

ASSIGNMENT-4

DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	26 October 2022
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Maximum Marks	2 Marks

Question 1:

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

CODE:

```
1  #include <WiFi.h>//library for wifi
2  #include <Pubsubclient.h>//library for Hott
3  void callback(char subscribtopic, byte payload, unsigned int payloadLength);
4
5
6  #define ORG 4h0jp"//IBM ORGANITION IO
7  #define DEVICE_TYPE "ULTRASON
8  #define DEVICE_ID "DISTANCEDETECT
9  #define TOKEN "wuo5s7PR)ZSegvk&Rx"
10 String data3;
11 float dist;
12 char server[] -ORG ".messaging internetofthings.ibmcloud.com";// Server Name
13 char publishTopic[] "iot-2/evata/fmt/json";
14 char authMethod[]"use-token-auth";// authentication method
15 char token[] TOKEN;
16 char clientId[]"d:" ORG ":" DEVICE_TYPE":"DEVICE_ID;//client id
17
18 int LED = 4;
19 int trig 5;
20 int echo= 18;
21 void setic()
22 {
23   Serial.begin(115200);
24 }
```

esp32-blink.ino • diagram.json • libraries.txt • Library Manager ▼

```
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

```

```

esp32-blink.ino • diagram.json • libraries.txt • Library Manager
98
99 if (client.publish(publishTopic, (char*) payload.c_str())) {
100     Serial.println("Publish ok");// if it sucessfully 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 defination 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());

```

esp32-blink.ino • diagram.json • libraries.txt • Library Manager ▾

```
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);
158     // if (data3=="Near") {
```

esp32-blink.ino ●

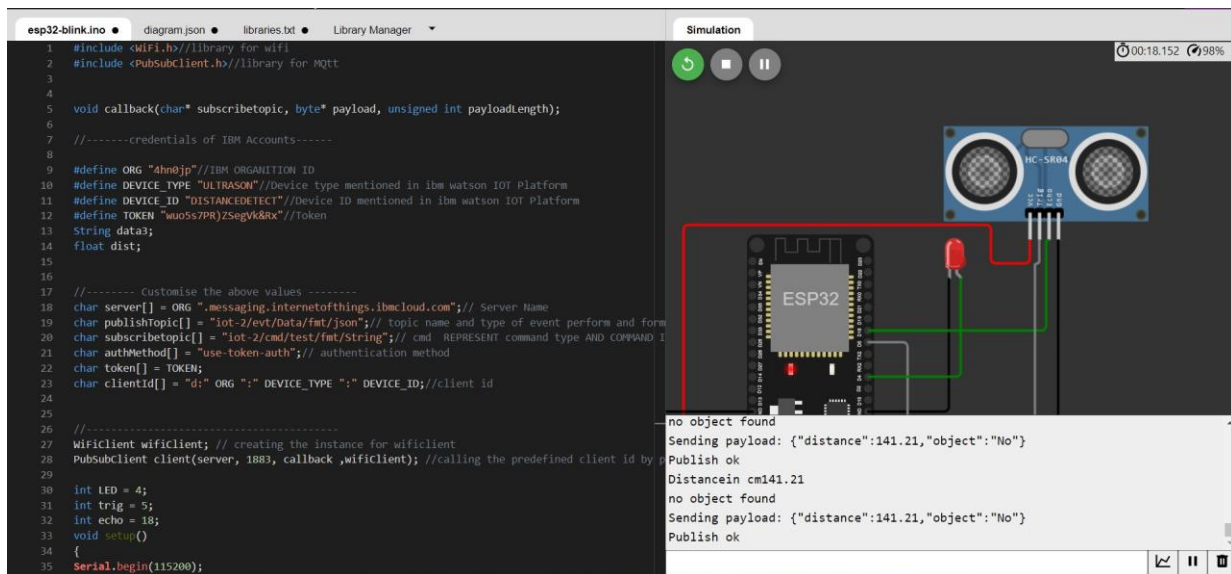
diagram.json ●

libraries.txt ●

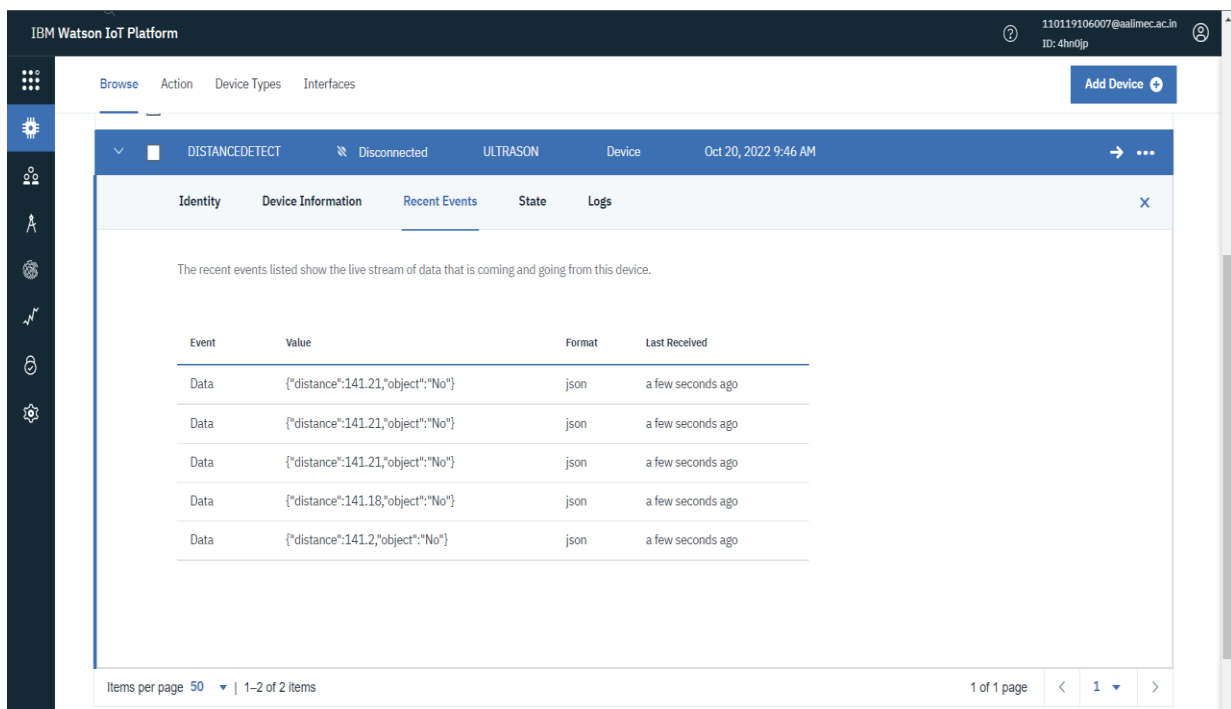
Library Manager ▼

```
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:



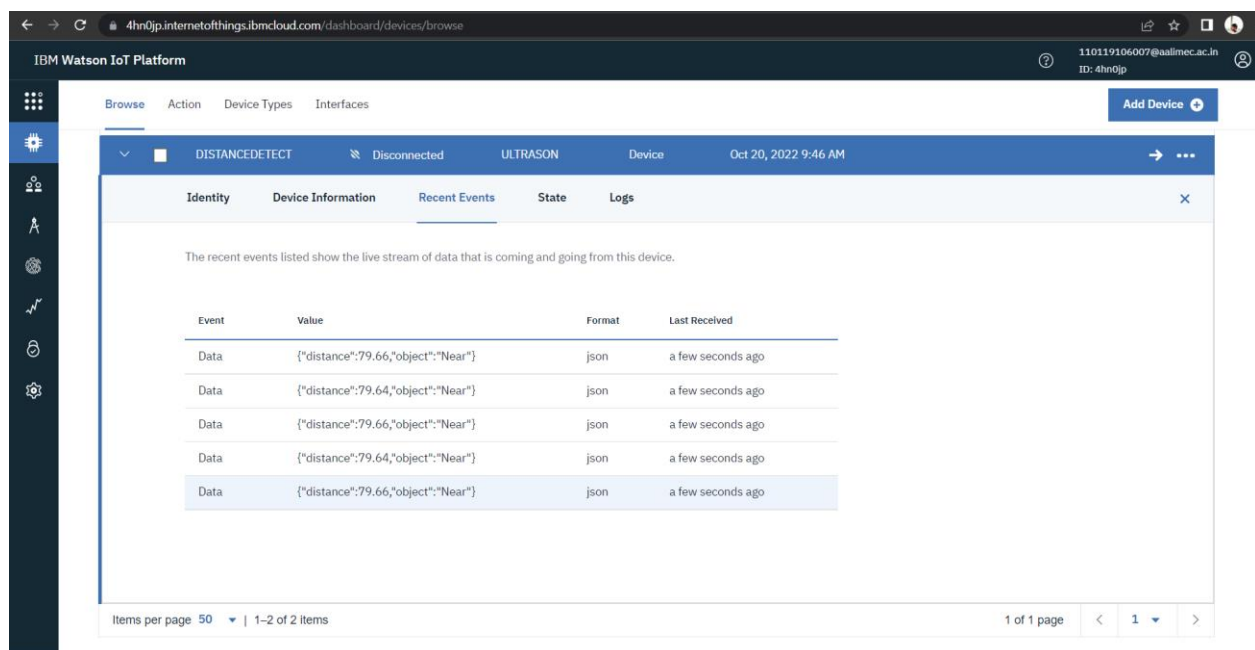
Data send to the IBM cloud device when the object is far



when object is near to the ultrasonic sensor



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



<https://wokwi.com/projects/305566932847821378>