

SMARTBRIDGE EXTERNSHIP

Internet Of Things

ASSIGNMENT-3

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Task: 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 "si3s8y"//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()// configuring the ESP32
{

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 += "}";
/*.....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("Knight", "", 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)
{

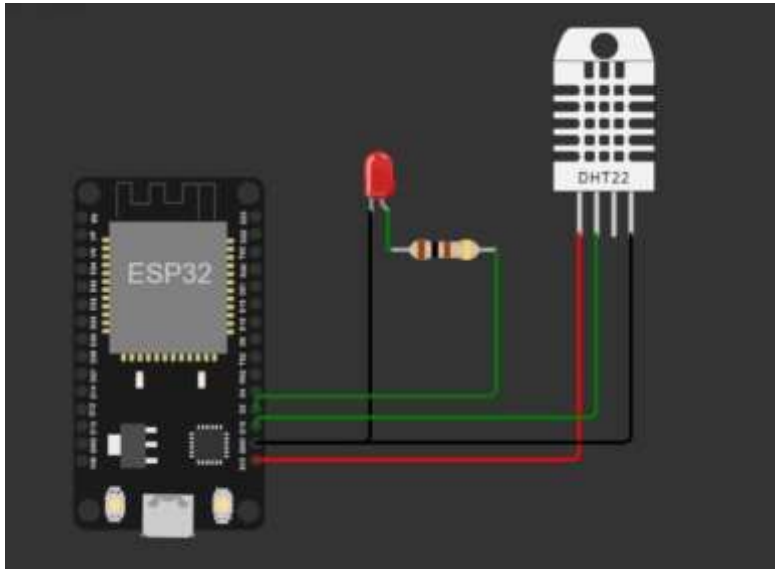
Serial.print("callback invoked for topic: "); Serial.println(subscribetopic);
for (int i = 0; i < payloadLength; i++) {
//Serial.print((char)payload[i]); data3 += (char)payload[i];
}
Serial.println("data: "+ data3); if(data3=="lighton")
{
Serial.println(data3); digitalWrite(LED,HIGH);
}
else
{
Serial.println(data3);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

```

I2C id: 1
101.76
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

```