

Assignment -4

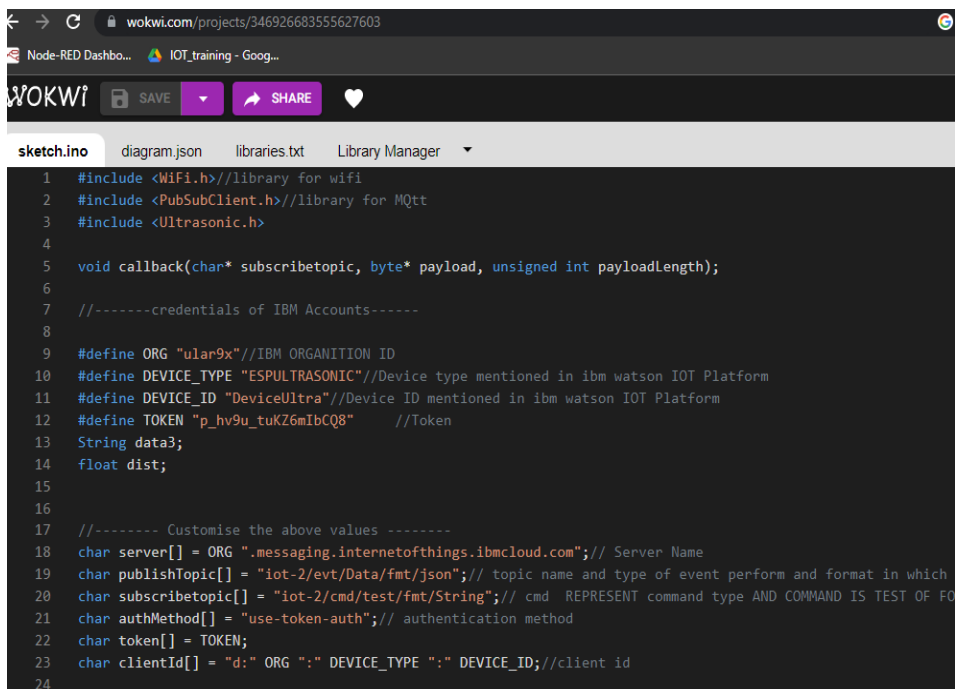
Assignment Date	30 OCTOBER 2022
Student Name	SNEHA .V
Student Roll Number	210419106108
Maximum Marks	2 Marks

QUESTION

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud

WOWKI LINK: <https://wokwi.com/projects/346926683555627603>

CODE



```
1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 #include <Ultrasonic.h>
4
5 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
6
7 //-----credentials of IBM Accounts-----
8
9 #define ORG "ular9x" //IBM ORGANITION ID
10 #define DEVICE_TYPE "ESPULTRASONIC" //Device type mentioned in ibm watson IOT Platform
11 #define DEVICE_ID "DeviceUltra" //Device ID mentioned in ibm watson IOT Platform
12 #define TOKEN "p_hv9u_tuKZ6mIbCQ8" //Token
13 String data3;
14 float dist;
15
16
17 //----- Customise the above values -----
18 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server Name
19 char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of event perform and format in which
20 char subscribetopic[] = "iot-2/cmd/test/fmt/String"; // cmd REPRESENT command type AND COMMAND IS TEST OF FO
21 char authMethod[] = "use-token-auth"; // authentication method
22 char token[] = TOKEN;
23 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
24
```

```

26 //
27 WiFiClient wifiClient; // creating the instance for wificlient
28 PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined cli
29
30 int LED=4;
31 int trig=5;
32 int echo=18;
33 void setup()// configureing the ESP32
34 {
35     Serial.begin(115200);
36
37     pinMode(trig,OUTPUT);
38     pinMode(echo,INPUT);
39     pinMode(LED,OUTPUT);
40     delay(10);
41     Serial.println();
42     wificonnect();
43     mqttconnect();
44 }
45
46 void loop()// Recursive Function
47 {
48
49     digitalWrite(trig,LOW);
50     digitalWrite(trig,HIGH);

```

```

51     delayMicroseconds(10);
52     digitalWrite(trig,LOW);
53     float dur=pulseIn(echo,HIGH);
54     float dist= (dur*0.0343)/2;
55     Serial.print("Distance in centimeter:");
56     Serial.println(dist);
57
58     PublishData(dist);
59     delay(1000);
60     if (!client.loop()) {
61         mqttconnect();
62     }
63 }
64
65
66
67 /*.....retrieving to Cloud.....
68
69 void PublishData(float dist) {
70     mqttconnect();//function call for connecting to ibm
71     /*
72     | | creating the String in in form JSon to update the data to ibm cloud
73     */
74

```

```

75     String object;
76     if(dist<100)
77     {
78         digitalWrite(LED,HIGH);
79         Serial.println("object is near");
80         object="Near";
81     }
82     else
83     {
84         digitalWrite(LED,LOW);
85         Serial.println("no object found");
86         object="No";
87     }
88     String payload = "{"distance\":";
89     payload += dist;
90     payload += "," "object\":";
91     payload += object;
92     payload += "}";
93
94
95     Serial.print("Sending payload: ");
96     Serial.println(payload);
97
98
99     if (client.publish(publishTopic, (char*) payload.c_str())) {

```

```

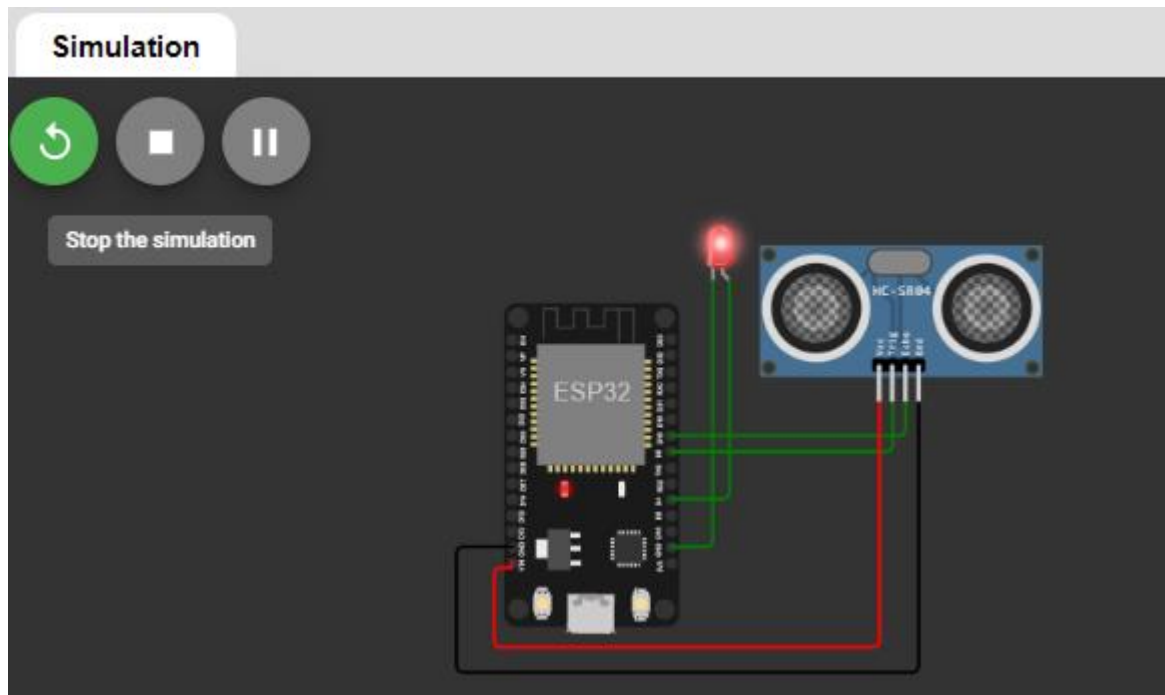
100         Serial.println("Publish ok");// if it successfully upload data on the cloud then it will print
101     } else {
102         Serial.println("Publish failed");
103     }
104
105 }
106 void mqttconnect() {
107     if (!client.connected()) {
108         Serial.print("Reconnecting client to ");
109         Serial.println(server);
110         while (!client.connect(clientId, authMethod, token)) {
111             Serial.print(".");
112             delay(500);
113         }
114
115         initManagedDevice();
116         Serial.println();
117     }
118 }
119 void wificonnect() //function definition for wificonnect
120 {
121     Serial.println();
122     Serial.print("Connecting to ");
123
124     WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection

```

```
125     while (WiFi.status() != WL_CONNECTED) {
126         delay(500);
127         Serial.print(".");
128     }
129     Serial.println("");
130     Serial.println("WiFi connected");
131     Serial.println("IP address: ");
132     Serial.println(WiFi.localIP());
133 }
134
135 void initManagedDevice() {
136     if (client.subscribe(subscribetopic)) {
137         Serial.println((subscribetopic));
138         Serial.println("subscribe to cmd OK");
139     } else {
140         Serial.println("subscribe to cmd FAILED");
141     }
142 }
143
144 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
145 {
146
147     Serial.print("callback invoked for topic: ");
148     Serial.println(subscribetopic);
149     for (int i = 0; i < payloadLength; i++) {
```

```
150     //Serial.print((char)payload[i])
151     data3 += (char)payload[i];
152 }
153
154 // Serial.println("data: "+ data3);
155 // if(data3=="lighton")
156 // {
157 //Serial.println(data3);
158 //digitalWrite(LED,HIGH);
159
160 // }
161
162 // else
163 // {
164 //Serial.println(data3);
165 //digitalWrite(LED,LOW);
166
167 // }
168 data3="";
169
170
171 }
172
```

CIRCUIT DIAGRAM



WOKWIP

SAVE SHARE

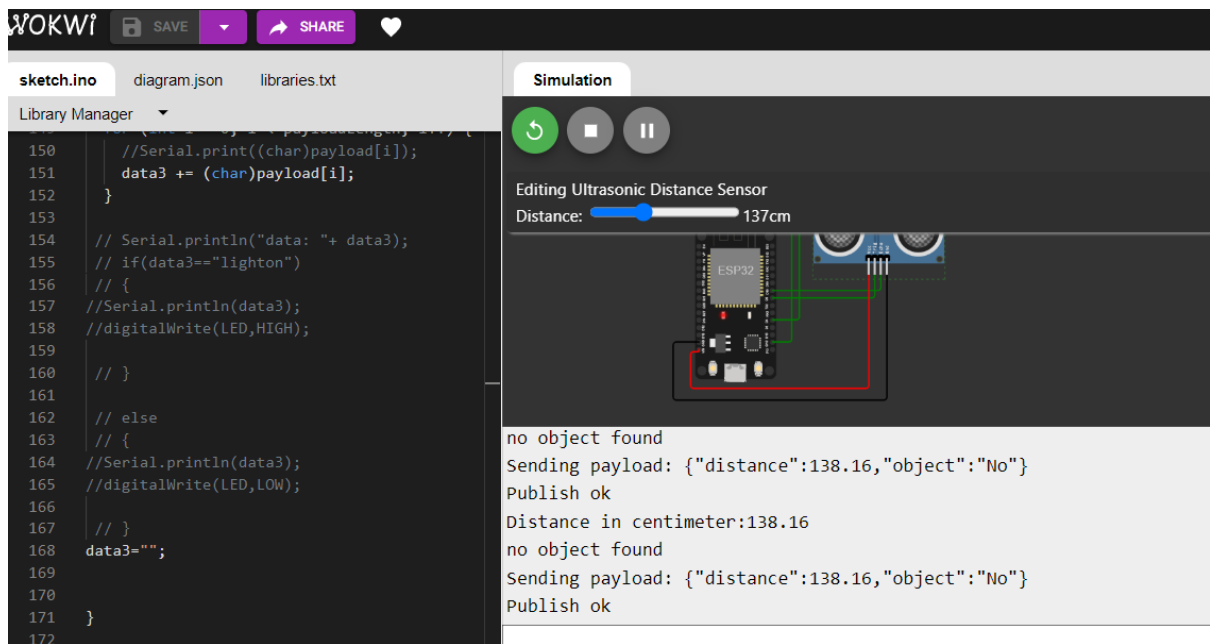
sketch.ino diagram.json libraries.txt

Library Manager

```
150 //Serial.print((char)payload[i]);
151 data3 += (char)payload[i];
152 }
153
154 // Serial.println("data: "+ data3);
155 // if(data3=="lighton")
156 // {
157 //Serial.println(data3);
158 //digitalWrite(LED,HIGH);
159
160 // }
161
162 // else
163 // {
164 //Serial.println(data3);
165 //digitalWrite(LED,LOW);
166
167 // }
168 data3="";
169
170
171 }
172
```

Simulation

object is near
Sending payload: {"distance":82.70,"object":"Near"}
Publish ok
Distance in centimeter:82.70
object is near
Sending payload: {"distance":82.70,"object":"Near"}
Publish ok



IBM CLOUD

ular9x.internetofthings.ibmcloud.com/dashboard/devices/browse

Node-RED Dashbo... IOT_training - Goog...

IBM Watson IoT Platform

210419106108@smartinternz.com
ID: ular9x

Browse Action Device Types Interfaces

Add Device +

DeviceUltra Connected ESPULTRASONIC Device Oct 30, 2022 3:17 PM

Identity Device Information Recent Events State Logs

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"distance":138.16,"object":"No"}	json	a few seconds ago
Data	{"distance":108.92,"object":"No"}	json	a few seconds ago
Data	{"distance":82.7,"object":"Near"}	json	a few seconds ago
Data	{"distance":82.7,"object":"Near"}	json	a few seconds ago

