

Assignment -4

Assignment Date	24 Oct 2022
Team ID	PNT2022TMID28615
Student Name	SIVARAMAN.E
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 "z60lnd"
#define DEVICE_TYPE "Arduino"
#define DEVICE_ID "98765"
#define TOKEN "987654321"
#define speed 0.034 #define led 14 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; char publishTopic[] = "iot-2/evt/karthi/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

IBM x IBM C x Obtain x Sign u x Obtain x Servic x IBM V x W sketch x W sketch x Servic x IBM V x Your I x W sketch x

wokwi.com/projects/347025053221651028

Gmail YouTube Maps News Translate

WOKWI

SAVE SHARE

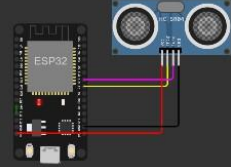
Docs K

sketch.ino diagram.json libraries.txt Library Manager

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wificlient;
4 String data3;
5 #define ORG "z60lnd"
6 #define DEVICE_TYPE "Arduino"
7 #define DEVICE_ID "98765"
8 #define TOKEN "987654321"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/karthi/fmt/json";
13 char topic[] = "iot-2/cmd/led/fmt/String";
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);
```

Simulation

00:13.730 100%



Publish OK


Sending payload: {"Distance":138.96}

Publish OK

Sending payload: {"Distance":138.96}

Publish OK

28°C Rain off and on



ENG IN

14:49 31-10-2022

IBM RECENT EVENTS:

IBM

IBM C

Obtain

Sign u

Obtain

Service

IBM V

W sketch

W sketch

Service

IBM V

Your I

W sketch

z60lnd.internetofthings.ibmcloud.com/dashboard/devices/browse

GmailYouTubeMapsNewsTranslate

IBM Watson IoT Platform

karthikargunkarthikargun875@gmail.com
ID: z60lnd

Browse

Action

Device Types

Interfaces

Add Device +

98765

Connected

Arduino

Device

31 Oct 2022 14:41

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
karthi	{"Distance":138.96}	json	a few seconds ago
karthi	{"Distance":138.98}	json	a few seconds ago
karthi	{"Distance":138.96}	json	a few seconds ago
karthi	{"Distance":138.96}	json	a few seconds ago
karthi	{"Distance":138.96}	json	a few seconds ago

>

987654321

Disconnected

Arduino

Device

31 Oct 2022 14:33

28°C
Rain off and on

ENG

IN

14:49
31-10-2022

2. When distance less than 100 cm

IBM x IBM C x Obtain x Sign u x Obtain x Service x IBM V x W sketch x W sketch x Service x IBM V x Your I x W sketch x +

wokwi.com/projects/347025053221651028

Gmail YouTube Maps News Translate

WOKWI SAVE SHARE

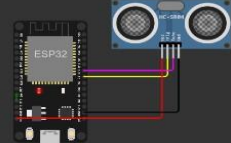
Docs K

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 "z60Ind"
6 #define DEVICE_TYPE "Arduino"
7 #define DEVICE_ID "98765"
8 #define TOKEN "987654321"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/karthi/fmt/json";
13 char topic[] = "iot-2/cmd/led/fmt/String";
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);
```

Simulation

00:06.428 97%



Publish OK

Sending payload: {"Alert Distance":95.96}
Publish OK

Sending payload: {"Alert Distance":95.96}
Publish OK

28°C Rain off and on

ENG IN 14:49 31-10-2022

IBM RECENT EVENTS:

IBM Watson IoT Platform dashboard showing device details for ID 98765. The device is connected and an event stream is displayed.

Device ID: 98765, Status: Connected, Type: Arduino, Last Update: 31 Oct 2022 14:41.

Recent Events:

Event	Value	Format	Last Received
karthi	{"Alert Distance":95.96}	json	a few seconds ago
karthi	{"Alert Distance":95.96}	json	a few seconds ago
karthi	{"Alert Distance":95.96}	json	a few seconds ago
karthi	{"Alert Distance":95.96}	json	a few seconds ago
karthi	{"Alert Distance":95.96}	json	a few seconds ago

Below the event stream, another device entry is visible: ID 987654321, Status: Disconnected, Type: Arduino, Last Update: 31 Oct 2022 14:33.

LINK:

<https://wokwi.com/projects/347025053221651028>