

SMARTBRIDGE EXTERNSHIP

Internet Of Things

ASSIGNMENT 3

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In wokwi add LED and switch on and off from node-red

Code:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQTT
#include "DHT.h"// Library for dht11
#define DHTPIN 15 // what pin we're connected to
#define DHTTYPE DHT22 // define type of sensor DHT 11
#define LED 2

DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of dht connected

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-----credentials of IBM Accounts-----
```

```

#define ORG "920spf"//IBM ORGANITION ID

#define DEVICE_TYPE "abcd"//Device type mentioned in ibm watson IOT Platform

#define DEVICE_ID "1234"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "12345678" //Token

String data3;

float h, t;


//----- Customise the above values -----

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name

char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and
format in which data to be send

char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd REPRESENT command type
AND COMMAND IS TEST OF FORMAT STRING

char authMethod[] = "use-token-auth";// authentication method

char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//-----

WiFiClient wifiClient; // creating the instance for wificlient

PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id by
passing parameter like server id,portand wificredential


void setup()// configureing the ESP32
{
    Serial.begin(115200);

```

```
dht.begin();  
pinMode(LED,OUTPUT);  
delay(10);  
Serial.println();  
wificonnect();  
mqttconnect();  
}  
  
void loop()// Recursive Function  
{  
  
    h = dht.readHumidity();  
    t = dht.readTemperature();  
    Serial.print("temp:");  
    Serial.println(t);  
    Serial.print("Humid:");  
    Serial.println(h);  
  
    PublishData(t, h);  
    delay(4000);  
    if (!client.loop()) {  
        mqttconnect();  
    }  
}
```

```
/*.....retrieving to Cloud.....*/
```

```
void PublishData(float temp, float humid) {
```

```
  mqttconnect();//function call for connecting to ibm
```

```
  /*
```

```
    creating the String in in form JSon to update the data to ibm cloud
```

```
  */
```

```
  String payload = "{\"temp\":";
```

```
  payload += temp;
```

```
  payload += "," "\"Humid\":";
```

```
  payload += humid;
```

```
  payload += "}";
```

```
  Serial.print("Sending payload: ");
```

```
  Serial.println(payload);
```

```
  if (client.publish(publishTopic, (char*) payload.c_str())) {
```

```
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it will print  
    publish ok in Serial monitor or else it will print publish failed
```

```
  } else {
```

```
    Serial.println("Publish failed");
```

```
  }
```

```
}
```

```

void mqttconnect() {
  if (!client.connected()) {
    Serial.print("Reconnecting client to ");
    Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
      delay(500);
    }

    initManagedDevice();
    Serial.println();
  }
}

void wificonnect() //function defination for wificonnect
{
  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("MADHYAM", "", 6);//passing the wifi credentials to establish the connection
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }

  Serial.println("");
  Serial.println("WiFi connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}

```

```
}
```

```
void initManagedDevice() {
```

```
    if (client.subscribe(subscribetopic)) {
```

```
        Serial.println((subscribetopic));
```

```
        Serial.println("subscribe to cmd OK");
```

```
    } else {
```

```
        Serial.println("subscribe to cmd FAILED");
```

```
    }
```

```
}
```

```
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
```

```
{
```

```
    Serial.print("callback invoked for topic: ");
```

```
    Serial.println(subscribetopic);
```

```
    for (int i = 0; i < payloadLength; i++) {
```

```
        //Serial.print((char)payload[i]);
```

```
        data3 += (char)payload[i];
```

```
    }
```

```
    Serial.println("data: "+ data3);
```

```
    if(data3=="lighton")
```

```
    {
```

```
        Serial.println(data3);
```

```
        digitalWrite(LED,HIGH);
```

```
    }
```

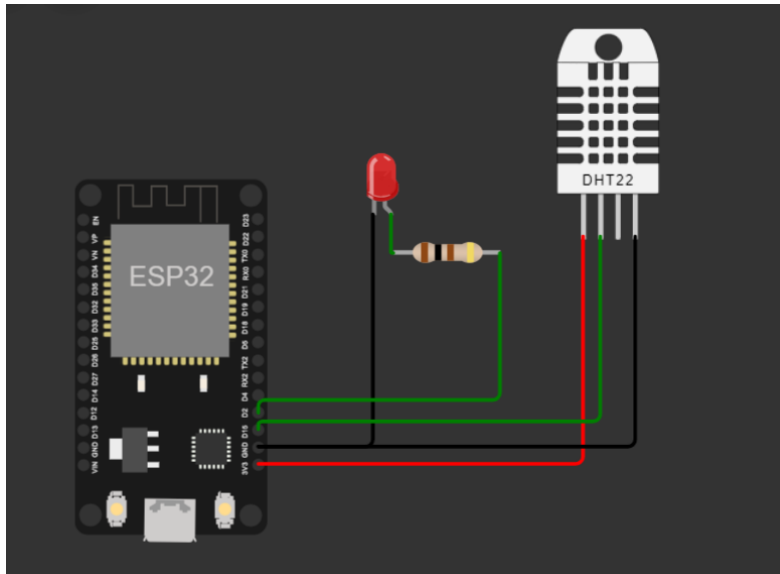
```
    else
```

```
{  
Serial.println(data3);  
digitalWrite(LED,LOW);  
}  
data3="";  
}
```

Diagram . json

```
{  
  "version": 1,  
  "author": "Anonymous maker",  
  "editor": "wokwi",  
  "parts": [  
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 4.8, "left": -127.69,  
      "attrs": {} },  
    {  
      "type": "wokwi-dht22",  
      "id": "dht1",  
      "top": -76.72,  
      "left": 137.76,  
      "attrs": { "temperature": "60.2", "humidity": "64" }  
    },  
    {  
      "type": "wokwi-led",  
      "id": "led1",  
      "top": -16.04,
```

```
"left": 21.83,
"attrs": { "color": "red" }
},
{
  "type": "wokwi-resistor",
  "id": "r1",
  "top": 41.63,
  "left": 48.17,
  "attrs": { "value": "100" }
}
],
"connections": [
  [ "esp:TX0", "$serialMonitor:RX", "", [] ],
  [ "esp:RX0", "$serialMonitor:TX", "", [] ],
  [ "dht1:VCC", "esp:3V3", "red", [ "v0" ] ],
  [ "dht1:GND", "esp:GND.1", "black", [ "v0" ] ],
  [ "led1:A", "r1:1", "green", [ "v0" ] ],
  [ "led1:C", "esp:GND.1", "black", [ "v0" ] ],
  [ "dht1:SDA", "esp:D15", "green", [ "v101.76", "h-2.06" ] ],
  [ "r1:2", "esp:D2", "green", [ "v80.85", "h-3.49" ] ]
],
"dependencies": {}
}
```

Output:

```
10:20:00 [REDACTED] 00:13.976 99%
Reconnecting client to
920spf.messaging.internetofthings.ibmcloud.com
iot-2/cmd/command/fmt/String
subscribe to cmd OK

temp:60.20
Humid:64.00
Sending payload: {"temp":60.20,"Humid":64.00}
Publish ok
temp:60.20
Humid:64.00
Sending payload: {"temp":60.20,"Humid":64.00}
Publish ok
temp:60.20
Humid:64.00
Sending payload: {"temp":60.20,"Humid":64.00}
Publish ok
```