ASSIGNMENT-4
SMART WASTE MANEGEMENT SYSTEM FOR
METROPOLITAN CITIES

Student Name:S.JENNIFA MARY

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Team ID	PNT2022TMIT38443
Maximum Marks	2 Marks

Question1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cm send "alert" to IBM cloud and display in device recent events.

CODE:

```arduino
36    pinMode(trig,OUTPUT);
37    pinMode(echo,INPUT);
38    pinMode(LED, OUTPUT);
39    delay(10);
40    wificonnect();
41    mqttconnect();
42    }
43    void loop()// Recursive Function
44    {
45
46     digitalWrite(trig,LOW);
47      digitalWrite(trig,HIGH);
48      delayMicroseconds(10);
49      digitalWrite(trig,LOW);
50      float dur = pulseIn(echo,HIGH);
51      float dist = (dur * 0.0343)/2;
52      Serial.print ("Distancein cm");
53      Serial.println(dist);
54
55
56      PublishData(dist);
57      delay(1000);
58      if (!client.loop()) {
59        mqttconnect();
60      }
61    }
62
63
64
65    /*..............................retrieving to Cloud...............................*/
66
67    void PublishData(float dist) {
68      mqttconnect();//function call for connecting to ibm
69      /*
70          creating the String in in form JSon to update the data to ibm cloud
```

```cpp
70        creating the String in in form JSon to update the data to ibm cloud
71   */
72   String object;
73   if (dist <100)
74   {
75     digitalWrite(LED,HIGH);
76     Serial.println("object is near");
77     object = "Near";
78   }
79   else
80   {
81     digitalWrite(LED,LOW);
82     Serial.println("no object found");
83     object = "No";
84   }
85
86     String payload = "{\"distance\":";
87     payload += dist;
88     payload += "," "\"object\":\"";
89     payload += object;
90     payload += "\"}";
91
92
93     Serial.print("Sending payload: ");
94     Serial.println(payload);
95
96
97
98
```

```cpp
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 publish ok in Serial monitor or else it will print publish failed
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());
```
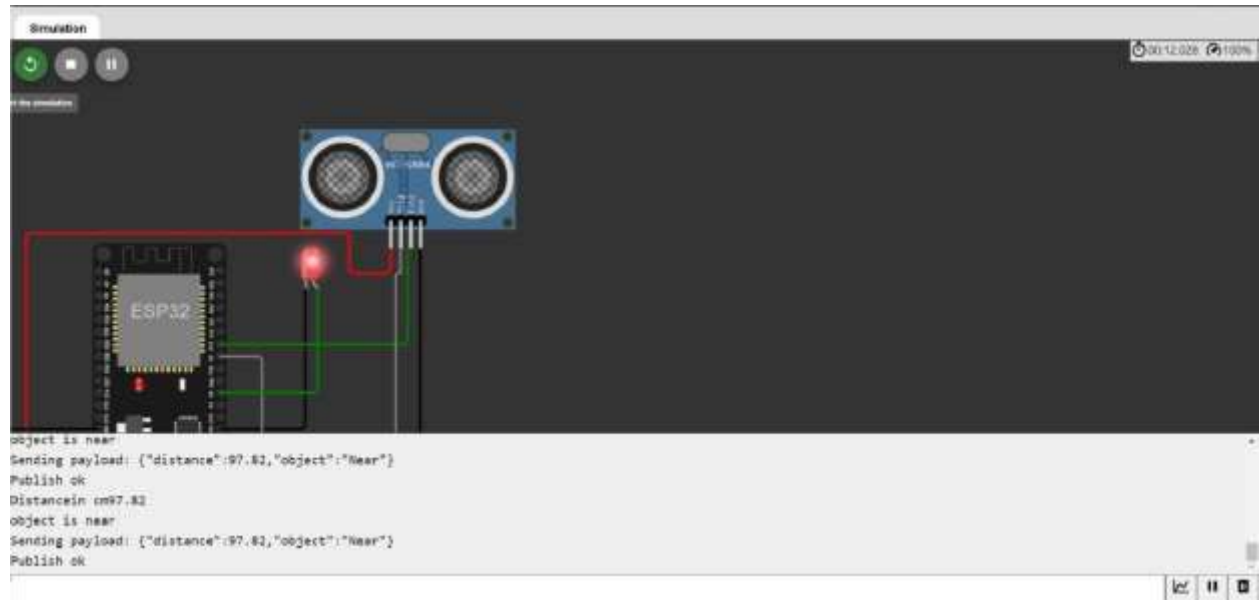
```
123
124     WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
125     while (WiFi.status() != WL_CONNECTED) {
126        delay(500);
127        Serial.print(".");
128     }
129     Serial.println("");
130     Serial.println("WiFi connected");
131     Serial.println("IP 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=="Near")
156  //    {
157  // Serial.println(data3);
```

```
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=="Near")
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    }
```

OUTPUT:

Data send to the IBM cloud device when the object is far

when object is near to the ultrasonic sensor

object is near
Sending payload: {"distance":97.82,"object":"Near"}
Publish ok
Distancein cm97.82
object is near
Sending payload: {"distance":97.82,"object":"Near"}
Publish ok

Data sent to the IBM Cloud Device when the object is near