ASSIGNMENT-4

DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	20 October 2022
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Maximum Marks	2 Marks

Question1 :

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.

WOKWI LINK :

https://wokwi.com/projects/305566932847821378

CODE :

```
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
```

```
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
```

```
      if (client.publish(publishTopic, (char*) payload.c_str())) {
100     Serial.println("Publish ok");// if it successfully upload data to 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   Serial2.println("");
130   Serial.println("WiFi connected");
131   Serial.println("IP address: ");
132   Serial.println(WiFi.localIP());
```

```cpp
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    }
```
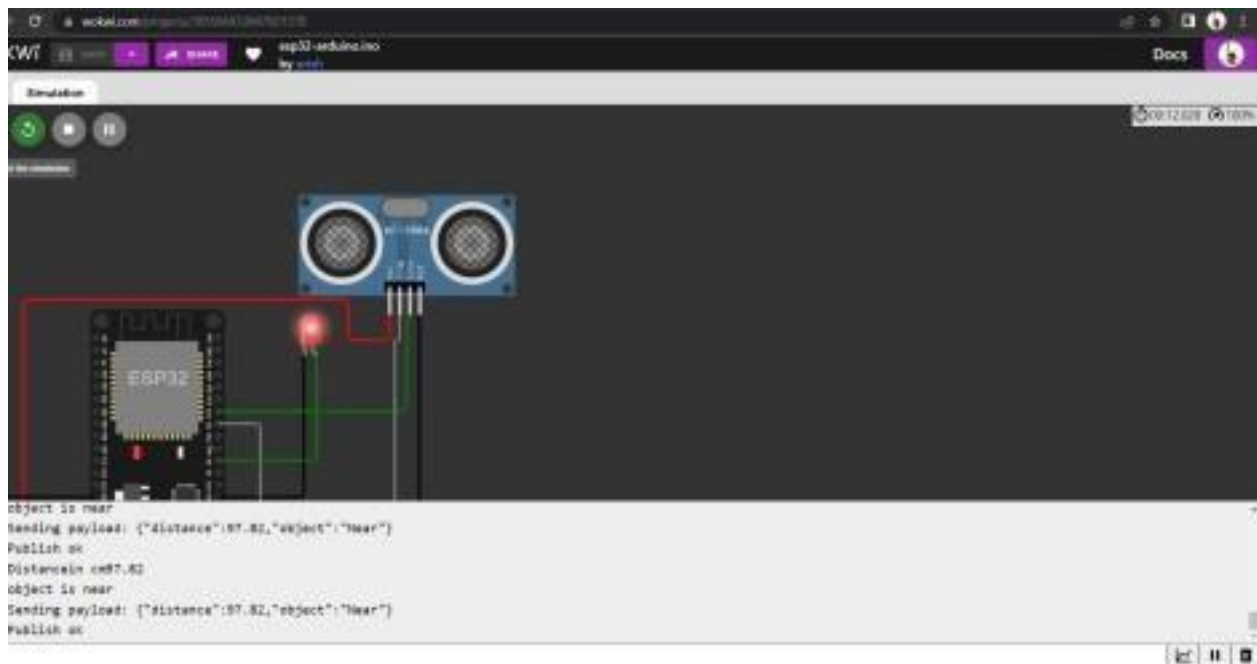
OUTPUT:
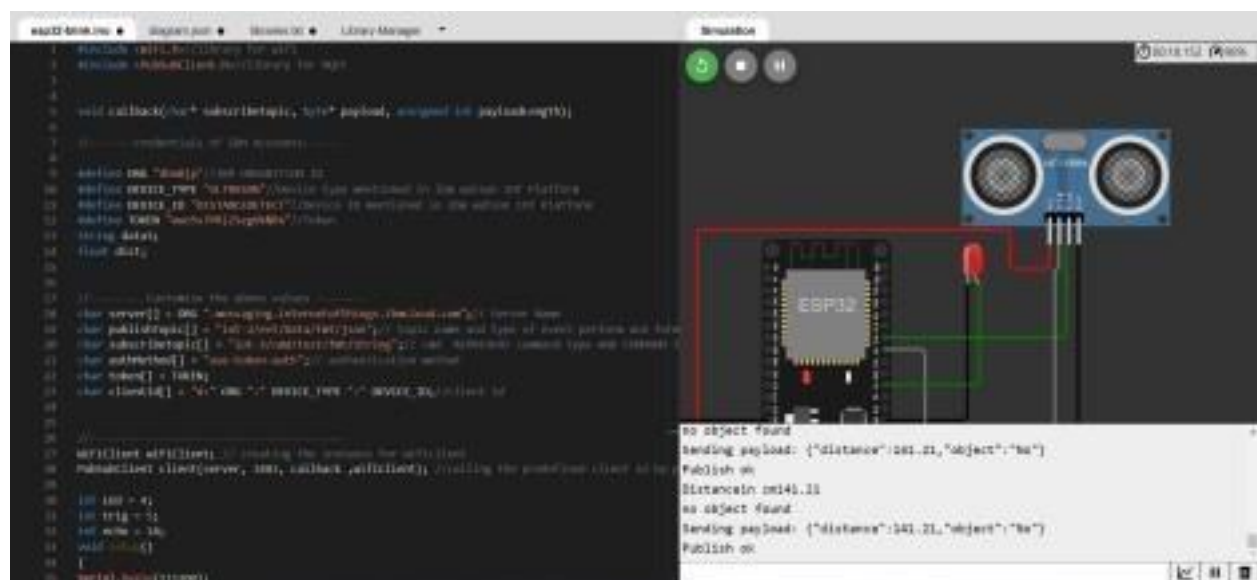
Data send to the IBM cloud device when the object is far
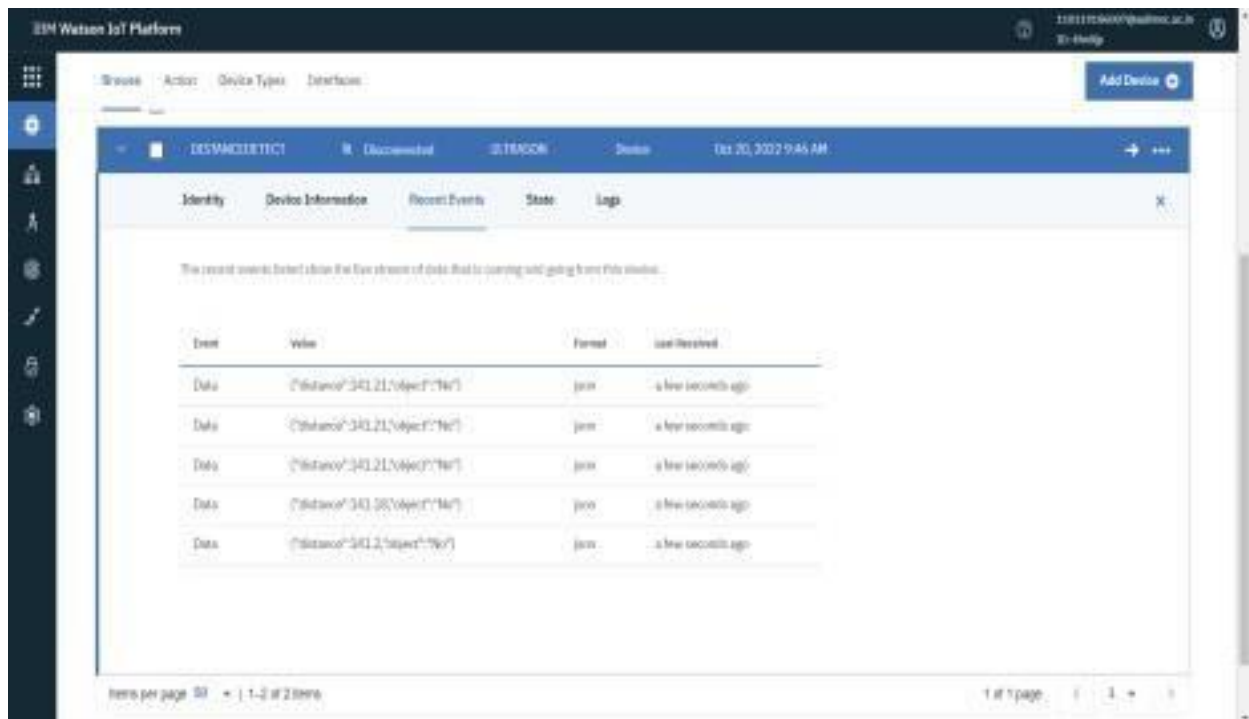
when object is near to the ultrasonic sensor

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

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