

ASSIGNMENT-4

DISTANCE DETECTION USING ULTRASONIC SENSOR

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PROJECT TITLE: Gas leakage monitoring and alerting system.

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

CODE:

```
1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3
4
5 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
6
7 //-----credentials of IBM Accounts-----
8
9 #define ORG "4hn0jp" //IBM ORGANIZATION ID
10 #define DEVICE_TYPE "ULTRASON" //Device type mentioned in ibm watson IOT Platform
11 #define DEVICE_ID "DISTANCEDETECT" //Device ID mentioned in ibm watson IOT Platform
12 #define TOKEN "wuo5s7PR)ZSegVkk&Rx" //Token
13 String data3;
14 float dist;
15
16
17 //----- Customise the above values -----
18 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server Name
19 char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of event perform and format in which data to be send
20 char subscribetopic[] = "iot-2/cmd/test/fmt/String"; // cmd REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING
21 char authMethod[] = "use-token-auth"; // authentication method
22 char token[] = TOKEN;
23 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
24
25
26 //-----
27 WiFiClient wificlient; // creating the instance for wificlient
28 PubSubClient client(server, 1883, callback, wificlient); //calling the predefined client id by passing parameter like server id, port and wificredential
29
30 int LED = 4;
31 int trig = 5;
32 int echo = 18;
33 void setup()
34 {
35   Serial.begin(115200);
```

```
diagram.json
36 pinMode(trig, OUTPUT);
37 pinMode(echo, INPUT);
38 pinMode(LED, OUTPUT);
39 delay(10);
40 wificonnect();
```

```

42     }

43     void loop()// Recursive Function
44     {
41     mqttconnect();
61     }

46     digitalWrite(trig,LOW);
47     digitalWrite(trig,HIGH);
48     delayMicroseconds(10);
49     digitalWrite(trig,LOW);
        dur = pulseIn(echo, HIGH);
        dist = (dur * 6.0343)/2;

52     Serial.print ("Distance in cm");
53     Serial.println(dist);

56     PublishData(dist);
57     delay(1000);
58     if (!client.loop()) {
59         mqttconnect();
60     }

```

```

69     //
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

```



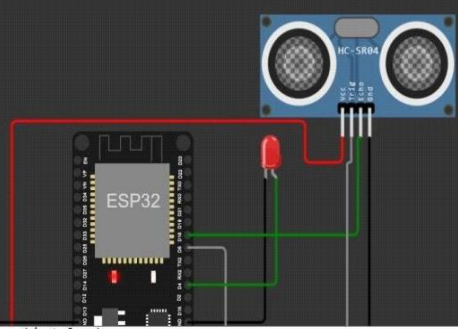
```
esp32-blink.ino • diagram.json • libraries.txt • Library Manager
142 }
143
144 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
145 {
146     Serial.print("callback invoked for topic: ");
147     Serial.println(subscribetopic);
148     for (int i = 0; i < payloadLength; i++) {
149         //Serial.print((char)payload[i]);
150         data3 += (char)payload[i];
151     }
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:

```
esp32-blink.ino • diagram.json • libraries.txt • Library Manager
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22 char token[] = TOKEN;
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```

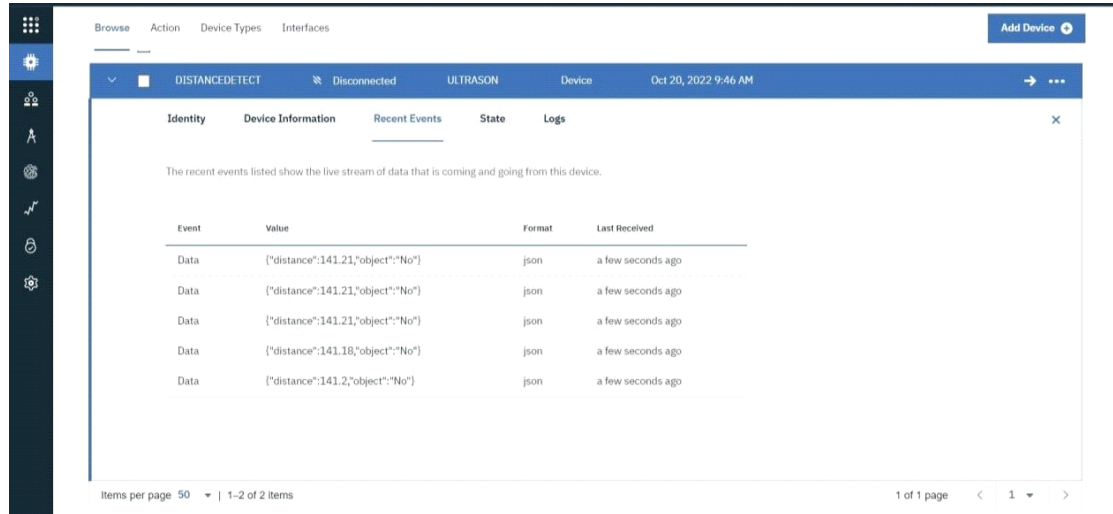
Simulation

00:18.152 98%



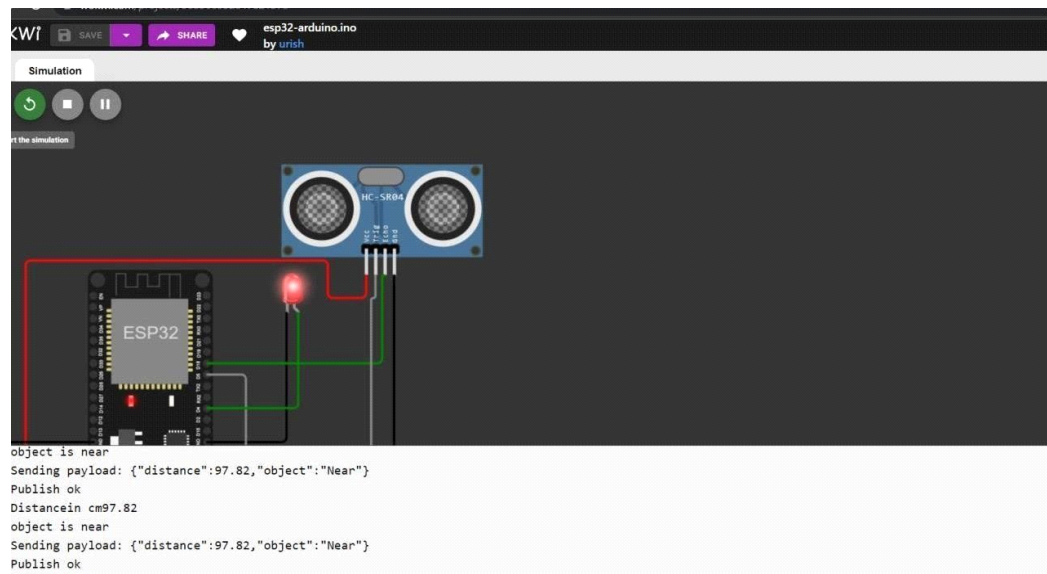
no object found
Sending payload: {"distance":141.21,"object":"No"}
Publish ok
Distancein cm141.21
no object found
Sending payload: {"distance":141.21,"object":"No"}
Publish ok

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



when object is near to the ultrasonic sensor

when object is near to the ultrasonic sensor



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

Browse
Action
Device Types
Interfaces
Add Device

DISTANCEDETECT
Disconnected
ULTRASON
Device
Oct 20, 2022 9:46 AM

Identity
Device Information
Recent Events
State
Logs

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.64,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.64,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago

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