String ledState3 = "NA";
String ledState4 = "NA";

//=====
// This routine is executed when you open its IP in browser
//=====

void handleRoot() {
String s = MAIN_page; //Read HTML contents
server.send(200, "text/html", s); //Send web page
}

void handleADC() {
float h = dht.getHumidity();
float t = dht.getTemperature();
String tmpValue = "Temp = ";
tmpValue += String(t) + " C, Humidity = ";
tmpValue += String(h) + " %";
server.send(200, "text/plain", tmpValue); //Send value to client ajax request
}

void handleLED() {
String t_state = server.arg("LEDstate"); //Refer
xhttp.open("GET", "setLED?LEDstate="+led, true);
Serial.println(t_state);
if (t_state == "11") {
digitalWrite(testLED1, HIGH); //Feedback parameter

```

```

ledState1 = "ON";
}
if (t_state == "10") {
digitalWrite(testLED1, LOW); //Feedback parameter
ledState1 = "OFF";
}
if (t_state == "21") {
digitalWrite(testLED2, HIGH); //Feedback parameter
ledState2 = "ON";
}
if (t_state == "20") {
digitalWrite(testLED2, LOW); //Feedback parameter
ledState2 = "OFF";
}
if (t_state == "31") {
digitalWrite(testLED3, HIGH); //Feedback parameter
ledState3 = "ON";
}
if (t_state == "30") {
digitalWrite(testLED3, LOW); //Feedback parameter
ledState3 = "OFF";
}
if (t_state == "41") {
digitalWrite(testLED4, HIGH); //Feedback parameter
ledState4 = "ON";
}
if (t_state == "40") {
digitalWrite(testLED4, LOW); //Feedback parameter
ledState4 = "OFF";
}
server.send(200, "text/plain", ledState1 + ", " + ledState2 + ", " + ledState3 + ", " +
ledState4);
//Send web page
}
void setup(void) {
Serial.begin(115200);
dht.setup(DHT_Pin, DHTesp::DHT22); // DHT_Pin D4, DHT22
pinMode(testLED1, OUTPUT);

```

```

pinMode(testLED2, OUTPUT);
pinMode(testLED3, OUTPUT);
pinMode(testLED4, OUTPUT);
Serial.print("\n\nConnect to ");
Serial.println(ssid);
WiFi.begin(ssid, password);
while (WiFi.status() != WL_CONNECTED) {
  delay(500); Serial.print(".");
}
Serial.print("\nConnected "); Serial.println(ssid);
Serial.print("IP address: "); Serial.println(WiFi.localIP());
server.on("/", handleRoot);
server.on("/setLED", handleLED);
server.on("/readADC", handleADC);
server.begin();
Serial.println("HTTP server started");
}
void loop(void) {
  server.handleClient(); //Handle client requests
}

```

Code (index.h)

```

const char MAIN_page[] PROGMEM = R"=====(
<!DOCTYPE html><html><body><div id="demo">
<h1>The ESP-32 Update web page without refresh</h1>
<button type="button" onclick="sendData(11)" style="background:
rgb(202,60,60);">LED1 ON</button>
<button type="button" onclick="sendData(21)" style="background:
rgb(202,60,60);">LED2 ON</button>
<button type="button" onclick="sendData(31)" style="background:
rgb(202,60,60);">LED3 ON</button>
<button type="button" onclick="sendData(41)" style="background:
rgb(202,60,60);">LED4 ON</button><br><br>
<button type="button" onclick="sendData(10)" style="background:
rgb(100,116,255);">LED1 OFF</button>
<button type="button" onclick="sendData(20)" style="background:
rgb(100,116,255);">LED2 OFF</button>
<button type="button" onclick="sendData(30)" style="background:
rgb(100,116,255);">LED3 OFF</button>
<button type="button" onclick="sendData(40)" style="background:
rgb(100,116,255);">LED4 OFF</button><br><br>
)====="

```

```

State of [LED1, LED2,LED3,LED4] is >> <span
id="LEDState">NA</span><br></div><div><br>
DHL-22 sensor : <spanid="ADCValue">0</span><br></div><script>
function sendData(led) {
var xhttp = new XMLHttpRequest();
xhttp.onreadystatechange = function() {
if (this.readyState == 4 && this.status == 200) {
document.getElementById("LEDState").innerHTML =
this.responseText;
}
};
xhttp.open("GET", "setLED?LEDstate="+led, true);
xhttp.send();
}
setInterval(function() {
// Call a function repetatively with 2 Second interval
getData();
}, 2000); //2000mSeconds update rate
function getData() {
var xhttp = new XMLHttpRequest();
xhttp.onreadystatechange = function() {
if (this.readyState == 4 && this.status == 200) {
document.getElementById("ADCValue").innerHTML =
this.responseText;
}
};
xhttp.open("GET", "readADC", true);
xhttp.send();
}
</script>

<br><a href="https://web.facebook.com/profile.php?id=100000723050860">FB : EYE
CHEKA KASSARAPRON</a>
</body>
</html>
)=====";

```

รูปถ่ายหน้า Web Browser

The ESP-32 Update web page without refresh

LED1 ON LED2 ON LED3 ON LED4 ON

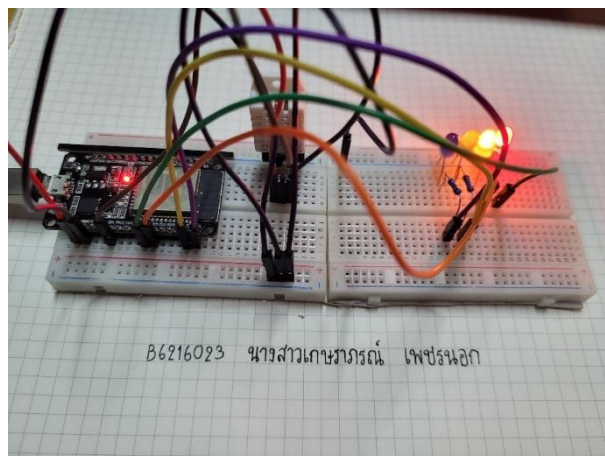
LED1 OFF LED2 OFF LED3 OFF LED4 OFF

State of [LED1, LED2, LED3, LED4] is >> OFF, OFF, OFF, OFF

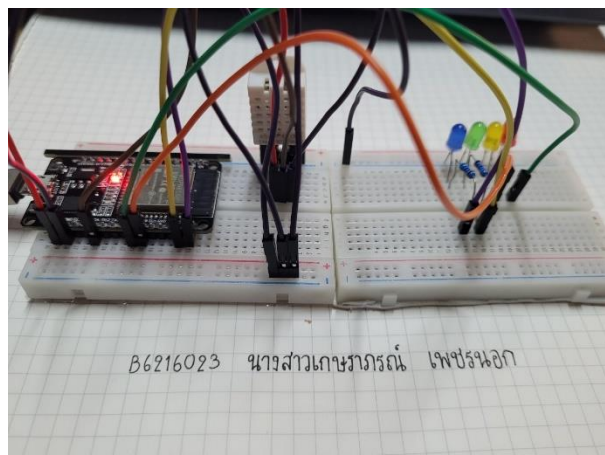
DHL-22 sensor : 0

[FB : EYE CHEKA KASSARAPRON](#)

รูปการทดสอบ 1

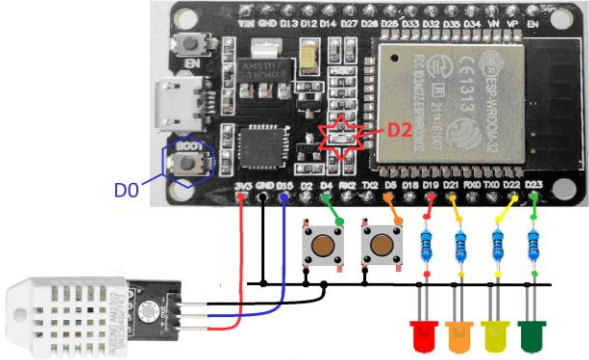



รูปการทดสอบ 2



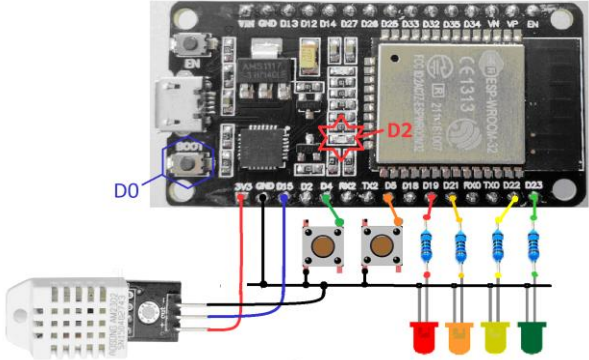

Quiz_103 – Pub/Sub Data from (DHT22 + 4 LED + 2 Switch)

- อ่านค่า DHT-22 แล้วส่งไปยัง MQTT Broker ทุกๆ 5 วินาที
- กำหนดให้ใช้ mqtt.eclipse.org เป็น Broker
- ควบคุมการปิดเปิด 4 LED
- รับค่าสวิตช์กำหนด SW1 แจ้ง Overheat Alarm, SW2 แจ้ง Intruders Alarm

| | |
|---|--|
|  |  |
| โปรแกรมที่ใช้ทดสอบ | |
| รูปหน้าจอ MQTT Lens | |
| รูปการต่อวงจร – 1 | |
| รูปการต่อวงจร – 2 | |

Quiz_104 – Blynk and LINE from (DHT22 + 4 LED + 2 Switch)

- ควบคุมการปิดเปิด 4 LED
- อ่านค่า DHT-22 แล้วส่งไปยัง Blynk ทุกๆ 5 วินาที
- บันทึกค่าไปยัง Google Sheet
- หากอุณหภูมิเกิน 28°C ให้แจ้งไปยัง LINE
- รับคำสั่งสวิตช์กำหนด SW1 แจ้ง Overheat Alarm, SW2 แจ้ง Intruders Alarm ไปยัง LINE

| | |
|---|--|
|  |  |
| โปรแกรมที่ใช้ทดสอบ | |
| รูปหน้าจอ Blynk | |
| รูปหน้าจอ LINE | |
| รูปการต่อวงจร – 1 | |
| รูปการต่อวงจร – 2 | |