

Assignment -4

Assignment Date	24 Oct 2022
Team ID	PNT2022TMID28556
Student Name	KRISHNAMURTHY RE
Project Name	GAS LEAKAGE MONITORING AND ALERTING SYSTEMS FOR INDUSTRIES

Question:

Write a 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 **Code:**

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "icnbza"
#define DEVICE_TYPE "Devices"
#define DEVICE_ID "1234"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Krishnamurthy/fmt/json";
char topic[] = "iot-2/cmd/led/fmt/String";
```

```
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
```

```
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);
    wifiConnect();
    mqttConnect();
}
```

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

    publishData();
}
```

```
    delay(500);

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

void wifiConnect() {
    Serial.print("Connecting to "); Serial.print("Wifi");
    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:

1. When distance greater than 100 cm

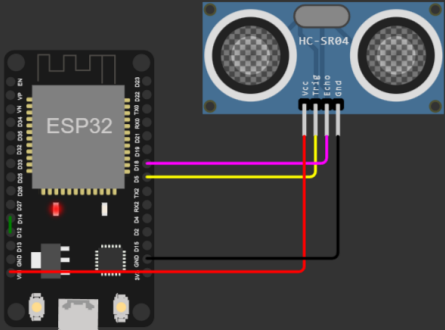
WOKWI

sketch.ino diagram.json libraries.txt Library Manager

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wificlient;
4 String data;
5 #define ORG "icnbza"
6 #define DEVICE_TYPE "Devices"
7 #define DEVICE_ID "1234"
8 #define TOKEN "12345678"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/Krishnamurthy/fmt/json";
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14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wificlient);
18
19
20
21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
28
29
30
31 void setup()
32 {
33   Serial.begin(115200);
34   pinMode(led, OUTPUT);
35   pinMode(trigpin, OUTPUT);
```

Simulation

00:06.229 99%



Publish OK

Sending payload: {"Distance":138.98}

Publish OK

Sending payload: {"Distance":138.96}

Publish OK

28°C Rain off and on

10:27 01-11-2022

IBM RECENT EVENTS:

IBM Watson IoT Platform

Search by device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
1234	Connected	Devices	Device	1 Nov 2022 10:18	

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
Krishnamurthy	{"Distance":138.96}	json	a few seconds ago
Krishnamurthy	{"Distance":138.96}	json	a few seconds ago
Krishnamurthy	{"Distance":138.96}	json	a few seconds ago
Krishnamurthy	{"Distance":138.96}	json	a few seconds ago
Krishnamurthy	{"Distance":138.96}	json	a few seconds ago

2. When distance less than 100 cm

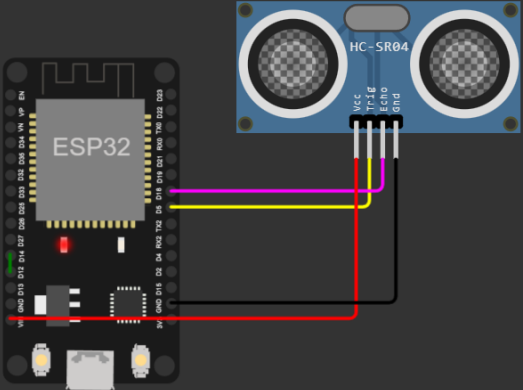
WOKWI

sketch.ino diagram.json libraries.txt Library Manager

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17 PubSubClient client(server, 1883, wificlient);
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21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
28
29
30
31 void setup()
32 {
33   Serial.begin(115200);
34   pinMode(led, OUTPUT);
35   pinMode(trigpin, OUTPUT);
```

Simulation

00:15.230 99%



Publish OK

Sending payload: {"Alert Distance":39.97}

Publish OK

Sending payload: {"Alert Distance":39.97}

Publish OK

28°C Rain off and on

10:28 01-11-2022

IBM RECENT EVENTS:

IBM Watson IoT Platform

rekishnamurthy@gmail.com
ID: icnbza

Browse Action Device Types Interfaces

Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
1234	Connected	Devices	Device	1 Nov 2022 10:18	

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
Krishnamurthy	{"Alert Distance":39.97}	json	a few seconds ago
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Krishnamurthy	{"Alert Distance":39.97}	json	a few seconds ago
Krishnamurthy	{"Alert Distance":39.97}	json	a few seconds ago

LINK:

<https://wokwi.com/projects/347099190237594194>