**Assignment -4**

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| Assignment Date | 26 October 2022 |
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| Student Roll Number | 95071914014 |

**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 "hycgw4"

#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 {

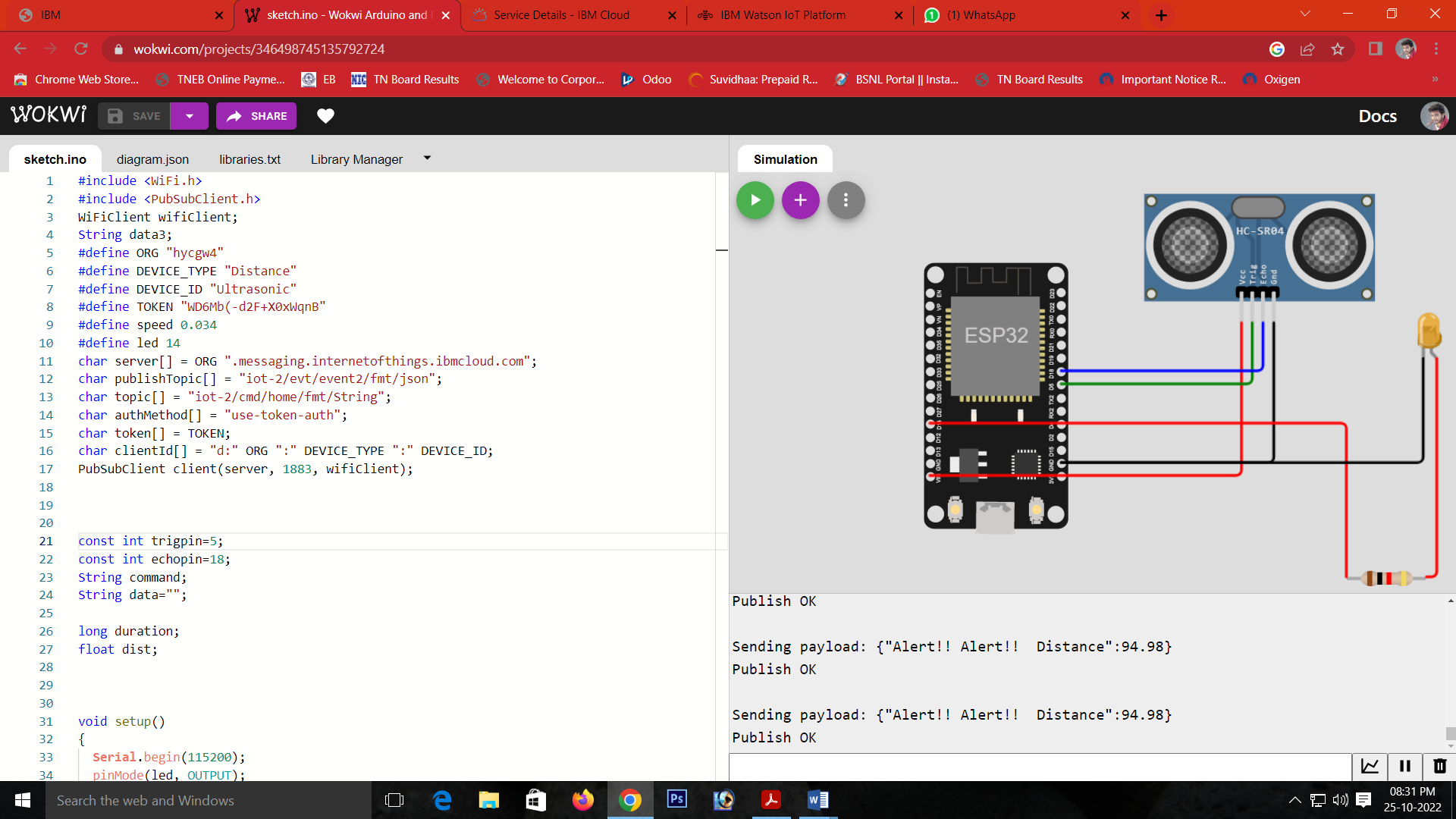
**Serial**.println("Publish FAILED");

    }

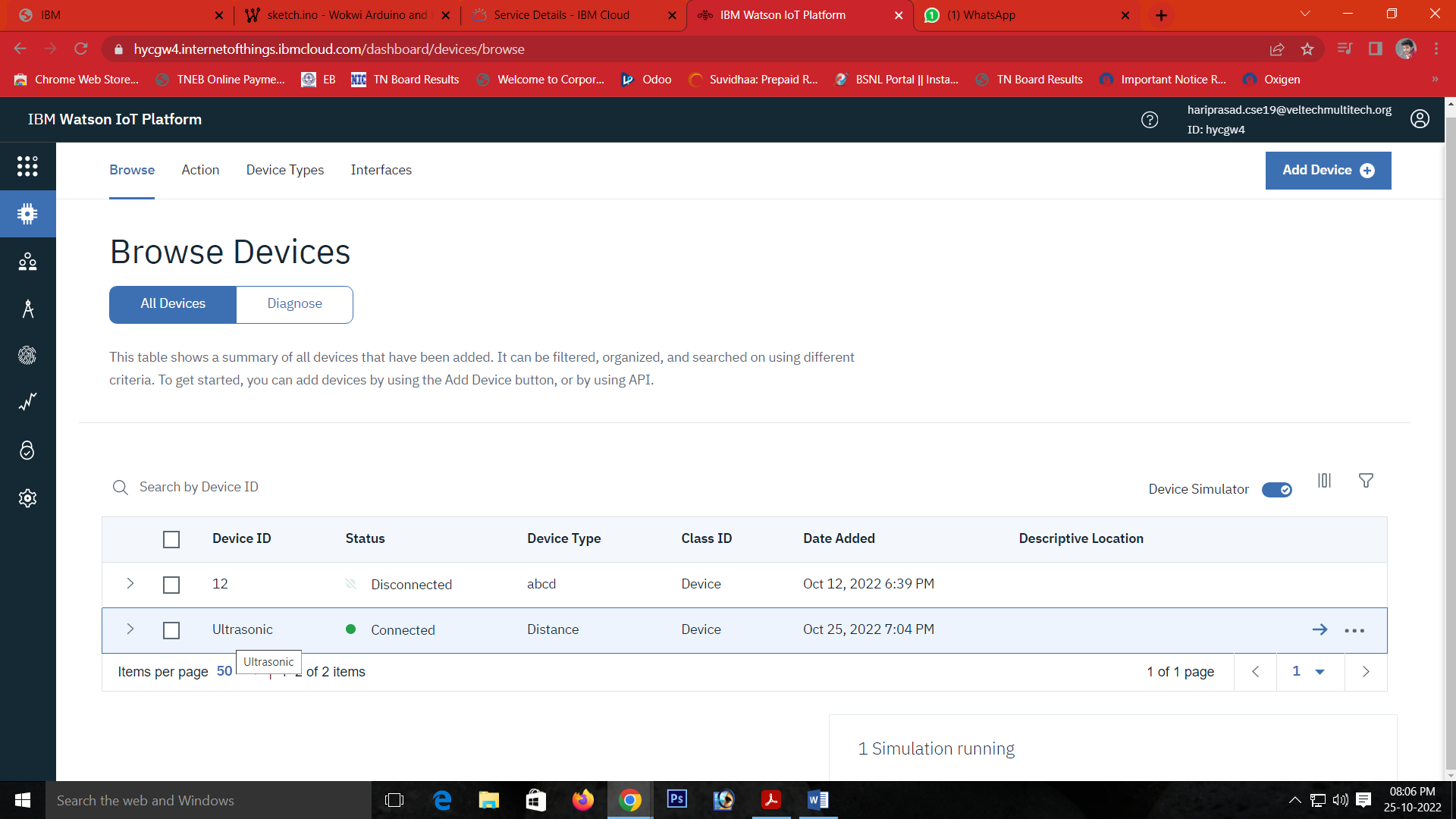
  }

  }

**Connections:**



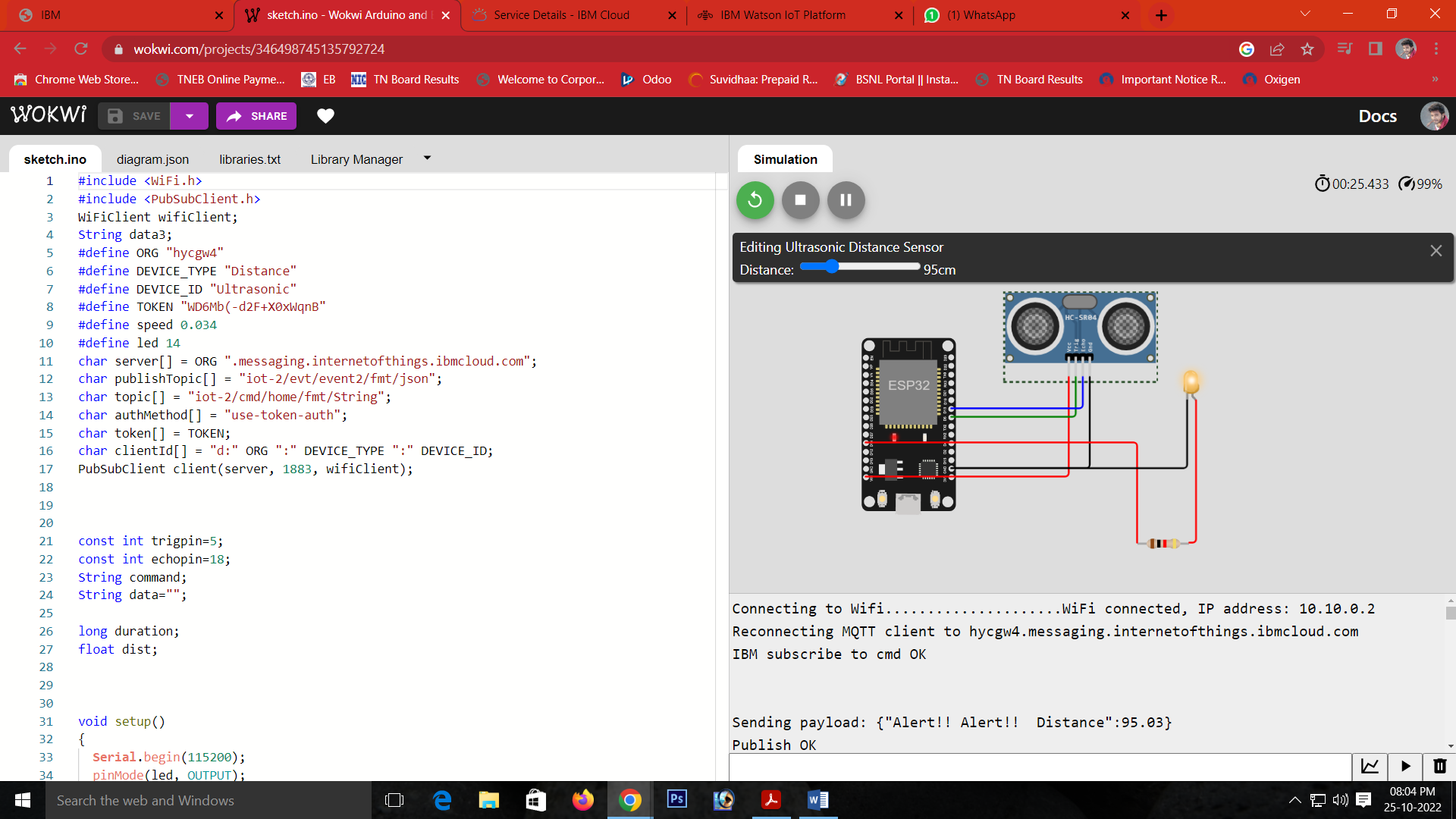
**WOKWI AND IBM CLOUD CONNECTED:**

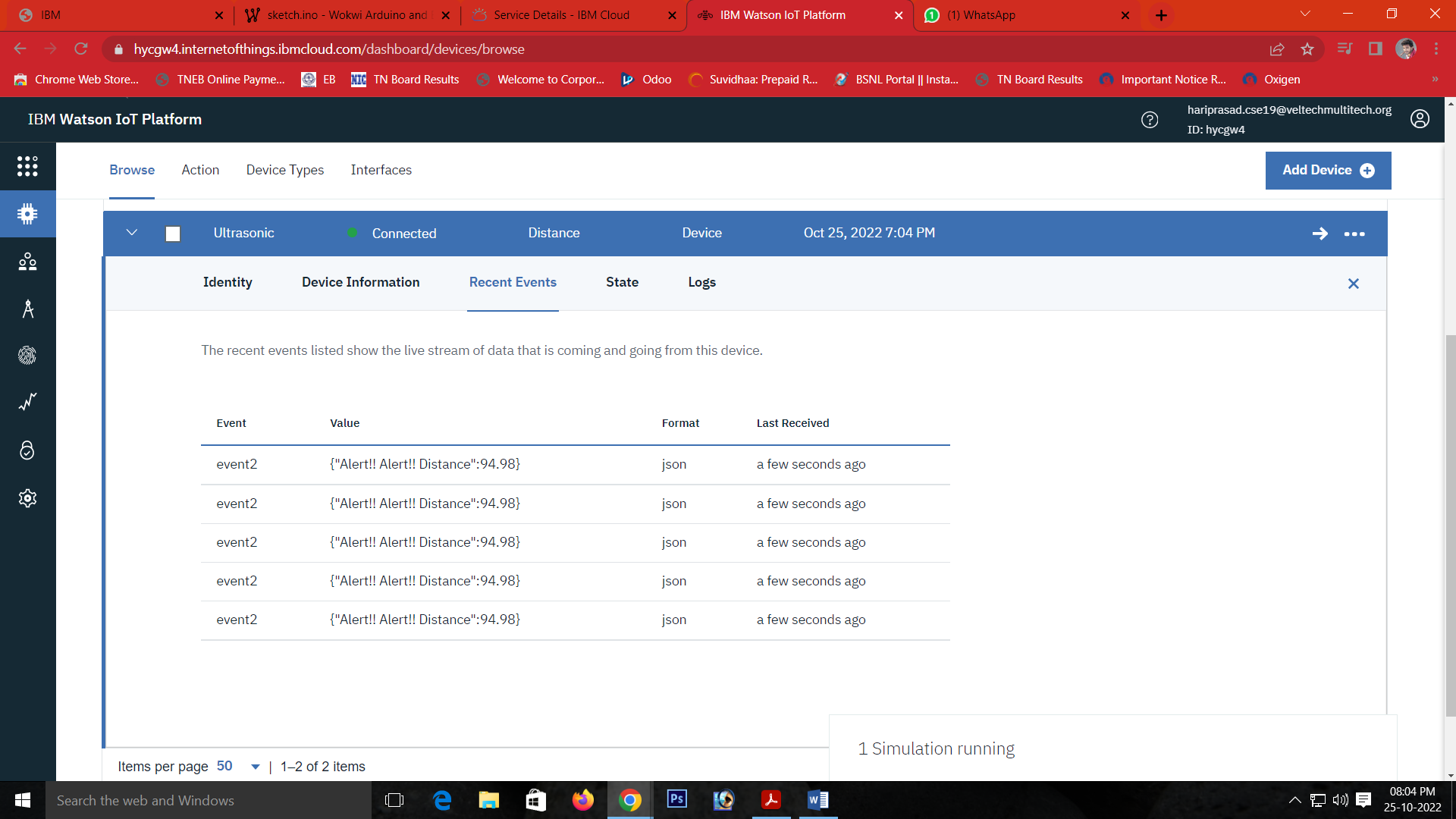


**OUTPUT:**

1. **Distance = 95 cm**

**Status = Alert Message**

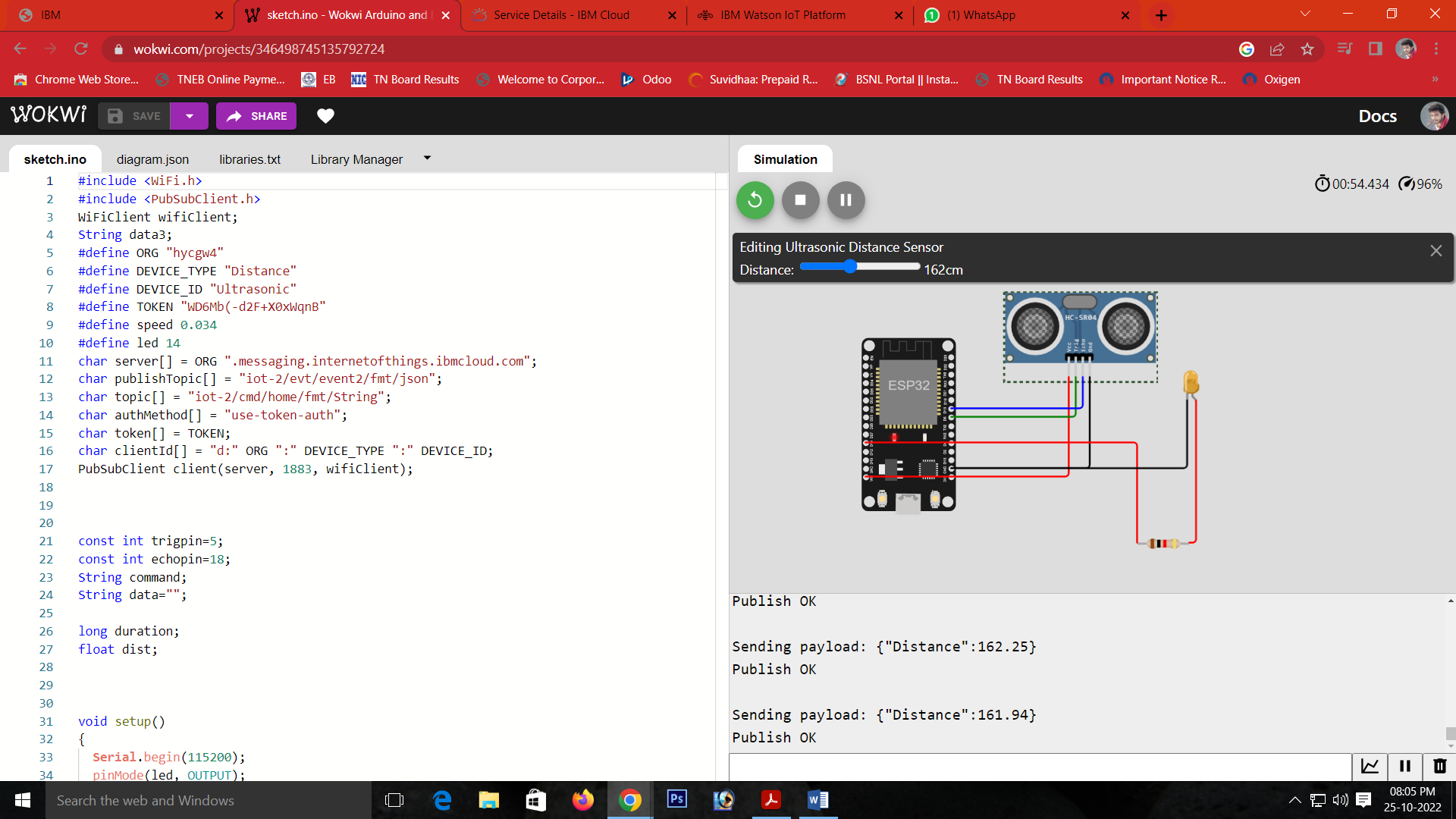


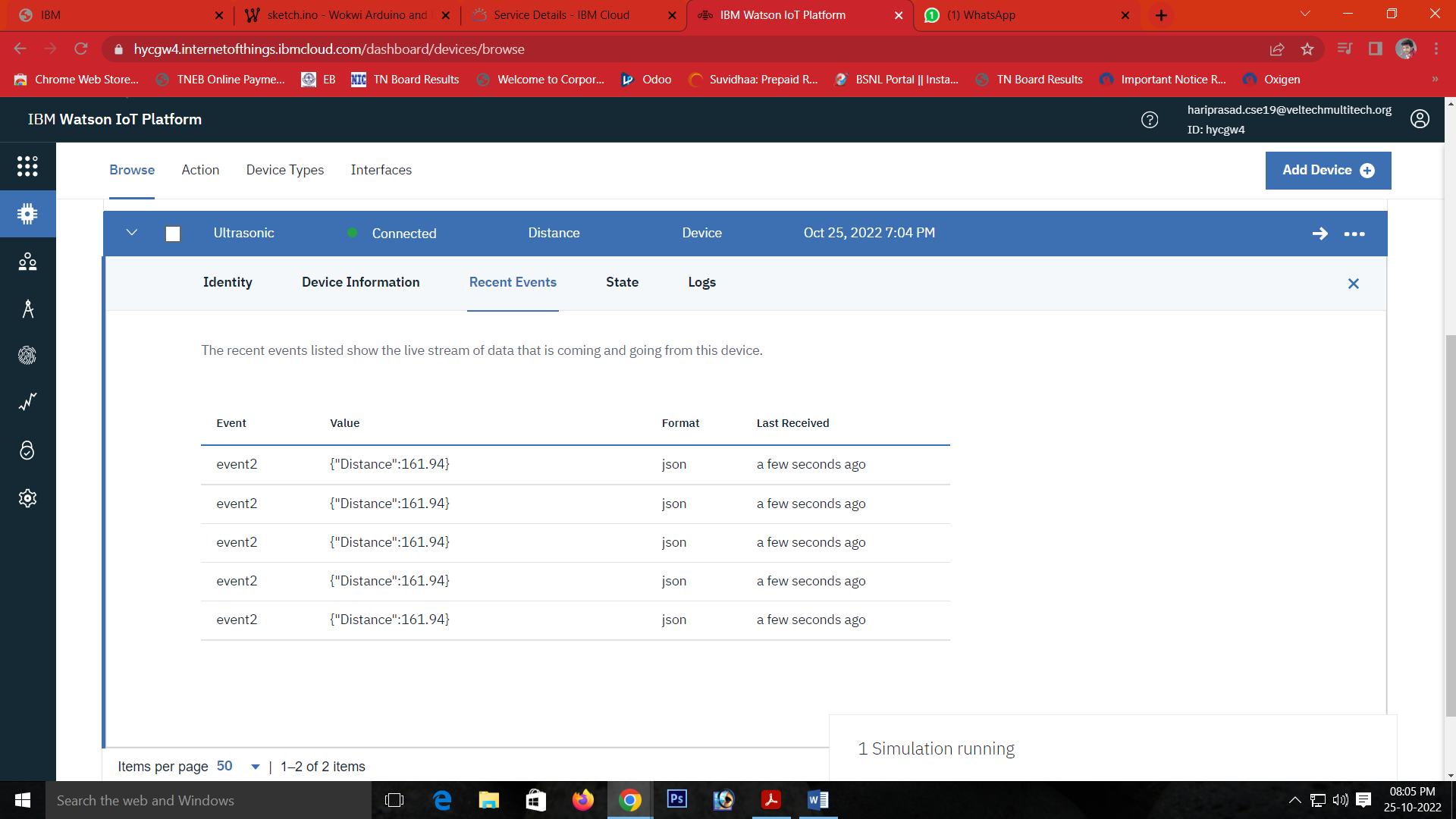


**Wokwi data publishing to ibm cloud**

1. **Distance = 162 cm**

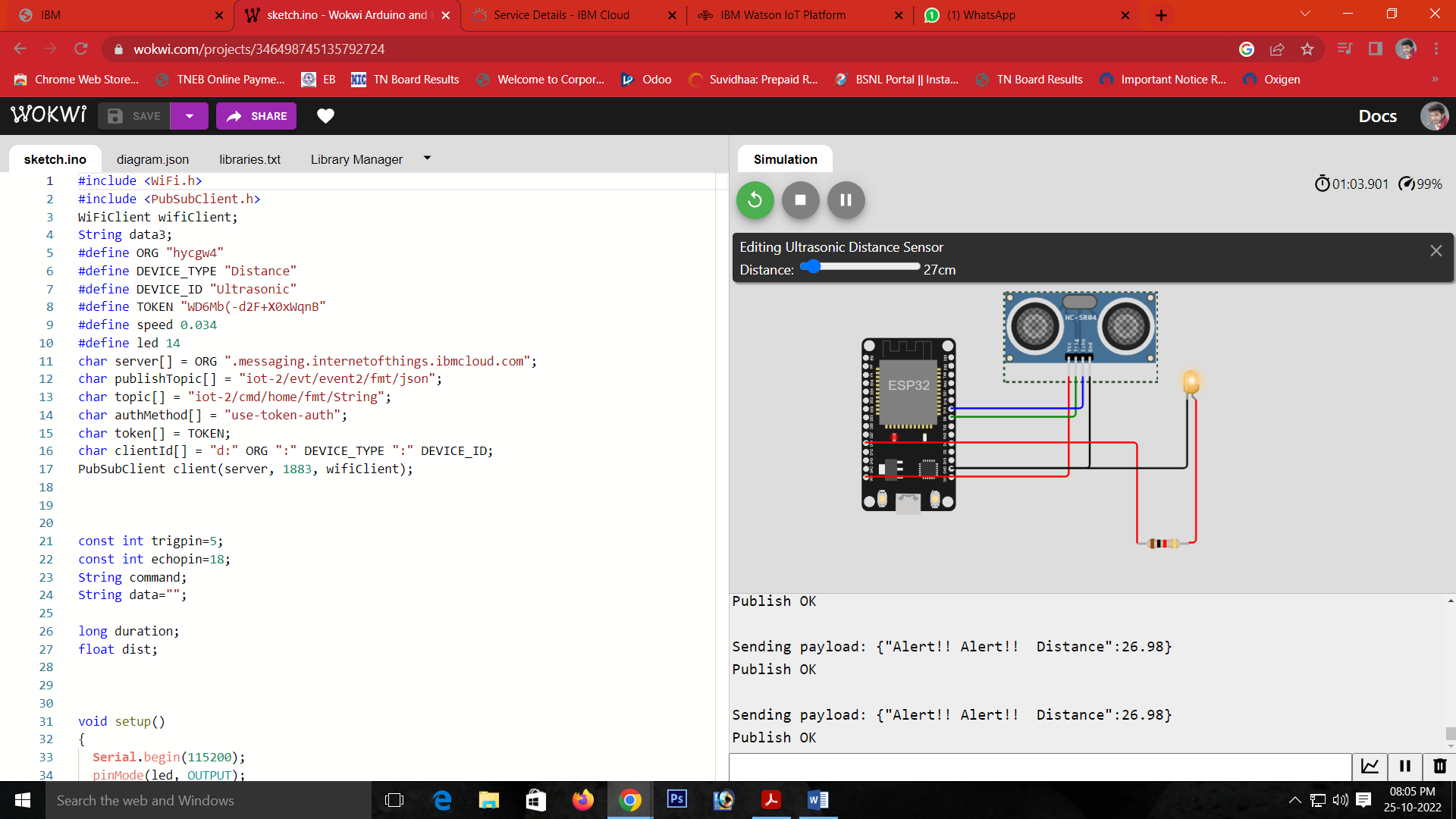
**Status = Normal**

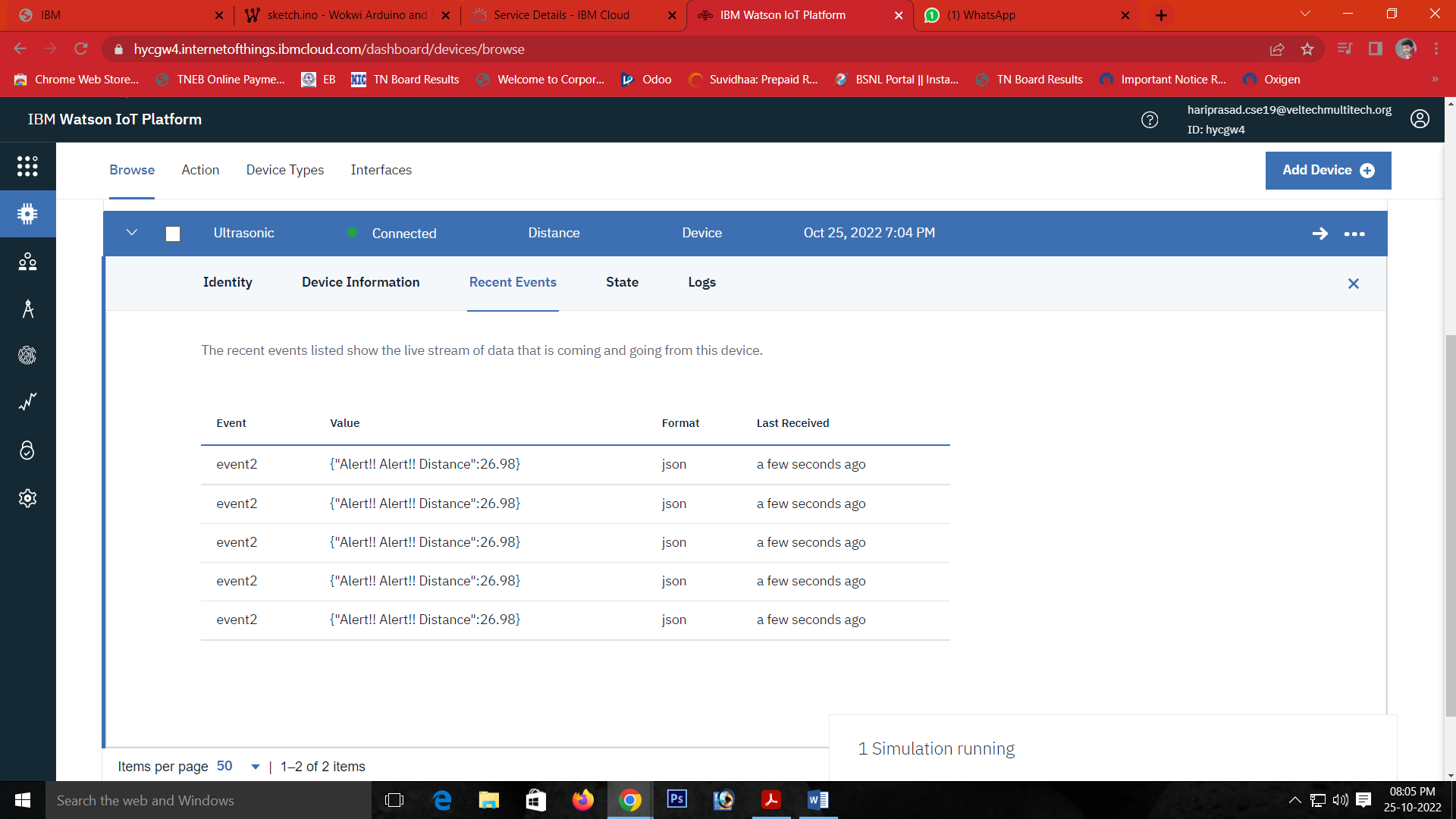




1. **Distance = 27 cm**

**Status = Alert Message**





**Reference link = https://wokwi.com/projects/346498745135792724**