

#### ASSIGNMENT 4

Date	25 October 2022
Team ID	PNT2022TMID33893
Project Name	Gas Leakage monitoring and Alerting system for Industries

**Project Title : Gas Leakage monitoring & Alerting**

**system for Industries**

**Team ID: PNT2022TMID33893**

QUESTION:

Write 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>
void callback(payloadLength);char*
subscribetopic, byte* payload, unsigned int

//-----credentials of IBM Accounts-----
#define ORG "r73wsb"//IBM ORGANITION ID
#define DEVICE_TYPE "sensor"//Device type
mentioned in ibm watson IOT Platform
#define DEVICE_ID "1234"//Device ID mentioned
in ibm watson IOT Platform
```

```
#define TOKEN "12345678" //Token
String data3;
char server[] = ORG
".messaging.internetofthings.ibmcloud.com";
char publishTopic[] =
"iot-2/evt/Data/fmt/json";
char subscribetopic[] =
"iot-2/cmd/test/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":"
DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback
,wifiClient);
const int trigPin = 5;
const int echoPin = 18;
#define SOUND_SPEED 0.034
long duration;
float distance;
void setup() {
  Serial.begin(115200);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  wificonnect();
  mqttconnect();
}
void loop()
{
```

```
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance = duration * SOUND_SPEED/2;
Serial.print("Distance (cm): ");
Serial.println(distance);
if(distance<100)
{
    Serial.println("ALERT!!");
    delay(1000);
    PublishData(distance);
    delay(1000);
    if (!client.loop()) {
        mqttconnect();
    }
}
delay(1000);
}

void PublishData(float dist) {
    mqttconnect();
    String payload = "{\"Distance\": ";
    payload += dist;
    payload += ", \"ALERT!!\": \"\" \"Distance less than 100cms\"";
    payload += "}";
    Serial.print("Sending payload: ");
```

```
Serial.println(payload);

if (client.publish(publishTopic, (char*)
payload.c_str())) {
    Serial.println("Publish ok");
} else {
    Serial.println("Publish failed");
}
}

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

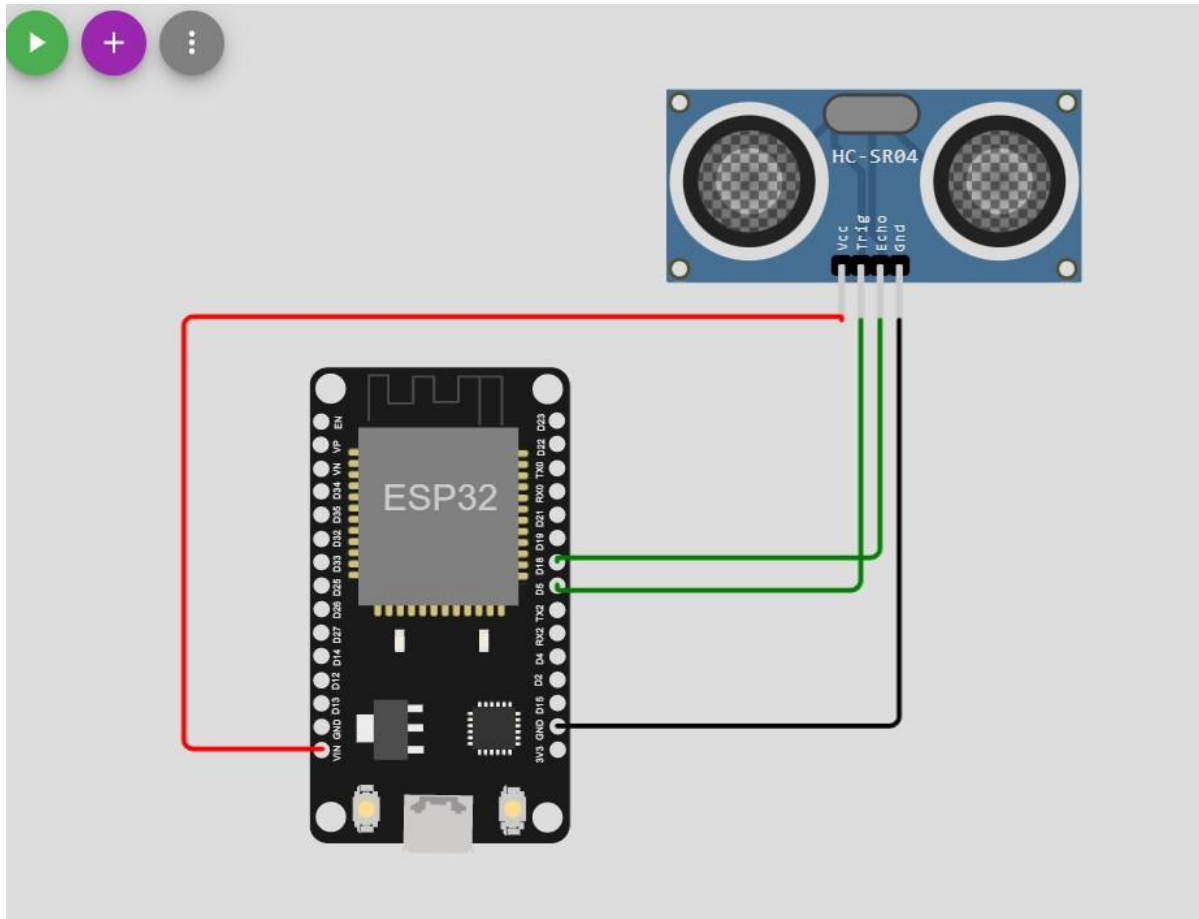
void wificonnect()
{
    Serial.println();
    Serial.print("Connecting to ");
    WiFi.begin("Wokwi-GUEST", "", 6);
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
    }
}
```

```

Serial.print(".");
}
Serial.println("");
Serial.println("WiFi connected");
Serial.println("IP address: ");
Serial.println(WiFi.localIP());
}
void initManagedDevice() {
if (client.subscribe(subscribetopic)) {
Serial.println((subscribetopic));
Serial.println("subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}
void callback(char* subscribetopic, byte*
payload, unsigned int payloadLength)
{
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic);
for (int i = 0; i < payloadLength; i++) {
//Serial.print((char)payload[i]);
data3 += (char)payload[i];
}
Serial.println("data: "+ data3);
data3="";
}

```

SCHEMATIC/CIRCUIT DIAGRAM:



## IBM CLOUD OUTPUT:

Browse Action Device Types Interfaces					Add Device +
Identity Device Information Recent Events State Logs					X
The recent events listed show the live stream of data that is coming and going from this device.					
Event	Value	Format	Last Received		
event_1	{"distance":7,"Alert":"Distance less than 10"}	json	a few seconds ago		
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago		
event_1	{"distance":8,"Alert":"Distance less than 10"}	json	a few seconds ago		
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago		

WOKWI LINK:

<https://wokwi.com/projects/346600099041772115>