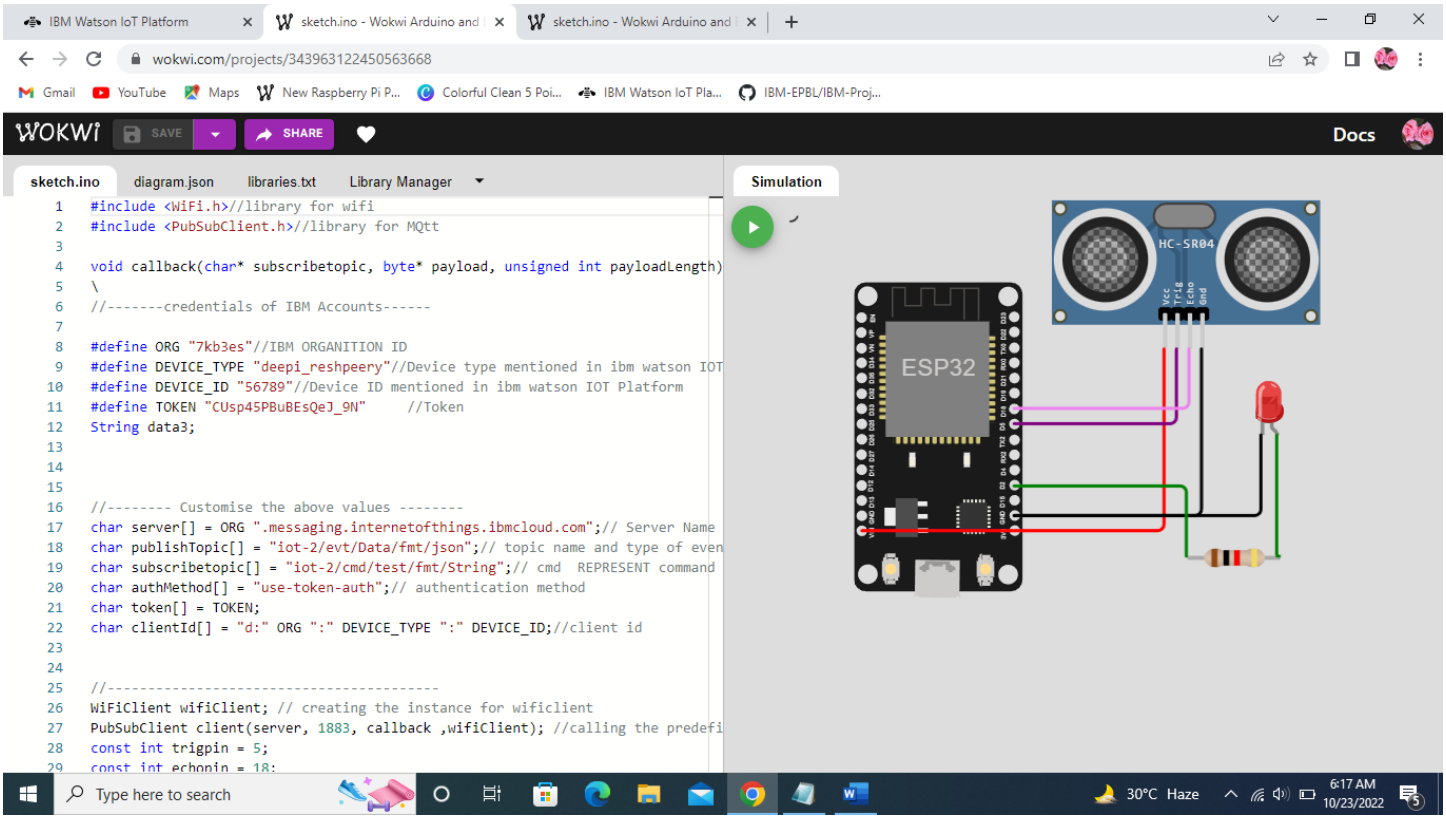
ASSIGNMENT – 04

Write code and connection in Wowki for ultrasonic sensor.

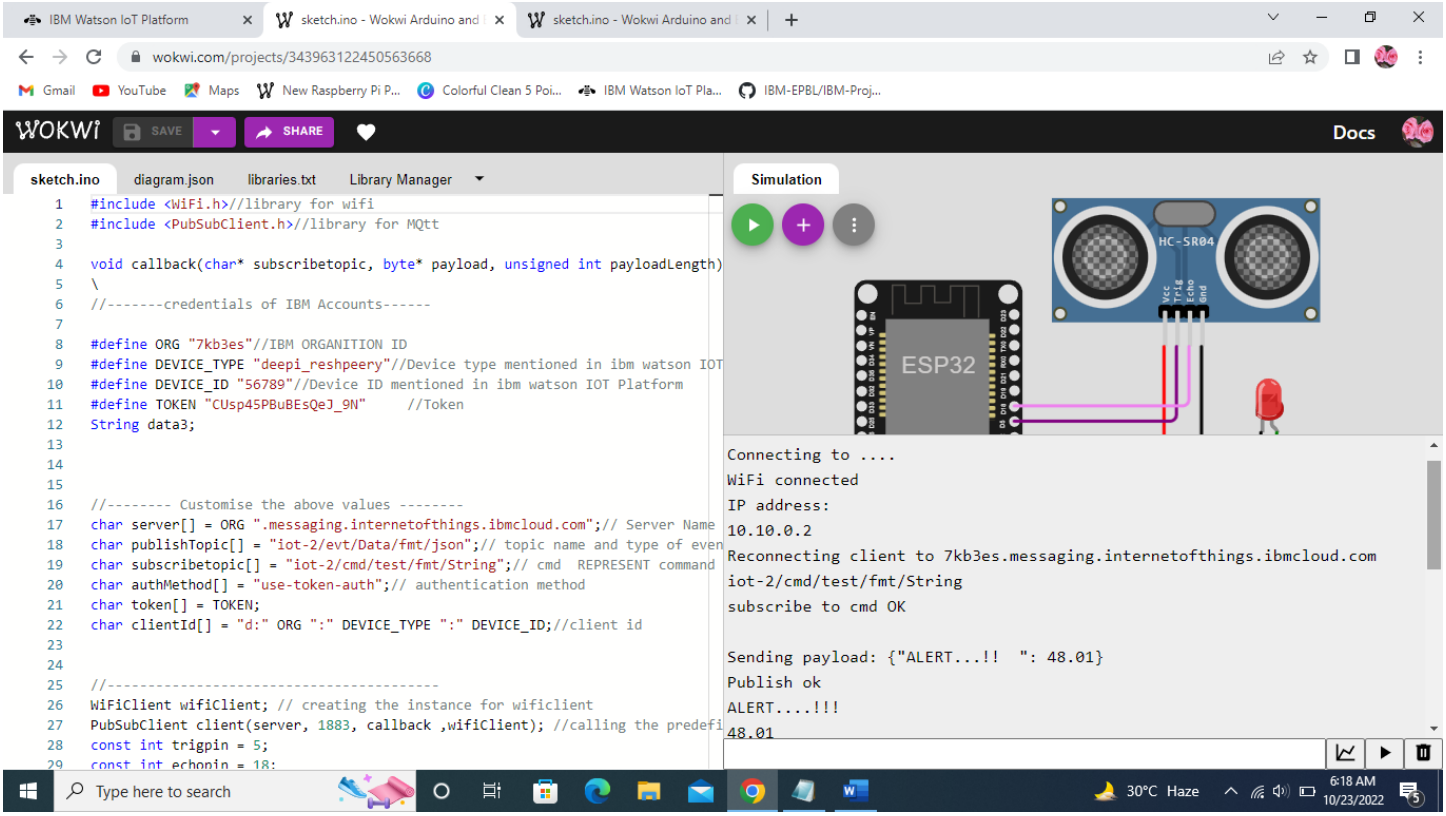
Whenever distance is less than 100 cms send **“Alert”** to IBM cloud and display in device recent events

Step 1 . Completed to build Circuit and run program

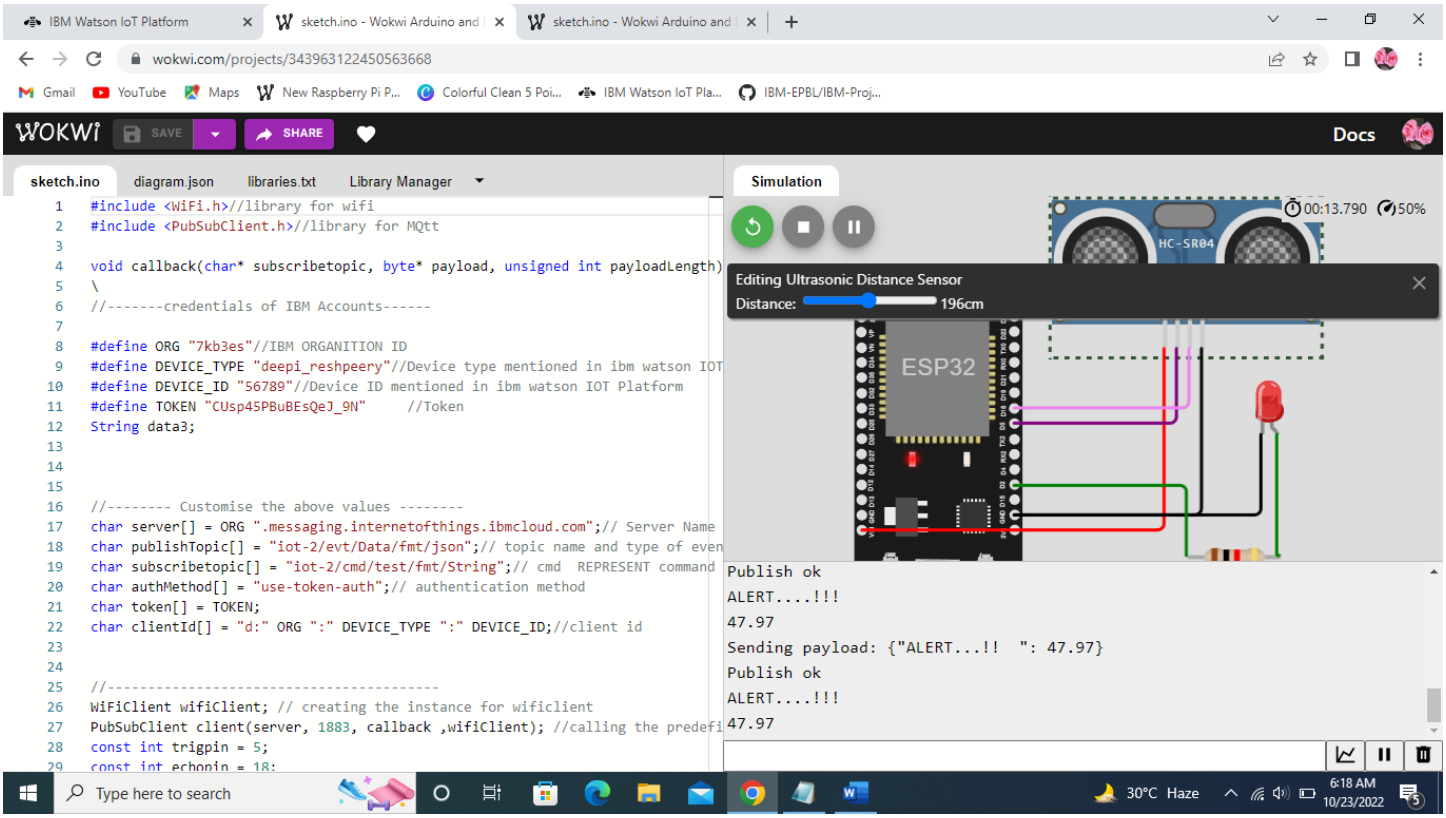


Step 2. Output in WOWKI

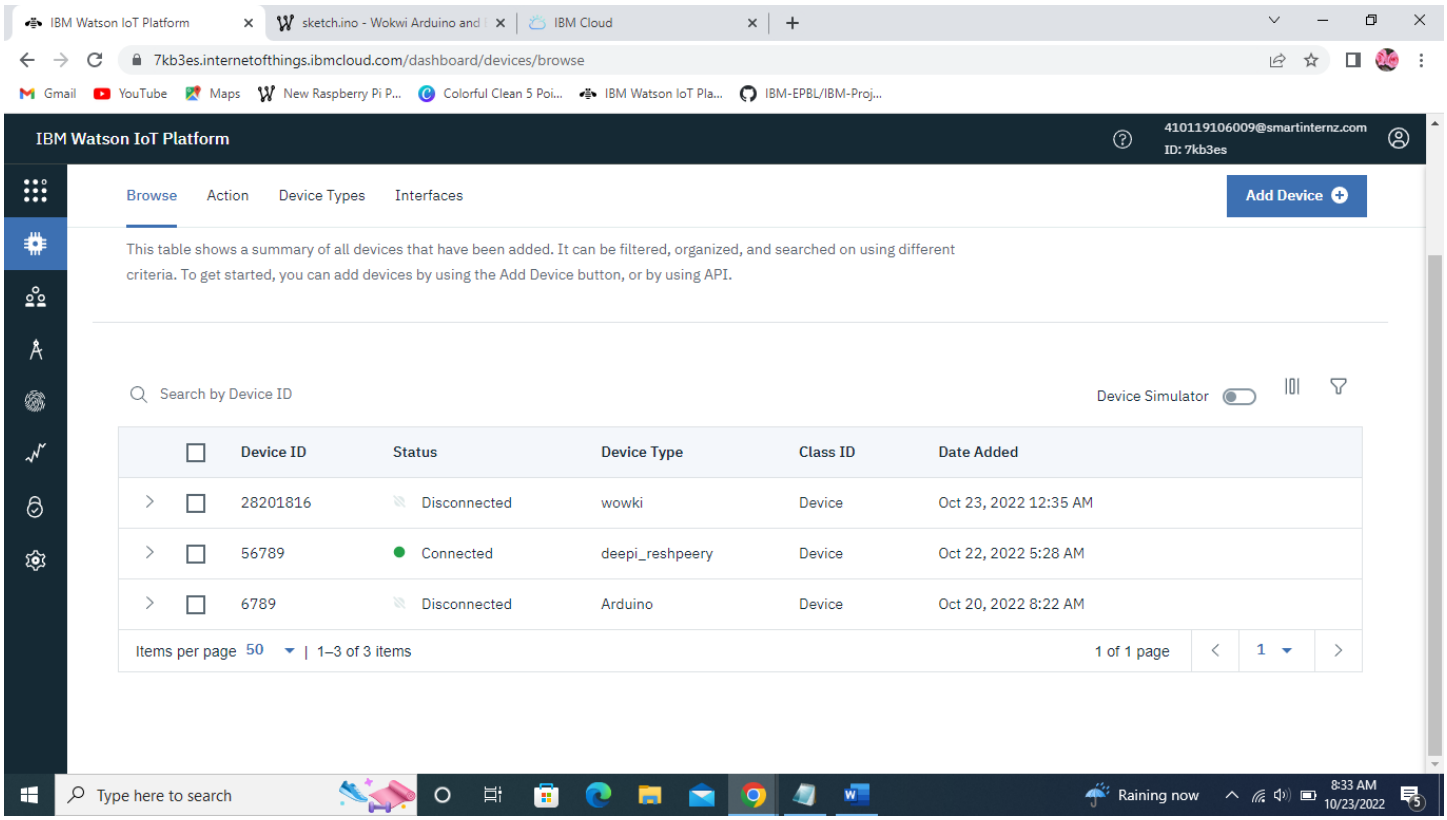
a) when distance is below 100 cms



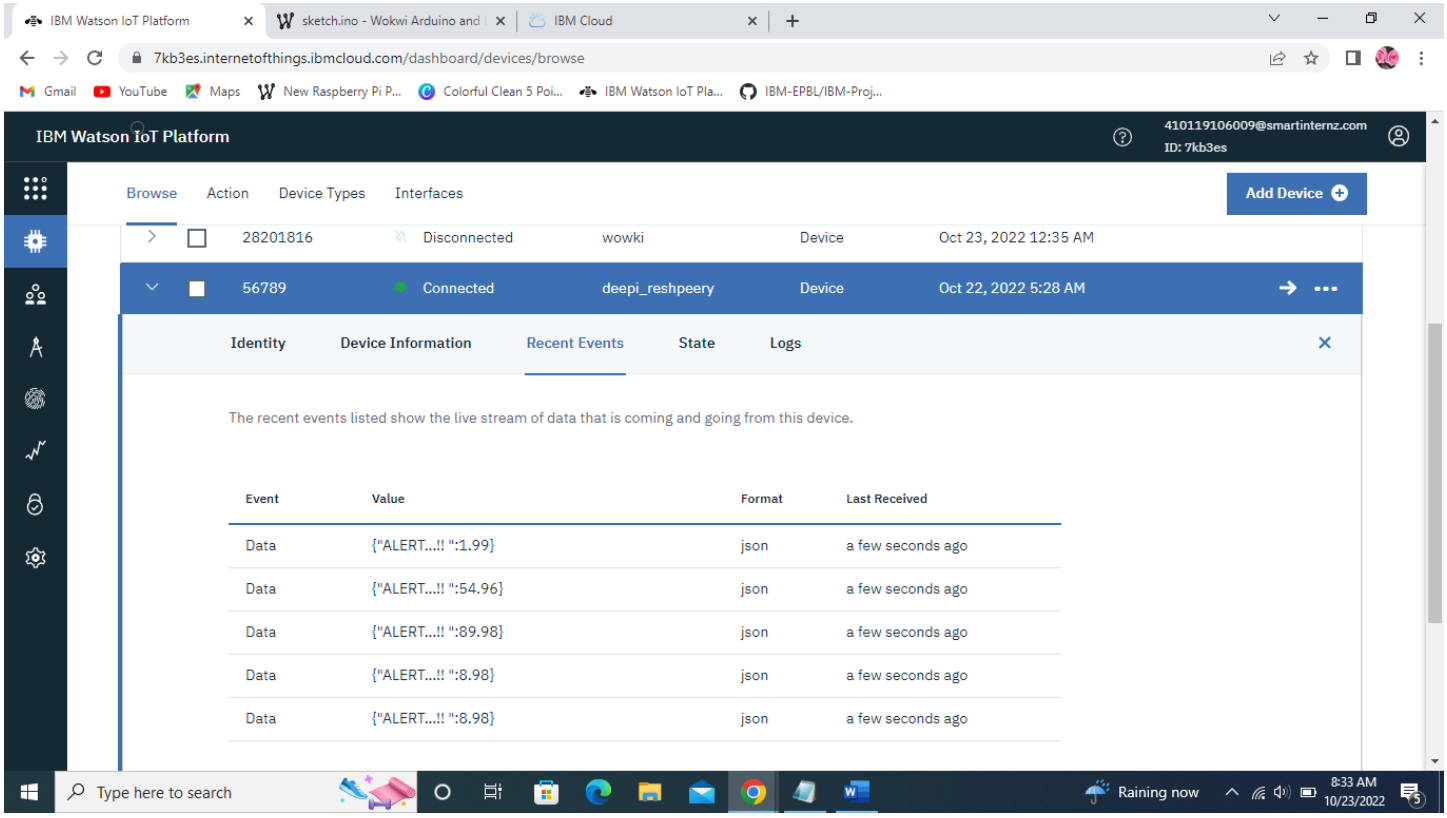
B) When Distance is above 100 cms



Step 3. ADD new devices in IBM cloud



Step 4. Output in IBM CLOUD (Watson Platform)



PROGRAM:

```
#include <WiFi.h>//library for wifi

#include <PubSubClient.h>//library for MQtt


void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

\

//-------credentials of IBM Accounts------


#define ORG "7kb3es"//IBM ORGANITION ID

#define DEVICE_TYPE "deepi_reshpeery"//Device type mentioned in ibm watson IOT Platform

#define DEVICE_ID "56789"//Device ID mentioned in ibm watson IOT Platform

#define TOKEN "CUsp45PBuBEsQeJ_9N"     //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 subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd  REPRESENT command type AND

COMMAND IS TEST OF FORMAT STRING

char authMethod[] = "use-token-auth";// authentication method

char 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 cloud
  String 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
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 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="";
}
```

Conclusion:

Here I showed the **ALERT** and **DISTANCE** in IBM cloud when the distance is less than 100 cms.