Assignment -4

Assignment Date	25 October 2022
Student Name	Mr.E.SATHEESH
Student Roll Number	113119UG03093

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100cm send "alert" to ibm cloud and display in device recent events.
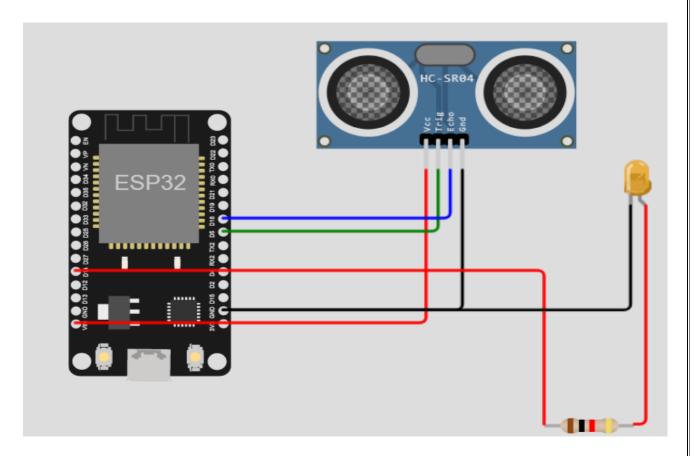
Code :

```cpp
#include<WiFi.h>
#include<PubSubClient.h>
WiFiClientwifiClient;
String data3;
#define ORG "hycgw4"
#define DEVICE_TYPE "Distance"
#define DEVICE_ID "Ultrasonic"
#define TOKEN "WD6Mb(-d2F+X0xWqnB"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
charpublishTopic[] = "iot-2/evt/event2/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
charauthMethod[] = "use-token-auth";
char token[] = TOKEN;
charclientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClientclient(server, 1883, wifiClient);



constinttrigpin=5;
constintechopin=18;
String command;
String data="";

long duration;
floatdist;



voidsetup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
```
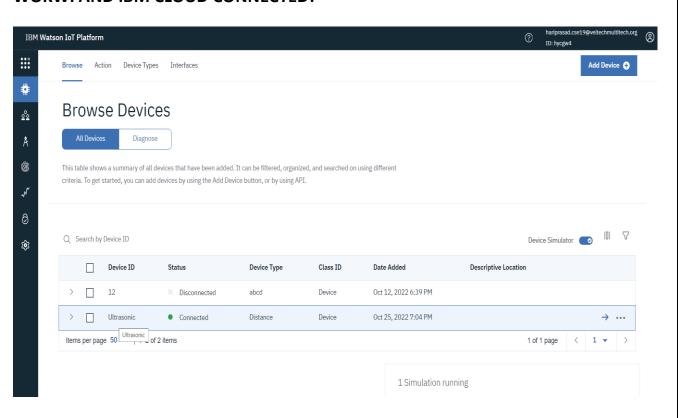
```
    wifiConnect();
    mqttConnect();
  }

  voidloop() {
    boolisNearby = dist<100;
    digitalWrite(led, isNearby);

    publishData();
    delay(500);

    if (!client.loop()) {
      mqttConnect();
    }
  }

  voidwifiConnect() {
    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());
  }

  voidmqttConnect() {
    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();
    }
  }

  voidinitManagedDevice() {
    if (client.subscribe(topic)) {
      // Serial.println(client.subscribe(topic));
      Serial.println("IBM subscribe to cmd OK");
    } else {
      Serial.println("subscribe to cmd FAILED");
    }
  }
  voidpublishData()
```

```cpp
{
  digitalWrite(trigpin,LOW);
  digitalWrite(trigpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin,LOW);
  duration=pulseIn(echopin,HIGH);
  dist=duration*speed/2;
  if(dist<100){
    String payload = "{\"Alert!! 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){
    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 {
      Serial.println("Publish FAILED");
    }

  }


  }
```
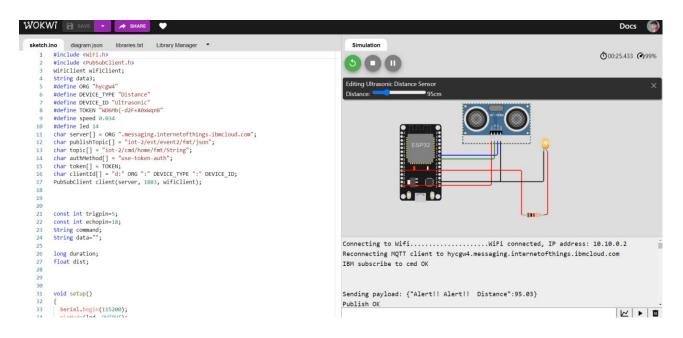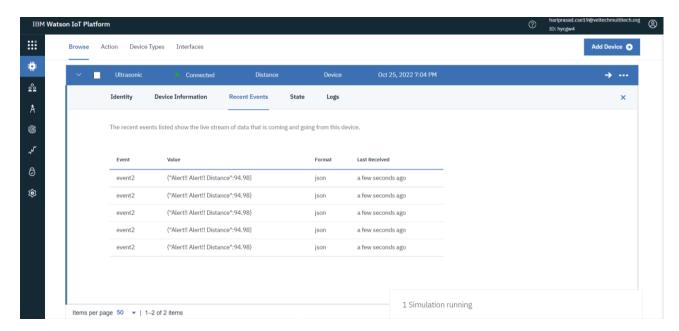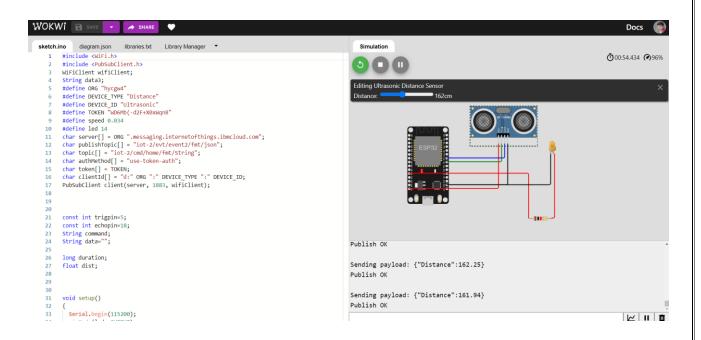
Connections:

WOKWI AND IBM CLOUD CONNECTED:

OUTPUT:

1. **Distance = 95 cm**
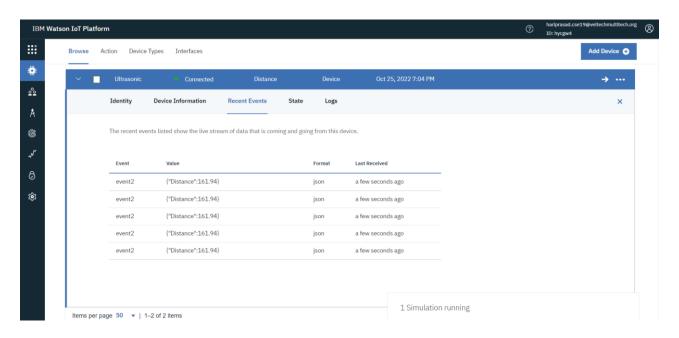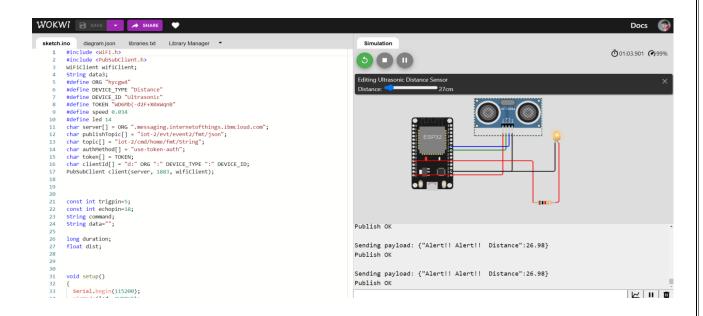   **Status = Alert Message**

Wokwi data publishing to ibm cloud

2. Distance = 162 cm
   Status = Normal

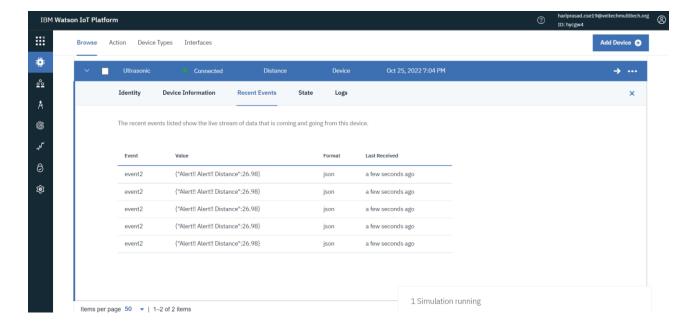3. **Distance = 27 cm**
   Status = Alert Message

Reference link = https://wokwi.com/projects/346498745135792724