

Assignment - 4

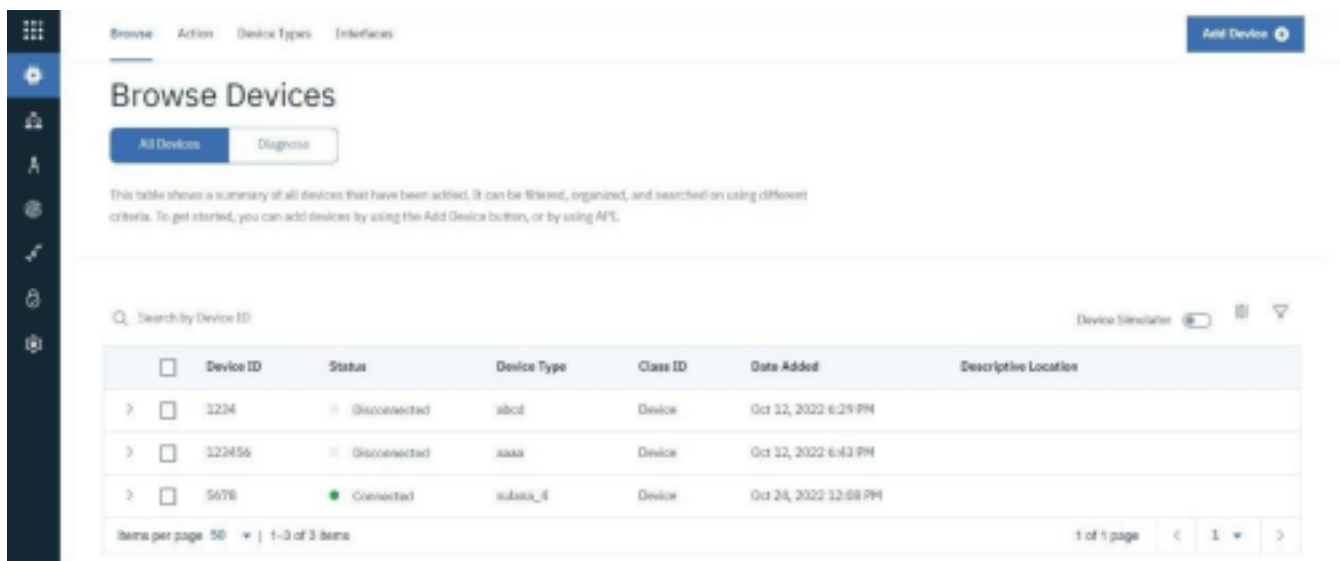
| | |
|---------------------|-----------------|
| Assignment Date | 22 October 2022 |
| Student Name | |
| Student Roll Number | 311019106075 |

Write code and connection in Wowki for ultrasonic sensor.

Whenever distance is less than 100 cm send “Alert” to IBM cloud and display in devicerecent events

Wowki link: <https://wokwi.com/projects/346389445244617300>

Step 1 : Add new device in IBM cloud

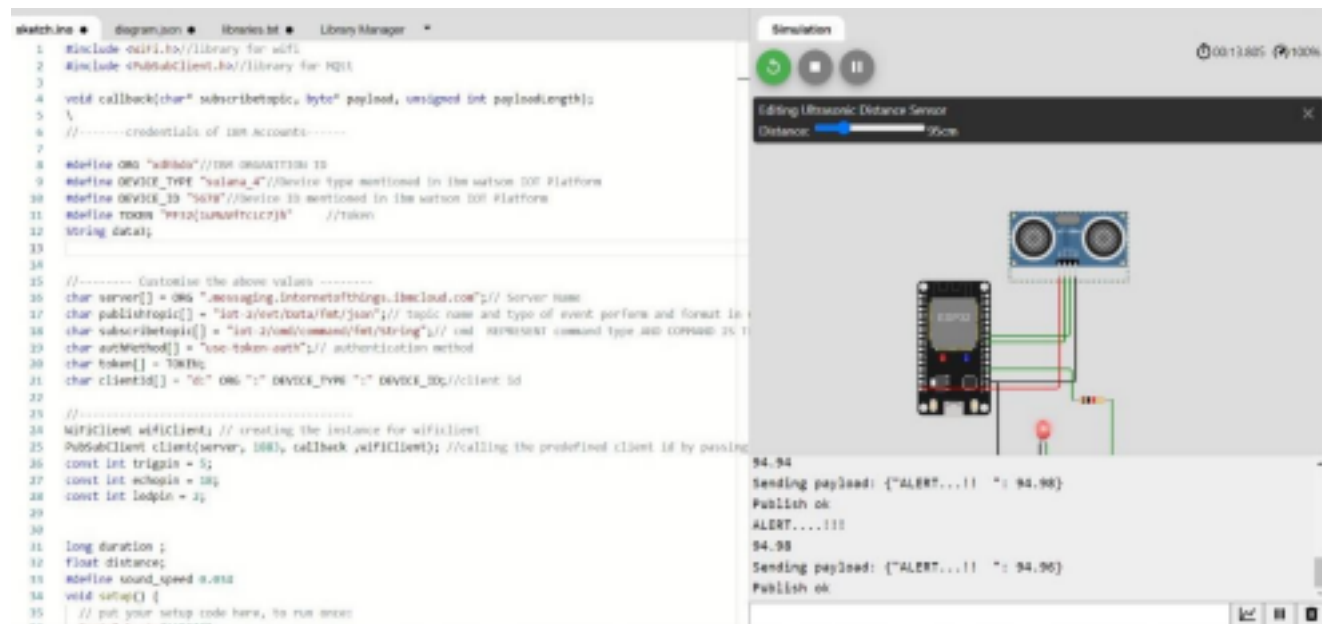


The screenshot displays the 'Browse Devices' interface in the IBM Cloud IoT Platform. The page includes a sidebar with navigation icons and a top navigation bar with tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. A blue 'Add Device' button is located in the top right corner. Below the navigation bar, the 'Browse Devices' section features a search bar and a 'Diagnose' button. A descriptive text states: 'This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.' The main content area contains a table with the following data:

| <input type="checkbox"/> | Device ID | Status | Device Type | Class ID | Date Added | Descriptive Location |
|--------------------------|---------------------------------|--------------|-------------|----------|-----------------------|----------------------|
| > | <input type="checkbox"/> 1234 | Disconnected | abcd | Device | Oct 12, 2022 6:29 PM | |
| > | <input type="checkbox"/> 123456 | Disconnected | xxxx | Device | Oct 12, 2022 6:43 PM | |
| > | <input type="checkbox"/> 5678 | Connected | ultrason_4 | Device | Oct 24, 2022 12:08 PM | |

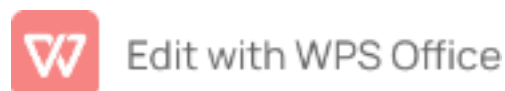
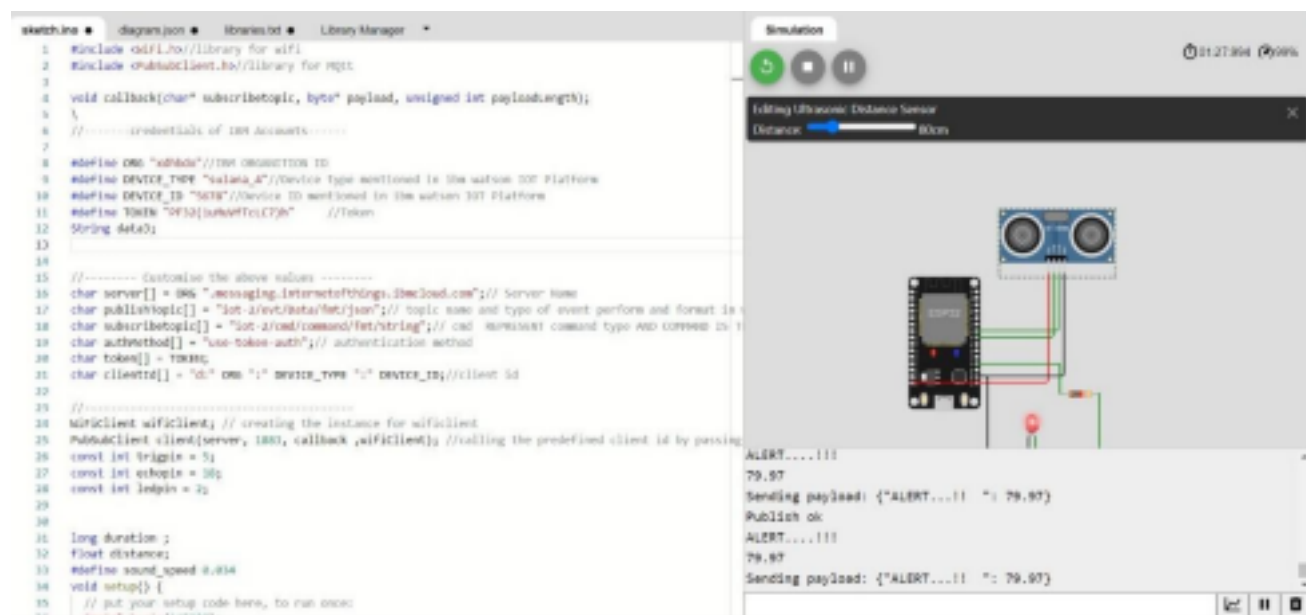
At the bottom of the table, there is a pagination bar showing 'Items per page: 50' and '1-3 of 3 items'. The page number '1 of 1 page' and navigation arrows are also visible.

Step 2 : Complete the Circuit and run the program



OUTPUT IN WOWKI

a) when the distance is below 100 cms



b) when the distance is above 100 cms ,(no alert message is displayed here for 202 cm)


```

publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and format
in which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd REPRESENT commandtype
AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication methodchar
token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id

//
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id by
passing parameter like server id,portand wificredential
const int trigpin = 5;
const int echopin = 18;
const int ledpin = 2;

long duration ;
float distance;
#define sound_speed 0.034
void setup() {
    // put your setup code here, to run once:
    Serial.begin(115200);
    pinMode(trigpin, OUTPUT);
    pinMode(echopin, OUTPUT);
    pinMode(ledpin, OUTPUT);
    wificonnect();
    mqttconnect();
}

void loop() {
    digitalWrite(trigpin, LOW);
    digitalWrite(trigpin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigpin, LOW);

    duration= pulseIn(echopin,HIGH);
    distance = duration * sound_speed /2;
    if(distance<=100){
        PublishData(distance);
        delay(1000);
        if (!client.loop()) {
            mqttconnect();
        }
        digitalWrite(ledpin, HIGH);
        Serial.println("ALERT
        ..... !!!")
        ;
        Serial.println(distance);
    }
    else
    {
        digitalWrite(ledpin, LOW);
    }
}

```

```

// put your main code here, to run repeatedly:
delay(10); // this speeds up the simulation
}
/*.....retrieving to Cloud.....*/
void PublishData(float distance) { mqttconnect();//function
call for connecting to ibm
    // creating the String in in form JSON to update the data to ibm cloudString
    payload = "{\"ALERT...!!\": ";
    payload += distance;
    payload += "}";

    Serial.print("Sending payload: ");
    Serial.println(payload);

    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish ok");// if it successfully upload data on the cloud then it will print publish ok
        in Serial monitor or else it will print publish failed
    } 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() //function definition for wificonnect
{
    Serial.println();
    Serial.print("Connecting to ");

    WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection 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++) {
    //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
  }
  Serial.println("data: "+ data3);
  if(data3=="lighton")
  {
    Serial.println(data3);
  }
  else
  {
    Serial.println(data3);
  }
  data3="";
}
```