

ASSIGNMENT 4

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

code:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifClient;
String data3;
#define ORG "x0fxss"
#define DEVICE_TYPE "Noder"
#define DEVICE_ID "1234"
#define TOKEN "987654321"
#define speed 0.034
#define led 14

char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; char
publishTopic[] = "iot-2/evt/shanmugam_assignment4/fmt/json"; char topic[] =
"iot-2/cmd/home/fmt/String"; char authMethod[] = "use-token-auth";

char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifClient);

const int trigpin=5;
const int echopin=18;
String command;
```

```
String data="";
```

```
long duration;
```

```
float dist;
```

```
void setup()
```

```
{  
    Serial.begin(115200);  
    pinMode(led, OUTPUT);  
    pinMode(trigpin, OUTPUT);  
    pinMode(echopin, INPUT);  
    wifConnect();  
    mqttConnect();  
}
```

```
void loop() {
```

```
    bool isNearby = dist < 100;  
    digitalWrite(led, isNearby);
```

```
    publishData();  
    delay(500);
```

```
    if (!client.loop()) {  
        mqttConnect();  
    }
```

```
}
```

```
void wifConnect() {
```

```
    Serial.print("Connecting to "); Serial.print("Wif");  
    WiFi.begin("Wokwi-GUEST", "", 6);  
    while (WiFi.status() != WL_CONNECTED)  
    { delay(500);  
      Serial.print(".");  
    }
```

```

    Serial.print("WiFi connected, IP address: ");
    Serial.println(WiFi.localIP()); }

void mqttConnect() {
    if (!client.connected()) {
        Serial.print("Reconnecting MQTT client to "); Serial.println(server); while
        (!client.connect(clientId, authMethod, token)) {
            Serial.print(".");
            delay(500);
        }
        initManagedDevice();
        Serial.println();
    }
}

void initManagedDevice() {
    if (client.subscribe(topic)) {
        // Serial.println(client.subscribe(topic));
        Serial.println("IBM subscribe to cmd OK");
    } else {
        Serial.println("subscribe to cmd FAILED");
    }
}

void publishData()
{
    digitalWrite(trigpin,LOW);
    digitalWrite(trigpin,HIGH);
    delayMicroseconds(10);
    digitalWrite(trigpin,LOW);
    duration=pulseIn(echopin,HIGH);
    dist=duration*speed/2;
    if(dist<100){
        String payload = "{\"Alert Distance\":\"";
        payload += dist;
        payload += "\"}";
    }
}

```

```

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str()))
        { Serial.println("Publish OK");
        }
    }

    if(dist>100){
    String payload = "{\"Distance\":";
    payload += dist;
    payload += "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if(client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish OK");
    }else {
        Serial.println("Publish FAILED");
    }
    }
}

```

OUTPUT:- i) When distance greater than 100 cm

ii) When distance less than 100 cms

WOKWI

SAVE

SHARE

Docs

sketch.ino

diagram.json

libraries.txt

Library Manager

```

1 {
2   "version": 1,
3   "author": "Keerthika J",
4   "editor": "wokwi",
5   "parts": [
6     {
7       "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 92.67, "left": 45.3
8     },
9     {
10      "type": "wokwi-led",
11      "id": "led1",
12      "top": 194.54,
13      "left": 309.26,
14      "attrs": { "color": "red" }
15    },
16    {
17      "type": "wokwi-hc-sr04",
18      "id": "ultrasonic1",
19      "top": 60.71,
20      "left": 185.64,
21      "attrs": { "distance": "139" }
22    }
23  ],
24  "connections": [
25    [ "esp:TX0", "$serialMonitor:RX", "", [ ] ],
26    [ "esp:RX0", "$serialMonitor:TX", "", [ ] ],
27    [ "esp:GPIO4", "led1:anode", "" ],
28    [ "esp:GPIO5", "led1:cathode", "" ],
29    [ "ultrasonic1:VCC", "esp:VCC", "" ],
30    [ "ultrasonic1:GND", "esp:GND", "" ],
31    [ "ultrasonic1:TRIG", "esp:GPIO16", "" ],
32    [ "ultrasonic1:ECH", "esp:GPIO17", "" ]
33  ]
34 }

```

Simulation

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00:43.263 69%

Publish OK

Sending payload: {"Distance":138.96}

Publish OK

Sending payload: {"Distance":138.98}

Publish OK

The screenshot shows the IBM Watson IoT Platform interface. The top navigation bar includes the IBM logo and the text 'IBM Watson IoT Platform'. The main header displays the device ID '9pjim1' and the user 'keerthikaj.cse19@veltechmultitech.org'. The left sidebar contains icons for various IoT functions. The main content area is titled 'Browse' and shows the 'Recent Events' tab for the device '9pjim1'. The events are listed in a table with the following data:

Event	Value	Format	Last Received
Node	{"distance":117}	json	a few seconds ago
Node	{"distance":153}	json	a minute ago
Node	{"distance":154}	json	a minute ago
Node	{"distance":155}	json	a minute ago
Node	{"distance":170}	json	a minute ago

At the bottom of the dashboard, a status bar indicates '1 Simulation running'.