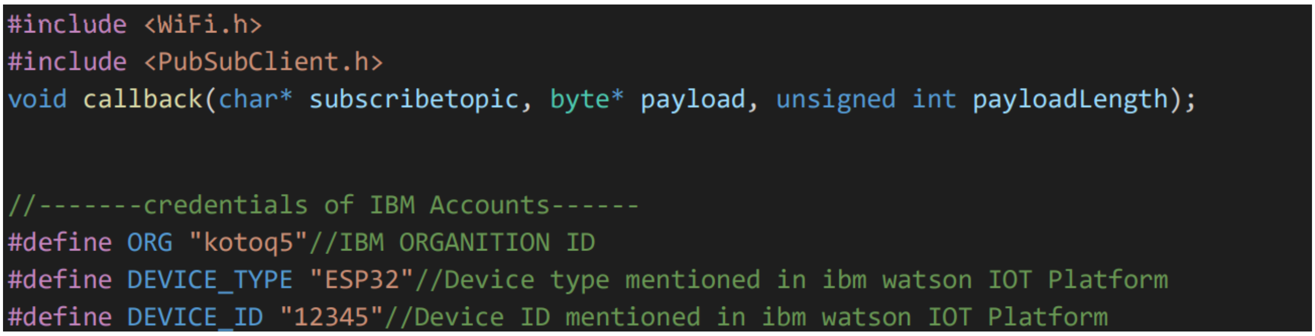
ASSIGNMENT – 4

STUDENT ROLL NUMBER	**718019Z359**
TECHNOLOGY	**INTERNER OF THINGS**
DOMAIN	**SMART SOLLUTIONS FOR RAILWAYS**

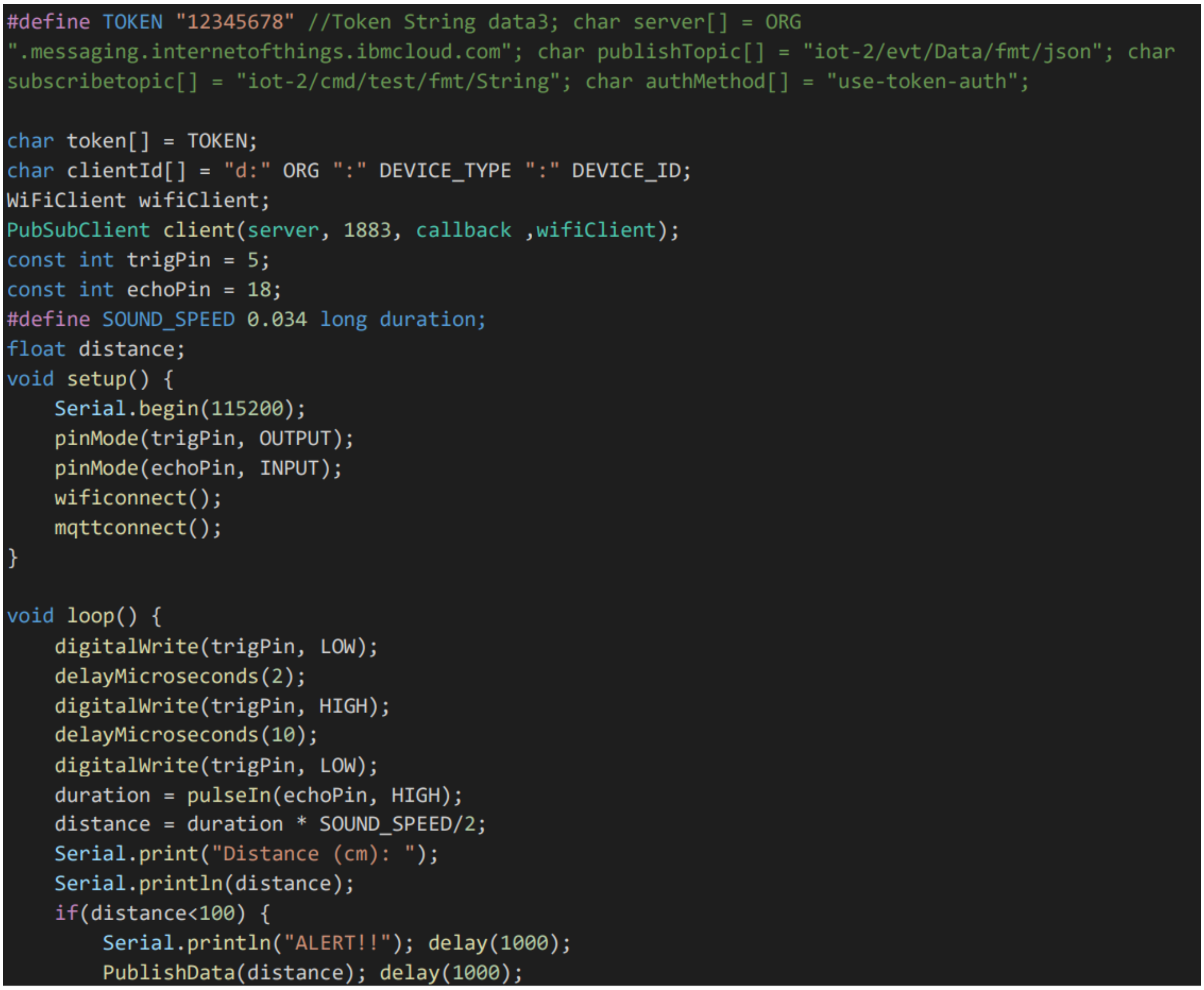
QUESTION :

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an “Alert” to IBM cloud and display in the device recent events.

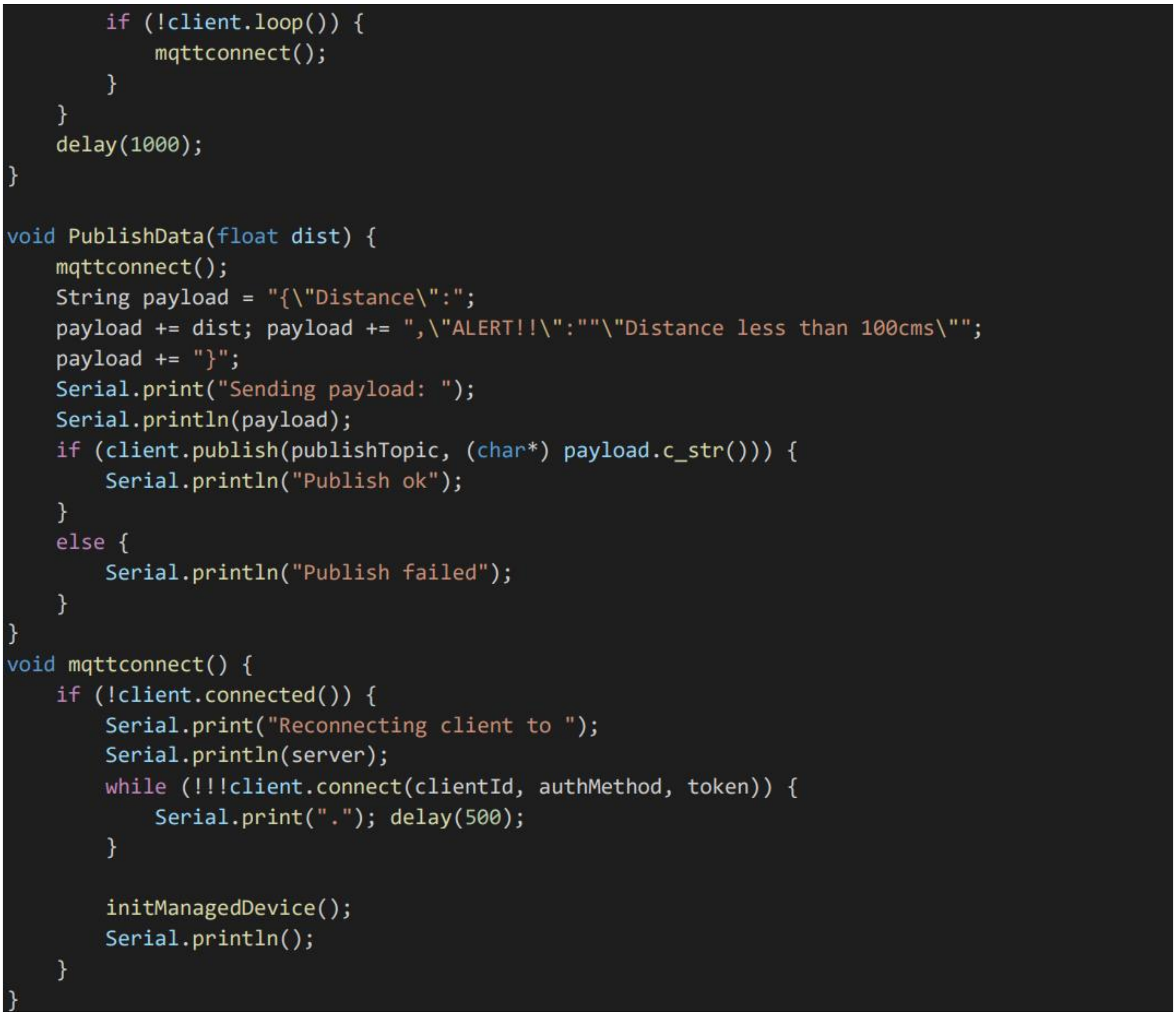
CODE :



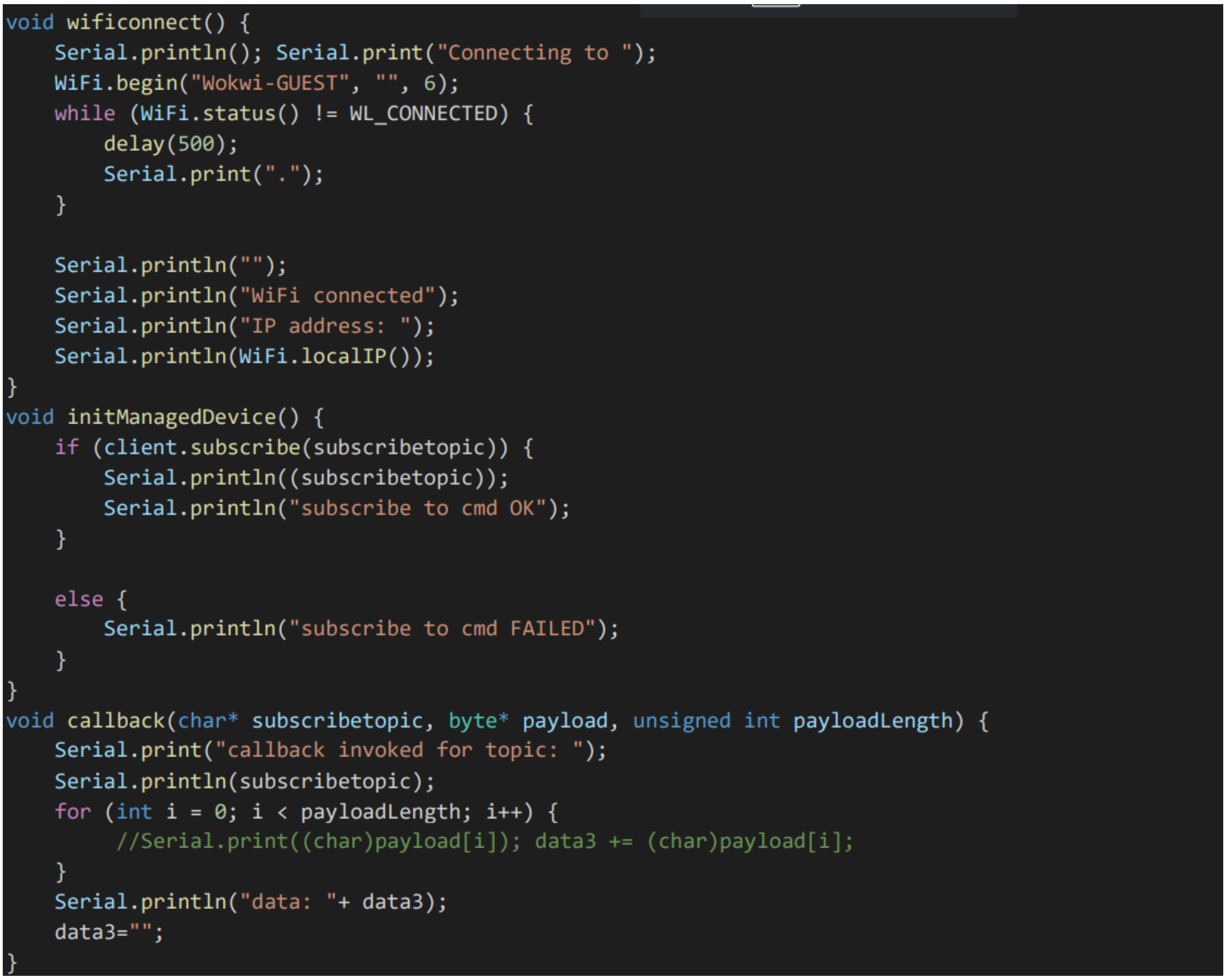
```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);


//-------credentials of IBM Accounts------
#define ORG "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform
```



```
#define TOKEN "12345678" //Token String data3; char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[] = "iot-2/evt/Data/fmt/json"; char
subscribetopic[] = "iot-2/cmd/test/fmt/String"; char authMethod[] = "use-token-auth";

char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);
const int trigPin = 5;
const int echoPin = 18;
#define SOUND_SPEED 0.034 long duration;
float distance;
void setup() {
    Serial.begin(115200);
    pinMode(trigPin, OUTPUT);
    pinMode(echoPin, INPUT);
    wificonnect();
    mqttconnect();
}

void loop() {
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    duration = pulseIn(echoPin, HIGH);
    distance = duration * SOUND_SPEED/2;
    Serial.print("Distance (cm): ");
    Serial.println(distance);
    if(distance<100) {
        Serial.println("ALERT!!"); delay(1000);
        PublishData(distance); delay(1000);
```

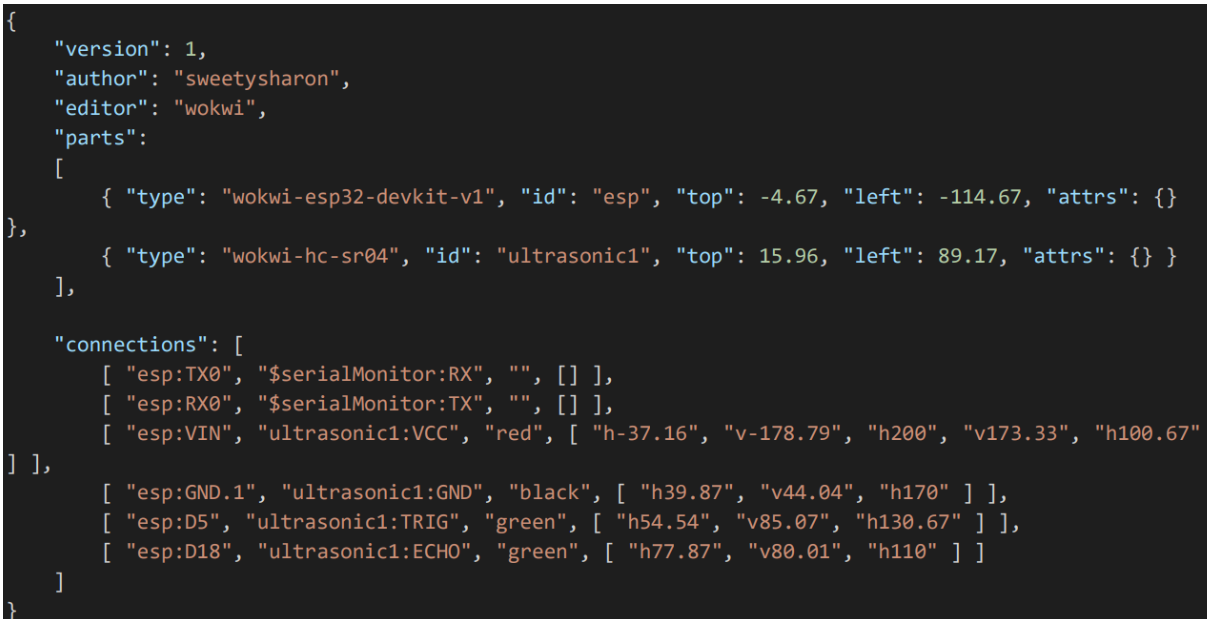


```
        if (!client.loop()) {
            mqttconnect();
        }
    }
    delay(1000);
}

void PublishData(float dist) {
    mqttconnect();
    String payload = "{\"Distance\":";
    payload += dist; payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";
    payload += "}";
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish ok");
    }
    else {
        Serial.println("Publish failed");
    }
}
void mqttconnect() {
    if (!client.connected()) {
        Serial.print("Reconnecting client to ");
        Serial.println(server);
        while (!!!client.connect(clientId, authMethod, token)) {
            Serial.print("."); delay(500);
        }

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



```
void wificonnect() {
    Serial.println(); Serial.print("Connecting to ");
    WiFi.begin("Wokwi-GUEST", "", 6);
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }

    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
}
void initManagedDevice() {
    if (client.subscribe(subscribetopic)) {
        Serial.println((subscribetopic));
        Serial.println("subscribe to cmd OK");
    }

    else {
        Serial.println("subscribe to cmd FAILED");
    }
}
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength) {
    Serial.print("callback invoked for topic: ");
    Serial.println(subscribetopic);
    for (int i = 0; i < payloadLength; i++) {
         //Serial.print((char)payload[i]); data3 += (char)payload[i];
    }
    Serial.println("data: "+ data3);
    data3="";
}
```

Diagram.json:



```
{
    "version": 1,
    "author": "sweetysharon",
    "editor": "wokwi",
    "parts":
    [
        { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -114.67, "attrs": {}
},
        { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17, "attrs": {} }
    ],

    "connections": [
        [ "esp:TX0", "$serialMonitor:RX", "", [] ],
        [ "esp:RX0", "$serialMonitor:TX", "", [] ],
        [ "esp:VIN", "ultrasonic1:VCC", "red", [ "h-37.16", "v-178.79", "h200", "v173.33", "h100.67"
] ],
        [ "esp:GND.1", "ultrasonic1:GND", "black", [ "h39.87", "v44.04", "h170" ] ],
        [ "esp:D5", "ultrasonic1:TRIG", "green", [ "h54.54", "v85.07", "h130.67" ] ],
        [ "esp:D18", "ultrasonic1:ECHO", "green", [ "h77.87", "v80.01", "h110" ] ]
    ]
}
```