ASSIGNMENT 4

Student name	Swetha V
Student Roll Number	2019504596
Maximum marks	2 marks

Question:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud

Solution:

Source code:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic,byte* payload, unsigned int
payloadLength);
#define ORG "9zsxrs"
#define DEVICE_TYPE "iot"
#define DEVICE_ID "5"
#define TOKEN "45964596"
String data3;

char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/distance/fmt/json";
```

```
char subscribeTopic[]="iot-2/cmd/test/fmt/String";
char authMethod[]="use-token-auth";
char token[]=TOKEN;
char clientID[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;

WiFiClient wifiClient;
PubSubClient client(server,1883,callback,wifiClient);

#define ECHO_PIN 2
#define TRIG_PIN 4
#define led 5

void setup() {
  // put your setup code here, to run once:
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  wificonnect();
  mqttconnect();
}
float readDistanceCM() {
  digitalWrite(TRIG_PIN, LOW);
  delayMicroseconds(2);
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
  int duration=random(1,200);
  //Serial.println(duration);
  //duration = pulseIn(ECHO_PIN, HIGH);
  return duration ;
  //Serial.println(duration);

}

void loop() {
  float distance = readDistanceCM();
  //Serial.println(distance);

  bool isNearby = distance < 100;
```

```
  digitalWrite(led, isNearby);

  Serial.print("Measured distance: ");
  Serial.println(distance);
  if(distance<100){
    PublishData2(distance);

  }else{
    PublishData1(distance);

  }
  //PublishData(distance);
  delay(1000);
  if(!client.loop()){
    mqttconnect();
  }

  //delay(2000);
}
void PublishData1(float dist){
  mqttconnect();
  String payload= "{\"distance\":";
  payload += dist;
  payload+="}";

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

  if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("publish ok");
  } else{
    Serial.println("publish failed");
  }
}
void PublishData2(float dist){
  mqttconnect();
  String payload= "{\"ALERT\":";
  payload += dist;
  payload+="}";
```

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

  if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("publish ok");
  } else{
    Serial.println("publish failed");
  }
}
void mqttconnect(){
  if(!client.connected()){
    Serial.print("Reconnecting to ");
    Serial.println(server);
    while(!!!client.connect(clientID, authMethod, token)){
      Serial.print(".");
      delay(500);
    }
    initManagedDevice();
    Serial.println();
  }
}

void wificonnect(){
  Serial.println();
  Serial.print("Connecting to");

  WiFi.begin("Wokwi-GUEST","",6);
  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));
```

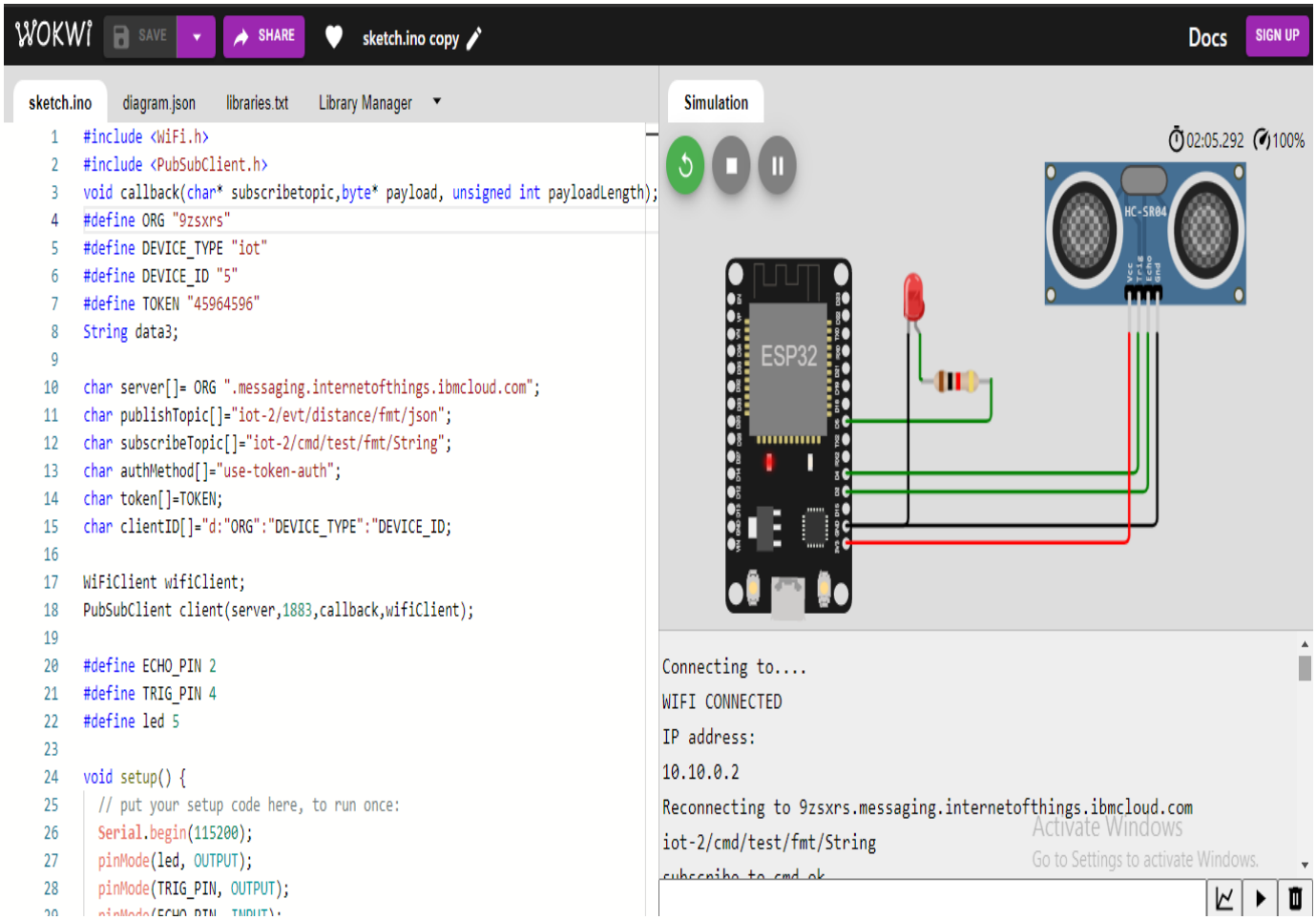
```
    Serial.println("subscribe to cmd ok");
  }else{
    Serial.println("subscribe to cmd failed");
  }
}

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++){
    data3 += (char)payload[i];
  }
  Serial.println("data:"+ data3);
  if(data3=="lighton"){
    Serial.println(data3);
    digitalWrite(led,HIGH);
  }else{
    Serial.println(data3);
    digitalWrite(led,LOW);
  }
  data3="";
}
```

Wokwi project link:

https://wokwi.com/projects/347324125989044820

Normal Case:

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  Serial.begin(115200);
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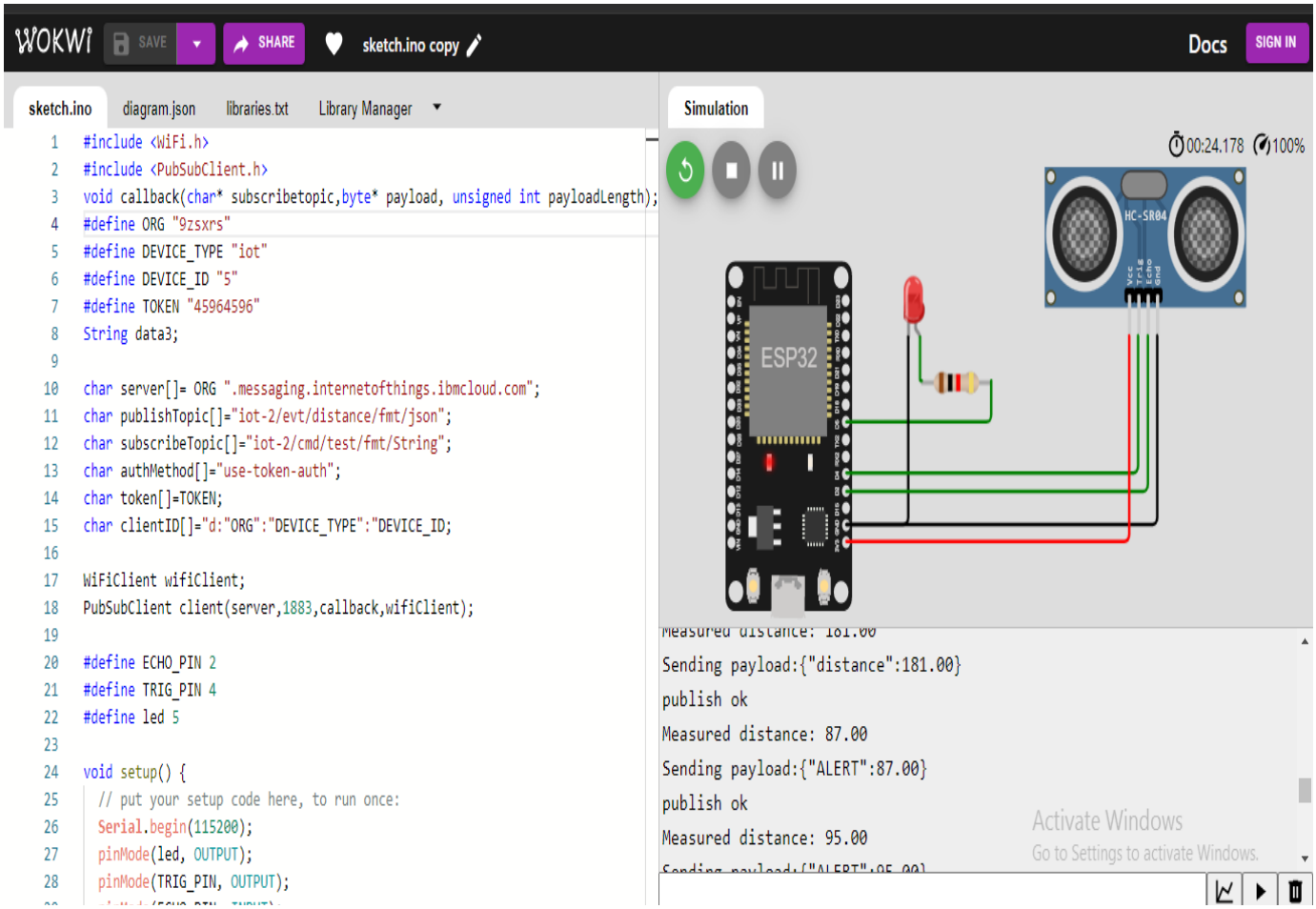
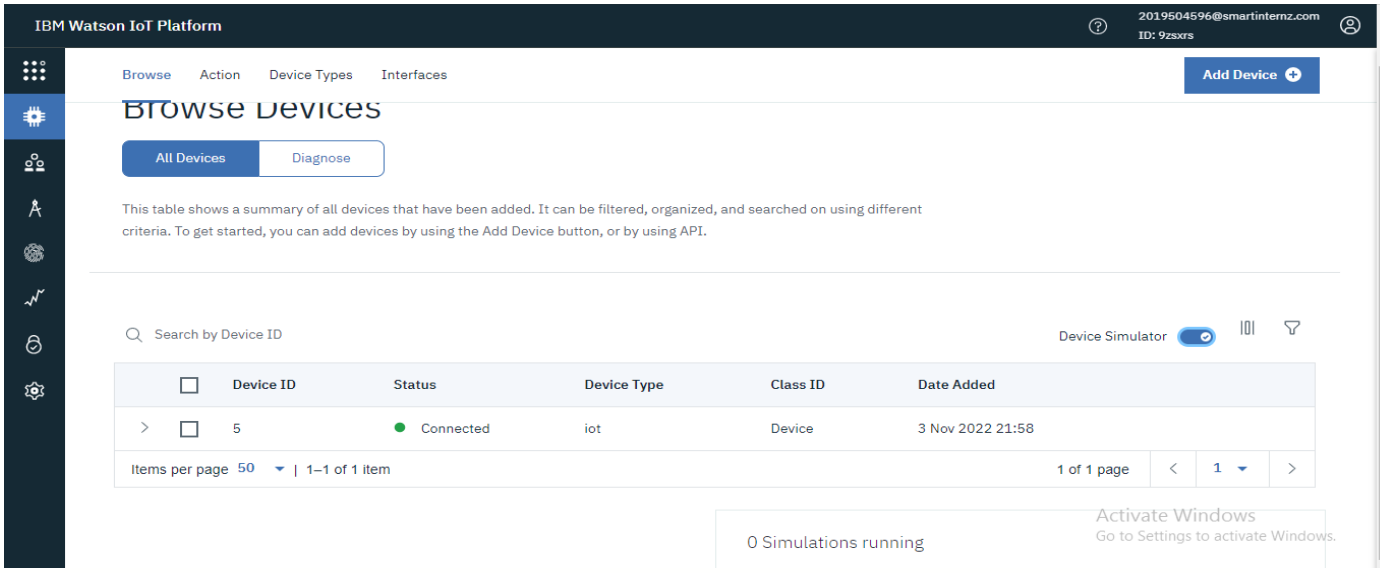
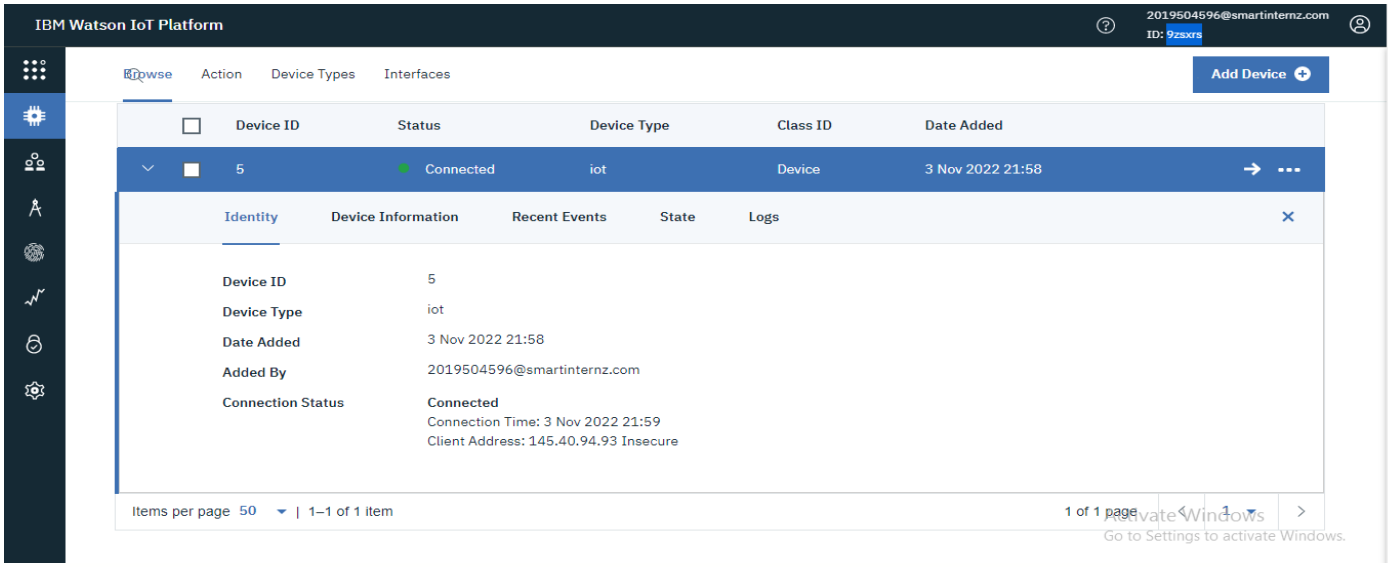
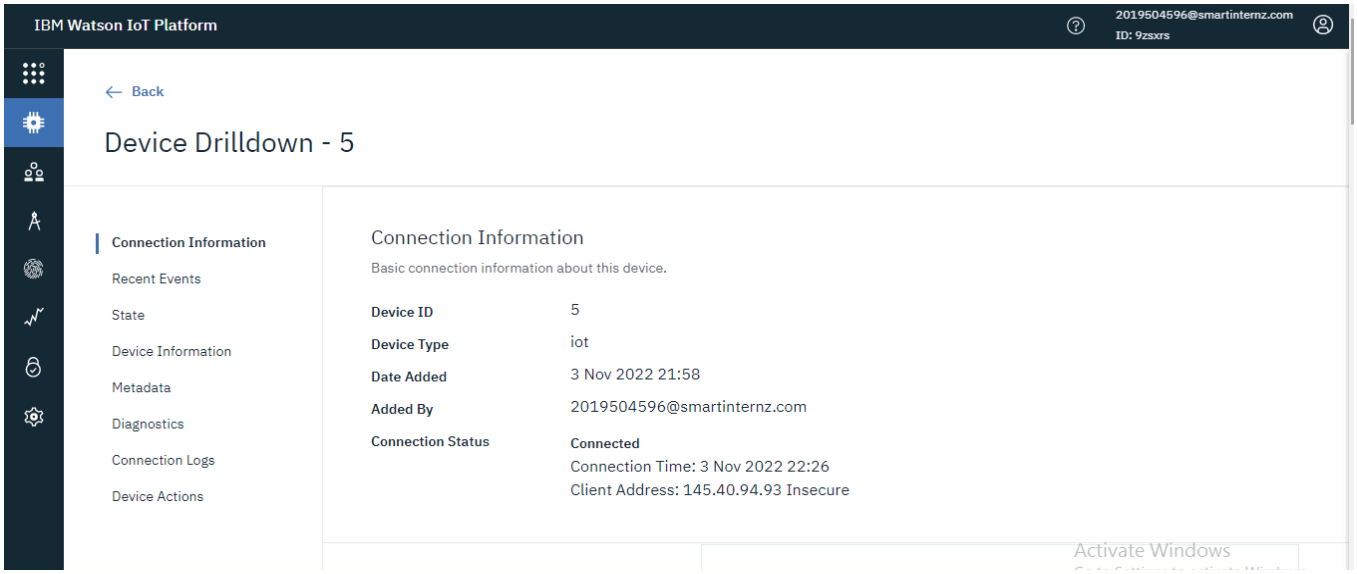
Alert Case:



Cloud storage:


IBM Watson IoT Platform
2019504596@smartinternz.com
ID: 9zsxrs
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
5
Connected
iot
Device
3 Nov 2022 21:58
Items per page 50
1–1 of 1 item
1 of 1 page
1
0 Simulations running
Activate Windows
Go to Settings to activate Windows.


IBM Watson IoT Platform
2019504596@smartinternz.com
ID: 9zsxrs
Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Class ID
Date Added
5
Connected
iot
Device
3 Nov 2022 21:58
Identity
Device Information
Recent Events
State
Logs
Device ID
5
Device Type
iot
Date Added
3 Nov 2022 21:58
Added By
2019504596@smartinternz.com
Connection Status
Connected
Connection Time: 3 Nov 2022 21:59
Client Address: 145.40.94.93 Insecure
Items per page 50
1–1 of 1 item
1 of 1 page
1
Activate Windows
Go to Settings to activate Windows.


IBM Watson IoT Platform
2019504596@smartinternz.com
ID: 9zsxrs
Back
Device Drilldown - 5
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
Connection Information
Basic connection information about this device.
Device ID
5
Device Type
iot
Date Added
3 Nov 2022 21:58
Added By
2019504596@smartinternz.com
Connection Status
Connected
Connection Time: 3 Nov 2022 22:26
Client Address: 145.40.94.93 Insecure
Activate Windows