Assignment -4

Assignment Date	25 October 2022
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Question-1:

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

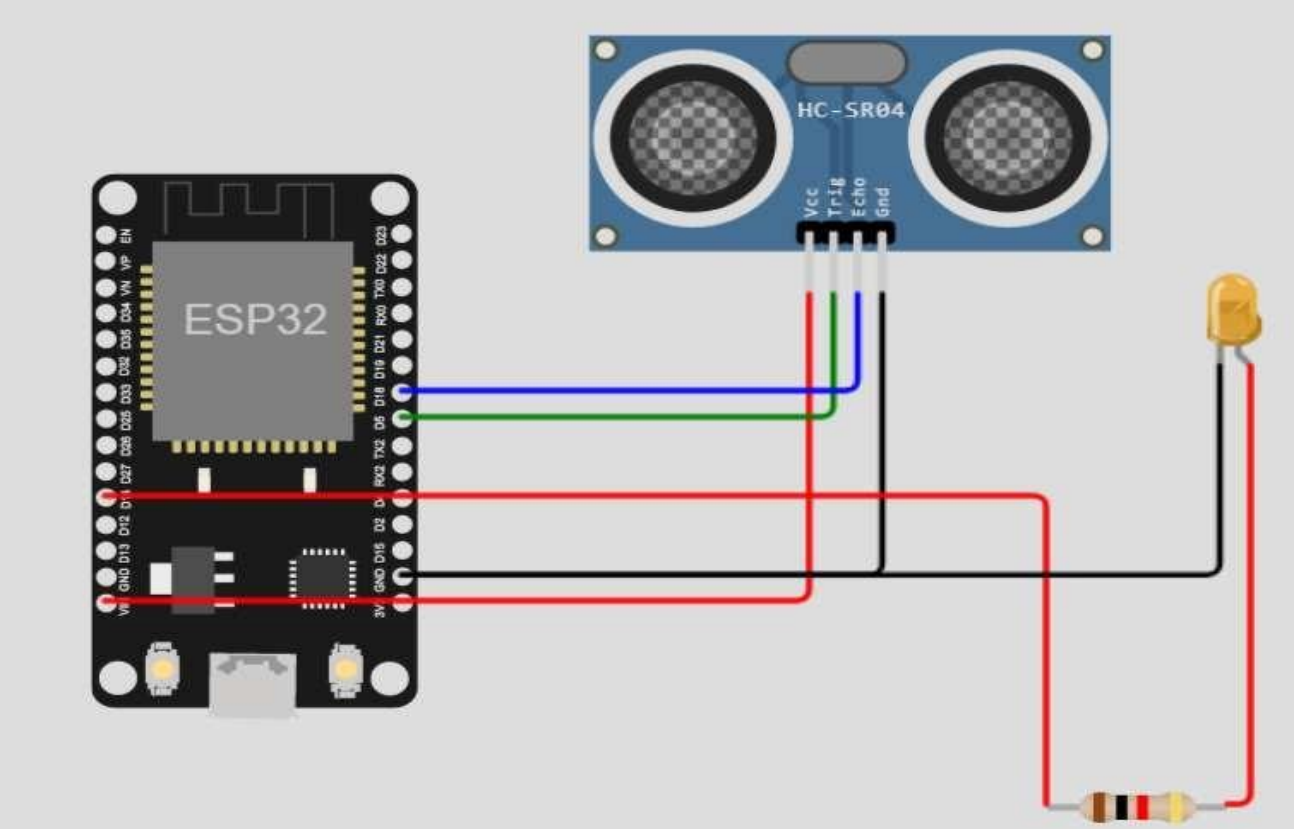
Code :

```
#include <WiFi.h> #include
<PubSubClient.h>WiFiClient
wifiClient; String data3;
#define ORG ""
#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";char publishTopic[]
= "iot-2/evt/event2/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);



const int trigpin=5; const int
echopin=18;String
command; String data="";

long duration;float
dist;



void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
```

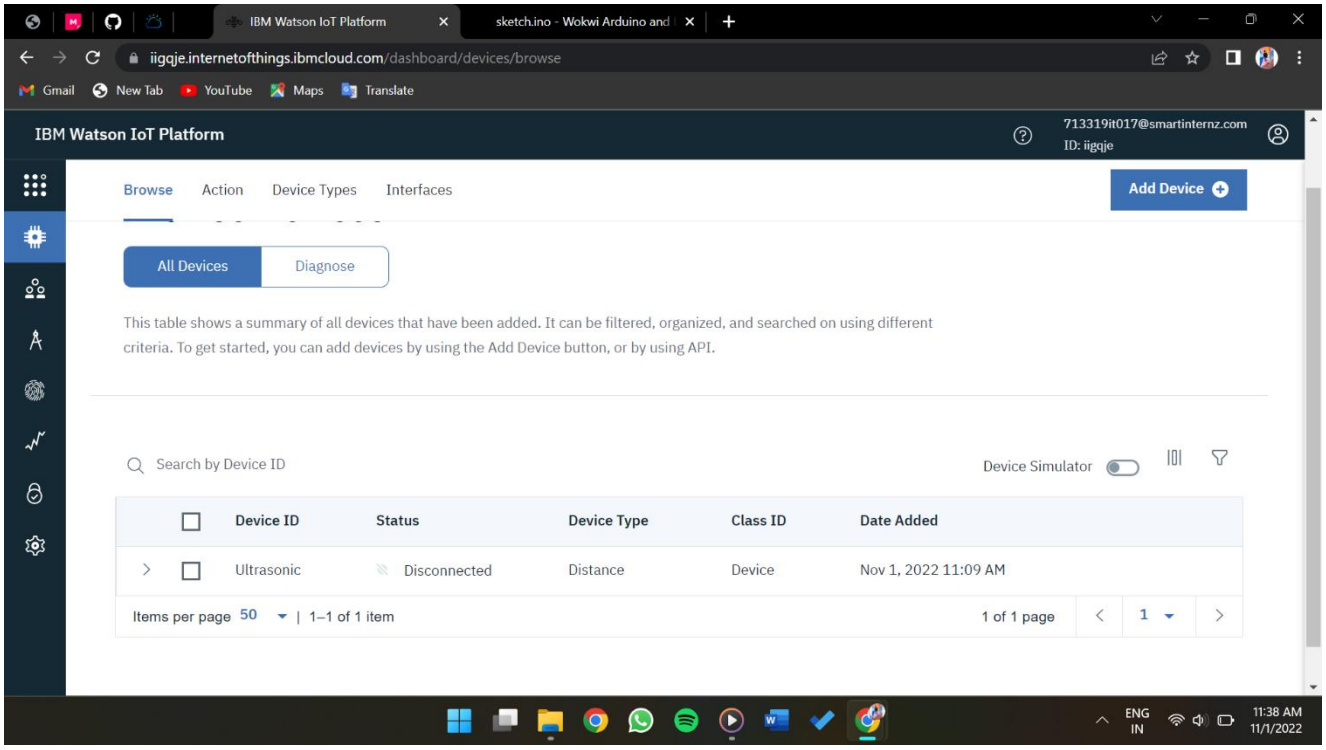
```
    wifiConnect();
    mqttConnect();
}

void loop() {
    bool isNearby = dist < 100;
    digitalWrite(led, isNearby);

    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(500);
        }
        initManagedDevice();
        Serial.println();
    }
}

void initManagedDevice() {
    if (client.subscribe(topic)) {
        // Serial.println(client.subscribe(topic));
        Serial.println("IBM 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){
        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:

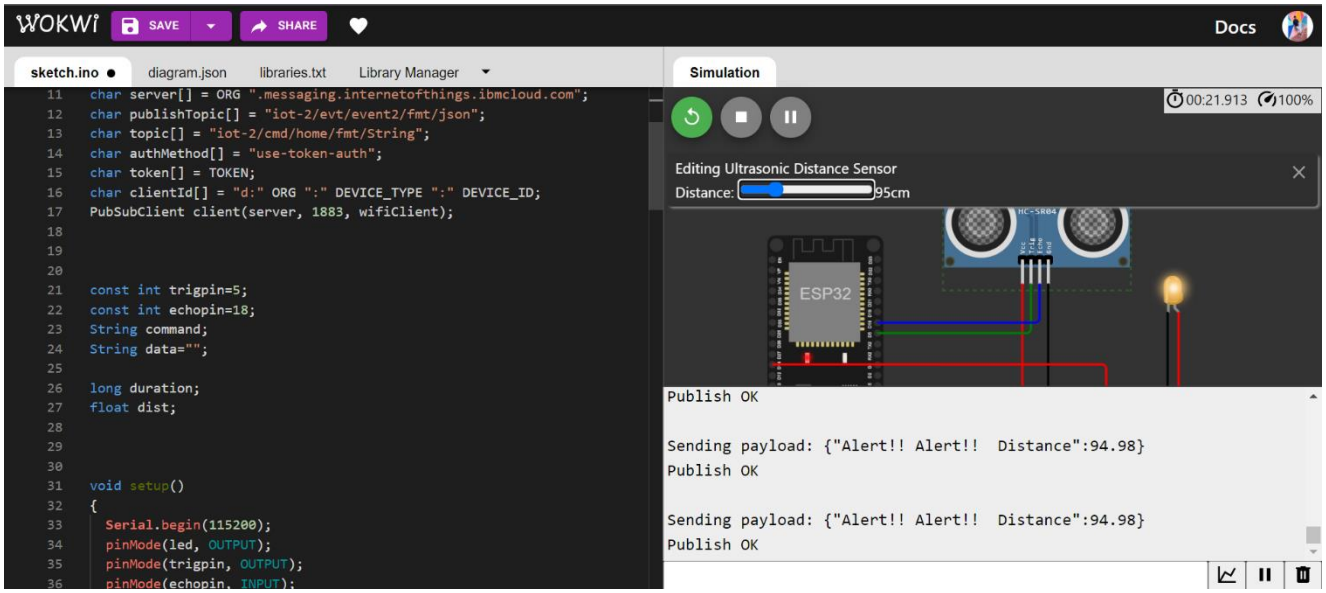


WOKWI AND IBM CLOUD CONNECTED:

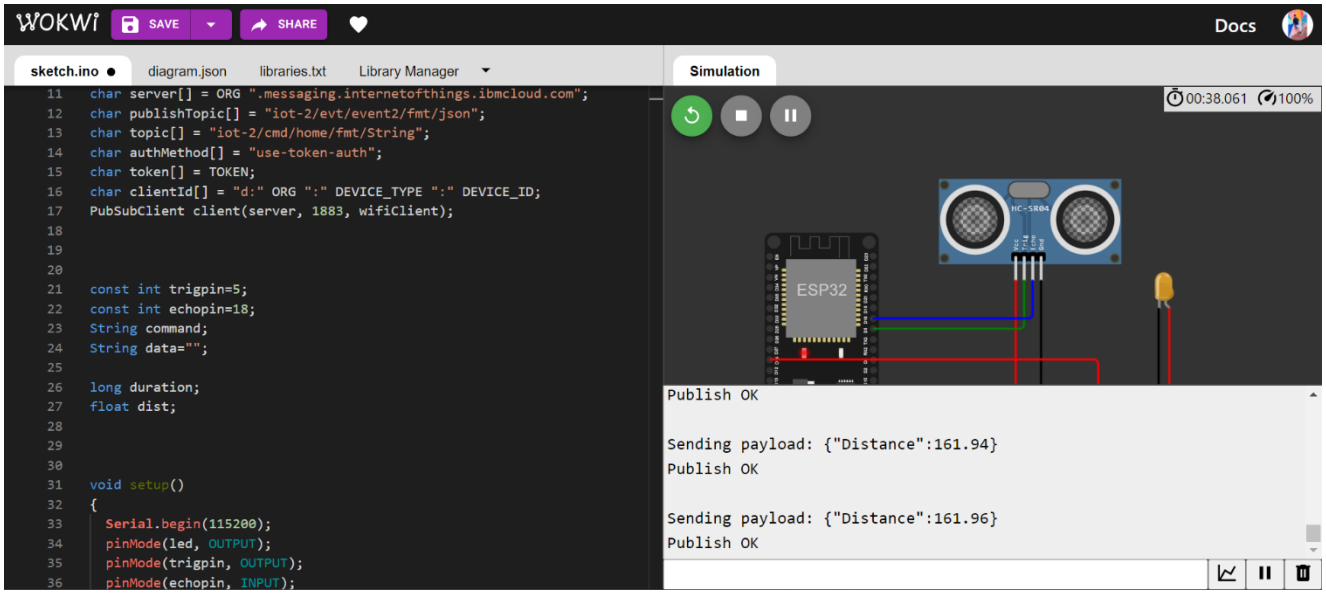


OUTPUT:

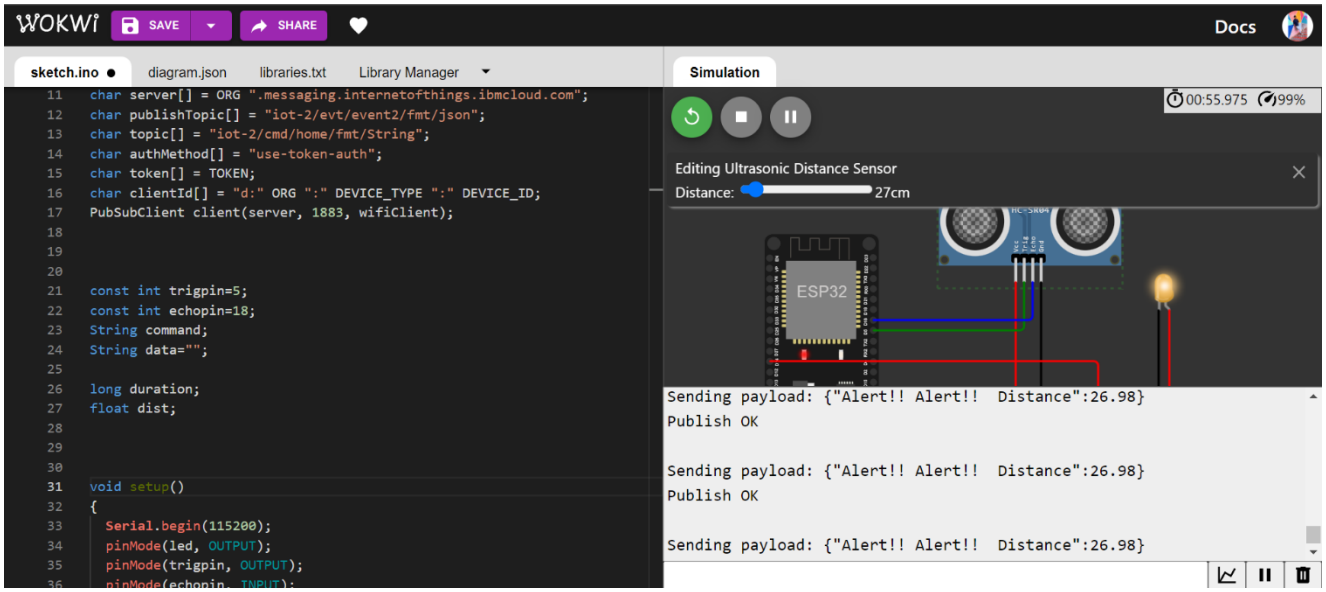
1. **Distance = 95 cm**
   Status = Alert
   Message



2. **Distance = 162 cmStatus = Normal**



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



Reference link = https://wokwi.com/projects/347107058566300242