

SMART BRIDGE EXTERNSHIP

ASSIGNMENT – 3

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Inwokwi add LED and switch on and off from node-red connect to IBM cloud add device in IoT Watson platform

Code:

Sketch.ino:

```
#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);

#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;
```

```

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();
  }
}

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("Sriya-desktop", "", 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)
{
```

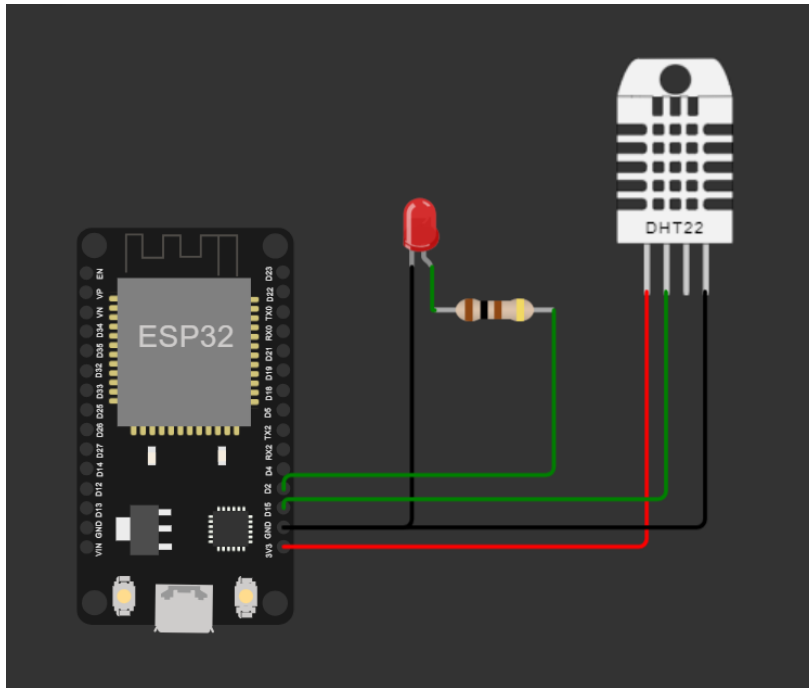
```
    Serial.print("callback invoked for topic: ");
    Serial.println(subscribetopic);
    for (int i = 0; i < payloadLength; i++) {
        //Serial.print((char)payload[i]);
        data3 += (char)payload[i];
    }
    Serial.println("data: "+ data3);
    if(data3=="lighton")
    {
        Serial.println(data3);
        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": {}  
}
```

Diagram:



Output:

```
Connecting to ..  
WiFi connected  
IP address:  
10.10.0.2  
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
```