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| **แนวทางการใช้งานอินเทอร์เน็ตของสรรพสิ่งในระบบการผลิต**  **IoT Approaches to Manufacturing System** |
| **ขื่อ-สกุล : นายธนพล กาศักดิ์** |

**3/3. คำถามท้ายบทเพื่อทดสอบความเข้าใจ**

**Quiz\_301 – 4 External LED Control**

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| #define BLYNK\_PRINT Serial  #include <WiFi.h>  #include <WiFiClient.h>  #include <BlynkSimpleEsp32.h>  char auth[] = "gOVELUAYorH-U-5YCExxEemXYjjhcl1S";  const char\* ssid = "iPhoneOhm";  const char\* password = "2444666668888888";  void setup()  {  // Debug console  Serial.begin(115200);  Blynk.begin(auth, ssid, pass);  }  void loop()  {  Blynk.run();  } |
| **รูปหน้าจอ Blynk** |
| **รูปการต่อวงจร – 1**  **A picture containing text, electrical supply, red, light  Description automatically generated** |
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**Quiz\_302 – DHT22 + 4 LED + 2 Switch**

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| **< Test Code >**  #define BLYNK\_PRINT Serial  #include <WiFi.h>  #include <WiFiClient.h>  #include <BlynkSimpleEsp32.h>  #include "DHTesp.h"  #define DHT22\_Pin 15  #define sw1 4  #define sw2 21  char auth[] = "gOVELUAYorH-U-5YCExxEemXYjjhcl1S";  const char\* ssid = "iPhoneOhm";  const char\* password = "2444666668888888";  DHTesp dht;  WidgetLED LED1(V2);  WidgetLED LED2(V3);  BlynkTimer timer;  void setup() {  Serial.begin(115200);  dht.setup(DHT22\_Pin, DHTesp::DHT22); // Connect DHT sensor to GPIO 15  pinMode(sw1, INPUT\_PULLDOWN);  pinMode(sw2, INPUT\_PULLDOWN);  Blynk.begin(auth, ssid, pass);  timer.setInterval(1000L, myTimerEvent);  }  void myTimerEvent() {  float humidity = dht.getHumidity();  float temperature = dht.getTemperature();  Blynk.virtualWrite(V0, temperature);  Blynk.virtualWrite(V1, humidity);  if (digitalRead(sw1)) LED1.on();  else LED1.off();  if (digitalRead(sw2)) LED2.on();  else LED2.off();  Serial.print(" Temp('C) >> "); Serial.print(temperature, 1);  Serial.print(", Humidity(%) >> "); Serial.println(humidity, 1);  }  void loop()  { Blynk.run();  timer.run(); // running timer every 250ms  } |
| **รูปหน้าจอ Blynk** |
| **รูปการต่อวงจร – 1** |
| **รูปการต่อวงจร – 2** |

**Quiz\_303 – Social Alert**

ทดสอบการส่งข้อมูลไป 🞎 LINE สำหรับสวิตซ์กด 3 ตัว

* + กดปุ่ม B ที่ต่อกับ ESP32– ให้ส่งข้อความ “Door Open Alarm”
  + กดปุ่ม C ที่ต่อกับ ESP32– ให้ส่งข้อความ “Intruders Alarm”

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| #include <WiFi.h>  #include <HTTPClient.h>  #define WIFI\_SSID "iPhoneOhm"  #define WIFI\_PASS "2444666668888888"  #define WebHooksKey "c6Dw2mHZ9znYfzd0i5Im4U\_wZEYKTCtNmV19i1dyUvI"  #define WebHooksEventName "ohm"  #define testSwitch1 22  #define testSwitch2 23  void setup() {  Serial.begin(115200);  WiFi.begin(WIFI\_SSID, WIFI\_PASS);  Serial.println("Connecting");  while (WiFi.status() != WL\_CONNECTED) {  delay(500);  Serial.print(".");  }  Serial.println("");  Serial.print("Connected to WiFi network with IP Address: ");  Serial.println(WiFi.localIP());  pinMode(testSwitch1, INPUT\_PULLUP);  pinMode(testSwitch2, INPUT\_PULLUP);  randomSeed(analogRead(33));  }  void loop() {  if (digitalRead(testSwitch1) == LOW) {  String serverName = "http://maker.ifttt.com/trigger/" +  String(WebHooksEventName) + "/with/key/" + String(WebHooksKey);  String httpRequestData = "value1=" + String("Door Open Alarm");  Serial.println("Server Name :" + serverName);  Serial.println("json httpRequestData :" + httpRequestData);  if (WiFi.status() == WL\_CONNECTED) {  HTTPClient http;  http.begin(serverName);  http.addHeader("Content-Type", "application/x-www-form-urlencoded");  int httpResponseCode = http.POST(httpRequestData);  Serial.print("HTTP Response code: ");  Serial.println(httpResponseCode);  http.end();  if (httpResponseCode == 200)  Serial.println("Successfully sent");  else  Serial.println("Failed!");  }  else {  Serial.println("WiFi Disconnected");  }  }  if (digitalRead(testSwitch2) == LOW) {  String serverName = "http://maker.ifttt.com/trigger/" +  String(WebHooksEventName) + "/with/key/" + String(WebHooksKey);  String httpRequestData = "value1=" + String("Intruders Alarm");  Serial.println("Server Name :" + serverName);  Serial.println("json httpRequestData :" + httpRequestData);  if (WiFi.status() == WL\_CONNECTED) {  HTTPClient http;  http.begin(serverName);  http.addHeader("Content-Type", "application/x-www-form-urlencoded");  int httpResponseCode = http.POST(httpRequestData);  Serial.print("HTTP Response code: ");  Serial.println(httpResponseCode);  http.end();  if (httpResponseCode == 200)  Serial.println("Successfully sent");  else  Serial.println("Failed!");  }  else {  Serial.println("WiFi Disconnected");  }  }  } |
| **รูปการต่อวงจร – 1** |
| **รูปการต่อวงจร – 2**  **A picture containing cable, electrical wiring, electronics, electronic engineering  Description automatically generated** |
| **รูปหน้าจอ LINE ผลการทดสอบ**  **A screenshot of a chat  Description automatically generated with medium confidence** |

**Quiz\_304 – Data Logger and Social Alarm**

* + ส่งข้อมูลอุณหภูมิไปยัง Google Spreadsheet (ทำแล้วในข้อ QB4)
  + หากอุณหภูมิที่อ่านได้เกิน 28’C ให้แจ้งเตือนผ่าน \_\_\_ และบอกด้วยว่าอุณหภูมิเท่าใด

🞎 SMS, 🞎 FB Page, 🞎 FB Massager, 🞎 Twitter, 🗹 LINE

* แสดงอุณหภูมิที่ 7\_Segment Display TM1638 Board

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| **< Test Code >**  #include <WiFi.h>  #include <HTTPClient.h>  #include <TM1638plus.h>  #define DHT22\_Pin 15  #include "DHTesp.h"  DHTesp dht;  #define WIFI\_SSID "iPhoneOhm"  #define WIFI\_PASS "2444666668888888"  #define WebHooksKey "c6Dw2mHZ9znYfzd0i5Im4U\_wZEYKTCtNmV19i1dyUvI"  #define WebHooksEventName "ohm"  #define WebHooksEventName\_line " ohm\_line"  #define My\_NAME "B6214005 Varasiri Limprasert"  #define Brd\_STB 18 // strobe = GPIO connected to strobe line of module  #define Brd\_CLK 19 // clock = GPIO connected to clock line of module  #define Brd\_DIO 21 // data = GPIO connected to data line of module  bool high\_freq = true; //default false,, If using a high freq CPU > ~100 MHZ set to true.  TM1638plus tm(Brd\_STB, Brd\_CLK , Brd\_DIO, high\_freq);  void setup() {  Serial.begin(115200);  tm.displayBegin();  dht.setup(DHT22\_Pin, DHTesp::DHT22); // Connect DHT sensor to GPIO 15  WiFi.begin(WIFI\_SSID, WIFI\_PASS);  Serial.println("Connecting");  while (WiFi.status() != WL\_CONNECTED) {  delay(500);  Serial.print(".");  }  Serial.println("");  Serial.print("Connected to WiFi network with IP Address: ");  Serial.println(WiFi.localIP());  }  void loop() {  float humidity = dht.getHumidity();  float temperature = dht.getTemperature();  Serial.println();  Serial.print("\nTemperature('C) = ");  Serial.print(temperature, 1);  Serial.print("\tHumidity(%) = ");  Serial.print(humidity, 1);  String serverName = "http://maker.ifttt.com/trigger/" +  String(WebHooksEventName) + "/with/key/" + String(WebHooksKey);  String httpRequestData = "value1=" + String(My\_NAME) + "&value2=" +  String(temperature) + "&value3=" +  String(humidity);  Serial.println();  Serial.println("Server Name >> " + serverName);  Serial.println("json httpRequestData >> " + httpRequestData);  if (WiFi.status() == WL\_CONNECTED) {  HTTPClient http;  http.begin(serverName);  http.addHeader("Content-Type", "application/x-www-form-urlencoded");  int httpResponseCode = http.POST(httpRequestData);  Serial.print("HTTP Response code: ");  Serial.println(httpResponseCode);  http.end();  if (httpResponseCode == 200)  Serial.println("[Google sheet] --> Successfully sent");  else  Serial.println("[Google sheet] --> Failed!");  }  else {  Serial.println("WiFi Disconnected");  }  /// if temp > 28 C send notifications >> line  if (temperature > 28) {  String serverName = "http://maker.ifttt.com/trigger/" +  String(WebHooksEventName\_line) + "/with/key/" + String(WebHooksKey);  String httpRequestData = "value1=" + String(temperature);  Serial.println();  Serial.println("Server Name >> " + serverName);  Serial.println("json httpRequestData >> " + httpRequestData);  if (WiFi.status() == WL\_CONNECTED) {  HTTPClient http;  http.begin(serverName);  http.addHeader("Content-Type", "application/x-www-form-urlencoded");  int httpResponseCode = http.POST(httpRequestData);  Serial.print("HTTP Response code: ");  Serial.println(httpResponseCode);  http.end();  if (httpResponseCode == 200)  Serial.println("[Line] --> Successfully sent");  else  Serial.println("[Line] --> Failed!");  }  else {  Serial.println("WiFi Disconnected");  }  }  /\*Display \*/  int t = int(temperature \* 100);  int Tempp2 = (int)temperature / 10; int Tempp1 = (int)temperature % 10; int Tempp0 =(int)(temperature \* 10) % 10;  int Humi2 = (int)humidity / 10; int Humi1 = (int)humidity % 10; int Humi0 =(int)(humidity \* 10) % 10;  tm.displayHex(0, Tempp2);  tm.displayASCIIwDot(1, Tempp1 + '0'); // turn on dot  tm.displayHex(2, Tempp0);  tm.display7Seg(3, B01011000); // Code=tgfedcba  tm.displayHex(4, Humi2);  tm.displayASCIIwDot(5, Humi1 + '0'); // turn on dot  tm.displayHex(6, Humi0);  tm.display7Seg(7, B01110100); // Code=tgfedcba  delay(2000);  int WaitTime = 60;  Serial.print(" >> Wait for next time --> ");  for (int i = WaitTime; i >= 0; i -= 5) {  Serial.print(",");  Serial.print(i);  delay(5000);  }  } |
| **รูปการต่อวงจร – 1** |
| **รูปการต่อวงจร – 2**  **A picture containing electronics, text, electronic engineering, electrical wiring  Description automatically generated** |
| **รูปหน้าจอ LINE ผลการทดสอบ** |