Assignment -4

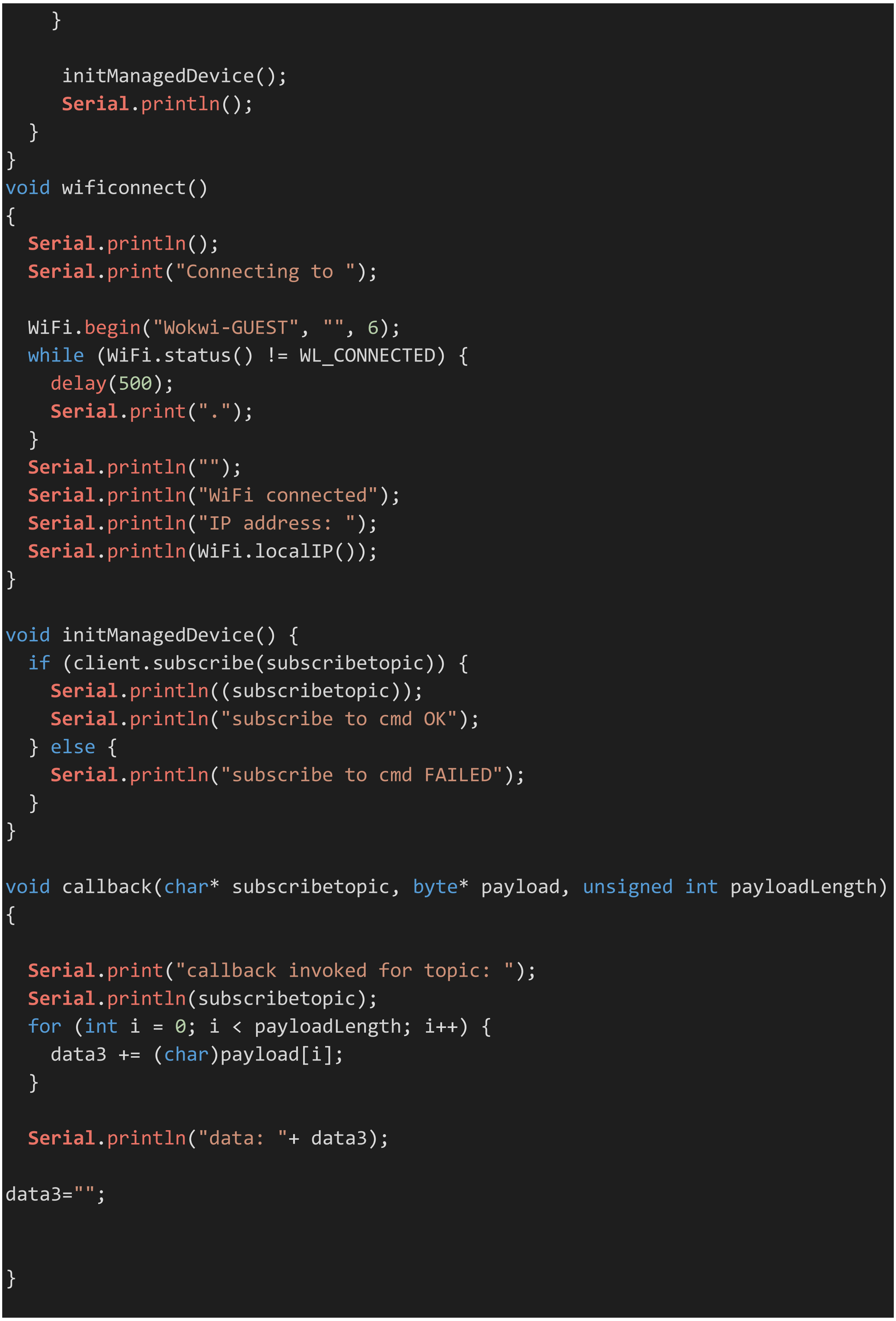
Assignment Date	19 October 2022
Student Name	Hariboobaalan P N
Student Roll Number	722819104042
Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor.

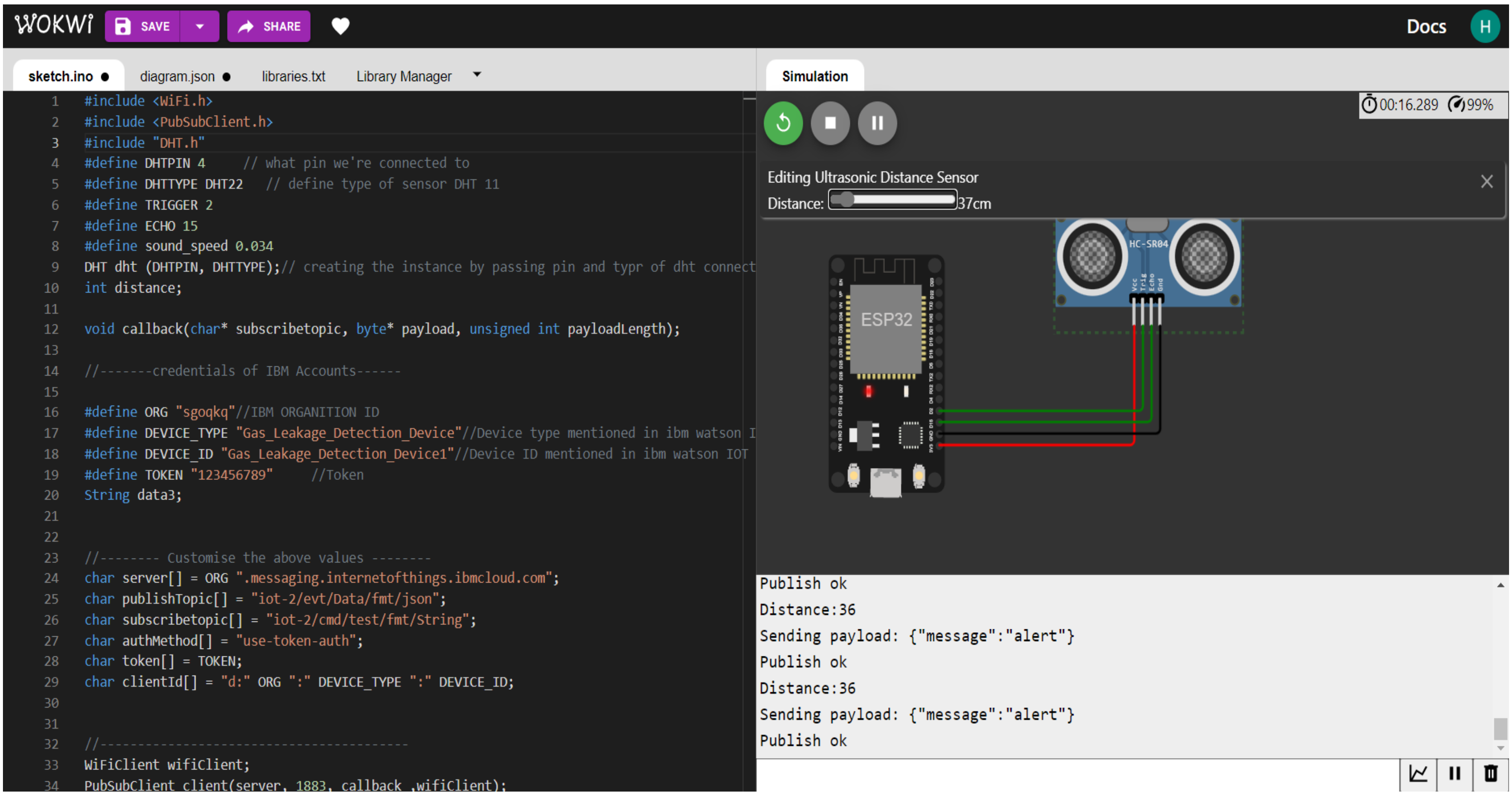
Whenever distance is less than 100cms send “alert” to IBM cloud and display in device recent events.

```
#include <WiFi.h>
#include <PubSubClient.h>
#include "DHT.h"
#define DHTPIN 4
#define DHTTYPE DHT22
#define TRIGGER 2
#define ECHO 15
#define sound_speed 0.034
DHT dht (DHTPIN, DHTTYPE);
int distance;

void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);

//-------credentials of IBM Accounts------

#define ORG "sgoqkq"
#define DEVICE_TYPE "Gas_Leakage_Detection_Device"
#define DEVICE_ID "Gas_Leakage_Detection_Device1"
#define TOKEN "123456789"
String data3;


//-------- Customise the above values --------
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);
void setup()
{
  Serial.begin(115200);
  pinMode(TRIGGER, OUTPUT);
  pinMode(ECHO, INPUT);
  pinMode(LED, OUTPUT);
  dht.begin();
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}

void loop()
{

  digitalWrite(TRIGGER, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIGGER, LOW);

  int duration=pulseIn(ECHO,HIGH);
  distance=(duration*sound_speed)/2;
  Serial.print("Distance:");
  Serial.print(distance);
  Serial.println("cms");
  if(distance<100){
    PublishData(distance);
  }
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}



/*.....................................retrieving to
Cloud...............................*/

void PublishData(int d) {
  mqttconnect();

  String payload = "{\"message\":alert}";

  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++) {
    data3 += (char)payload[i];
  }

  Serial.println("data: "+ data3);

data3="";



}
```

Wokwi Platform Coding and Circuit Design

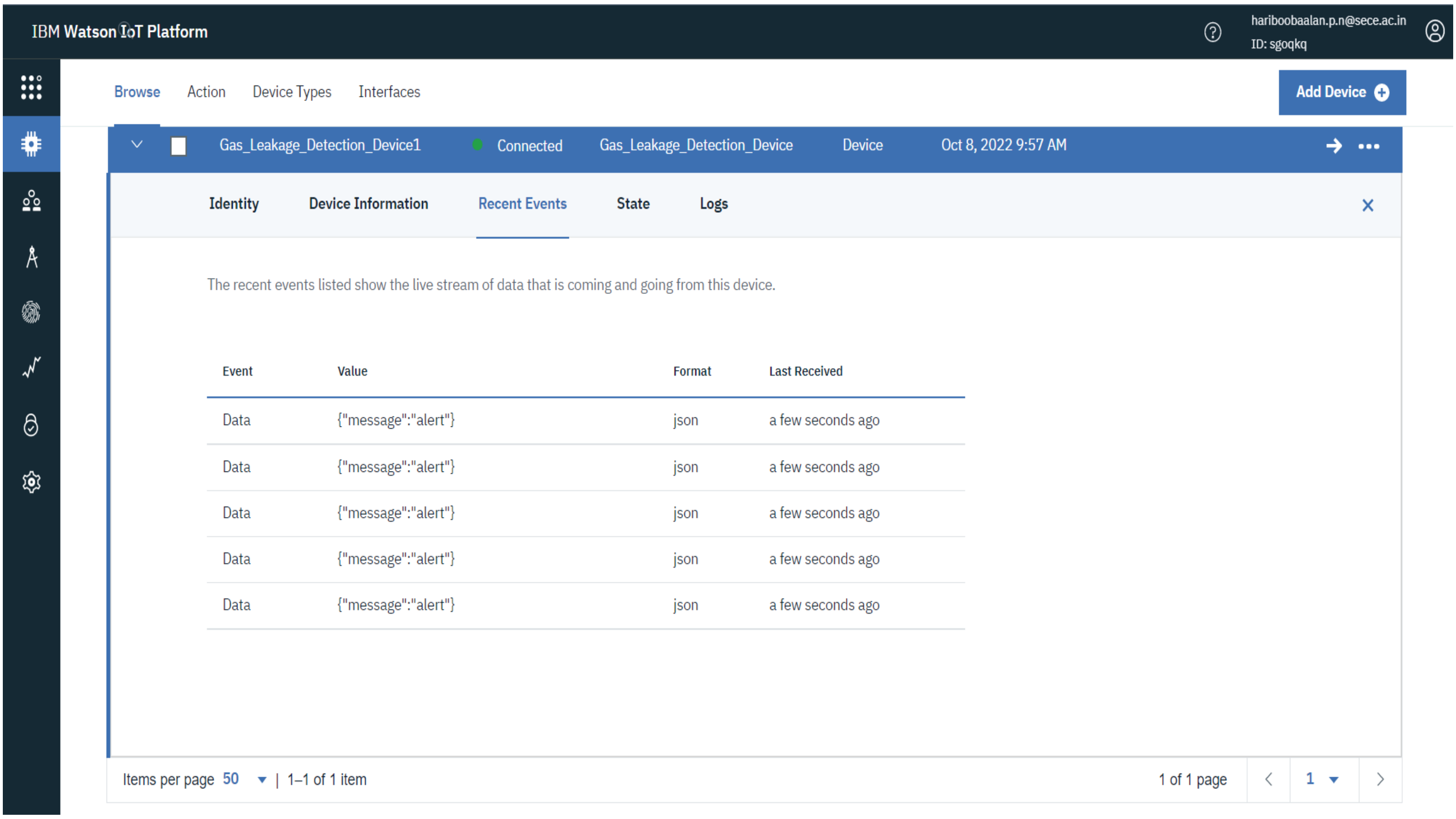


```
#include <WiFi.h>
#include <PubSubClient.h>
#include "DHT.h"
#define DHTPIN 4     // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11
#define TRIGGER 2
#define ECHO 15
#define sound_speed 0.034
DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of dht connect
int distance;

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-------credentials of IBM Accounts------

#define ORG "sgoqkq"//IBM ORGANITION ID
#define DEVICE_TYPE "Gas_Leakage_Detection_Device"//Device type mentioned in ibm watson I
#define DEVICE_ID "Gas_Leakage_Detection_Device1"//Device ID mentioned in ibm watson IOT
#define TOKEN "123456789"     //Token
String data3;


//-------- Customise the above values --------
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);
```

Editing Ultrasonic Distance Sensor
Distance: 37cm

```
Publish ok
Distance:36
Sending payload: {"message":"alert"}
Publish ok
Distance:36
Sending payload: {"message":"alert"}
Publish ok
```

IBM IoT Platform Device Recent Events



Gas_Leakage_Detection_Device1 ● Connected Gas_Leakage_Detection_Device Device Oct 8, 2022 9:57 AM

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago
Data	{"message":"alert"}	json	a few seconds ago

Items per page 50 | 1–1 of 1 item

1 of 1 page 1