

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 += "}";

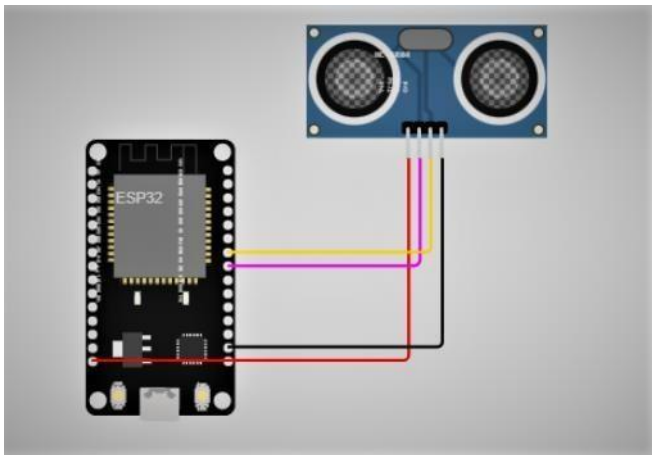
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish OK");
}else {
    Serial.println("Publish FAILED");
}

}

}

```

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 the IBM logo and several open tabs: IBM, IBM-Project-26653-10, IBM Watson IoT Platform, sketch.ino - Wokwi A..., Download file | iLoveF..., and New Tab. The main content area shows a list of devices under the 'Browse' tab. Two devices are visible: one with ID 001 (Disconnected) and another with ID 2000 (Connected). The 'Connected' device is selected, and its details are shown in a modal window. The details include the device ID (2000), type (Ultrasonic), date added (Nov 17, 2022 9:22 AM), added by (ashwinkumargiri2000@gmail.com), and connection status (Connected). The connection time is Nov 17, 2022 11:10 AM, and the client address is 145.40.93.209 Insecure. The bottom of the image shows a Windows taskbar with a search bar, several application icons, and a system tray displaying the temperature (26°C Cloudy), language (ENG IN), and time (11:11 AM 17-11-2022).

Device ID	Device Type	Date Added	Added By	Connection Status
001	Child_Safety_Gadgets	Nov 12, 2022 7:04 PM		Disconnected
2000	Ultrasonic	Nov 17, 2022 9:22 AM	ashwinkumargiri2000@gmail.com	Connected

Device Details for ID 2000:

- 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

IBM Watson IoT Platform dashboard showing device details for device ID 2000. The device is connected and is an Ultrasonic sensor. The recent events tab is selected, displaying a table of 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

Wokwi link:

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