

Project Development Phase

Sprint - 1

Date	13-12-2022
Team ID	PNT2022TMID51479
Project Name	Signs with Smart Connectivity for Better Road Safety

WOKWI

sketch.ino

```

1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 #include "DHT.h" // Library for DHT11
4 #define DHTPIN 5 // what pin we're connected to
5 #define DHTTYPE DHT22 // define type of sensor DHT 11
6
7 DHT dht (DHTPIN, DHTTYPE); // creating the instance by passing pin and type of
8
9 void callback(char* topic, byte* payload, unsigned int payloadLength)
10
11 //-----credentials of IBM Accounts-----
12
13 #define ORG "psh4py" //IBM ORGANIZATION ID
14 #define DEVICE_TYPE "alert-device" //Device type mentioned in IBM Watson IOT Platform
15 #define DEVICE_ID "4571" //Device ID mentioned in IBM Watson IOT Platform
16 #define TOKEN "12345678" //Token
17 String data;
18 float h, t;
19
20
21 //----- Customise the above values -----
22 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server Name
23 char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of event
24 char subscribeTopic[] = "iot-2/cmd/command/fmt/json"; // cmd REPRESENT command
25 char authMethod[] = "use-token-auth"; // authentication method
26 char token[] = TOKEN;
27 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
28
29 //-----
30

```

Simulation

00:09.316 76%

```

{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
temp:1.30
humidity:86.00
Sending payload:
{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
Go to Settings to activate Windows.

```

WOKWI

sketch.ino

```

30 //-----
31 WiFiClient wifiClient; // creating the instance for wifiClient
32 PubSubClient client(server, 1883, callback, wifiClient); //calling the predefined
33
34
35 void setup() // configuring the ESP32
36 {
37   Serial.begin(115200);
38   dht.begin();
39   pinMode(33, INPUT); //North
40   pinMode(25, INPUT); // South
41   pinMode(26, INPUT); // East
42   pinMode(27, INPUT); // West
43   delay(10);
44   Serial.println();
45   wifiConnect();
46   mqttConnect();
47 }
48
49 int n, s, e, w;
50
51 void loop() // Recursive Function
52 {
53
54   h = dht.readHumidity();
55   t = dht.readTemperature();
56   Serial.print("temp:");
57   Serial.println(t);
58   Serial.print("humidity:");
59   Serial.println(h);
60

```

Simulation

00:05.133 73%

```

{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
temp:1.30
humidity:86.00
Sending payload:
{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
Go to Settings to activate Windows.

```

WOKWI SAVE SHARE temp hum Docs

sketch.ino diagram.json libraries.txt Library Manager

```

61 n = digitalRead(33);
62 s = digitalRead(25);
63 e = digitalRead(26);
64 w = digitalRead(27);
65
66 PublishData(t, h, n, s, e, w);
67 delay(1000);
68 if (!client.loop()) {
69   mqttconnect();
70 }
71 }
72
73
74
75 /*.....retrieving to Cloud.....*/
76
77 void PublishData(float temp, float humid, int n, int s, int e, int w) {
78   mqttconnect();//function call for connecting to ibm
79   /*
80    | creating the String in in form JSON to update the data to ibm cloud
81    */
82   String payload = "{\"temp\":\"";
83   payload += temp;
84   payload += "\", \"humidity\":\"";
85   payload += humid;
86   payload += "\", \"North\":\"";
87   payload += n;

```

Simulation

00:05.133 73%

```

{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
temp:1.30
humidity:86.00
Sending payload:
{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok

```

Activate Windows

WOKWI SAVE SHARE temp hum Docs

sketch.ino diagram.json libraries.txt Library Manager

```

88 payload += ", \"South\":\"";
89 payload += s;
90 payload += "\", \"East\":\"";
91 payload += e;
92 payload += "\", \"West\":\"";
93 payload += w;
94 payload += "\"";
95
96
97 Serial.print("Sending payload: ");
98 Serial.println(payload);
99
100
101 if (client.publish(publishTopic, (char*) payload.c_str())) {
102   Serial.println("Publish ok");// if it sucessfully upload data on the cloud
103 } else {
104   Serial.println("Publish failed");
105 }
106
107 }
108
109
110 void mqttconnect() {
111   if (!client.connected()) {
112     Serial.print("Reconnecting client to ");
113     Serial.println(server);
114     while (!client.connect(clientId, authMethod, token)) {

```

Simulation

00:05.133 73%

```

{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
temp:1.30
humidity:86.00
Sending payload:
{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok

```

Activate Windows

WOKWI SAVE SHARE temp hum Docs

sketch.ino diagram.json libraries.txt Library Manager

```

115 Serial.print(".");
116 delay(500);
117 }
118
119 initManagedDevice();
120 Serial.println();
121 }
122
123 void wificonnect() //function definition for wificonnect
124 {
125   Serial.println();
126   Serial.print("Connecting to ");
127
128   WiFi.begin("Wokwi-GUEST", "", 6); //passing the wifi credentials to establish connection
129   while (WiFi.status() != WL_CONNECTED) {
130     delay(500);
131     Serial.print(".");
132   }
133   Serial.println("");
134   Serial.println("WiFi connected");
135   Serial.println("IP address: ");
136   Serial.println(WiFi.localIP());
137 }
138
139 void initManagedDevice() {
140   if (client.subscribe(subscribetopic)) {
141     Serial.println((subscribetopic));
142   }
143 }

```

Simulation

00:05.133 73%

```

{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
temp:1.30
humidity:86.00
Sending payload:
{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok

```

Activate Windows

WOKWI SAVE SHARE temp hum Docs

sketch.ino diagram.json libraries.txt Library Manager

```

144 Serial.println("subscribe to cmd FAILED");
145 }
146 }
147
148 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
149 {
150
151   Serial.print("callback invoked for topic: ");
152   Serial.println(subscribetopic);
153   for (int i = 0; i < payloadLength; i++) {
154     //Serial.print((char)payload[i]);
155     data3 += (char)payload[i];
156   }
157   Serial.println("data: " + data3);
158   // if(data3=="lighton")
159   // {
160   //   Serial.println(data3);
161   //   digitalWrite(LED,HIGH);
162   // }
163   // else
164   // {
165   //   Serial.println(data3);
166   //   digitalWrite(LED,LOW);
167   // }
168   // data3="";
169 }

```

Simulation

00:05.133 73%

```

{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok
temp:1.30
humidity:86.00
Sending payload:
{"temp":1.30,"humidity":86.00,"North":0,"South":0,"East":0,"West":0}
Publish ok

```

Activate Windows