

Assignment-4

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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/SURYA PRAKASH J /fmt/json"; char pubTopic2[] =
"iot-2/evt/status2/fmt/json"; char authMethod[] = "use-
tokenauth"; 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 simulator interface. On the left, the 'sketch.ino' file contains 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/SURYA PRAKASH J /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 }

```

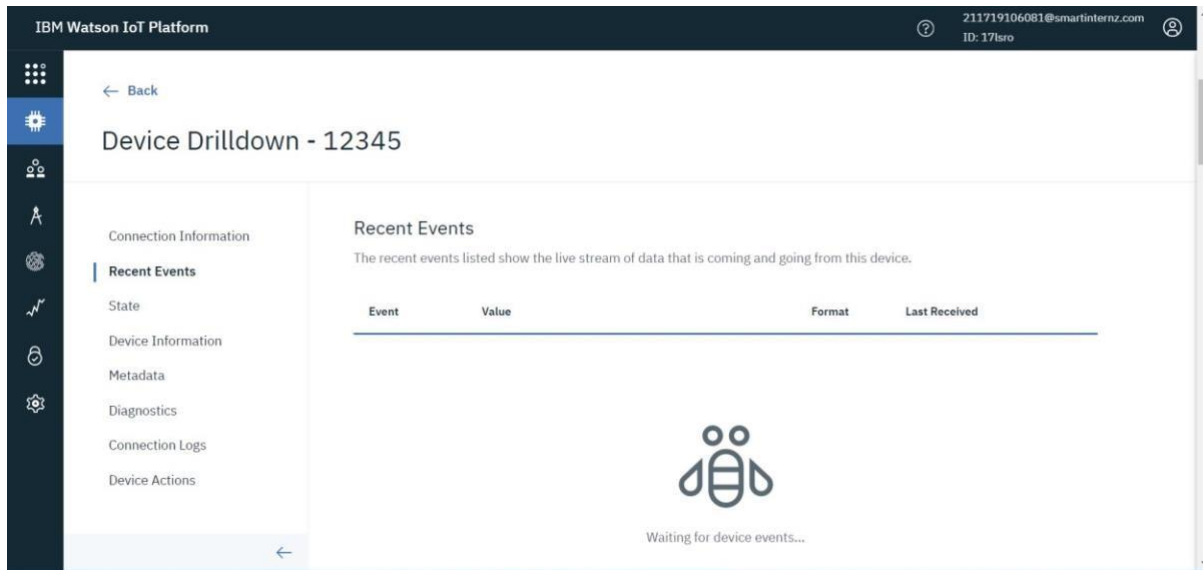
On the right, the 'Simulation' window shows a visual representation of the hardware: an ESP32 microcontroller board connected to a DHT11 temperature and humidity sensor. The simulation log at the bottom shows the following output:

```

Connecting to .....
WiFi connected, IP address: 10.10.0.2
Reconnecting client to
17lsro.messaging.internetofthings.ibmcloud.com
Bluemix connected
Measured distance: 204.95
Measured distance: 204.99

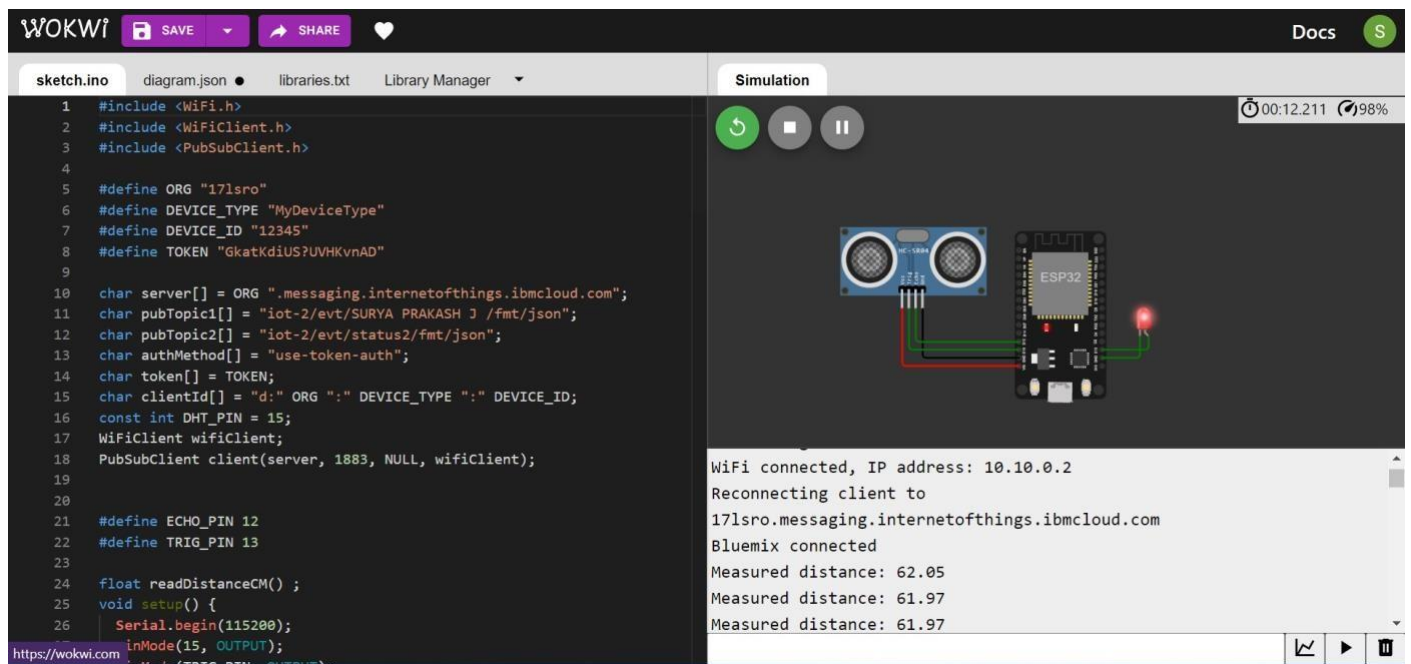
```

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



Case:2

When Distance Is Below 100 Cm



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

IBM Watson IoT Platform

?

211719106081@smartinternz.com

ID: 17lsro

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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
SURYA PRAK...	{"distance":61.97}	json	a few seconds ago
SURYA PRAK...	{"distance":61.97}	json	a few seconds ago

State

This table shows a list of data points that are reported by this device.