

ASSIGNMENT-4

DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	28 October 2022
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Student Names	ARCHANA B
Project Name	Personal Assistance for Seniors Who Are Self Reliant
Maximum Marks	2 Marks

Question :

- 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 :

```
esp32-blink.ino • diagram.json Library Manager *
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3
4
5 void callback(char* topic, byte* payload, unsigned int payloadlength);
6
7 ///-credentials-
8
9 #define ORG "otivtr"
10 #define DEVICE_TYPE "UltrasonDistance"
11 #define DEVICE_ID "12345"
12 #define TOKEN "Ultrason-Distance_12345"
13 String data;
14 float dist;
15
16
17
18 char server[] = ORG + ".messaging.internetofthings.ibmcloud.com";
19 char publishTopic[] = "iot-2/evt/Data/fmt/json";
20 char subscribeTopic[] = "iot-2/cmd/test/fmt/String";
21 char authMethod[] = "use-token-auth";
22 char token[] = TOKEN;
23 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
24
25
26
27 WiFiClient wifiClient;
28 PubSubClient client(wifiClient, 8883, callback, clientId);
```

```
esp32-blink.ino • diagram.json Library Manager
27 WiFiClient wificlient;
28 PubSubClient client(server,3883,callback,wificlient);
29
30 int LED=4;
31 int trig=5;
32 int echo=18;
33 void setup()
34 {
35   Serial.begin(115200);
36   pinMode(trig, OUTPUT);
37   pinMode(echo, INPUT);
38   pinMode(LED, OUTPUT);
39   delay(10);
40   wificlient.connect();
41   mqttconnect();
42 }
43 void loop()
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);
```

```
esp32-blink.ino • diagram.json Library Manager
53   Serial.println(dist);
54
55
56   PublishData(dist);
57   delay(1000);
58   if (!client.loop()){
59     mqttconnect();
60   }
61 }
62
63
64
65 /* do */
66
67 void PublishData(float dist){
68   mqttconnect();
69
70
71
72   String object;
73   if(dist<100){
74     digitalWrite(LED, HIGH);
75     Serial.println("Object is Near");
76     object="Near";
77   }
78   else{
79     digitalWrite(LED, LOW);
```

```

esp32-blink.ino  diagram.json  Library Manager
79     digitalWrite(LED, LOW);
80     Serial.println("NO Object Found");
81     object="No";
82 }
83 String payload="{\"distance\":";
84 payload += dist;
85 payload +=\", \"object\":\":";
86 payload += object;
87 payload +=\"}\";
88
89
90
91
92
93     Serial.print("Sending Payload:");
94     Serial.println(payload);
95
96
97
98
99     if(client.publish(publishTopic,(char*) payload.c_str())){
100         Serial.println("Publish OK");
101     }else{
102         Serial.println("publish failed");
103     }
104
105 }
106
107
108 }
109 void reconnect(){
110     if (!client.connected()){
111         Serial.print("Reconnecting client to");
112         Serial.println(server);
113         while(!client.connect(clientId,authMethod,tokan)) {
114             Serial.print(".");
115             delay(500);
116         }
117         initManagedDevice();
118         Serial.println();
119     }
120 }
121 void wifiConnect()
122 {
123     Serial.println();
124     Serial.print("Connecting to");
125
126     WiFi.begin("wired-netst","",0);
127     while(WiFi.status() != WL_CONNECTED){
128         delay(500);
129         Serial.print(".");
130     }
131     Serial.println("");
132     Serial.print("WiFi CONNECTED");
133     Serial.println("IP ADDRESS:");
134 }
135
136
137 void wifiConnect()
138 {
139     Serial.println();
140     Serial.print("Connecting to");
141
142     WiFi.begin("wired-netst","",0);
143     while(WiFi.status() != WL_CONNECTED){
144         delay(500);
145         Serial.print(".");
146     }
147     Serial.println("");
148     Serial.print("WiFi CONNECTED");
149     Serial.print("IP ADDRESS:");
150     Serial.println(WiFi.localIP());
151 }
152
153 void initManagedDevice(){
154     if(client.subscribe(subscribetopic)){
155         Serial.println((subscribetopic));
156         Serial.println("SUBSCRIBE TO OK OK");
157     }else{
158         Serial.println("SUBSCRIBE TO OK FAILED");
159     }
160 }
161
162 void callback(char* subscribetopic,byte*payload,unsigned int payloadlength)
163 {

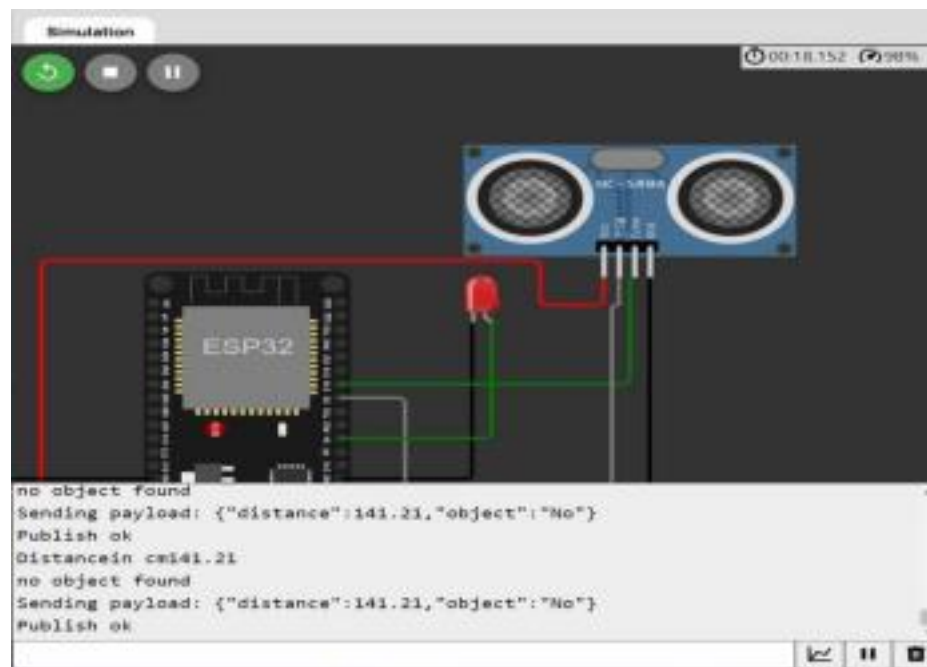
```

```
esp32-blink.ino • diagram.json Library Manager • Simulat

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
151     data1 +=(char)payload[i];
152   }
153   data3="";
154 }
```

OUTPUT:

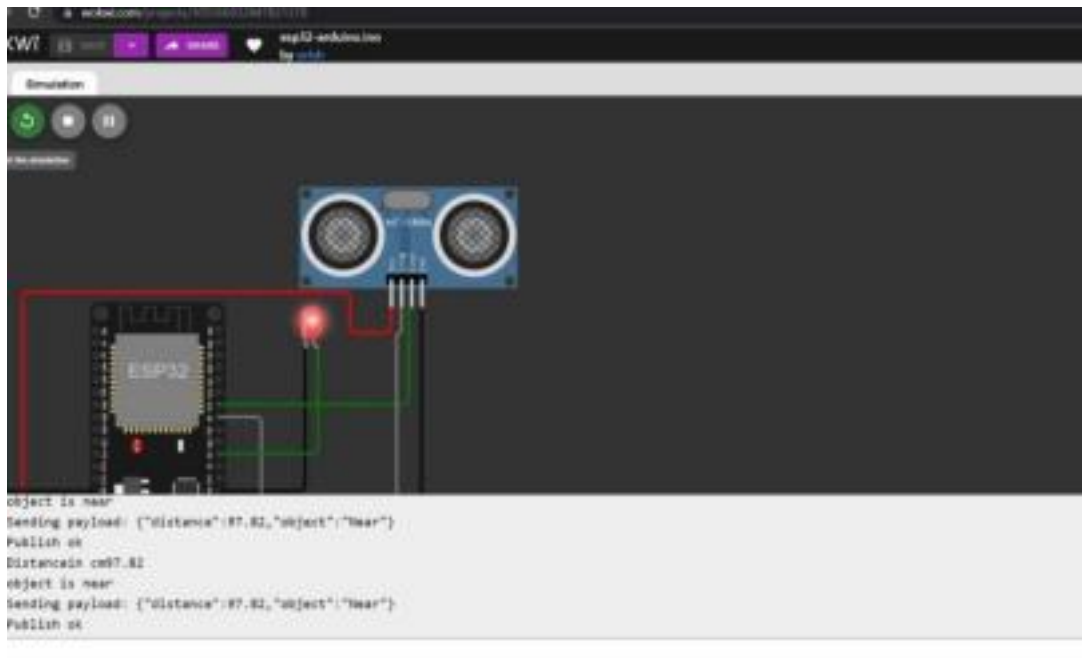
OUTPUT ON WOKWI SITE



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

Event	Value	Format	Last Received
Data	{"distance":141.23,"object":"Near"}	json	a few seconds ago
Data	{"distance":141.23,"object":"Near"}	json	a few seconds ago
Data	{"distance":141.23,"object":"Near"}	json	a few seconds ago
Data	{"distance":141.18,"object":"Near"}	json	a few seconds ago
Data	{"distance":141.2,"object":"Near"}	json	a few seconds ago

OUTPUT ON WOKWI SITE



Object is near
Sending payload: {"distance":87.82,"object":"Near"}
Publish ok
Distance is 87.82
Object is near
Sending payload: {"distance":87.82,"object":"Near"}
Publish ok

IBM CLOUD DATA GENERATION



The recent events listed show the flow 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":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"Near"}	json	a few seconds ago

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