

ASSIGNMENT-4

DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	28 October 2022
Team ID	PNT2022TMID17665
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Student Roll Number	713319EC066
Maximum Marks	2 Marks

Question:

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 }
```

```

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 |

```

```

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());

```

```

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     // Serial.println("Near");
159 }

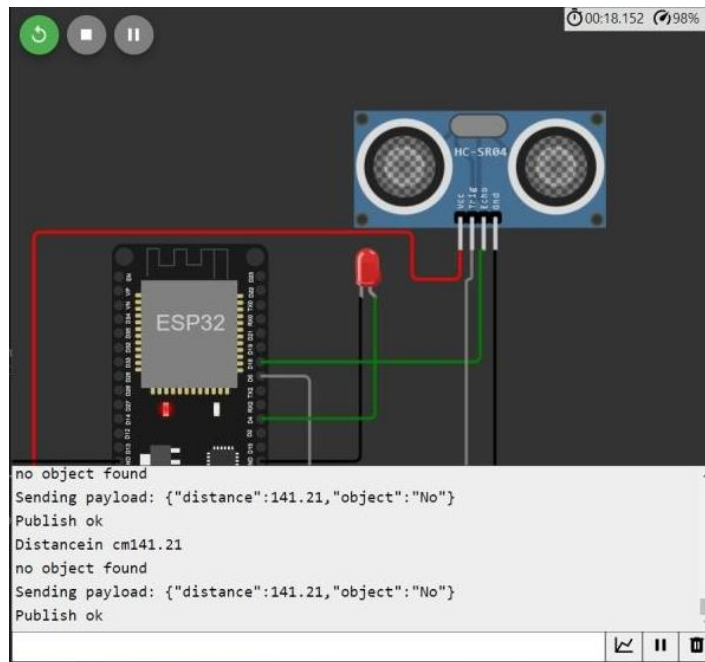
```

```

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:

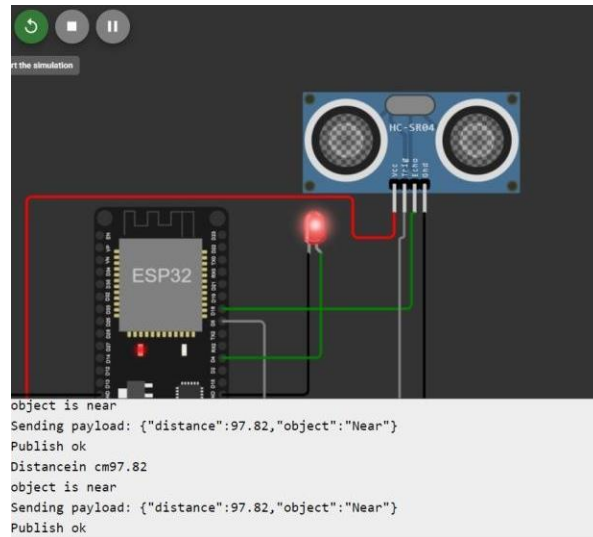


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▼	DISTANCEDETECT	Disconnected	ULTRASON	Device	Oct 20, 2022 9:46 AM	→ ...
Identity Device Information <u>Recent Events</u> State Logs						
The recent events listed show the live stream of data that is coming and going from this device.						
Event	Value	Format	Last Received			
Data	{"distance":141.21,"object":"No"}	json	a few seconds ago			
Data	{"distance":141.21,"object":"No"}	json	a few seconds ago			
Data	{"distance":141.21,"object":"No"}	json	a few seconds ago			
Data	{"distance":141.18,"object":"No"}	json	a few seconds ago			
Data	{"distance":141.2,"object":"No"}	json	a few seconds ago			

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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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1 of 1 page				