ASSIGNMENT - 4

DATE	4th November 2022
TEAM ID	PNT2022TMID10102
Maximum mark	2 marks

QUESTION :

Write code and connections in wokwi for ultrasonic sensor.

Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.

Upload document with wokwi share link and images of ibm cloud

WOKWI CODE AND IMPLEMENTATION LINK:

https://wokwi.com/projects/346506498129527380

```
34  void setup()
35  {
36
37    Serial.begin(115200);
38    pinMode(trig, OUTPUT);
39    pinMode(echo, INPUT);
40    pinMode(LED, OUTPUT);
41    delay(10);
42
43    wificonnect();
44
45    mqttconnect();
46
47  }
48
49  void loop()// Recursive Function
50
51  {
52    delayMicroseconds(10);
53    digitalWrite(trig, LOW);
54    digitalWrite(trig, LOW);
55    digitalWrite(trig,HIGH);
56    float dur= pulseIn(echo,HIGH);
57    float dist = (dur* 0.0343)/2;
58    Serial.print ("Distance in cm : ");
59    Serial.println(dist);
60
61    PublishData(dist);
62
63    delay(1000);
64
65    if (!client.loop()) {
66
67      mqttconnect();
68    }
```

```
67      mqttconnect();
68    }
69  }
70
71  void PublishData(float dist) {
72    mqttconnect();
73
74    String object;
75
76    if (dist<100)
77    {
78      digitalWrite(LED, HIGH);
79      Serial.println("object is near");
80      object = "ALERT! object is near";
81    }
82
83    else
84    {
85      digitalWrite(LED,LOW);
86      Serial.println("no object found");
87      object ="No object found";
88    }
89
90    String payload="{\"distance\":";
91    payload += dist;
92    payload += "," "\"object\":\"";
93    payload += object;
94    payload += "\"}";
95
96    Serial.print("Sending payload: ");
97    Serial.println(payload);
98
99    if (client.publish(publishTopic, (char*) payload.c_str()))
100   {
101     Serial.println("Publish ok"); // if it sucessfully upload
102   }
```

```
103     else {
104       Serial.println("Publish failed");
105     }
106   }
107
108   void mqttconnect() {
109     if (!client.connected()) {
110       Serial.print("Reconnecting client to ");
111       Serial.println(server);
112       while (!!!client.connect(clientId, authMethod, token)) {
113         Serial.print(".");
114         delay(500);
115       }
116
117         initManagedDevice();
118         Serial.println();
119     }
120   }
121
122
123   void wificonnect() //function defination for wificonnect
124   {
125     Serial.println();
126     Serial.print("Connecting to ");
127
128     WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the 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   }
```

```
137   }
138
139   void initManagedDevice() {
140
141     if (client.subscribe(subscribetopic)) {
142       Serial.println((subscribetopic));
143       Serial.println("subscribe to cmd OK");
144     }
145     else {
146       Serial.println("subscribe to cmd FAILED");
147     }
148   }
149
150   void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
151   {
152    Serial.print("callback invoked for topic: ");
153     Serial.println(subscribetopic);
154     for (int i = 0; i < payloadLength; i++) {
155       //Serial.print((char)payload[i]);
156       // data3 += (char)payload[i];
157     }
158
159   // Serial.println("data: "+ data3);
160     //if(data3=="lighton")
161     {
162   //Serial.println(data3);
163     digitalWrite(LED,HIGH);
164
165     }
166
167     //else
168     {
169   //Serial.println(data3);
170   digitalWrite(LED,LOW);
171
```
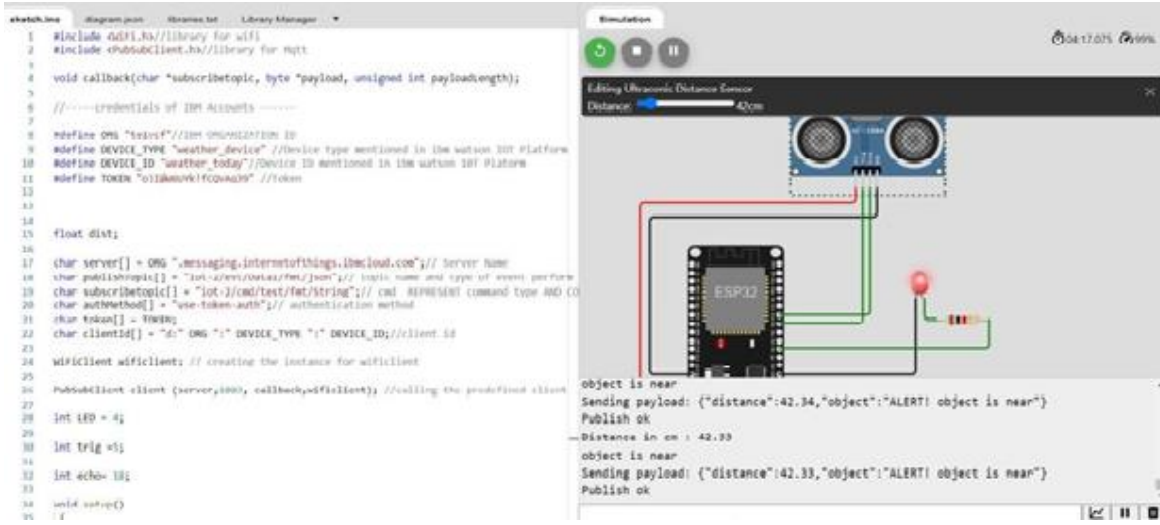
OUTPUT:

When the distance is less than 100 cms, send an "alert" message to IBM Watson IoT Platform.

When the object is far(greater than 100 cms) , send " no object found" to the IBM Watson IOT Platform.

```
sketch.ino    diagram.json    libraries.txt    Library Manager  ▼
1   #include <wifi.h>//library for wifi
2   #include <PubSubClient.h>//library for mqtt
3
4   void callback(char *subscribetopic, byte *payload, unsigned int payloadlength);
5
6   //-----credentials of IBM Accounts ------
7
8   #define ORG "tsivcf"//IBM ORGANIZATION ID
9   #define DEVICE_TYPE "weather_device" //Device type mentioned in ibm watson IOT Platform
10  #define DEVICE_ID "weather_today"//Device ID mentioned in ibm watson IOT Platform
11  #define TOKEN "o)I@WAzYk!fCQukqI9" //Token
12
13
14
15  float dist;
16
17  char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
18  char publishTopic[] = "iot-2/evt/Data1/fmt/json";// topic name and type of event perform
19  char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd  REPRESENT command type AND CO
20  char authMethod[] = "use-token-auth";// authentication method
21  char token[] = TOKEN;
22  char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
23
24  WiFiClient wificlient; // creating the instance for wificlient
25
26  PubSubClient client (server,1883, callback,wificlient); //calling the predefined client
27
28  int LED = 4;
29
30  int trig =5;
31
32  int echo= 18;
33
34  void setup()
35  {
```

Simulation

⏱ 04:29.440 🔋 89%

Editing Ultrasonic Distance Sensor   ✕
Distance: ▬▬▬▬▬▬▬   141cm

```
no object found
Sending payload: {"distance":142.19,"object":"No object found"}
Publish ok
Distance in cm : 142.19
no object found
Sending payload: {"distance":142.19,"object":"No object found"}
Publish ok
```

| weather_today | ● Connected | weather_device | Device | Oct 7, 2022 11:22 AM |

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
Data1	{"distance":142.19,"object":"No object found"}	json	a few seconds ago
Data1	{"distance":142.19,"object":"No object found"}	json	a few seconds ago
Data1	{"distance":142.22,"object":"No object found"}	json	a few seconds ago