

## ASSIGNMENT 4

<b>Date</b>	<b>17 November 2022</b>
<b>Team ID</b>	<b>PNT2022TMID38324</b>
<b>Project Name</b>	<b>Gas Leakage Monitoring &amp; Alerting System for Industries</b>

### QUESTION :

Write code and connection 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> //library for wifi
#include <PubSubClient.h> //library for MQTT
WiFiClient wifiClient;
String data3;
#define ORG "7xyyxh"
#define DEVICE_TYPE "Muthukumaran_Assignment_4"
#define DEVICE_ID "Muthukumaran"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/Muthukumaran/fmt/json";
char topic[] = "iot-2/cmd/status/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=19;
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

```
1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "7xyyxx"
6 #define DEVICE_TYPE "Muthukumaran_Assignment_4"
7 #define DEVICE_ID "Muthukumaran"
8 #define TOKEN "12345678"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12
13 char publishTopic[] = "iot-2/evt/Muthukumaran/fmt/json";
14 char topic[] = "iot-2/cmd/status/fmt/String";
15 char authMethod[] = "use-token-auth";
16 char token[] = TOKEN;
17 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
18 PubSubClient client(server, 1883, wifiClient);
19
20 const int trigpin=19;
21 const int echopin=18;
22 String command;
23 String data="";
24 long duration;
25 float dist;
26
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(led, OUTPUT);
```

Simulation

01:09.724 72%

Publish OK

Sending payload: {"Distance":272.95}

Publish OK

Sending payload: {"Distance":272.95}

Publish OK

## ❖ IBM RECENT EVENTS

Service Details - IBM Cloud | IBM Watson IoT Platform

7xyyxx.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform

muthur1582@gmail.com  
ID: 7xyyxx

Identity | Device Information | **Recent Events** | State | Logs

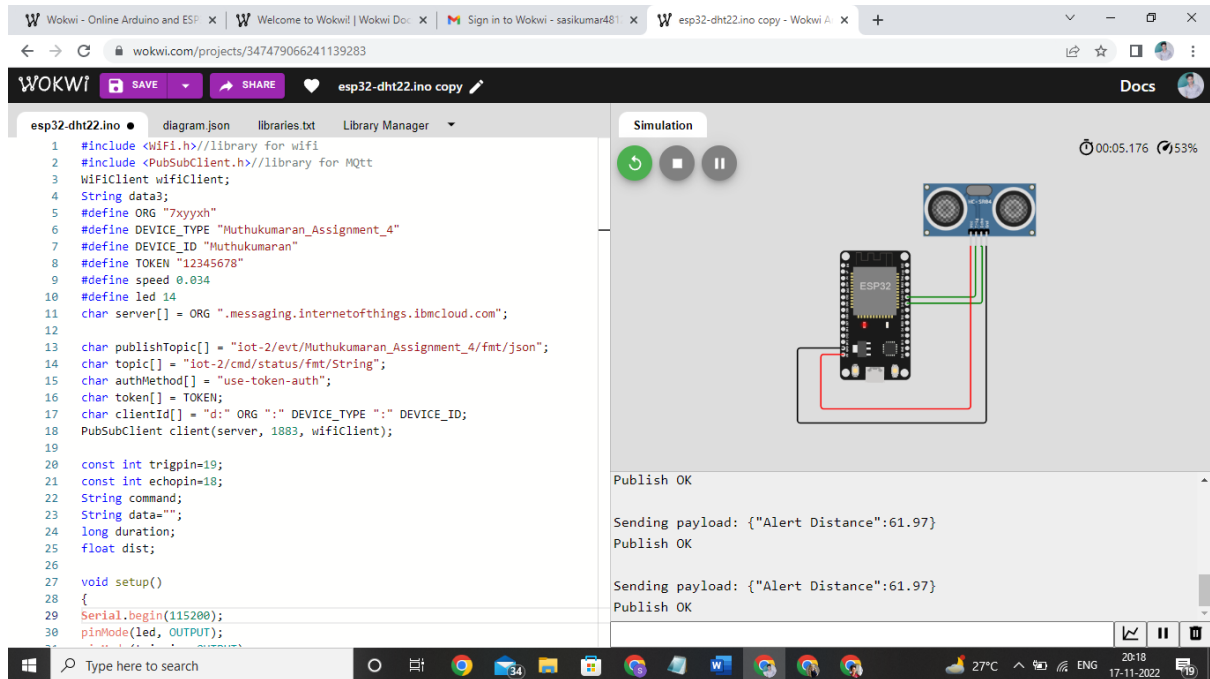
The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Muthukumaran	{"Distance":272.95}	json	a few seconds ago
Muthukumaran	{"Distance":272.95}	json	a few seconds ago
Muthukumaran	{"Distance":272.95}	json	a few seconds ago
Muthukumaran	{"Distance":272.95}	json	a few seconds ago
Muthukumaran	{"Distance":272.95}	json	a few seconds ago

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## 2) When distance less than 100



```
1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "7xyyhx"
6 #define DEVICE_TYPE "Muthukumaran_Assignment_4"
7 #define DEVICE_ID "Muthukumaran"
8 #define TOKEN "12345678"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12
13 char publishTopic[] = "iot-2/evt/Muthukumaran_Assignment_4/fmt/json";
14 char topic[] = "iot-2/cmd/status/fmt/String";
15 char authMethod[] = "use-token-auth";
16 char token[] = TOKEN;
17 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
18 PubSubClient client(server, 1883, wifiClient);
19
20 const int trigpin=19;
21 const int echopin=18;
22 String command;
23 String data="";
24 long duration;
25 float dist;
26
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(led, OUTPUT);
```

Simulation

Publish OK

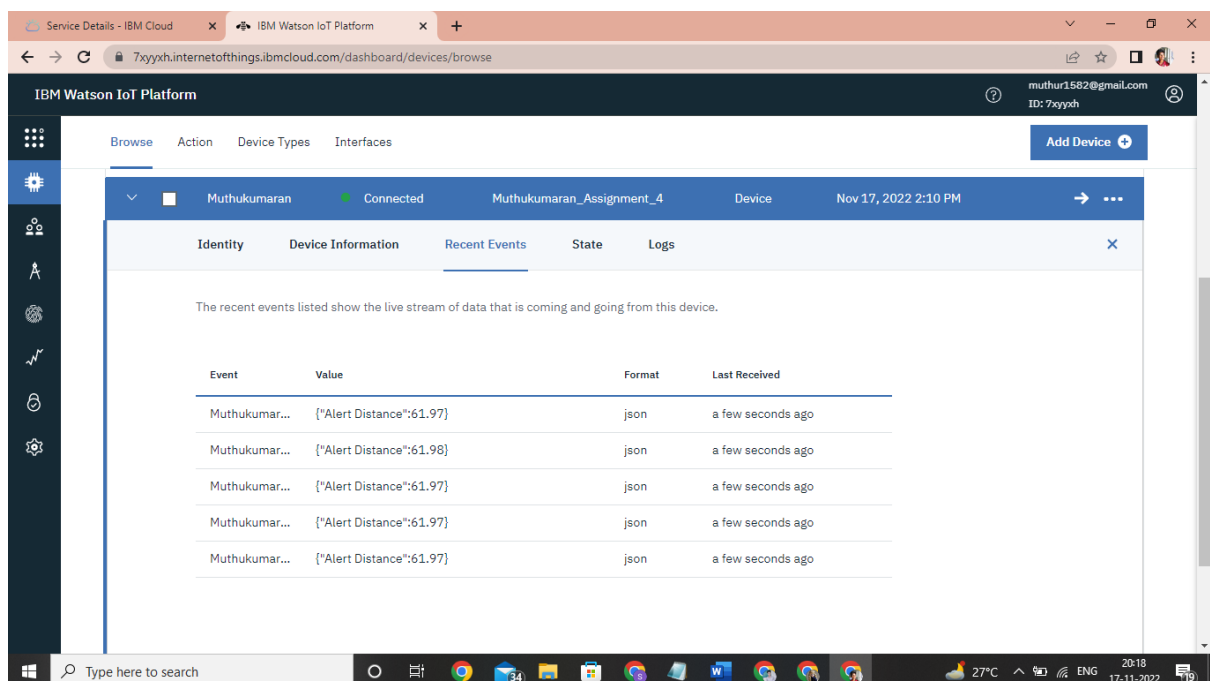
Sending payload: {"Alert Distance":61.97}

Publish OK

Sending payload: {"Alert Distance":61.97}

Publish OK

## ❖ IBM RECENT EVENTS



IBM Watson IoT Platform

Browse Action Device Types Interfaces

Add Device

Muthukumaran Connected Muthukumaran\_Assignment\_4 Device Nov 17, 2022 2:10 PM

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
Muthukumar...	{"Alert Distance":61.97}	json	a few seconds ago
Muthukumar...	{"Alert Distance":61.98}	json	a few seconds ago
Muthukumar...	{"Alert Distance":61.97}	json	a few seconds ago
Muthukumar...	{"Alert Distance":61.97}	json	a few seconds ago
Muthukumar...	{"Alert Distance":61.97}	json	a few seconds ago

