Assignment -4

Assignment Date	19 October 2022
Student Name	Kavin P
Student Roll Number	722819104056
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.

Code:

```
#include <WiFi.h>

#include <PubSubClient.h>

#include "DHT.h"

#define DHTPIN 4

#define DHTTYPE DHT22

#define TRIGGER 2

#define ECHO 15

#define sound 0.034

DHT dht (DHTPIN, DHTTYPE);

int distance;

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

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

#define ORG "85br02"

#define DEVICE_TYPE "gas_leakage_system"

#define DEVICE_ID "gas_leakage_device"

#define TOKEN "_NAMIjLh@&H&(w6*Ts"

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;
```

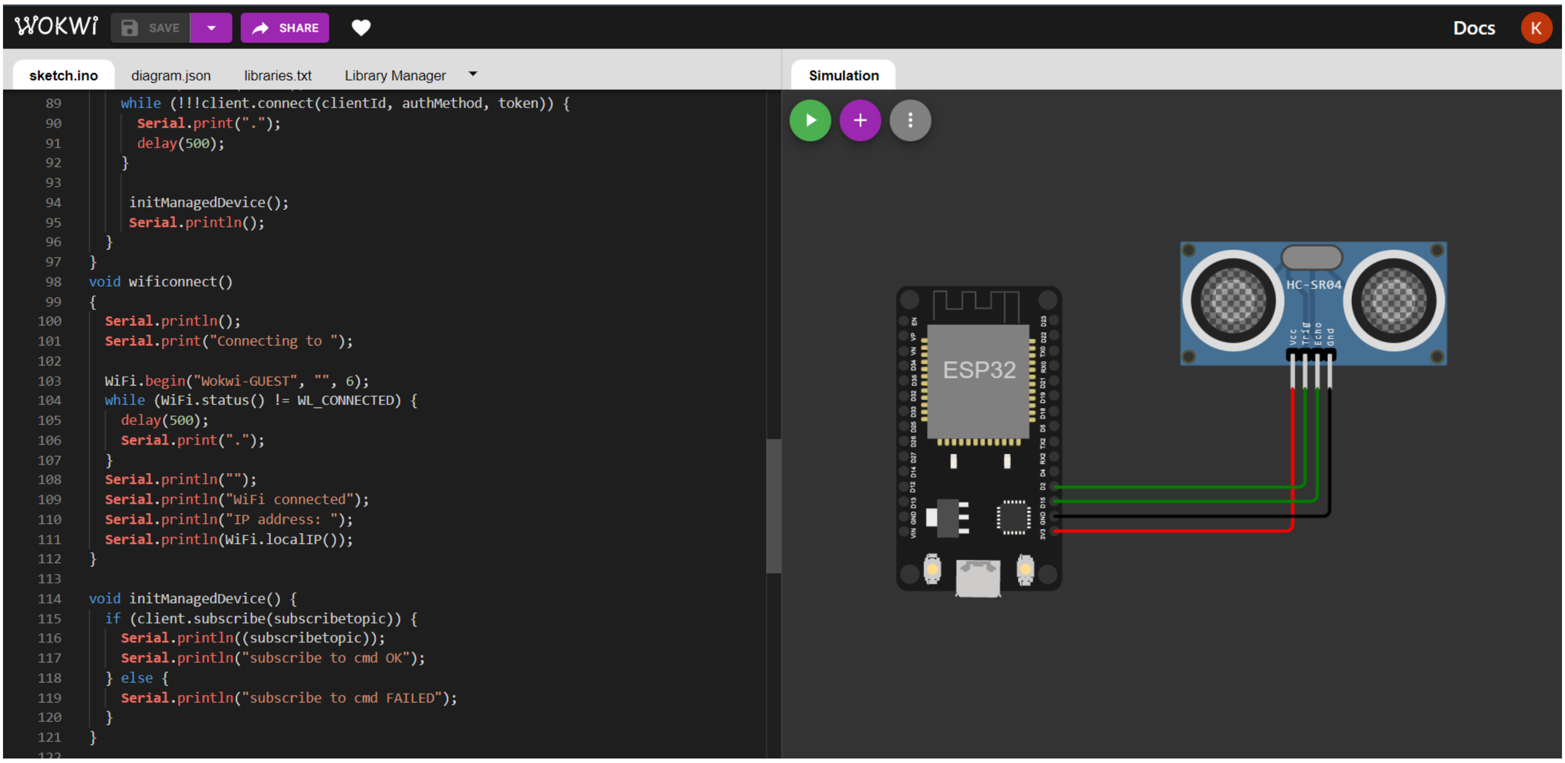
```
//----------------------------------------
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);
void setup()
{
  Serial.begin(115200);
  pinMode(TRIGGER, OUTPUT);
  pinMode(ECHO, INPUT);
  dht.begin();
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}
void loop()
{
  digitalWrite(TRIGGER, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIGGER, LOW);
  int time=pulseIn(ECHO,HIGH);
  distance=(time*sound)/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



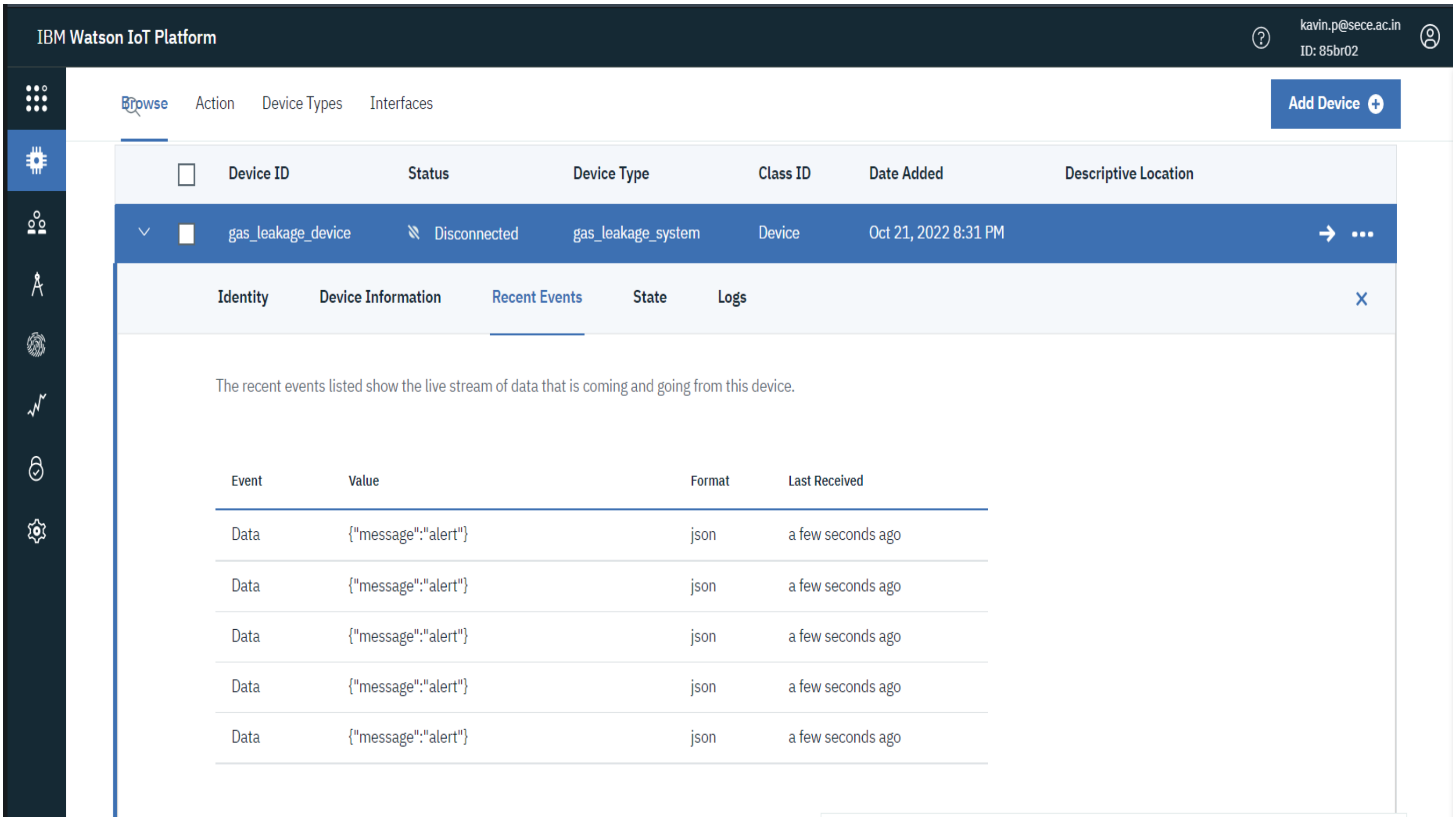
```
    while (!!!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
      delay(500);
    }

    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");
  }
}
```

Device Recent Events



□	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
□	gas_leakage_device	Disconnected	gas_leakage_system	Device	Oct 21, 2022 8:31 PM	

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