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Project name	Smart Waste Management system for Metropolitan cities

ASSIGNMENT 4

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.

```
#include <WiFi.h>
#include <PubSubClient.h>
#define ORG "prbqrn"
#define DEVICE_TYPE "Ultrasonic"
#define DEVICE_ID "Assignment"
#define TOKEN "6qL3DUu-zuo8yPl7tS"
#define speed 0.034
#define led 14
String data3;
int LED = 4;

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot2/evt/sreedhar/fmt/json";
char topic[] = "iot-2/cmd/led/fmt/string";
char authMethod[] = "use-
tokenauth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

WiFiClient
wifiClient;
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("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)
    {
        digitalWrite(LED, HIGH);
        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)
    {
        digitalWrite(LED, HIGH);
        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  
    {  
        digitalWrite(LED, LOW);  
        Serial.println("Publish FAILED");  
    }  
}  
}
```