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 cmsend “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;
```

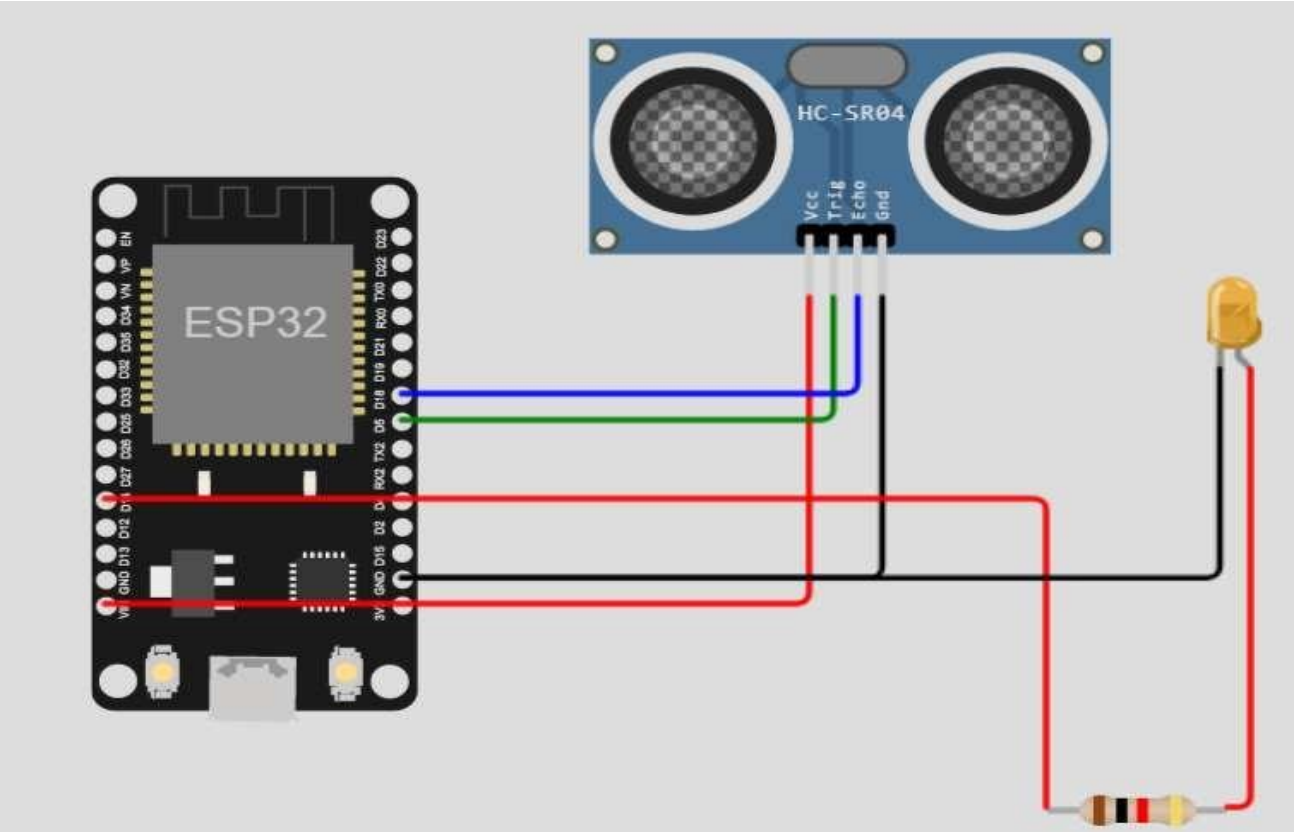
```
float dist;



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() {
```

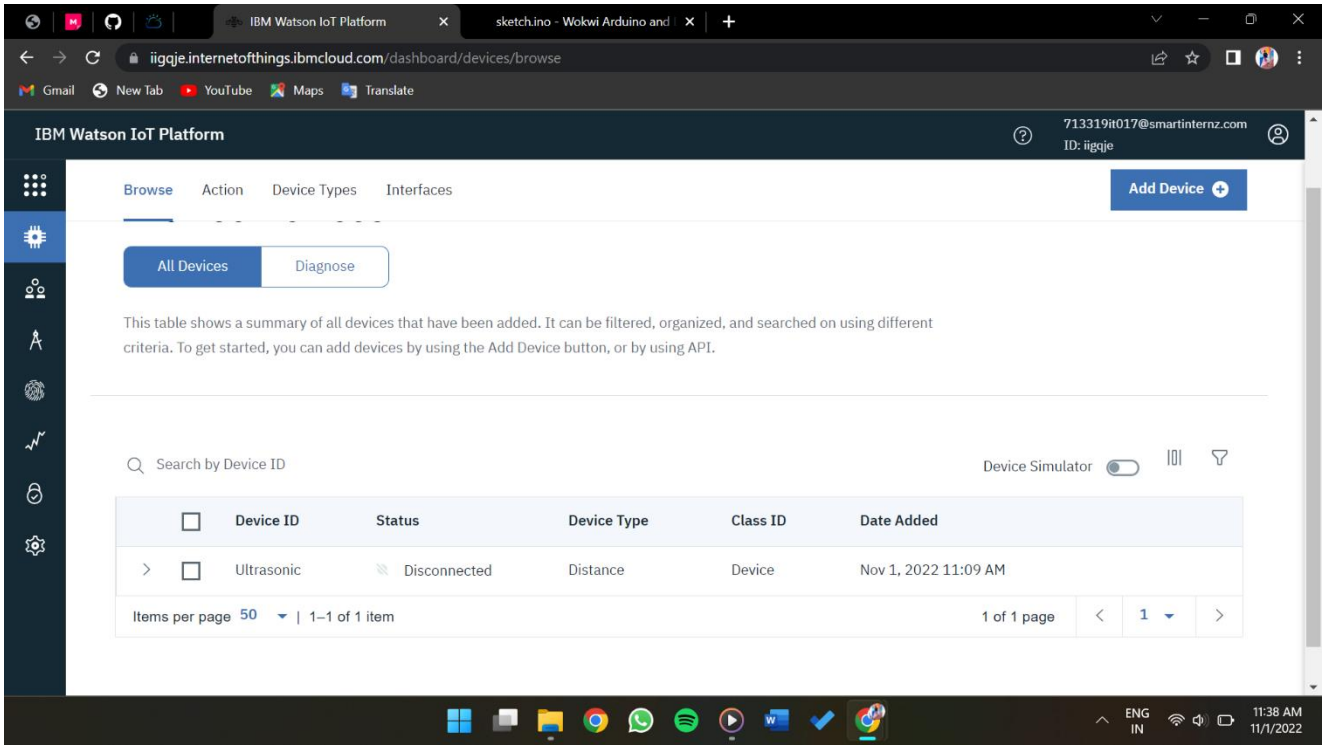
```
  if (client.subscribe(topic)) {
    // Serial.println(client.subscribe(topic));
    Serial.println("IBM subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}
void publishData()
```

```
{
  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:

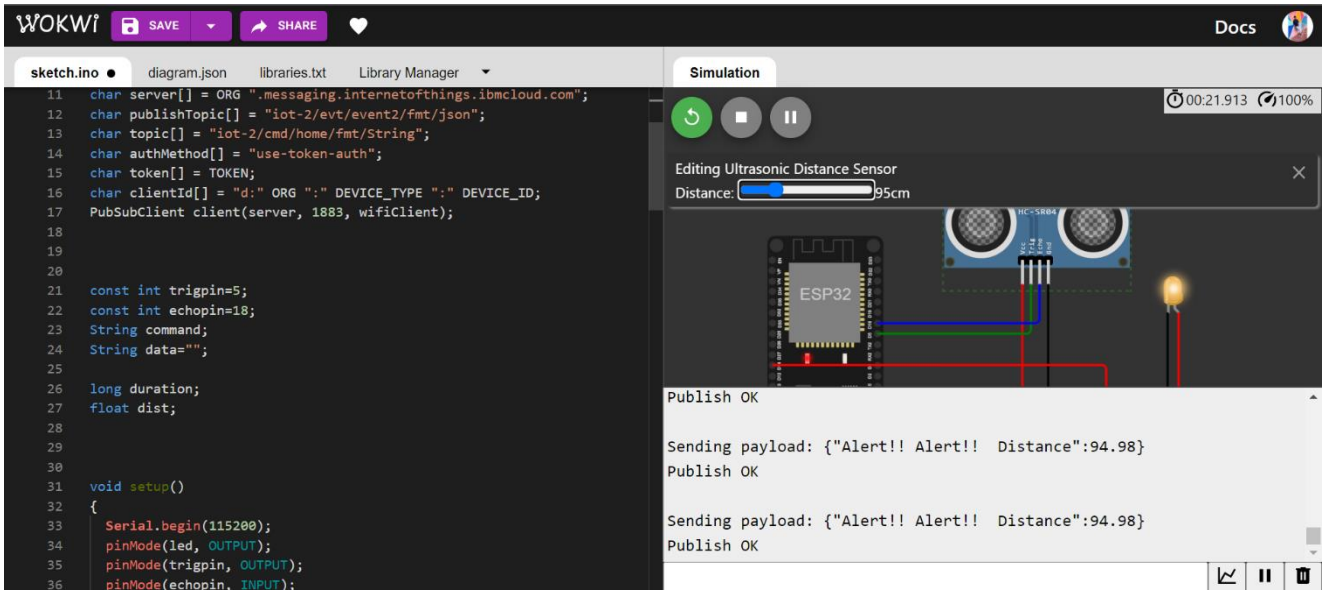


WOKWI AND IBM CLOUD CONNECTED:

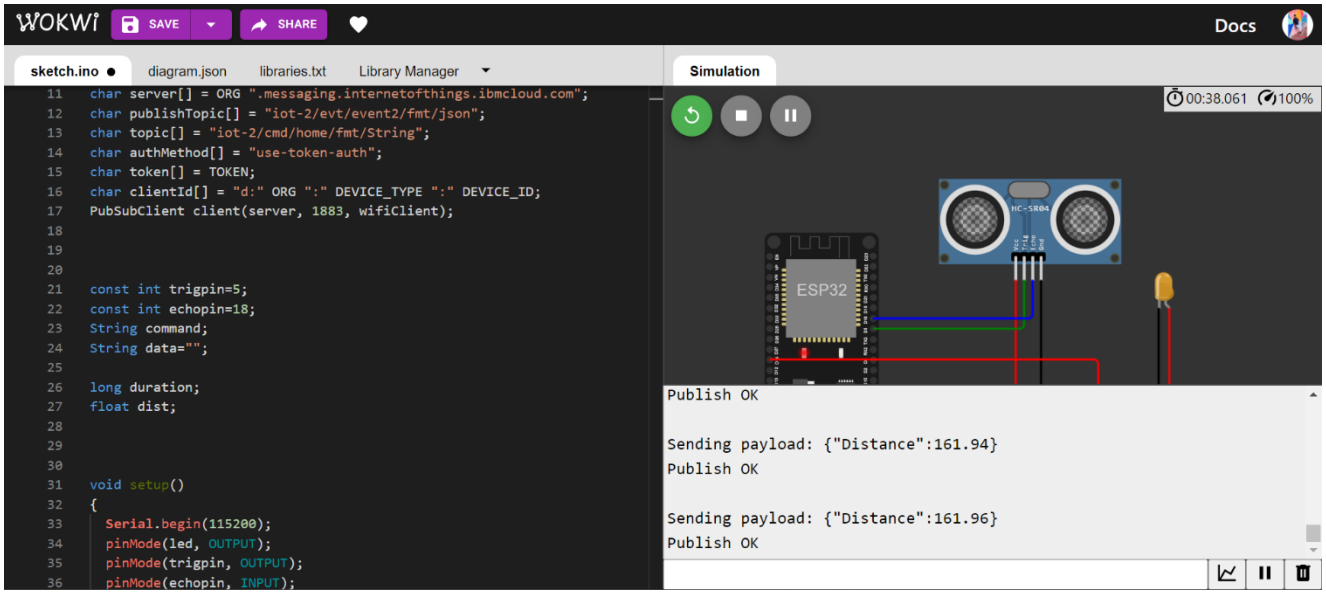


OUTPUT:

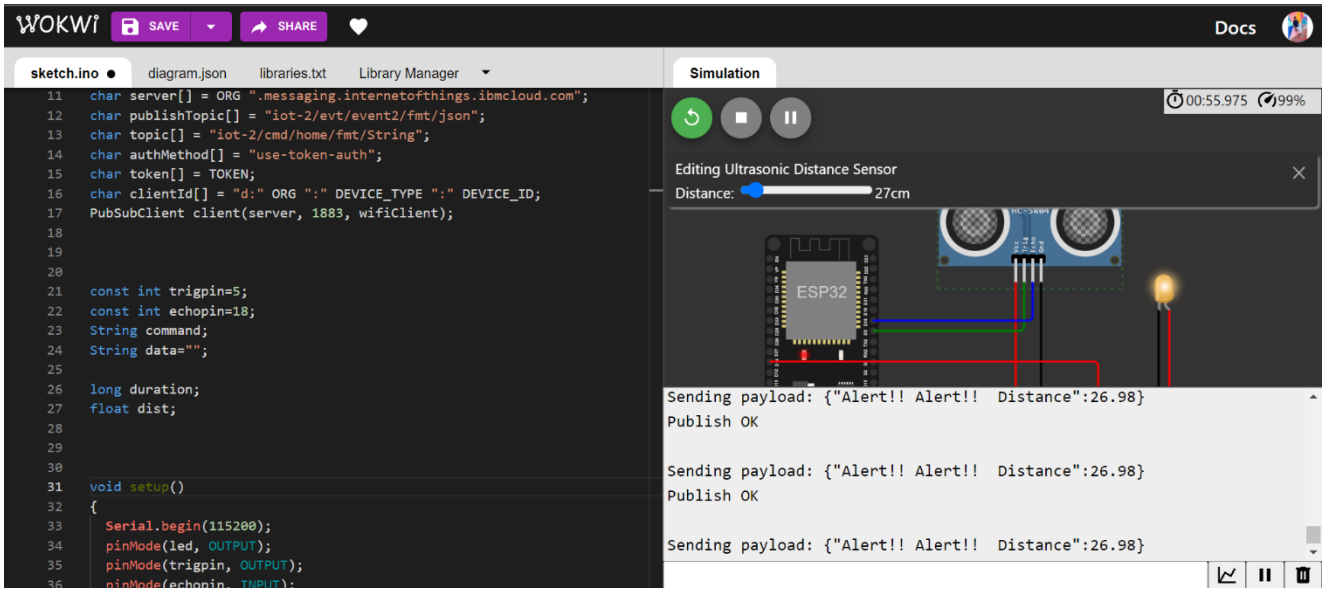
1. **Distance = 95 cm**
   Status = Alert
   Message



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



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



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