

Assignment 4

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| 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 += "}";

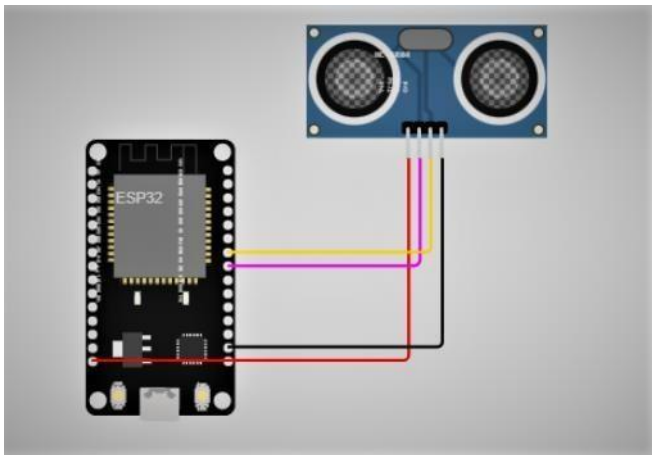
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
}else {
    Serial.println("Publish FAILED");
}

}

}

```

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, is highlighted, and its details are shown in a modal window.

| Device ID | Device Type | Date Added | Added By | Connection Status |
|-----------|-------------|----------------------|-------------------------------|-------------------|
| 2000 | Ultrasonic | Nov 17, 2022 9:22 AM | ashwinkumargiri2000@gmail.com | Connected |

Connection Time: Nov 17, 2022 11:10 AM
Client Address: 145.40.93.209 Insecure

IBM Watson IoT Platform dashboard showing device details for device ID 2000. The device is connected and is an Ultrasonic sensor. The recent events table shows three entries, all with a value of {"Distance":399.96} and a format of json, received a few seconds ago.

| 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":399.96} | json | a few seconds ago |

Wokwi link:

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