SPRINT-4

PROJECT	INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM
TEAM ID	PNT2022TMDI36769

PROGRAM:

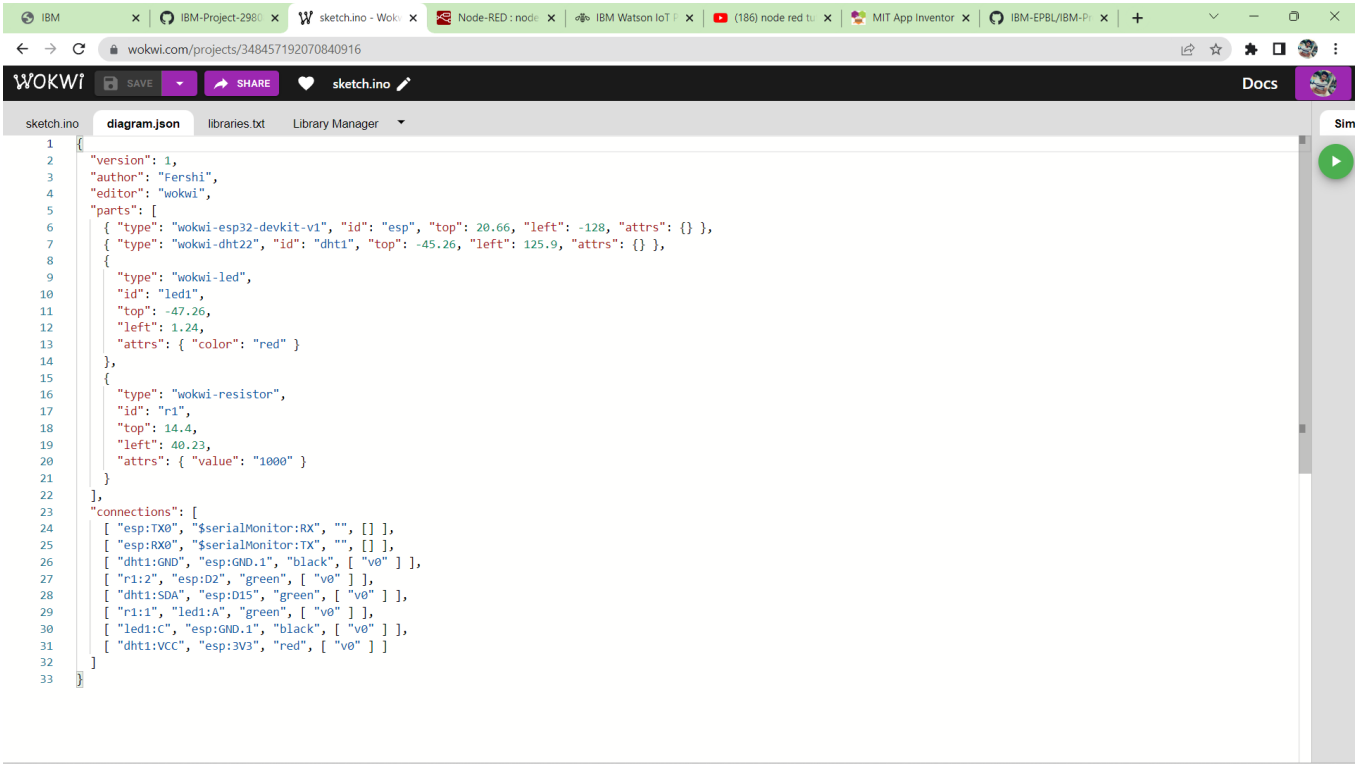
```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#include "DHT.h"// Library for dht11
#define DHTPIN 15   // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11
#define LED 2
DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of dht connected

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

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

#define ORG "1vqi0j"//IBM ORGANITION ID
#define DEVICE_TYPE "node-red"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "123456789"     //Token
String data3;
float t;


//-------- 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/command/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
void setup()// configureing the ESP32
{
  Serial.begin(115200);
  dht.begin();
  pinMode(LED,OUTPUT);
```

```
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}

void loop()// Recursive Function
{

  t = dht.readTemperature();
  Serial.print("temperature:");
  Serial.println(t);

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



/*.....................................retrieving to Cloud.............................*/

void PublishData(float temp) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"temperature\":";
  payload += temp;
  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)) {
```

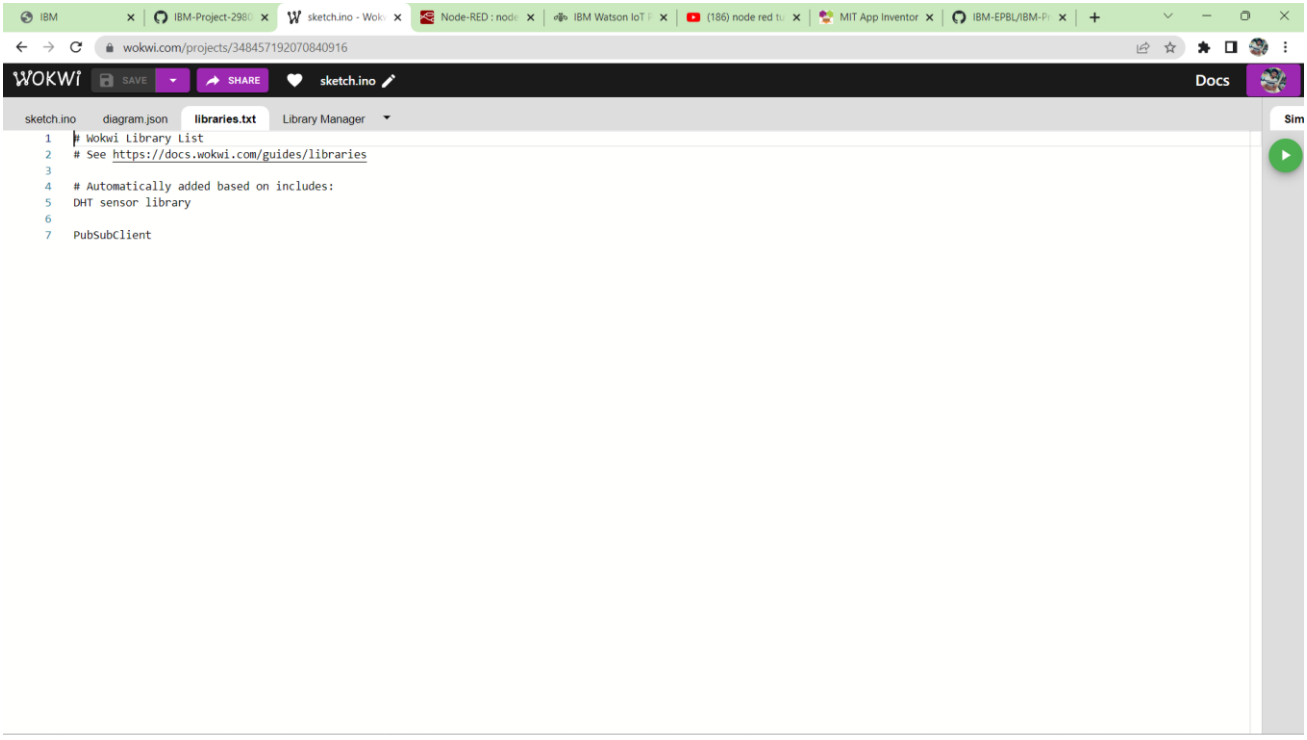
```
      Serial.print(".");
      delay(500);
    }

     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);
digitalWrite(LED,HIGH);

  }
```

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

  }
data3="";


}
```

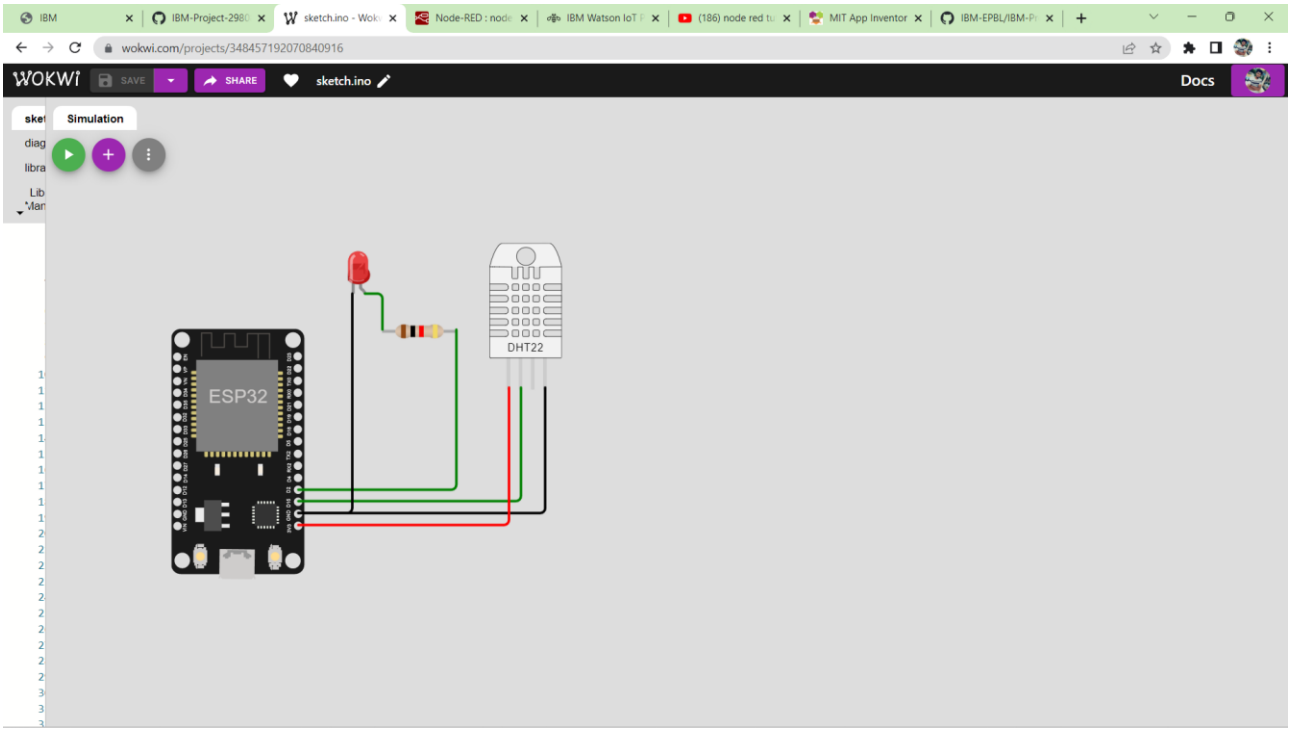
DIAGRAM.JSON:



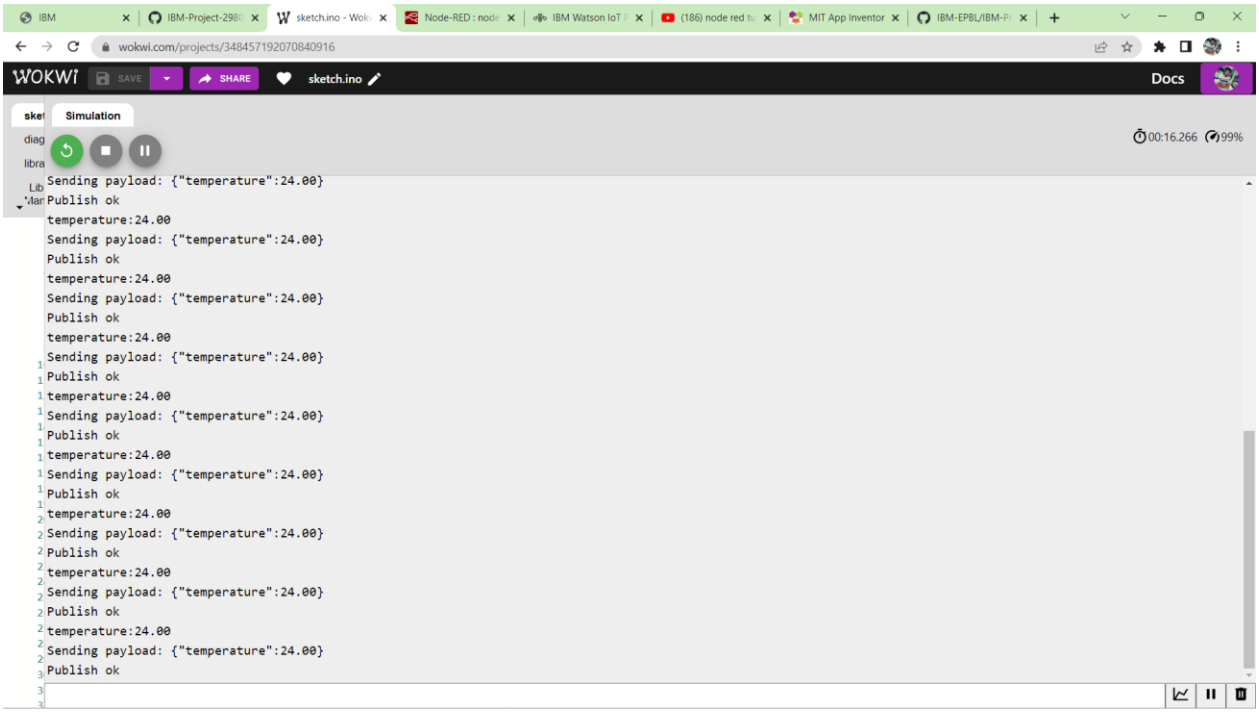
LIBRARIES TEXT:



CIRCUIT:



OUTPUT:



WOKWI LINK:

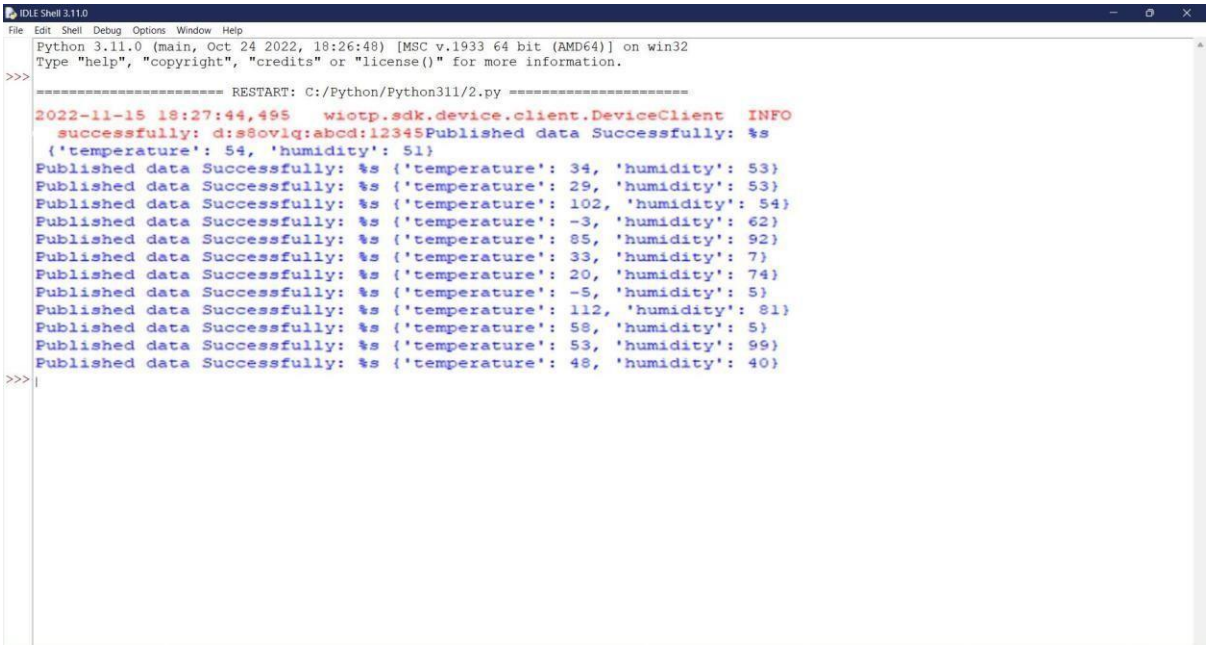
https://wokwi.com/projects/348457192070840916

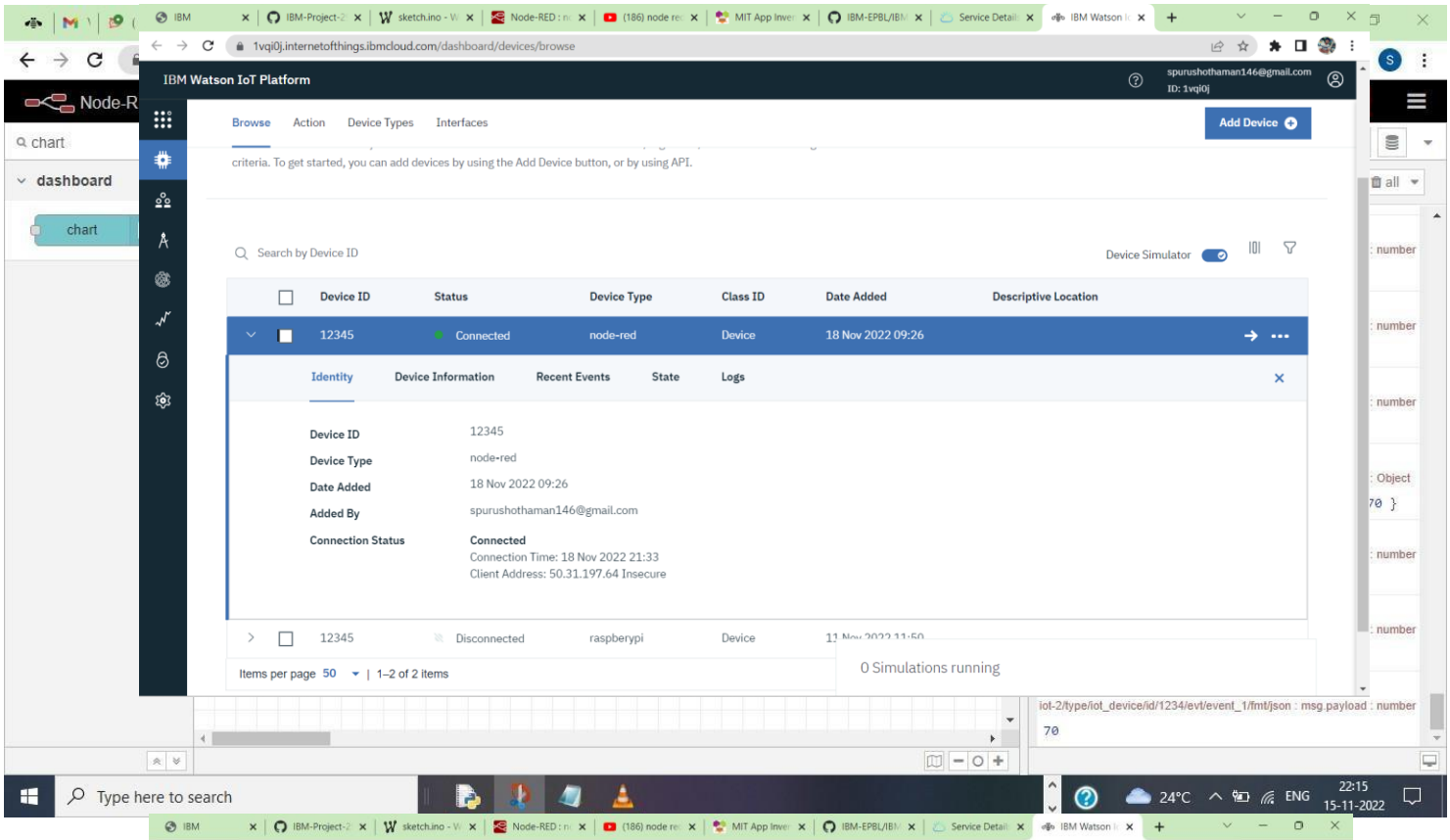
TESTCASES & OUTPUT

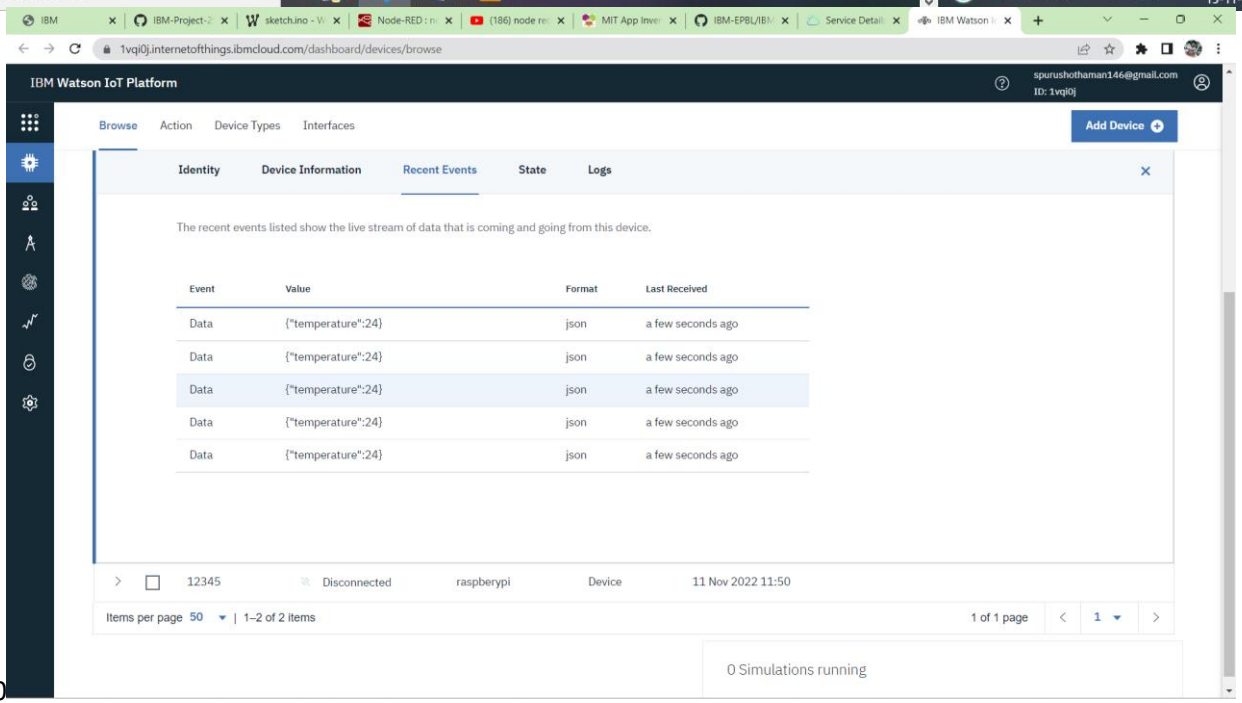
SL.NO	INPUT	OUTPUT	RESULT

01.	Gas:933 Temperature:59.30 Flame:207	Exhaust fan on:TRUE Sprinklers:OFF	Passed
02.	Gas:437 Temperature:59.30 Flame:693	Exhaust fan on:TRUE Sprinklers:OFF	Passed
03.	Gas:218 Temperature:59.30 Flame:369	Exhaust fan on:TRUE Sprinklers:ON	Passed
04.	Gas:2503 Temperature:59.30 Flame:531	Exhaust fan on:TRUE Sprinklers:ON	Passed
05.	Gas:437 Temperature:59.30 Flame:693	Exhaust fan on:TRUE Sprinklers:ON	Passed
06.	Gas:722 Temperature:59.30 Flame:855	Exhaust fan on:TRUE Sprinklers:ON	Passed
07.	Gas:7 Temperature:59.30 Flame:1017	Exhaust fan on:FALSE Sprinklers:ON	Passed
08.	Gas:941 Temperature:59.30 Flame:155	Exhaust fan on:TRUE Sprinklers:OFF	Passed
09.	Gas:226 Temperature: 59.30 Flame:317	Exhaust fan on:TRUE Sprinklers:OFF	Passed
10.	Gas:511 Temperature:59.30 Flame:479	Exhaust fan on:TRUE Sprinklers:ON	Passed
11.	Gas:444 Temperature:59.30 Flame:641	Exhaust fan on:TRUE Sprinklers:ON	Passed

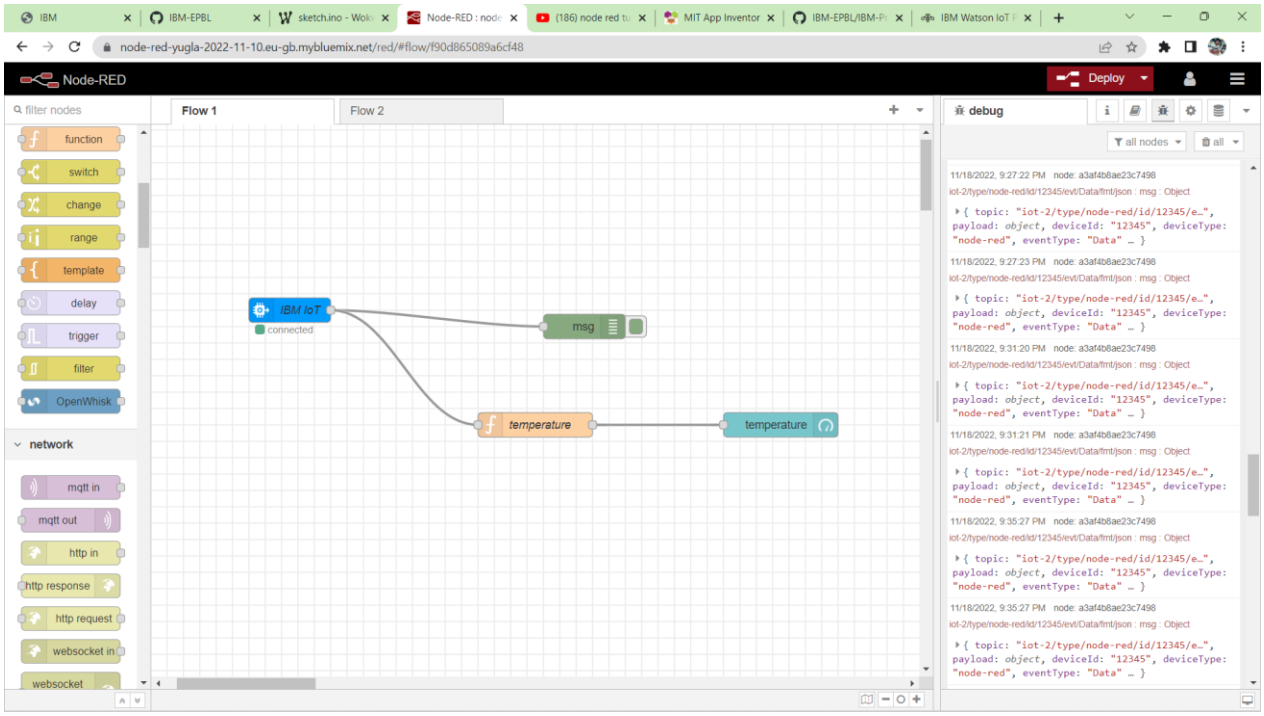

ibm.py - C:/Python/Python3.11/ibm.py (3.11.0)
File Edit Format Run Options Window Help
#IBM Watson IOT platform
import wiotp.sdk.device
import time
import random
myConfig={
"identity": {
"orgId":"sg5c1o",
"typeId":"xyz",
"deviceId":"5678"
},
"auth": {
"token":"567891011"
}
}
def myCommandCallback(cmd):
print("Message received from IBM IOT Platform: %s" % cmd.data['command'])
m=cmd.data['command']
client=wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=none)
client.connect()
while True:
temp=random.randint(-20,125)
hum=random.randint(0,100)
myData={'temperature':temp,'humidity':hum}
client.publishEvent(eventId="status",msgFormat="json",data=myData,qos=0,onPublish=None)
print("Published data Successfully: %s", mydata)
client.commandCallback=myCommandCallback
time.sleep(2)
client.disconnect()
Ln: 12 Col: 27

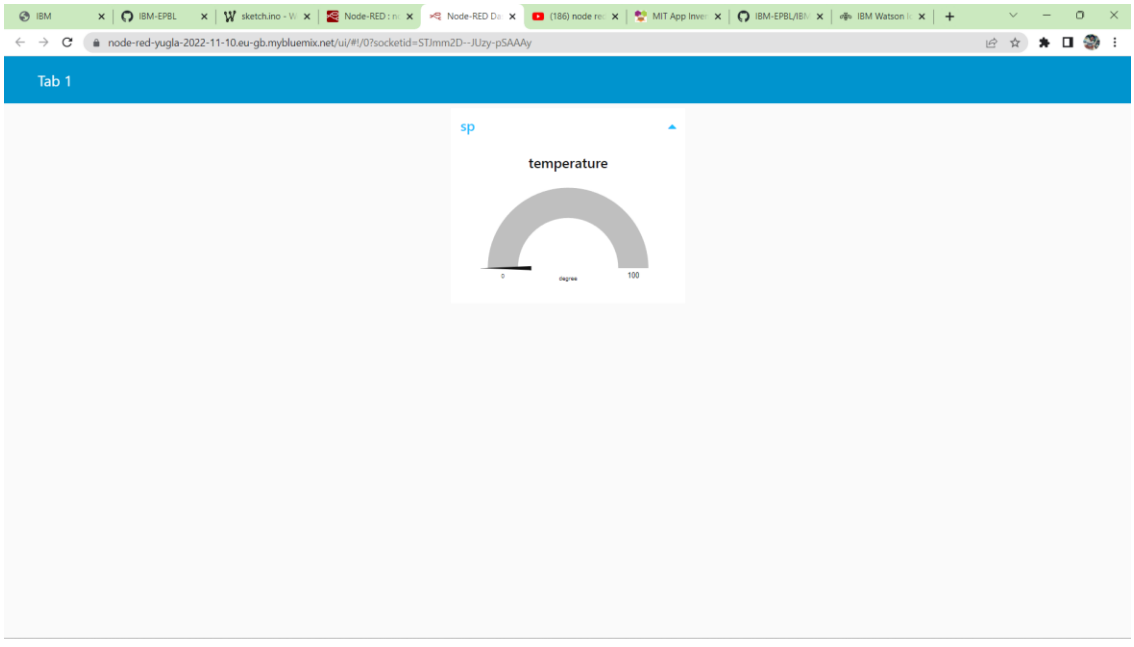

IDLE Shell 3.11.0
File Edit Shell Debug Options Window Help
Python 3.11.0 (main, Oct 24 2022, 18:26:48) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: C:/Python/Python311/2.py ==========
2022-11-15 18:27:44,495 wiotp.sdk.device.client.DeviceClient INFO
successfully: d:s8ovlq:abcd:12345Published data Successfully: %s
{'temperature': 54, 'humidity': 51}
Published data Successfully: %s {'temperature': 34, 'humidity': 53}
Published data Successfully: %s {'temperature': 29, 'humidity': 53}
Published data Successfully: %s {'temperature': 102, 'humidity': 54}
Published data Successfully: %s {'temperature': -3, 'humidity': 62}
Published data Successfully: %s {'temperature': 85, 'humidity': 92}
Published data Successfully: %s {'temperature': 33, 'humidity': 7}
Published data Successfully: %s {'temperature': 20, 'humidity': 74}
Published data Successfully: %s {'temperature': -5, 'humidity': 5}
Published data Successfully: %s {'temperature': 112, 'humidity': 81}
Published data Successfully: %s {'temperature': 58, 'humidity': 5}
Published data Successfully: %s {'temperature': 53, 'humidity': 99}
Published data Successfully: %s {'temperature': 48, 'humidity': 40}
>>>

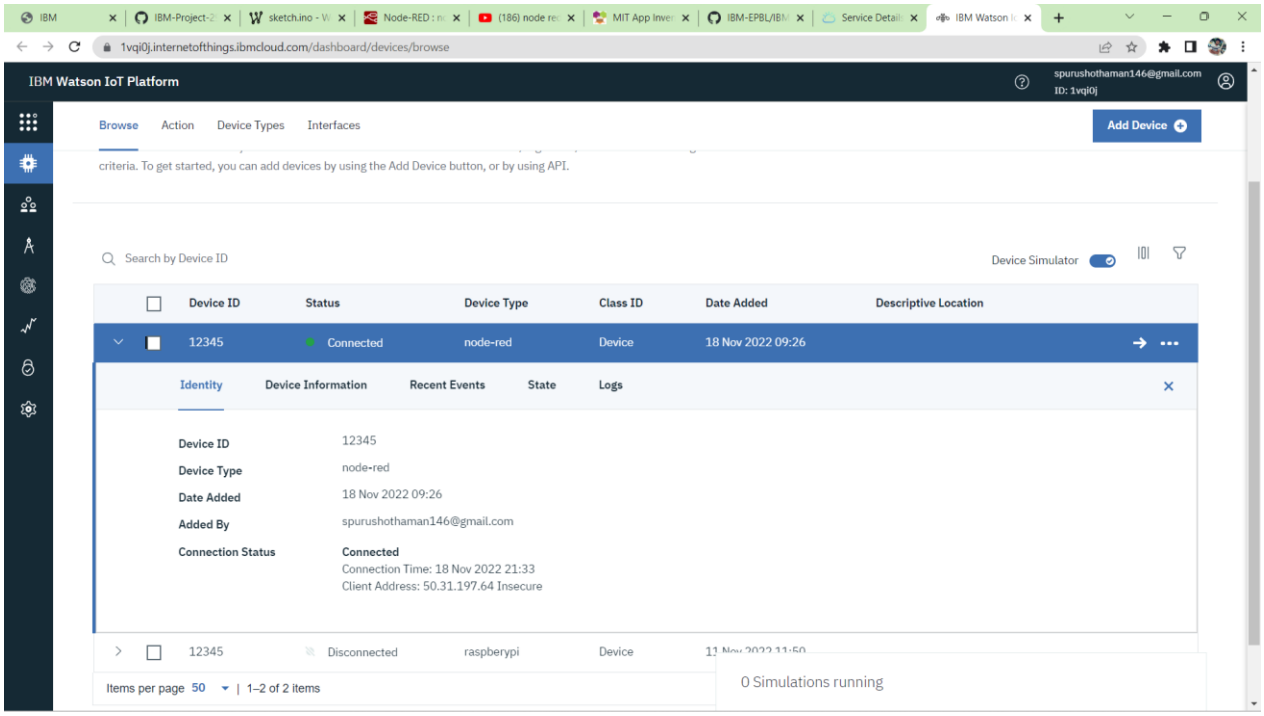

IBM Watson IoT Platform
spurushothaman146@gmail.com
ID: 1vqi0j
Browse
Action
Device Types
Interfaces
Add Device
criteria. To get started, you can add devices by using the Add Device button, or by using API.
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
12345
Connected
node-red
Device
18 Nov 2022 09:26
Identity
Device Information
Recent Events
State
Logs
Device ID
12345
Device Type
node-red
Date Added
18 Nov 2022 09:26
Added By
spurushothaman146@gmail.com
Connection Status
Connected
Connection Time: 18 Nov 2022 21:33
Client Address: 50.31.197.64 Insecure
12345
Disconnected
raspberypi
Device
Items per page 50
1–2 of 2 items
0 Simulations running
chart
dashboard
Node-R
iot-2/type/iot_device/id/1234/evt/event_1/fmt/json : msg.payload : number
70
Type here to search
24°C
ENG
22:15
15-11-2022


IBM Watson IoT Platform
spurushothaman146@gmail.com
ID: 1vqi0j
Browse
Action
Device Types
Interfaces
Add Device
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
{"temperature":24}
json
a few seconds ago
12345
Disconnected
raspberypi
Device
11 Nov 2022 11:50
Items per page 50
1–2 of 2 items
1 of 1 page
0 Simulations running

0


Node-RED
Deploy
filter nodes
Flow 1
Flow 2
function
switch
change
range
template
delay
trigger
filter
OpenWhisk
network
mqtt in
mqtt out
http in
http response
http request
websocket in
websocket
IBM IoT
connected
msg
temperature
temperature
debug
all nodes
all
11/18/2022, 9:27:22 PM node: a3af4b8ae23c7496
iot-2/type/node-red/id/12345/evt/Data/fmt/json : msg : Object
{ topic: "iot-2/type/node-red/id/12345/e…", payload: object, deviceId: "12345", deviceType: "node-red", eventType: "Data" … }
11/18/2022, 9:27:23 PM node: a3af4b8ae23c7496
iot-2/type/node-red/id/12345/evt/Data/fmt/json : msg : Object
{ topic: "iot-2/type/node-red/id/12345/e…", payload: object, deviceId: "12345", deviceType: "node-red", eventType: "Data" … }
11/18/2022, 9:31:20 PM node: a3af4b8ae23c7496
iot-2/type/node-red/id/12345/evt/Data/fmt/json : msg : Object
{ topic: "iot-2/type/node-red/id/12345/e…", payload: object, deviceId: "12345", deviceType: "node-red", eventType: "Data" … }
11/18/2022, 9:31:21 PM node: a3af4b8ae23c7496
iot-2/type/node-red/id/12345/evt/Data/fmt/json : msg : Object
{ topic: "iot-2/type/node-red/id/12345/e…", payload: object, deviceId: "12345", deviceType: "node-red", eventType: "Data" … }
11/18/2022, 9:35:27 PM node: a3af4b8ae23c7496
iot-2/type/node-red/id/12345/evt/Data/fmt/json : msg : Object
{ topic: "iot-2/type/node-red/id/12345/e…", payload: object, deviceId: "12345", deviceType: "node-red", eventType: "Data" … }
11/18/2022, 9:35:27 PM node: a3af4b8ae23c7496
iot-2/type/node-red/id/12345/evt/Data/fmt/json : msg : Object
{ topic: "iot-2/type/node-red/id/12345/e…", payload: object, deviceId: "12345", deviceType: "node-red", eventType: "Data" … }


Tab 1
sp
temperature
0
degree
100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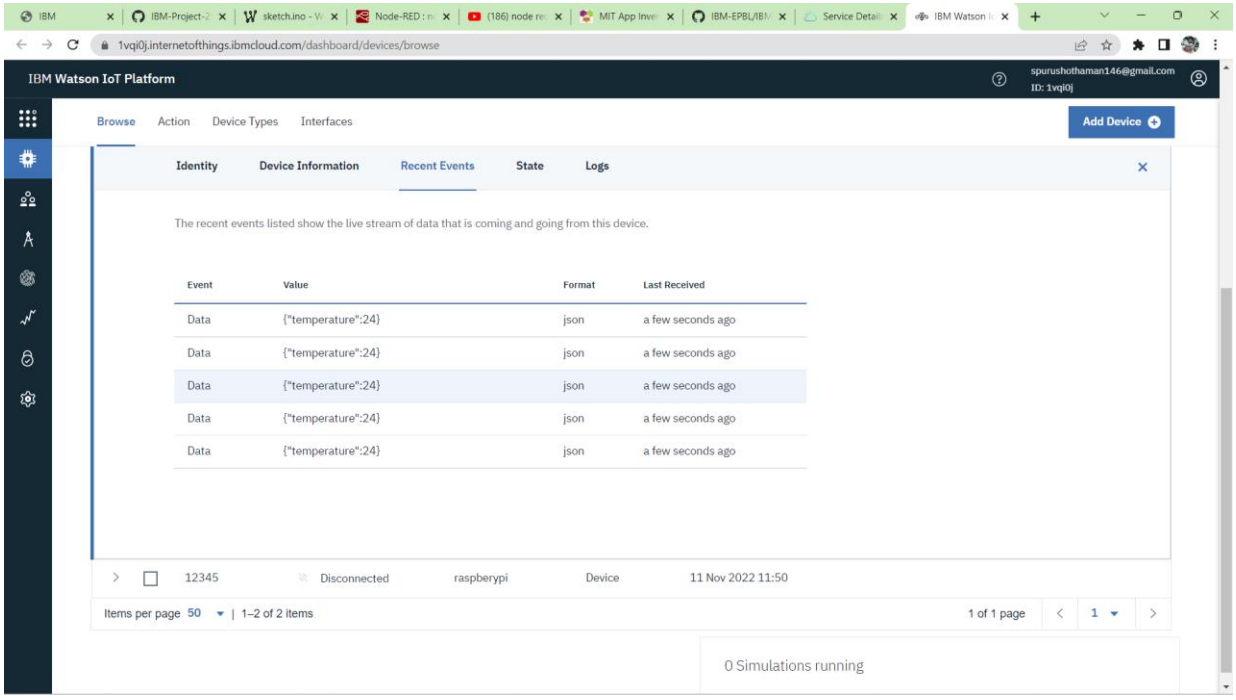
Device Type
Class ID
Date Added
Descriptive Location
12345
Connected
node-red
Device
18 Nov 2022 09:26
Identity
Device Information
Recent Events
State
Logs
Device ID
12345
Device Type
node-red
Date Added
18 Nov 2022 09:26
Added By
spurushothaman146@gmail.com
Connection Status
Connected
Connection Time: 18 Nov 2022 21:33
Client Address: 50.31.197.64 Insecure
12345
Disconnected
raspberypi
Device
Items per page 50
1–2 of 2 items
0 Simulations running


IBM Watson IoT Platform
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ID: 1vqi0j
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Device Types
Interfaces
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Identity
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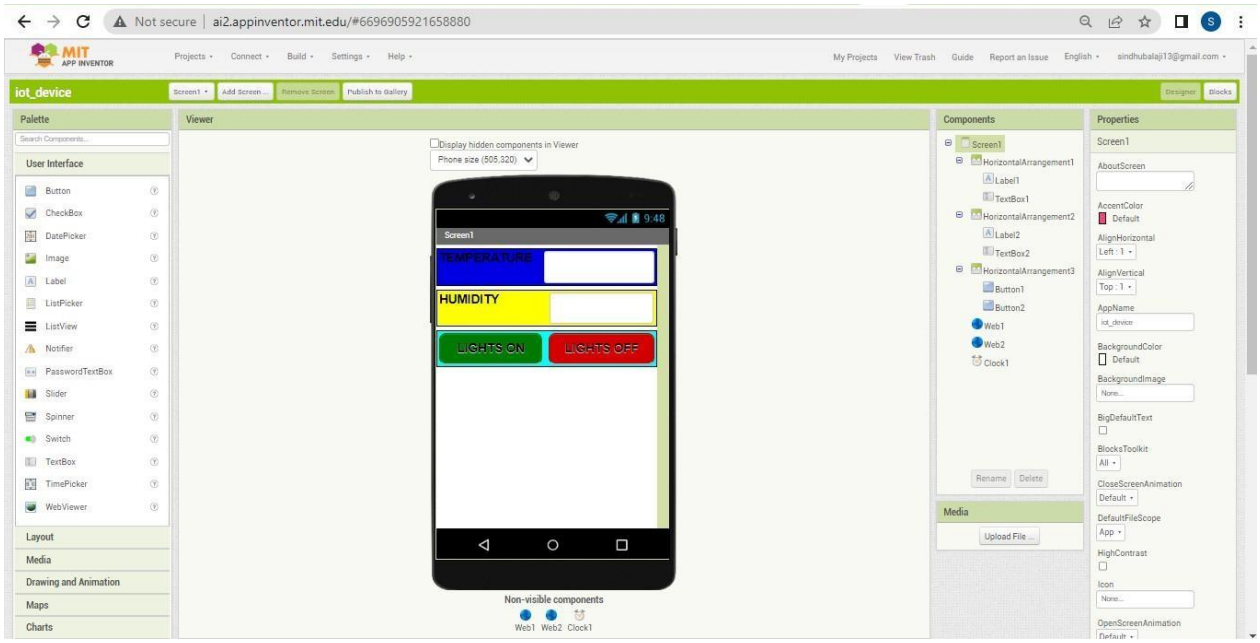
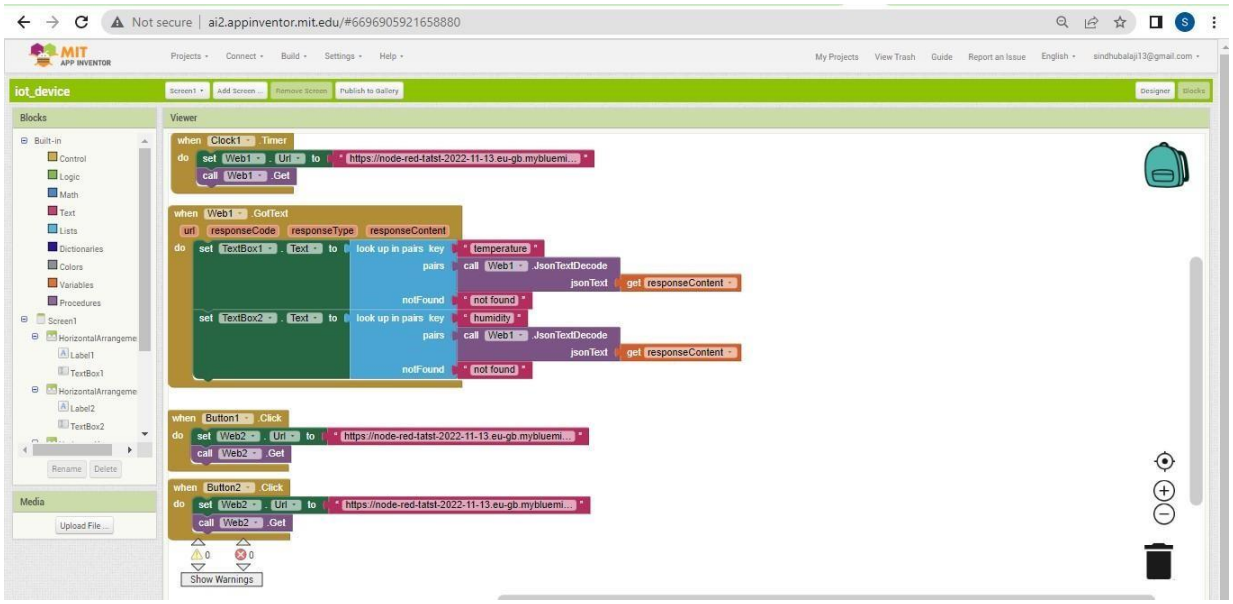
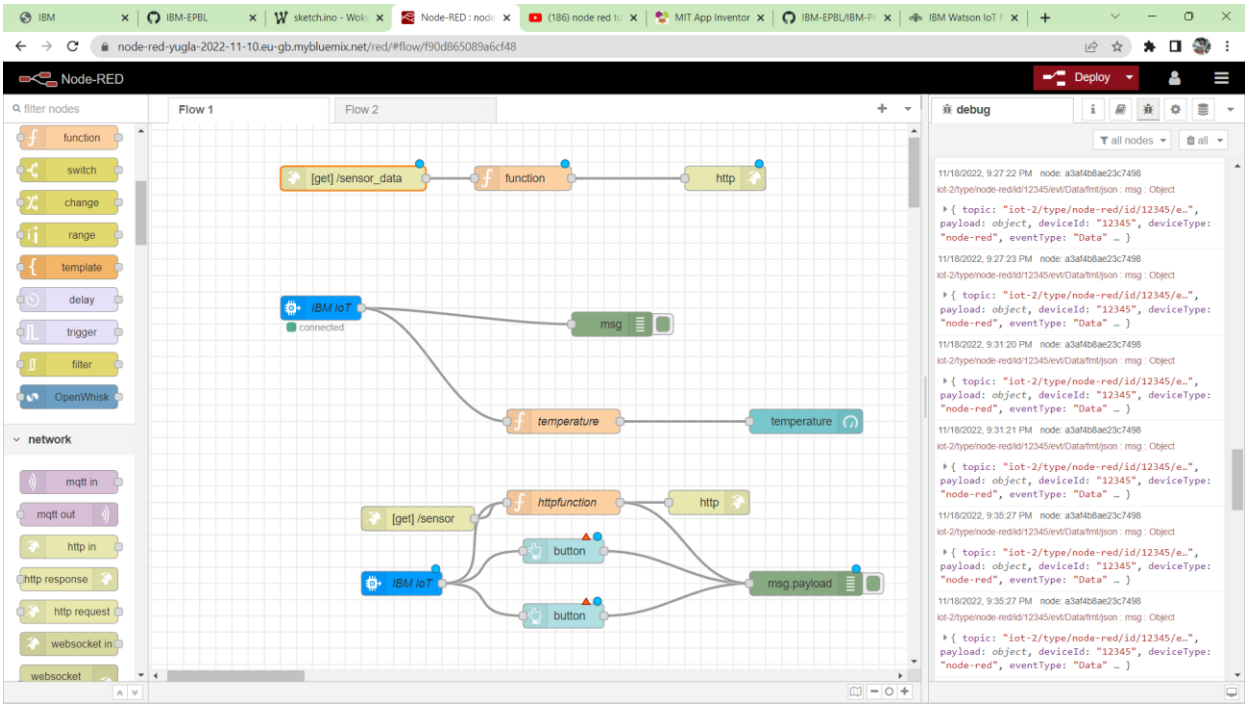
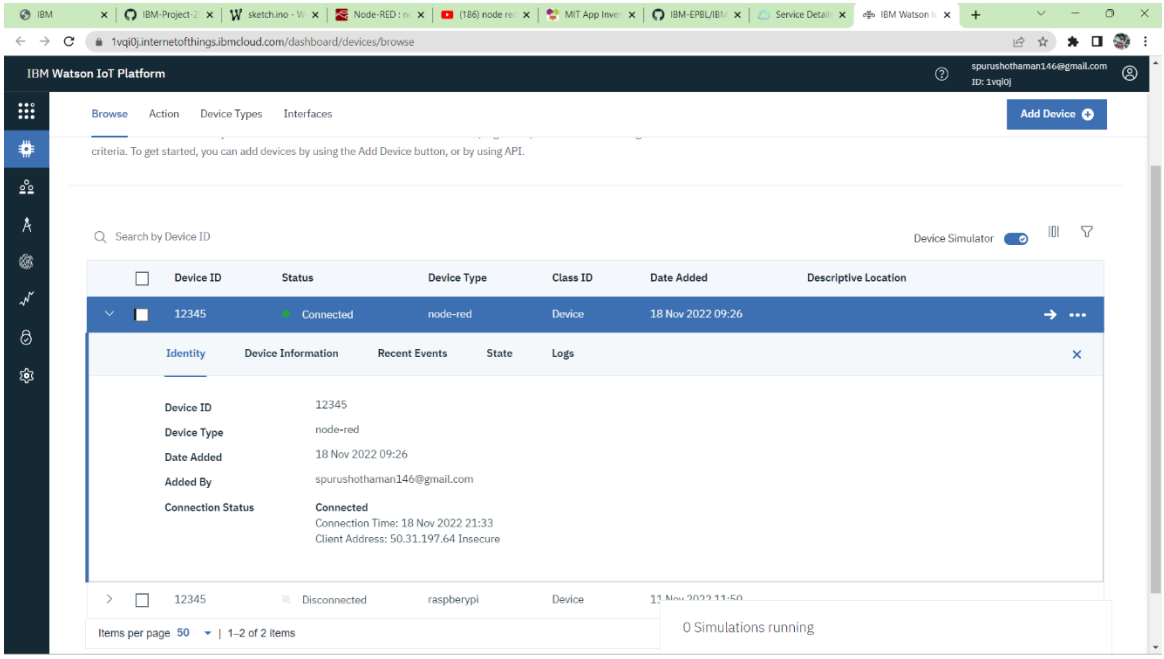
Event
Value
Format
Last Received
Data
{"temperature":24}
json
a few seconds ago
Data
{"temperature":24}
json
a few seconds ago
Data
{"temperature":24}
json
a few seconds ago
Data
{"temperature":24}
json
a few seconds ago
Data
{"temperature":24}
json
a few seconds ago
12345
Disconnected
raspberypi
Device
11 Nov 2022 11:50
Items per page 50
1–2 of 2 items
1 of 1 page
0 Simulations running


Not secure | ai2.appinventor.mit.edu/#6696905921658880
MIT APP INVENTOR
Projects
Connect
Build
Settings
Help
My Projects
View Trash
Guide
Report an Issue
English
sindhubalaji13@gmail.com
iot_device
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Palette
User Interface
Button
CheckBox
DatePicker
Image
Label
ListPicker
ListView
Notifier
PasswordTextBox
Slider
Spinner
Switch
TextBox
TimePicker
WebViewer
Layout
Media
Drawing and Animation
Maps
Charts
Viewer
Display hidden components in Viewer
Phone size (505,320)
9:48
Screen1
TEMPERATURE
HUMIDITY
LIGHTS ON
LIGHTS OFF
Non-visible components
Web1
Web2
Clock1
Components
Screen1
HorizontalArrangement1
Label1
TextBox1
HorizontalArrangement2
Label2
TextBox2
HorizontalArrangement3
Button1
Button2
Web1
Web2
Clock1
Rename
Delete
Media
Upload File ...
Properties
Screen1
AboutScreen
AccentColor
Default
AlignHorizontal
Left : 1
AlignVertical
Top : 1
AppName
iot_device
BackgroundColor
Default
BackgroundImage
None...
BigDefaultText
BlocksToolkit
All
CloseScreenAnimation
Default
DefaultFileScope
App
HighContrast
Icon
None...
OpenScreenAnimation
Default


Not secure | ai2.appinventor.mit.edu/#6696905921658880
MIT APP INVENTOR
Projects
Connect
Build
Settings
Help
My Projects
View Trash
Guide
Report an Issue
English
sindhubalaji13@gmail.com
iot_device
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Blocks
Built-in
Control
Logic
Math
Text
Lists
Dictionaries
Colors
Variables
Procedures
Screen1
HorizontalArrangeme
Label1
TextBox1
HorizontalArrangeme
Label2
TextBox2
Rename
Delete
Media
Upload File ...
Viewer
when Clock1 .Timer
do set Web1 . Url to https://node-red-tatst-2022-11-13.eu-gb.mybluemi...
call Web1 .Get
when Web1 .GotText
url responseCode responseType responseContent
do set TextBox1 . Text to look up in pairs key temperature
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound not found
set TextBox2 . Text to look up in pairs key humidity
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound not found
when Button1 .Click
do set Web2 . Url to https://node-red-tatst-2022-11-13.eu-gb.mybluemi...
call Web2 .Get
when Button2 .Click
do set Web2 . Url to https://node-red-tatst-2022-11-13.eu-gb.mybluemi...
call Web2 .Get
0
0
Show Warnings


Node-RED
Deploy
Flow 1
Flow 2
debug
function
switch
change
range
template
delay
trigger
filter
OpenWhisk
network
mqtt in
mqtt out
http in
http response
http request
websocket in
websocket
[get] /sensor_data
function
http
IBM IoT
connected
msg
temperature
temperature
[get] /sensor
httpfunction
http
button
IBM IoT
button
msg.payload


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
12345
Connected
node-red
Device
18 Nov 2022 09:26
Identity
Device Information
Recent Events
State
Logs
Device ID
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Device Type
node-red
Date Added
18 Nov 2022 09:26
Added By
spurushothaman146@gmail.com
Connection Status
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Client Address: 50.31.197.64 Insecure
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Disconnected
raspberypi
Device
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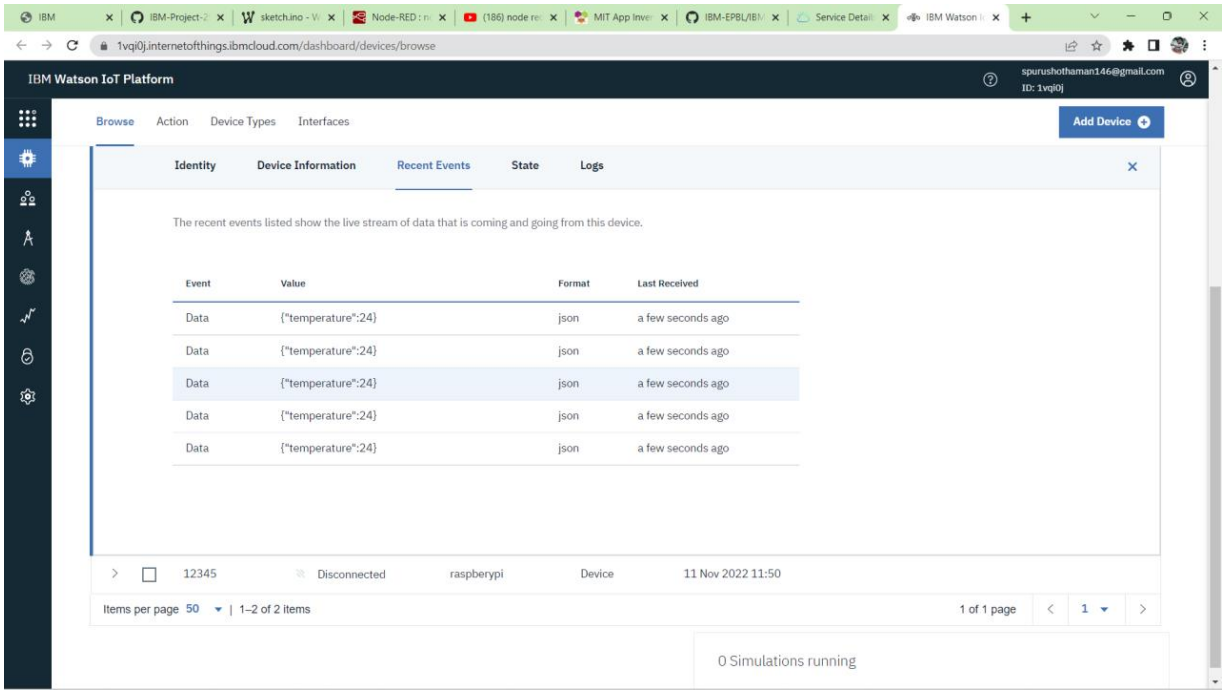
1vqi0j.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
spurushothaman146@gmail.com
ID: 1vqi0j
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Recent Events
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Logs
The recent events listed show the live stream of data that is coming and going from this device.
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Format
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Data
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json
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Data
{"temperature":24}
json
a few seconds ago
Data
{"temperature":24}
json
a few seconds ago
12345
Disconnected
raspberypi
Device
11 Nov 2022 11:50
Items per page 50
1–2 of 2 items
1 of 1 page
1
0 Simulations running