Assignment -4

DistanceDetectionUsingUltrasonicSensor

Question-1:

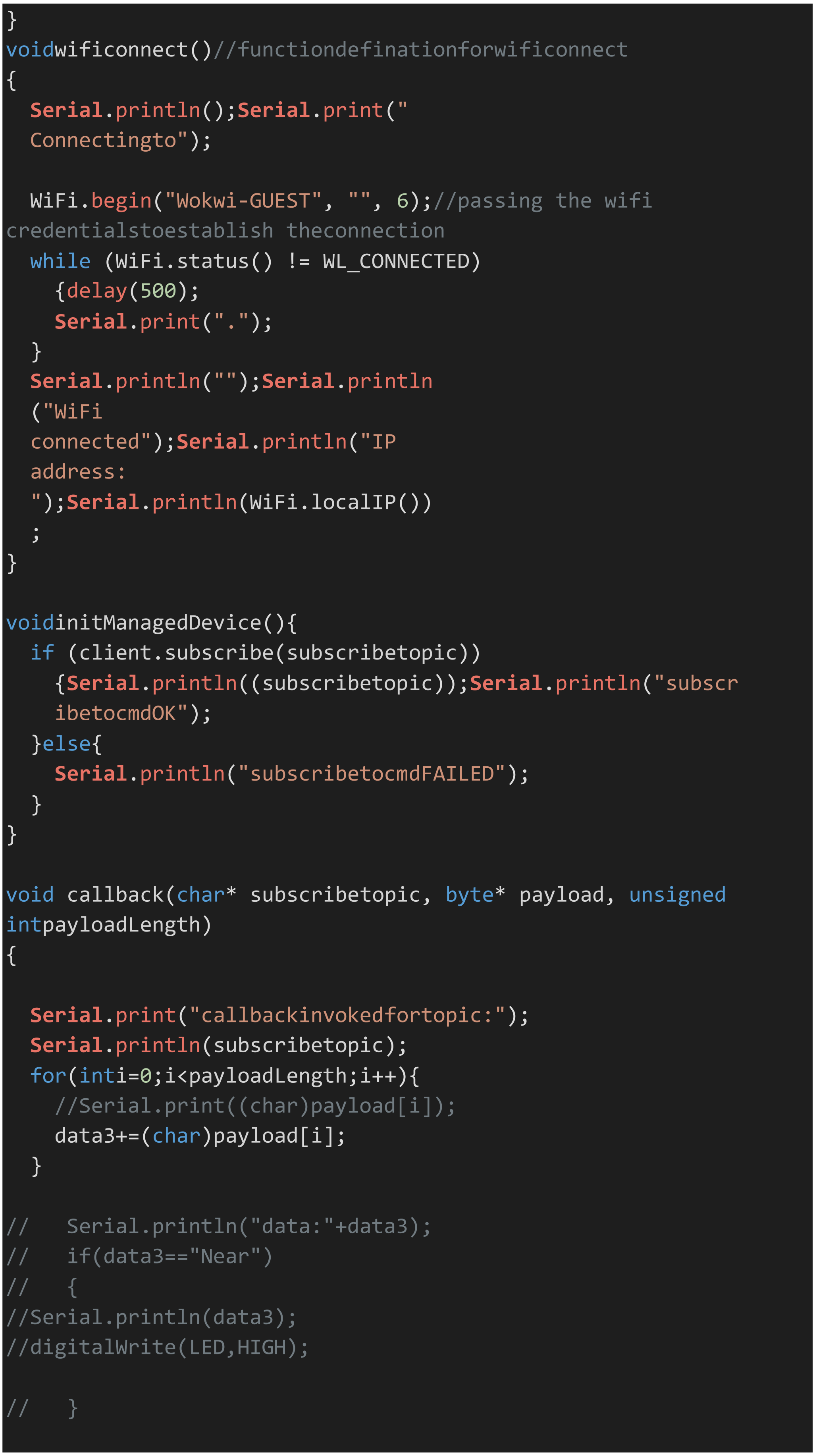
Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cmssend"alert" toibmcloudanddisplay indevicerecentevents.

WOKWILINK:https://wokwi.com/projects/345964118720643668

CODE:

```
#include<WiFi.h>//library
forwifi#include<PubSubClient.h>//libraryfor
MQtt


voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLe
ngth);

//-------credentialsofIBMAccounts------

#defineORG"f59trs"//IBMORGANITIONID
#defineDEVICE_TYPE"ultrasonicsensor"//Devicetypementionedinibmwats
onIOTPlatform
#defineDEVICE_ID"distancedetection"//DeviceIDmentionedinibmwatsonI
OTPlatform
#defineTOKEN"AlGMGaaF01nawa1QA3"
                                        //Token
Stringdata3;
floatdist;


//--------Customisetheabovevalues--------
char server[] = ORG
".messaging.internetofthings.ibmcloud.com";//ServerName
charpublishTopic[]="iot-
2/evt/Data/fmt/json";//topicnameandtypeofevent perform
andformatinwhich datatobesend
charsubscribetopic[]="iot-2/cmd/test/fmt/String";//
cmdREPRESENTcommandtypeANDCOMMANDIS TESTOFFORMATSTRING
charauthMethod[]="use-token-
auth";//authenticationmethodchartoken[]=TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":"
DEVICE_ID;//clientid


//                                          -
  -----------------------------------------
```

```
WiFiClient wifiClient; // creating the instance for
wificlientPubSubClientclient(server,1883, callback
,wifiClient);
//calling the predefined client id by passing parameter
likeserverid,portandwificredential

int LED =
4;int trig =
5;int echo =
18;voidsetup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);p
inMode(LED,
OUTPUT);delay(10);wif
iconnect();mqttconnec
t();
}
voidloop()//RecursiveFunction
{

 digitalWrite(trig,LOW);di
  gitalWrite(trig,HIGH);de
  layMicroseconds(10);digi
  talWrite(trig,LOW);
  float dur =
  pulseIn(echo,HIGH);float dist =
  (dur * 0.0343)/2;Serial.print
  ("Distancein
  cm");Serial.println(dist);


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



/*....................................retrievingto
Cloud. ............................ */

void PublishData(float dist)
  {mqttconnect();//functioncallforconnectingtoibm
  /*
     creating the String in in form JSon to update the data
toibmcloud
  */
  String
  object;if(dist
  <100)
  {
    digitalWrite(LED,HIGH);Serial.pri
    ntln("object is
    near");object="Near";
  }
  else
  {
    digitalWrite(LED,LOW);Serial.print
    ln("no object found");object="No";
  }

  String payload =
  "{\"distance\":";payload+=dist;
  payload += ","
  "\"object\":\"";payload+=object
  ;
  payload+= "\"}";


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




  if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("Publish ok");// if it sucessfully upload
dataon the cloud then it will print publish ok in Serial monitor
orelseitwill printpublishfailed
  }else{
    Serial.println("Publishfailed");
  }

}
voidmqttconnect(){
  if (!client.connected())
    {Serial.print("Reconnecting client to
    ");Serial.println(server);
    while(!!!client.connect(clientId,authMethod,token)){
      Serial.print(".");
      delay(500);
    }

     initManagedDevice();
     Serial.println();
  }
```



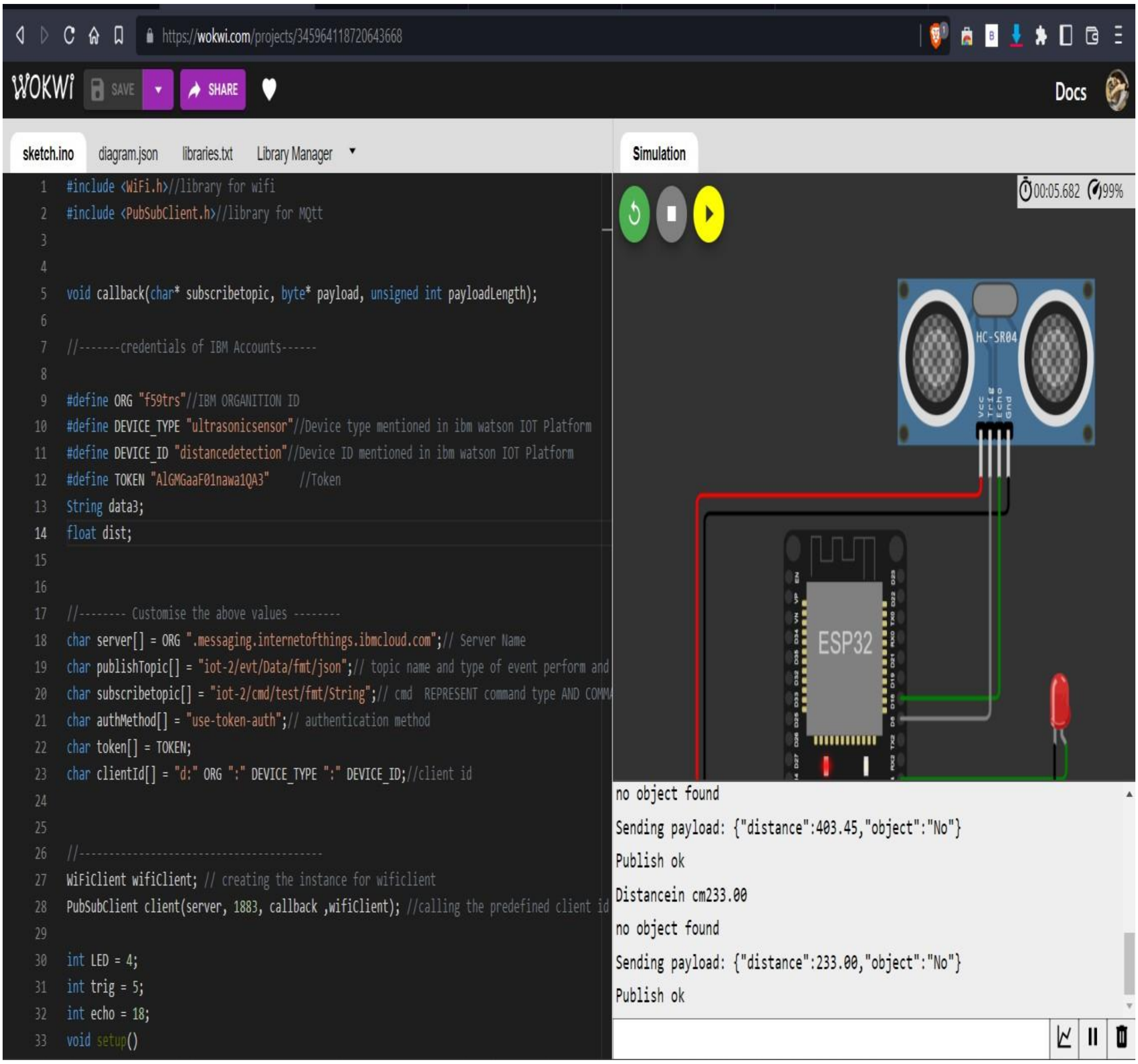
```
}
voidwificonnect()//functiondefinationforwificonnect
{
  Serial.println();Serial.print("
  Connectingto");

  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi
credentialstoestablish theconnection
  while (WiFi.status() != WL_CONNECTED)
    {delay(500);
    Serial.print(".");
  }
  Serial.println("");Serial.println
  ("WiFi
  connected");Serial.println("IP
  address:
  ");Serial.println(WiFi.localIP())
  ;
}

voidinitManagedDevice(){
  if (client.subscribe(subscribetopic))
    {Serial.println((subscribetopic));Serial.println("subscr
    ibetocmdOK");
  }else{
    Serial.println("subscribetocmdFAILED");
  }
}

void callback(char* subscribetopic, byte* payload, unsigned
intpayloadLength)
{

  Serial.print("callbackinvokedfortopic:");
  Serial.println(subscribetopic);
  for(inti=0;i<payloadLength;i++){
    //Serial.print((char)payload[i]);
    data3+=(char)payload[i];
  }

//    Serial.println("data:"+data3);
//    if(data3=="Near")
//    {
//Serial.println(data3);
//digitalWrite(LED,HIGH);

//    }
```

```
//    else
//    {
```

```
//Serial.println(data3);
//digitalWrite(LED,LOW);

//
        }dat
a3="";
```

OUTPUT:

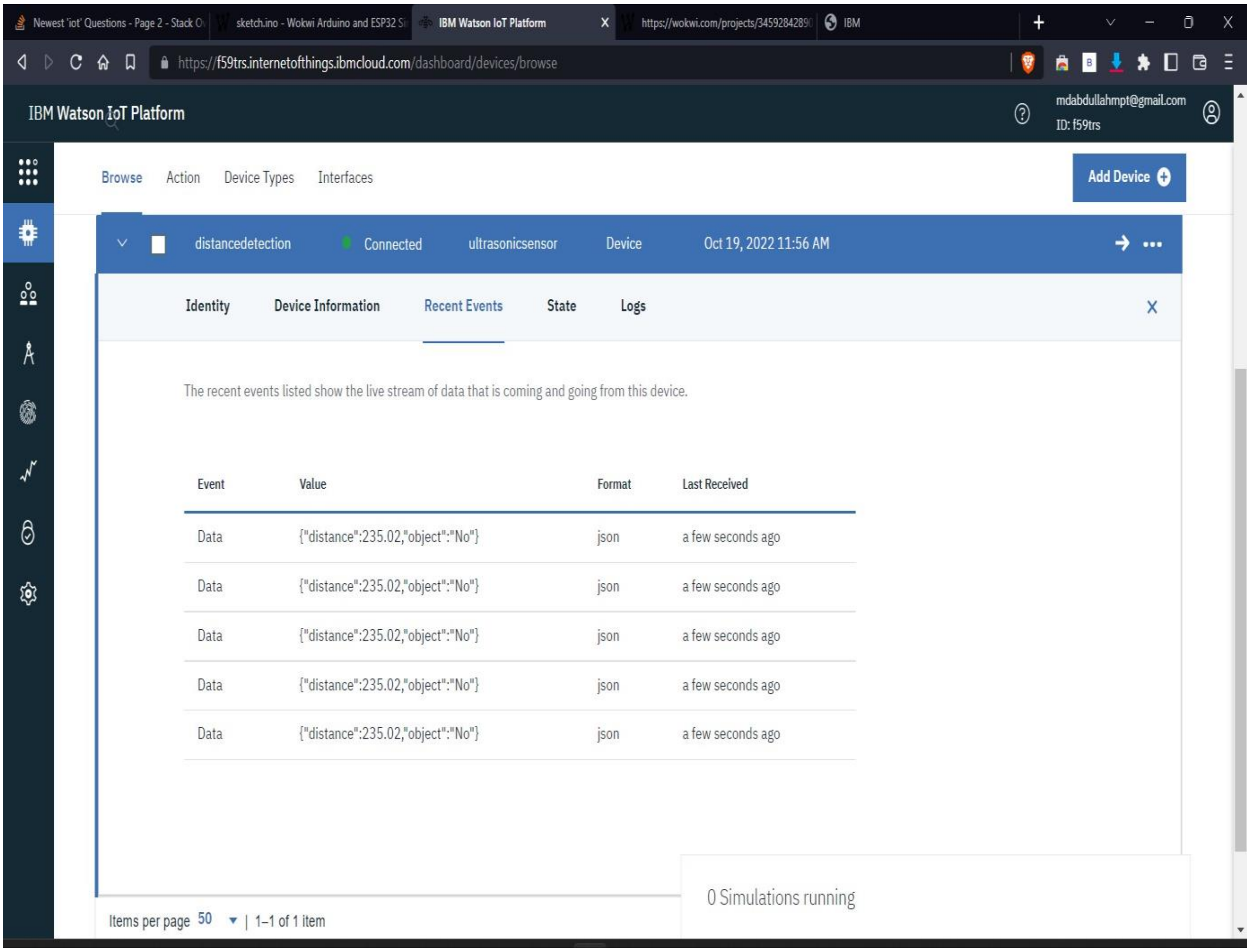
Whenobjectisnotneartotheultrasonicsensor



```
#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 "f59trs"//IBM ORGANITION ID
#define DEVICE_TYPE "ultrasonicsensor"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "distancedetection"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "AlGMGaaF01nawa1QA3"     //Token
String data3;
float dist;


//-------- 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
char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd  REPRESENT command type AND COMMA
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

int LED = 4;
int trig = 5;
int echo = 18;
void setup()
```

```
no object found
Sending payload: {"distance":403.45,"object":"No"}
Publish ok
Distancein cm233.00
no object found
Sending payload: {"distance":233.00,"object":"No"}
Publish ok
```

DatasenttotheIBMclouddevice whentheobjectis far



Newest 'iot' Questions - Page 2 - Stack O
sketch.ino - Wokwi Arduino and ESP32 Si
IBM Watson IoT Platform
https://wokwi.com/projects/34592842890
IBM
https://f59trs.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
mdabdullahmpt@gmail.com
ID: f59trs
Browse
Action
Device Types
Interfaces
Add Device

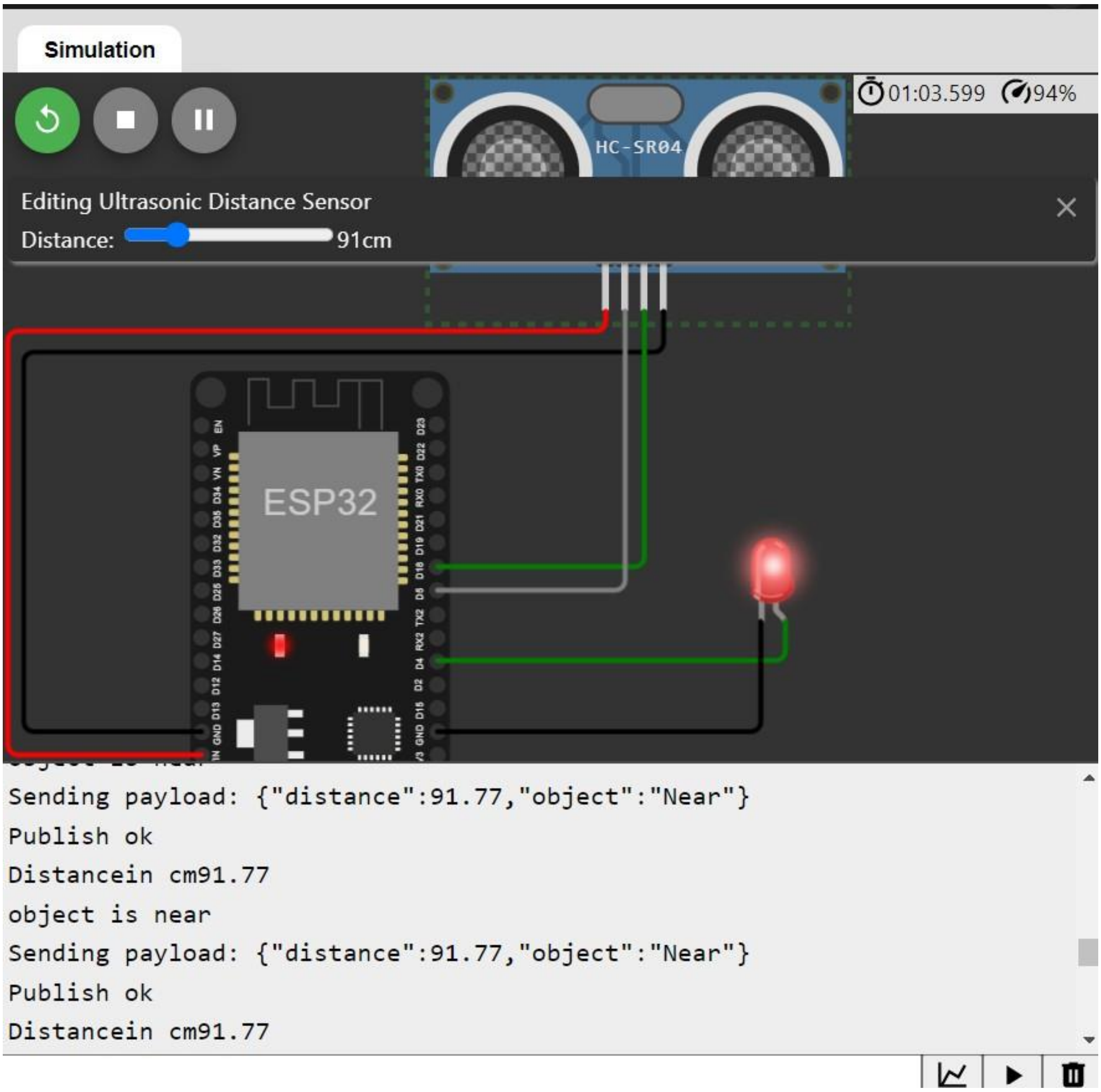
distancedetection Connected ultrasonicsensor Device Oct 19, 2022 11:56 AM

Identity
Device Information
Recent Events
State
Logs

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"distance":235.02,"object":"No"}	json	a few seconds ago
Data	{"distance":235.02,"object":"No"}	json	a few seconds ago
Data	{"distance":235.02,"object":"No"}	json	a few seconds ago
Data	{"distance":235.02,"object":"No"}	json	a few seconds ago
Data	{"distance":235.02,"object":"No"}	json	a few seconds ago

Whenobjectisnearertotheultrasonicsensor

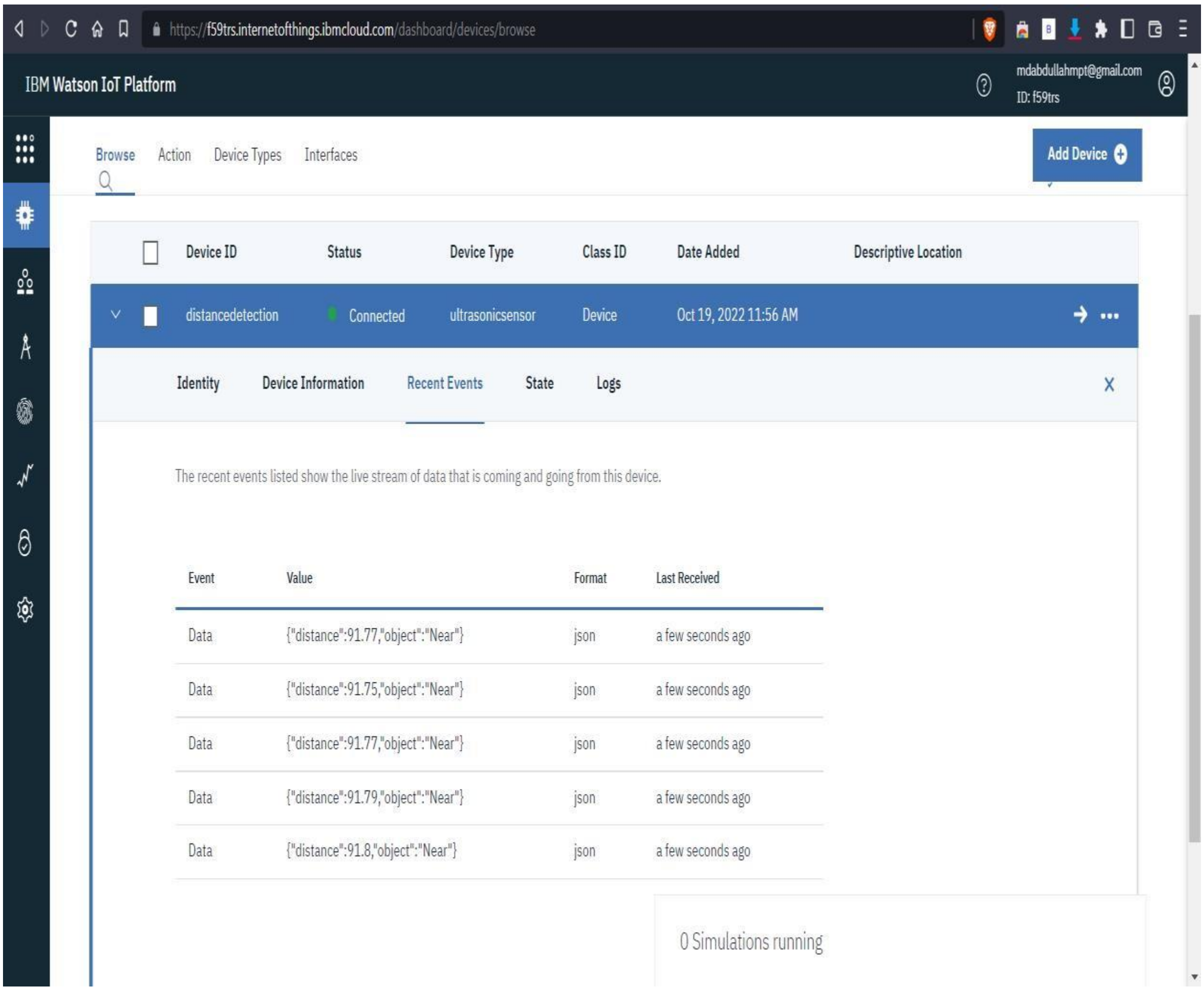


Editing Ultrasonic Distance Sensor

Distance: 91cm

```
object is near
Sending payload: {"distance":91.77,"object":"Near"}
Publish ok
Distancein cm91.77
object is near
Sending payload: {"distance":91.77,"object":"Near"}
Publish ok
Distancein cm91.77
```

DatasenttotheIBMclouddevice whentheobjectisnear



	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
□	distancedetection	Connected	ultrasonicsensor	Device	Oct 19, 2022 11:56 AM	

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"distance":91.77,"object":"Near"}	json	a few seconds ago
Data	{"distance":91.75,"object":"Near"}	json	a few seconds ago
Data	{"distance":91.77,"object":"Near"}	json	a few seconds ago
Data	{"distance":91.79,"object":"Near"}	json	a few seconds ago
Data	{"distance":91.8,"object":"Near"}	json	a few seconds ago

0 Simulations running

https://wokwi.com/projects/345964118720643668