

#### Assignment-4

Student Name	Someshwaran B
Roll Number	211719106081
Team ID	PNT2022TMID26547
Date	30-October 2022
Project Name	Project -Smart farmer-IOT enabled smart Farming Application

#### Question:

Write code and connections in wokwi for ultrasonic sensor.

Whenever distance is less than 100cm send "alert" to IBM cloud and display in device recent events.

Upload document with wokwi share link and images of IBM cloud.

#### CODE:

```
#include <WiFi.h>
#include <WiFiClient.h>
#include <PubSubClient.h>

#define ORG "17lsro"
#define DEVICE_TYPE "MyDeviceType"
#define DEVICE_ID "12345"
#define TOKEN "GkatKdiUS?UVHKvnAD"

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char pubTopic1[] = "iot-2/evt/Someshwaran B/fmt/json";
char pubTopic2[] = "iot-2/evt/status2/fmt/json";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
const int DHT_PIN = 15;
WiFiClient wifiClient;
PubSubClient client(server, 1883, NULL, wifiClient);

#define ECHO_PIN 12
#define TRIG_PIN 13

float readDistanceCM() ;
void setup() {
  Serial.begin(115200);
  pinMode(15, OUTPUT);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);

  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("Wokwi-GUEST", "", 6);
```

```

while (WiFi.status() != WL_CONNECTED) {
    delay(50);
    Serial.print(".");
}
Serial.println("");

Serial.print("WiFi connected, IP address: ");
Serial.println(WiFi.localIP());

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

float readDistanceCM()
{
    digitalWrite(TRIG_PIN, LOW);
    delayMicroseconds(2);
    digitalWrite(TRIG_PIN, HIGH);
    delayMicroseconds(10);
    digitalWrite(TRIG_PIN, LOW);
    int duration = pulseIn(ECHO_PIN, HIGH);
    return duration * 0.034 / 2;
}

long lastMsg = 0;
void loop() {
    float distance = readDistanceCM();

    bool isNearby = distance < 100; //checking whether the distance is less than 100
    digitalWrite(15, isNearby);

    Serial.print("Measured distance: ");
    Serial.println(readDistanceCM());

    delay(100);
    if(isNearby) //Whenever the distance is less than 100 cms send an "alert" to the IBM
cloud
    {

        client.loop();
        long now = millis();
        if (now - lastMsg > 3000) {
            lastMsg = now;

            String payload = "{\"Distance\":\"";

```

```

    payload += distance;

    payload += "}";

    Serial.print("Sending payload: ");
    Serial.println(payload);

    if (client.publish(pubTopic1, (char*) payload.c_str())) {
        Serial.println("Publish ok");
    } else {
        Serial.println("Publish failed");
    }
}
}
}

```

## OUTPUT:

### Case: 1

When Distance Is Above 100 Cm

The screenshot displays the WOKWI IoT simulation interface. On the left, the 'sketch.ino' file is open in a code editor, showing the following code:

```

1 #include <WiFi.h>
2 #include <WiFiClient.h>
3 #include <PubSubClient.h>
4
5 #define ORG "17lsro"
6 #define DEVICE_TYPE "MyDeviceType"
7 #define DEVICE_ID "12345"
8 #define TOKEN "GkatKdiUS?UVHKvnAD"
9
10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char pubTopic1[] = "iot-2/evt/Someshwaran B/fmt/json";
12 char pubTopic2[] = "iot-2/evt/status2/fmt/json";
13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
15 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
16 const int DHT_PIN = 15;
17 WiFiClient wifiClient;
18 PubSubClient client(server, 1883, NULL, wifiClient);
19
20
21 #define ECHO_PIN 12
22 #define TRIG_PIN 13
23
24 float readDistanceCM();
25 void setup() {
26     Serial.begin(115200);
27     pinMode(15, OUTPUT);
28 }

```

On the right, the 'Simulation' window shows a 3D model of an ESP32 microcontroller board connected to a blue ultrasonic sensor module. Below the model, a log window displays the following output:

```

Connecting to .....
WiFi connected, IP address: 10.10.0.2
Reconnecting client to
17lsro.messaging.internetofthings.ibmcloud.com
Bluemix connected
Measured distance: 175.97
Measured distance: 176.00

```

## Data Is Not Send to IBM IOT PLATFORM If Distance Is Above 100 Cm

IBM Watson IoT Platform

211719106081@smartinternz.com  
ID: 17lsro

← Back

### Device Drilldown - 12345

Connection Information

**Recent Events**

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

Event	Value	Format	Last Received
-------	-------	--------	---------------

Waiting for device events...

## Case:2

### When Distance Is Below 100 Cm

WOKWI

SAVE SHARE

Docs

sketch.ino diagram.json libraries.txt Library Manager

Simulation

00:16.695 98%

```
1 #include <WiFi.h>
2 #include <WiFiClient.h>
3 #include <PubSubClient.h>
4
5 #define ORG "17lsro"
6 #define DEVICE_TYPE "MyDeviceType"
7 #define DEVICE_ID "12345"
8 #define TOKEN "GkatKdiUS?UVHKvnAD"
9
10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char pubTopic1[] = "iot-2/evt/Someshwaran B/fmt/json";
12 char pubTopic2[] = "iot-2/evt/status2/fmt/json";
13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
15 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
16 const int DHT_PIN = 15;
17 WiFiClient wifiClient;
18 PubSubClient client(server, 1883, NULL, wifiClient);
19
20
21 #define ECHO_PIN 12
22 #define TRIG_PIN 13
23
24 float readDistanceCM();
25 void setup() {
26   Serial.begin(115200);
27   pinMode(15, OUTPUT);
28 }
```

Connecting to .....  
WiFi connected, IP address: 10.10.0.2  
Reconnecting client to  
17lsro.messaging.internetofthings.ibmcloud.com  
Bluemix connected  
Measured distance: 69.99  
Measured distance: 69.96

When The Distance Is Below 100Cm Data Is Sent To IBM Iot Platform

IBM Watson IoT Platform

211719106081@smartinternz.com  
ID: 17tsro

← Back

Device Drilldown - 12345

Connection Information

Recent Events

State

Device Information

Metadata

Diagnostics

Connection Logs

Device Actions

Recent Events

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

Event	Value	Format	Last Received
Someshwara...	{"Distance":69.99}	json	a few seconds ago
Someshwara...	{"Distance":69.99}	json	a few seconds ago
Someshwara...	{"Distance":69.99}	json	a few seconds ago