

Assignment 4
Student Name: KISHORE K S

DATE	25-10-2022
TEAM ID	PNT2022TMID22305
PROJECT NAME	Signs with Smart Connectivity for Better Road Safety

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

```
#include <WiFi.h> #include
<PubSubClient.h> WiFiClient
wifiClient;
String data3;
#define ORG "c0mbt9" #define
DEVICE_TYPE "Node" #define
DEVICE_ID "1234"
#define TOKEN "987654321"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; char
publishTopic[] = "iot-2/evt/shanmugam_assignment4/fmt/json"; char topic[] =
"iot-2/cmd/home/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:

i) When distance greater than 100 cm

```
1 #include <u1.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data;
5 #define ORG "c0bct9"
6 #define DEVICE_TYPE "Node"
7 #define DEVICE_ID "1234"
8 #define TOKEN "087654321"
9 #define speed 0.634
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/shamugan_assignment4/fet/json";
13 char topic[] = "iot-2/cmd/home/fet/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;
```

Simulation

00:37.184 98%

Sending payload: {"Distance":399.96}
Publish OK

Sending payload: {"Distance":399.96}
Publish OK
Reconnecting MQTT client to
x0fxx.messaging.internetofthings.ibmcloud.com

IBM Watson IoT Platform

Browse Action Device Types Interfaces

Add Device

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
Node	{"distance":144}	json	a few seconds ago
Node	{"distance":182}	json	a few seconds ago
Node	{"distance":196}	json	a few seconds ago
Node	{"distance":165}	json	a few seconds ago
Node	{"distance":164}	json	a few seconds ago

1 Simulation running

ii) When distance is less than 100

The screenshot shows the Wokwi IoT simulator interface. On the left, a code editor displays the following sketch:

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data;
5 #define ORG "cobot9"
6 #define DEVICE_TYPE "Node"
7 #define DEVICE_ID "1234"
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/sharmugan_assignment4/fmt/json";
13 char topic[] = "iot-2/cmd/home/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=10;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
28
29
30
```

On the right, a simulation window shows a circuit with an Arduino Uno, an Ultrasonic Distance Sensor, and an LED. The sensor's distance is displayed as 55cm. Below the simulation, the console shows the following output:

```
Publish OK
Sending payload: {"Alert Distance":54.94}
Publish OK
Sending payload: {"Alert Distance":54.94}
Publish OK
```

The screenshot shows the IBM Watson IoT Platform dashboard. The main table displays the following data:

Event	Value	Format	Last Received
Node	["distance":8]	json	a few seconds ago
Node	["distance":88]	json	a few seconds ago
Node	["distance":8]	json	a few seconds ago
Node	["distance":9]	json	a few seconds ago
Node	["distance":11]	json	a few seconds ago

At the bottom, a status bar indicates "1 Simulation running".

WOKWI LINK -

<https://wokwi.com/projects/346481190622986834>