ASSIGNMENT-4
DISTANCE DETECTION USING ULTRASONIC
SENSOR

Date	28 October 2022
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Student Register Number	820319104038
Student Names	Sharitha G
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* subscribetopic,byte* payload, unsigned int payloadLength);
6
7    //--credentials--
8
9    #define ORG "qt1vtr"
10   #define DEVICE_TYPE "UltraSonDistance"
11   #define DEVICE_ID "12345"
12   #define TOKEN "UltraSon-Distance_12345"
13   String data3;
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;
```

```cpp
27   WiFiClient wifiClient;
28   PubSubClient client(server,1883,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   wificonnect();
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("Distancein cm");
53      Serial.println(dist);
```

```cpp
53      Serial.println(dist);
54
55
56     PublishData(dist);
57     delay(1000);
58     if (!client.loop()){
59       mqttconnect();
60     }
61   }
62
63
64
65   /* dv*/
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);
```

```
 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    }
```
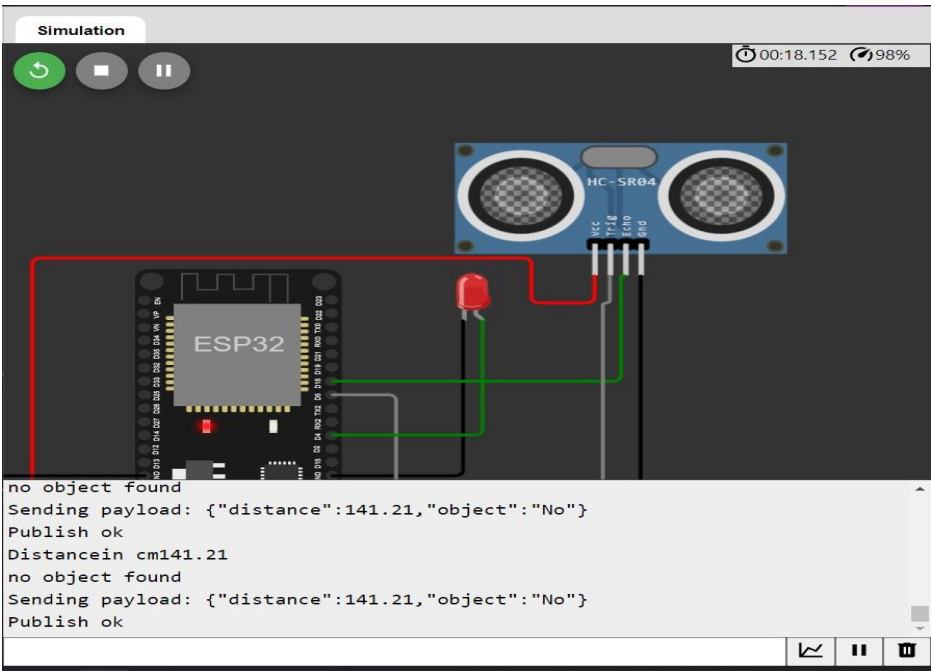
```
104
105    }
106    void mqttconnect(){
107      if (!client.connected()){
108        Serial.print("Reconnecting client to");
109        Serial.println(server);
110        while(!!!client.connect(clientId,authMethod,token)) {
111          Serial.print(".");
112          delay(500);
113        }
114
115        initManagedDevice();
116        Serial.println();
117      }
118    }
119    void wificonnect()
120    {
121      Serial.println();
122      Serial.print("Connecting To");
123
124      WiFi.begin("Wokwi-GUEST","",6);
125      while(WiFi.status() !=WL_CONNECTED){
126        delay(500);
127        Serial.println(".");
128      }
129      Serial.println("");
130      Serial.print("WIFI CONNECTED");
131      Serial.println("IP ADDRESS:");
```

```
esp32-blink.ino    diagram.json    Library Manager ▼

119   void wificonnect()
120   {
121     Serial.println();
122     Serial.print("Connecting To");
123
124     WiFi.begin("Wokwi-GUEST","",6);
125     while(WiFi.status() !=WL_CONNECTED){
126       delay(500);
127       Serial.println(".");
128     }
129     Serial.println("");
130     Serial.print("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   {
```

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

OUTPUT:

OUTPUT ON WOKWI SITE

IBM CLOUD DATA GENERATION:

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

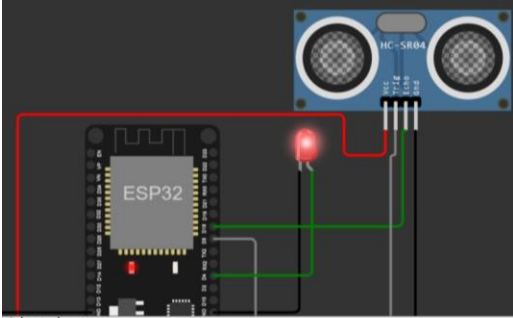| Event	Value	Format	Last Received
Data	{"distance":141.21,"object":"No"}	json	a few seconds ago
Data	{"distance":141.21,"object":"No"}	json	a few seconds ago
Data	{"distance":141.21,"object":"No"}	json	a few seconds ago
Data	{"distance":141.18,"object":"No"}	json	a few seconds ago
Data	{"distance":141.2,"object":"No"}	json	a few seconds ago

OUTPUT ON WOKWI SITE


```
object is near
Sending payload: {"distance":97.82,"object":"Near"}
Publish ok
Distancein cm97.82
object is near
Sending payload: {"distance":97.82,"object":"Near"}
Publish ok
```

IBM CLOUD DATA GENEREATION

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

Items per page 50 ▼ | 1–2 of 2 items   1 of 1 page