Assignment -4

Assignment Date	16 NOVEMBER 2022
Student Name	D.VIGNESH
TEAM ID	PNT2022TMID06071
Maximum Marks	2 Marks

Question :

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an "Alert" to IBM cloud and display in the device recent events.

Code:

```
#include <WiFi.h>
#include
<PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "jqr6mg"//IBM ORGANITION ID
#define DEVICE_TYPE "generaldevice"//Device type mentioned in ibm watson IOT
Platform #define DEVICE_ID "generaldevice"//Device ID mentioned in ibm watson
IOT Platform #define TOKEN "25214317" //Token
String data3;
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char subscribetopic[] = "iot-2/cmd/test/fmt/String";
char authMethod[] = "use-generaldevicetoken-auth";
```

```cpp
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);
const int trigPin = 5;
const int echoPin = 18;
#define SOUND_SPEED
0.034 long duration;
float
distance; void
setup() {
Serial.begin(115200);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
wificonnect();
mqttconnect();
}
void loop()
{
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance = duration *
SOUND_SPEED/2;
Serial.print("Distance (cm): ");
Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!");
delay(1000);
```

```
PublishData(distance)
; delay(1000);
if (!client.loop()) {
mqttconnect();
}
}
delay(1000);
}
void PublishData(float dist) {
mqttconnect();
String payload = "{\"Distance\":";
payload += dist;
payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";
payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");
} else {
Serial.println("Publish failed");
}
}
void mqttconnect() {
if (!client.connected()) {
Serial.print("Reconnecting client to
"); Serial.println(server);
while (!!!client.connect(clientId, authMethod, token)) {
Serial.print(".")
; delay(500);
}
```

```cpp
  initManagedDevice();
  Serial.println();
  }
}
void wificonnect()
{
Serial.println(); Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6); while (WiFi.status() !=
WL_CONNECTED) { delay(500);
Serial.print(".");
}
Serial.println(""); Serial.println("WiFi
connected"); Serial.println("IP address: ");
Serial.println(WiFi.localIP());
}
void initManagedDevice() {
if (client.subscribe(subscribetopic)) {
Serial.println((subscribetopic)); Serial.println("subscribe
to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic);
for (int i = 0; i < payloadLength; i++) {
```

```
     //Serial.print((char)payload[i])
     ; data3 += (char)payload[i];
     }
     Serial.println("data: "+ data3);
     data3="";
     }
```

Diagram.json:

```json
{
  "version": 1,
  "author": "Monish kumar T S",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -31.21, "left": -107.74, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -81.19, "left": 86.48, "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [
      "ultrasonic1:VCC",
      "esp:VIN",
      "red",
      [ "v26.91", "h-139.87", "v-90.66", "h-143.91", "v10.14" ]
    ],
    [ "ultrasonic1:GND", "esp:GND.1", "black", [ "v102.36", "h-186.36" ] ],
    [ "ultrasonic1:TRIG", "esp:D5", "green", [ "v46.57", "h-177.56" ] ],
    [ "ultrasonic1:ECHO", "esp:D18", "green", [ "v38.33", "h-183.55" ] ]
  ]
}
```

Crcuit Diagram:

Output:
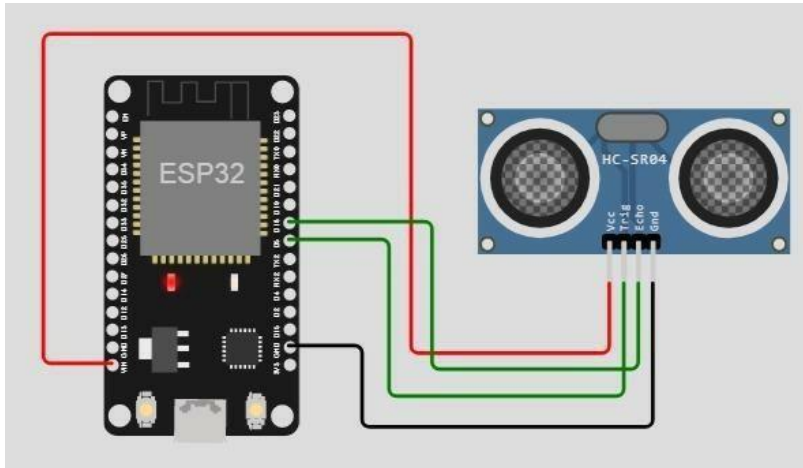
Wokwi output:


```
Connecting to ....
WiFi connected
IP address:
10.10.0.2
Reconnecting client to ytluse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 399.92
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.98
Distance (cm): 399.94
Distance (cm): 399.92
Distance (cm): 399.94
```

IBM cloud output:

| | Browse | Action | Device Types | Interfaces | | | Add Device ⊕ |

| 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
event_1	{"distance":7,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":8,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago