

Assignment -4

Assignment Date	24 Oct 2022
Team ID	PNT2022TMID28556
Student Name	DINESHKUMAR.S(TEAM LEADER)
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 "vm84qw"
#define DEVICE_TYPE "Arduino"
#define DEVICE_ID "1234"
#define TOKEN "123456789"
#define speed 0.034 #define led 14 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; char publishTopic[] = "iot-2/evt/dinesh/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

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```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wificlient;
4 String data3;
5 #define ORG "vm84qw"
6 #define DEVICE_TYPE "Arduino"
7 #define DEVICE_ID "1234"
8 #define TOKEN "123456789"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/dinesh/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);
34 }
```

Simulation

00:17.910 100%

Publish OK

Sending payload: {"Distance":138.96}

Publish OK

Sending payload: {"Distance":138.96}

Publish OK

27°C Rain to stop

ENG IN 13:45 31-10-2022

IBM RECENT EVENTS:

IBM Watson IoT Platform dashboard showing a device named '1234' with status 'Connected'. The device is an Arduino. The dashboard displays recent events, including distance measurements (e.g., 138.96, 138.98) received from the device.

Device ID: 1234, Status: Connected, Device Type: Arduino, Class ID: Device, Date Added: 31 Oct 2022 13:37.

Recent Events:

Event	Value	Format	Last Received
dinesh	{"Distance":138.96}	json	a few seconds ago
dinesh	{"Distance":138.96}	json	a few seconds ago
dinesh	{"Distance":138.96}	json	a few seconds ago
dinesh	{"Distance":138.98}	json	a few seconds ago
dinesh	{"Distance":138.96}	json	a few seconds ago

2. When distance less than 100 cm

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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);
```

Simulation

00:28.300 100%

Editing Ultrasonic Distance Sensor

Distance: 42cm

ESP32

HC-SR04

Publish OK

Sending payload: {"Alert Distance":41.99}

Publish OK

Sending payload: {"Alert Distance":41.94}

Publish OK

27°C Rain to stop

ENG IN 13:45 31-10-2022

IBM RECENT EVENTS:

IBM Watson IoT Platform dashboard showing a device (ID: 1234) with status "Connected". The device is an Arduino. The dashboard displays recent events (alerts) for the device, showing a stream of distance data (Alert Distance) in JSON format, received a few seconds ago.

Event	Value	Format	Last Received
dinesh	{"Alert Distance":42.02}	json	a few seconds ago
dinesh	{"Alert Distance":41.94}	json	a few seconds ago
dinesh	{"Alert Distance":41.94}	json	a few seconds ago
dinesh	{"Alert Distance":41.99}	json	a few seconds ago
dinesh	{"Alert Distance":42.21}	json	a few seconds ago

LINK:

<https://wokwi.com/projects/347020634111345236>

