

## Assignment -4

Assignment Date	24 Oct 2022
Team ID	PNT2022TMID28572
Student Name	Praveen M
Student Roll Number	312819106028
Project Name	Project - Hazardous Area Monitoring for Industrial Plant powered by IoT

### 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> //library for wifi
#include <PubSubClient.h> //library for MQTT
WiFiClient wifiClient;
String data3;
#define ORG "g05aq3"
#define DEVICE_TYPE "selva"
#define DEVICE_ID "selva_assignment_4"
#define TOKEN "qwertyuio"
#define speed 0.034 #define led 14 char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[]
= "iot-2/evt/selva/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**

Wokwi Assignment 4 - Wokwi A x IBM Watson IoT Platform x +

wokwi.com/projects/346410390406562387

WOKWI SAVE SHARE

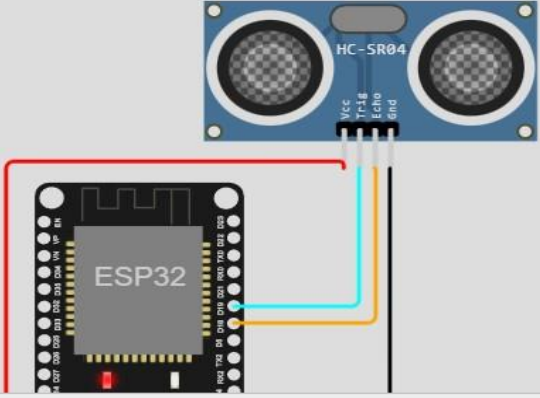
Docs

sketch.ino diagram.json libraries.txt Library Manager

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11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/selva/fmt/json";
13 char topic[] = "iot-2/cmd/status/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=19;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
```

Simulation

00:26.081 89%



Publish OK

Sending payload: {"Distance":160.97}

Publish OK

Sending payload: {"Distance":160.97}

Publish OK

Type here to search

20:38 24-10-2022

**IBM RECENT EVENTS:**

Selvaraj Assignment 4 - Wokwi x IBM Watson IoT Platform x +

g05aq3.internetofthings.ibmcloud.com/dashboard/devices/browse

IBM Watson IoT Platform 312819106034@smartinternz.com ID: g05aq3

Browse Action Device Types Interfaces Add Device +

selva\_assignment\_4 Connected selva Device Oct 24, 2022 8:13 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
selva	{"Distance":160.97}	json	a few seconds ago
selva	{"Distance":160.97}	json	a few seconds ago
selva	{"Distance":160.96}	json	a few seconds ago
selva	{"Distance":160.97}	json	a few seconds ago
selva	{"Distance":153.97}	json	a few seconds ago

1 Simulation running

Type here to search 20:37 24-10-2022 ENG

## 2. When distance less than 100 cm

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wokwi.com/projects/346410390406562387

WOKWI SAVE SHARE Docs

sketch.ino diagram.json libraries.txt Library Manager

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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=19;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
```

Simulation

00:33.027 85%

Editing Ultrasonic Distance Sensor

Distance: 87cm

ESP32

Publish OK

Sending payload: {"Alert Distance":86.96}

Publish OK

Sending payload: {"Alert Distance":86.96}

Publish OK

Type here to search

21:12 24-10-2022

**IBM RECENT EVENTS:**





Event	Value	Format	Last Received
selva	{"Alert Distance":86.96}	json	a few seconds ago
selva	{"Alert Distance":86.96}	json	a few seconds ago
selva	{"Alert Distance":86.96}	json	a few seconds ago
selva	{"Alert Distance":86.96}	json	a few seconds ago
selva	{"Alert Distance":86.96}	json	a few seconds ago

1 Simulation running