

ASSIGNMENT-4
DISTANCE DETECTION USING ULTRASONIC SENSOR

Project Name: IOT BASED SAFETY GADGET FOR CHILD SAFETY MONITORING
AND NOTIFICATION

Batch Number: B5-51ME

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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 :

```

1 #include <stdio.h> //library for io
2 #include <pubsubClient.h> //library for mqtt
3
4
5 void callback(char* serverTopic, byte* payload, unsigned int payloadLength);
6
7 //----- Credentials of MQTT account -----
8
9 #define MQTT_USERNAME "MQTT_USERNAME"
10 #define MQTT_PASS "MQTT_PASS" //Device type must send in the within 300 platform
11 #define MQTT_DEVICE_ID "MQTT_DEVICE_ID" //Device ID must send in the within 300 platform
12 #define MQTT_TOKEN "MQTT_TOKEN" //token
13
14 String data;
15 float dist;
16
17
18 //----- Function the show values -----
19
20 char server[] = MQTT_SERVER; //mqtt server ip
21 char publishTopic[] = "iot-arduino/arduino/"; //topic name and type of event perform and found in which data to be send
22 char subscribeTopic[] = "iot-arduino/arduino/string"; // mqtt subscribe channel type and channel is this or other string
23 char authMethod[] = "non-token-auth" // authentication method
24 char token[] = "token";
25 char clientId[] = "iot-arduino" // device type and device id //client id
26
27
28 //
29 #include <PubSubClient.h> //creating the instance for PubSubClient
30 PubSubClient client(server, 1883, callback, authMethod, token, clientId); //calling the predefined client id by passing parameter like server id, mqtt username id, mqtt password id
31
32 int LED = 5;
33 int trig = 9;
34 int echo = 10;
35 void setup()
36 {
37     Serial.begin(115200);
38 }

```

```
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 ("Distance in 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 ibe 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

```

```

esp12-06rk.ino • debug.json • Serial.txt • Library Manager
99
100 if (!client.publish(publishTopic, (char*) payload_c_str())) {
101     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.
102 } else {
103     Serial.println("publish failed");
104 }
105
106 void reconnect() {
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         initManagedDevice();
115         Serial.println();
116     }
117 }
118
119 void wifiConnect() //Function definition for wifiConnect
120 {
121     Serial.println();
122     Serial.print("Connecting to ");
123
124     WiFi.begin("wskw-04001", "", 0);//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

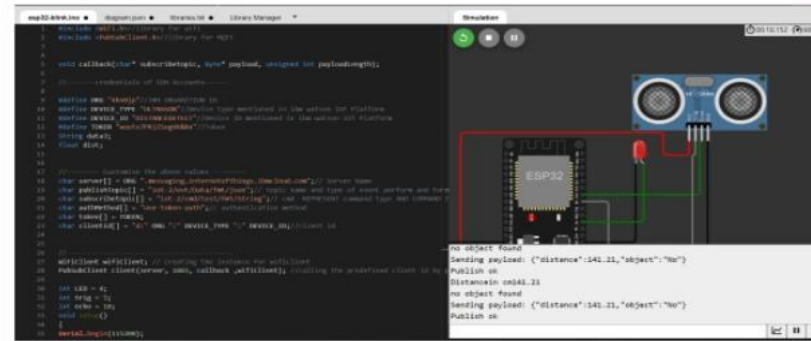
diagram.json

libraries.txt

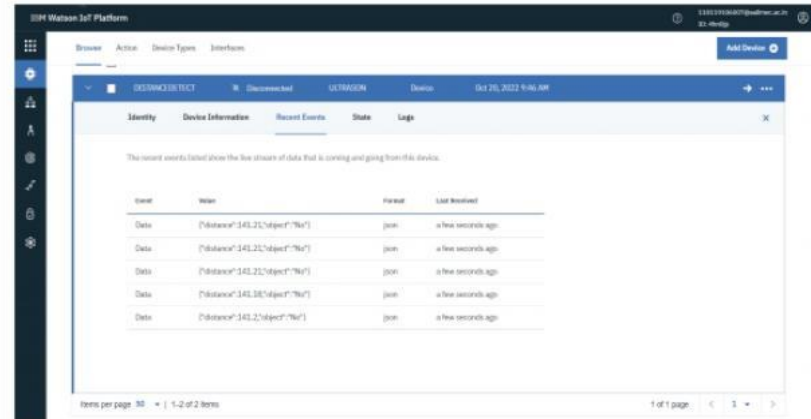
Library Manager

```
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     // }
```

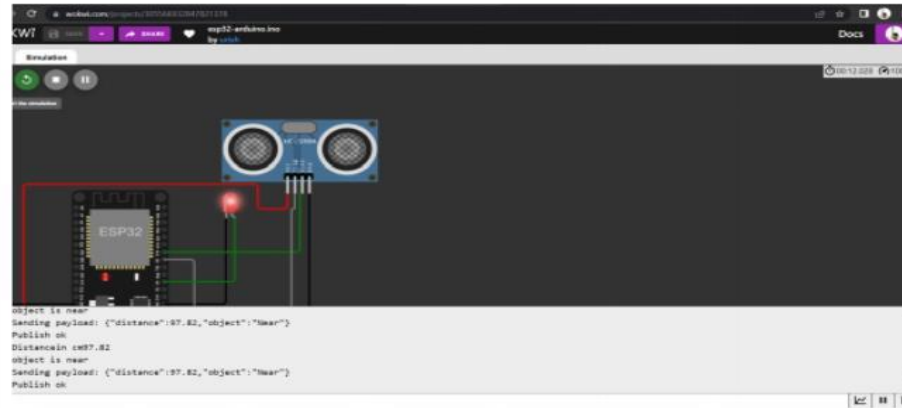
OUTPUT:



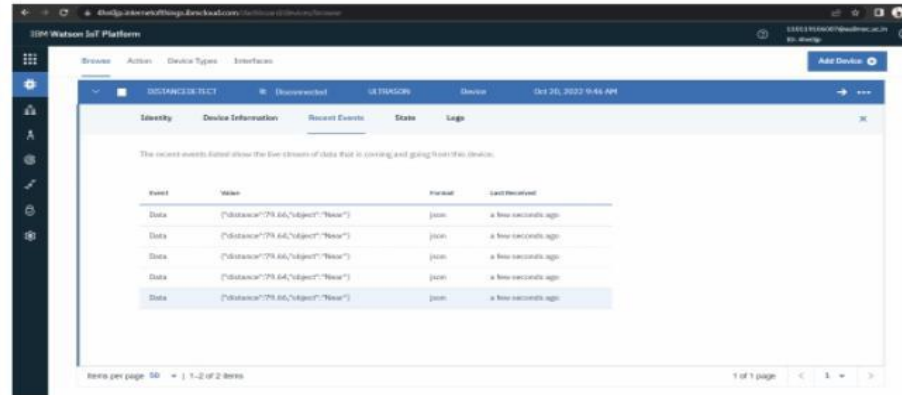
Data send to the IBM cloud device when the object is far



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>