

## Assignment 4

Date	17 Nov 2022
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Project Name	Project-IoTBasedSafetyGadgetForChild SafetyMonitoring& Notification

**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. Upload document with wokwi share link and images of ibmcloud.**

### **Code:**

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "gpqw2a"//IBM ORGANITION ID
#define DEVICE_TYPE "Ultrasonic"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "2000"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "Ultrasonic2000"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/shreedharen/fmt/json";
char topic[] = "iot-2/cmd/led/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 += "}";

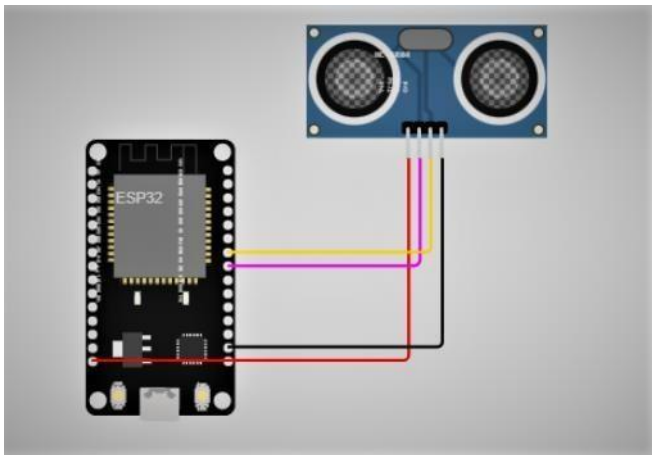
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
}else {
    Serial.println("Publish FAILED");
}

}

}

```

## Connections



## Output:

```
Connecting to Wifi..WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to
gpqw2a.messaging.internetofthings.ibmcloud.com
IBM subscribe to cmd OK

Sending payload: {"Distance":399.92}
Publish OK

Sending payload: {"Distance":400.18}
Publish OK

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

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

## Cloud image:

The screenshot displays the IBM Watson IoT Platform dashboard. The top navigation bar includes tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains icons for various functions. The main content area shows a table of devices. One device, with ID '2000' and type 'Ultrasonic', is highlighted. A modal window is open, displaying detailed information about this device.

Identity	Device Information	Recent Events	State	Logs
Device ID	2000			
Device Type	Ultrasonic			
Date Added	Nov 17, 2022 9:22 AM			
Added By	ashwinkumargiri2000@gmail.com			
Connection Status	Connected			
	Connection Time: Nov 17, 2022 11:10 AM			
	Client Address: 145.40.93.209 Insecure			

The screenshot displays the IBM Watson IoT Platform interface. The top navigation bar includes tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. A user profile for 'ashwinkumargiri2000@gmail.com' is visible in the top right. The main content area shows a device named '2000' with a status of 'Connected' and a type of 'Ultrasonic'. Below the device header, there are tabs for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is active, displaying a table of recent data points.

Event	Value	Format	Last Received
Ashwin	{"Distance":399.96}	json	a few seconds ago
Ashwin	{"Distance":399.96}	json	a few seconds ago
Ashwin	{"Distance":399.98}	json	a few seconds ago

The bottom of the image shows a Windows taskbar with various application icons and a system tray displaying the date and time as 11:13 AM on 17-11-2022.

## Wokwi link:

<https://wokwi.com/projects/347195489784955474>