

Assignment -4

Assignment Date	22 October 2022
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Write code and connection in Wowki for ultrasonic sensor.

Whenever distance is less than 100 cm send "Alert" to IBM cloud and display in device recent events

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

Step 1 : Add new device in IBM cloud

Browse Action Device Types Interfaces
Add Device +

Browse Devices

All Devices
Diagnose

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.

Search by Device ID

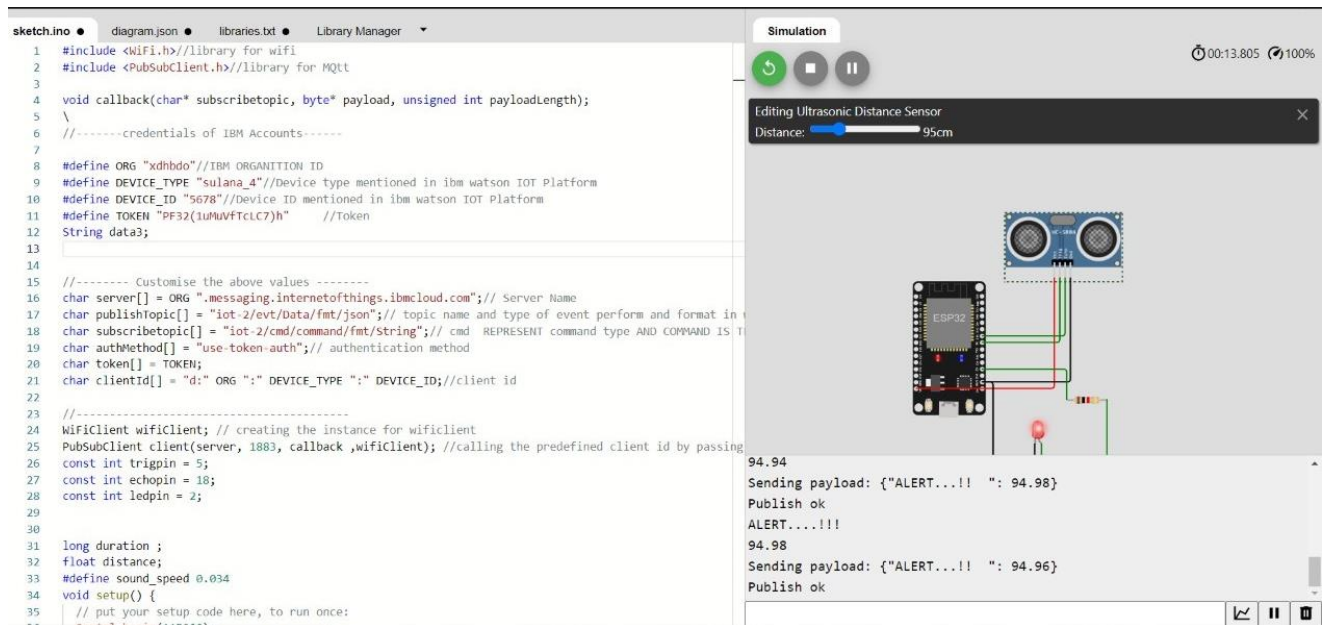
Device Simulator ☒
|||
▼

	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	aaaa	Device	Oct 12, 2022 6:43 PM	
>	<input type="checkbox"/> 5678	Connected	sulana_4	Device	Oct 24, 2022 12:08 PM	

Items per page 50 ▼ | 1–3 of 3 items

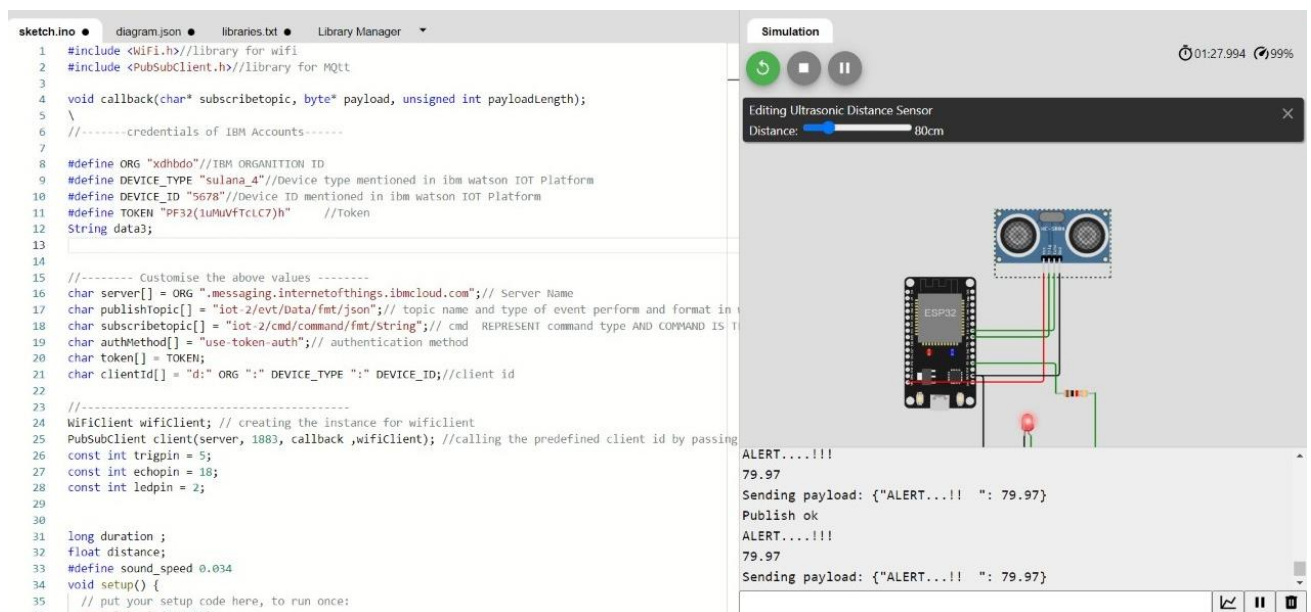
1 of 1 page
 <
 1 ▼
 >

Step 2: Complete the Circuit and run the program

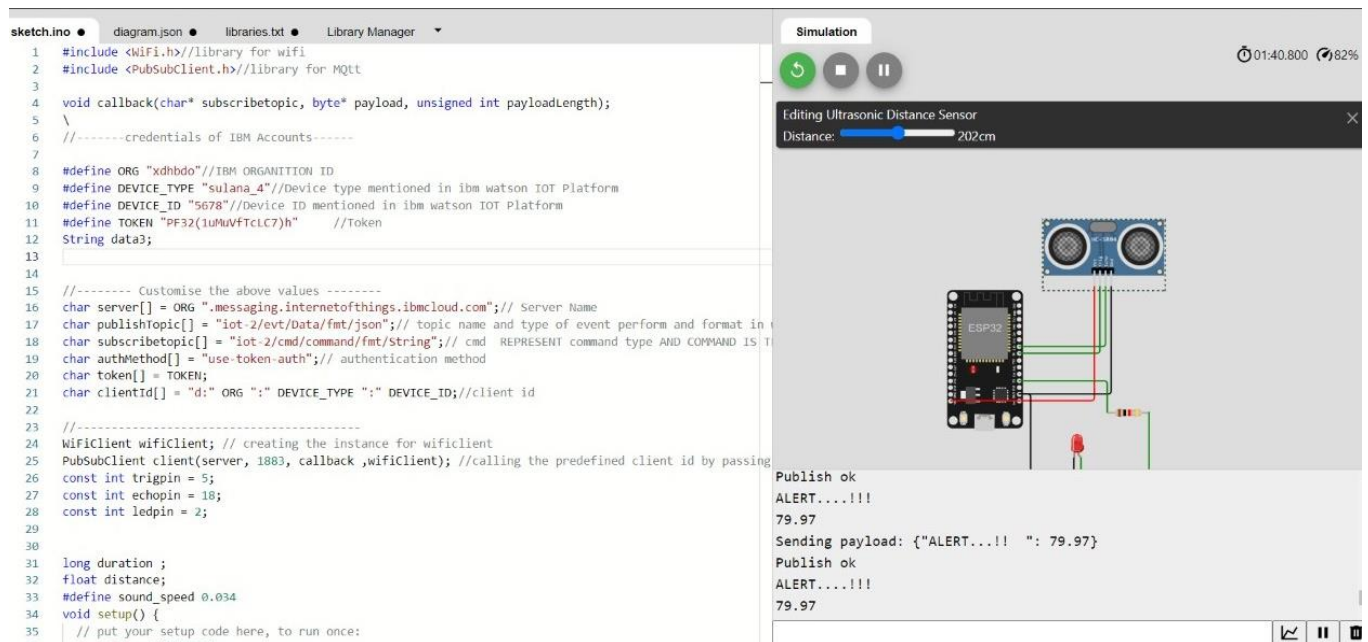


Output in WOWKI

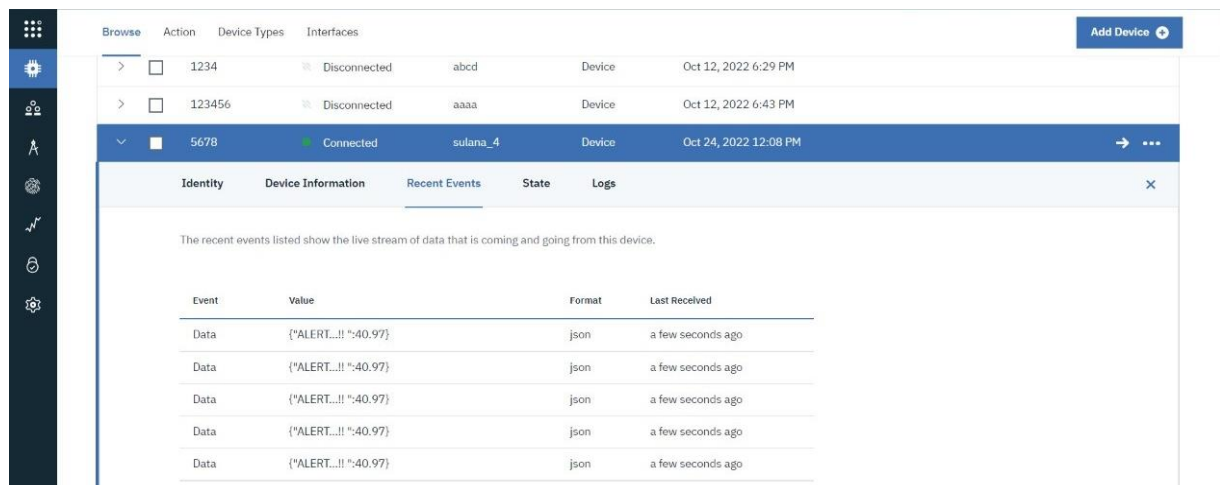
a) when the distance is below 100 cms



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



Output in IBM CLOUD (Watson Platform)Displayed in device recent events



Program Code:

```

#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQTT
void callback(char* subscribtopic, byte* payload, unsigned int payloadLength);
\
//-----credentials of IBM Accounts-----
#define ORG "xdhbdo"//IBM ORGANITION ID
#define DEVICE_TYPE "sulana_4"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "5678"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "PF32(1uMuVfTcLC7)h" //Token
String data3;
//----- Customise the above values -----
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and
format in which data to be send
char subscribtopic[] = "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 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 sucessfully upload data on the cloud then it will printpublish
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 defination 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="";
}

```

