

SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY
ASSIGNMENT-4

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PROJECT NAME	Signs with Smart Connectivity for Better Road Safety

ASSIGNMENT-4

Write code and connections in wokwi for ultrasonic sensors. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>

WiFiClient wifiClient;

#define ORG "5fh666"
#define DEVICE_TYPE "raspberrypi"
#define DEVICE_ID "2011"
#define TOKEN "12345678"
#define speed 0.034

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/raspberrypi_1/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();

const int trigpin=5;
const int echopin=18;
String command;
String data="";
String lat="14.167589";
String lon="80.248510";
String name="point2";
String icon="";
```

```

long duration;
int dist;

void setup()
{
    Serial.begin(115200);
    pinMode(trigpin, OUTPUT);
    pinMode(echopin, INPUT);
    wifiConnect();
    mqttConnect();
}

void loop() {

    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(1000);
        }
        initManagedDevice();
        Serial.println();
    }
}

void initManagedDevice() {
    if (client.subscribe(topic)) {
        Serial.println(client.subscribe(topic));
    }
}

```

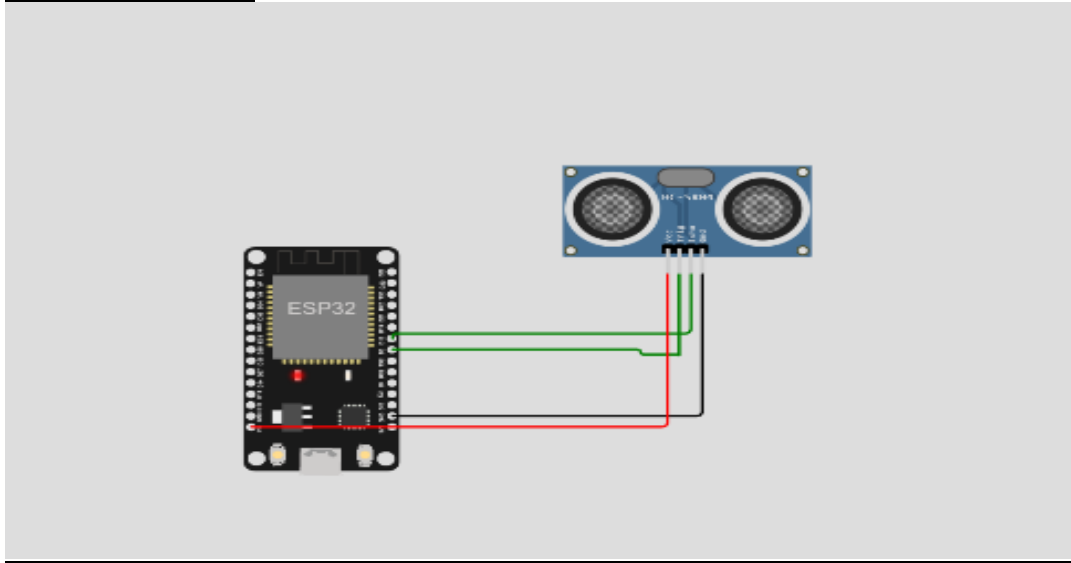
```

        Serial.println("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){
        dist=100-dist;
        icon="fa-trash";
    }else{
        dist=0;
        icon="fa-trash-o";
    }
    DynamicJsonDocument doc(1024);
    String payload;
    doc["Name"]=name;
    doc["Latitude"]=lat;
    doc["Longitude"]=lon;
    doc["Icon"]=icon;
    doc["FillPercent"]=dist;
    serializeJson(doc, payload);
    delay(3000);
    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:



WOKWI LINK:

<https://wokwi.com/projects/346486197647835731>

OUTPUT:

Wokwi Arduino IDE interface showing the sketch and simulation results.

```
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2 #include <PubSubClient.h>
3 #include <ArduinoJson.h>
4
5 WiFiClient wifiClient;
6
7 #define ORG "5fh666"
8 #define DEVICE_TYPE "raspberrypi"
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14 char publishTopic[] = "iot-2/evt/raspberrypi_1/fmt/json";
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16 char authMethod[] = "use-token-auth";
17 char token[] = TOKEN;
18 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19 PubSubClient client(server, 1883, wifiClient);
20 void publishData();
21
22 const int trigpin=5;
```

Simulation output:

```
Connecting to Wifi..Wifi connected, IP address: 10.10.0.2
Reconnecting MQTT client to
5fh666.messaging.internetofthings.ibmcloud.com
```

IBM Watson IoT Platform interface showing device information and recent events.

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location	Added By
12245	Disconnected	raspberrypi	Device	Oct 14, 2022 2:16 PM		412719106006@emartinterna.com
2011	Disconnected	raspberrypi	Device	Oct 26, 2022 1:13 PM		412719106006@emartinterna.com

Event	Value	Format	Last Received
event_1	["alardistance":42]	json	a few seconds ago
event_1	["alardistance":11]	json	a few seconds ago
event_1	["alardistance":44]	json	a minute ago
event_1	["alardistance":5]	json	2 minutes ago
event_1	["alardistance":49]	json	2 minutes ago

