ASSIGNMENT - 4

DATE	17 October 2022
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MAXIMUM MARKS	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

CODE:

```
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     }
```
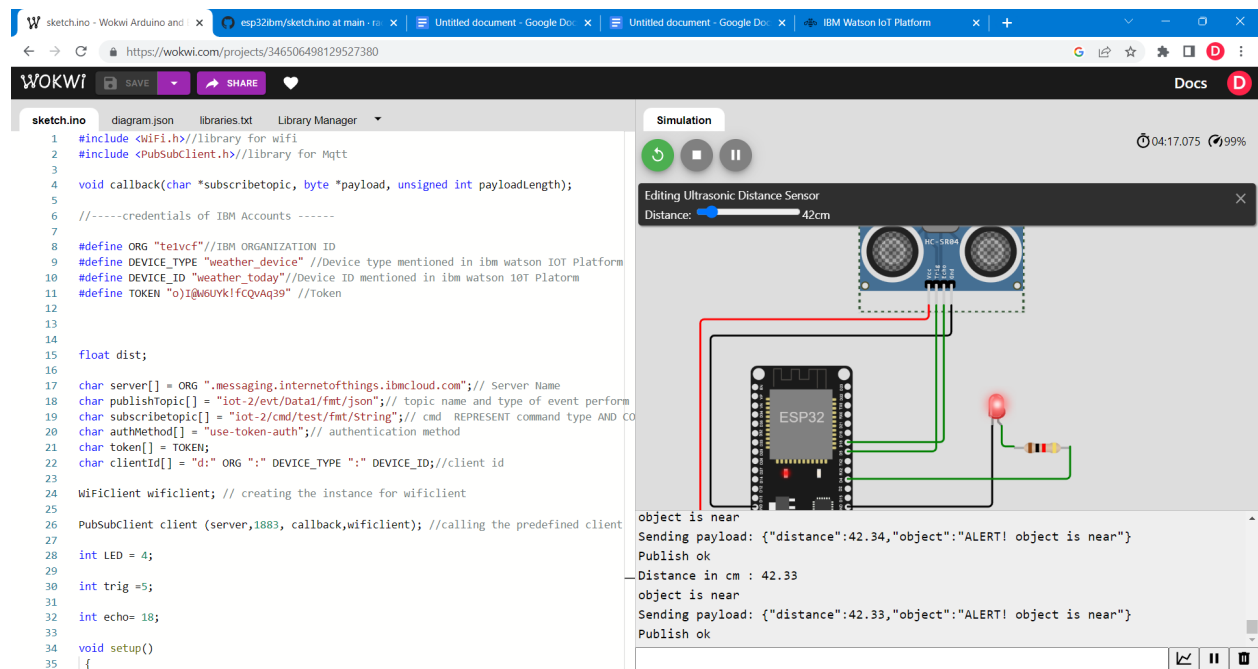
```
67       mqttconnect();
68     }
69   }
70
71   void PublishData(float dist) {
72     mqttconnect();
73
74     String object;
75
76     if (dist<100)
77     {
78       digitalWrite(LED, HIGH);
79       Serial.println("object is near");
80       object = "ALERT! object is near";
81     }
82
83     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.

IBM CLOUD IMAGE

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

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