PUBLISH DATA TO IBM CLOUD

Team ID	PNT2022TMID21245
Project Name	INDUSTRY-SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM

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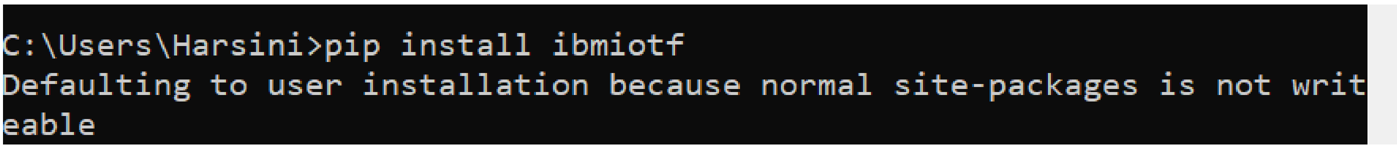
STEPS TO CONNECT IBM WATSON IOT WITH PYTHON SCRIPT

Step 1

Install Python 3.7.0

Step 2:



```
C:\Users\Harsini>pip install ibmiotf
Defaulting to user installation because normal site-packages is not writ
eable
```

Step 3:

Develop the script and connect to the IBM Watson IOT using organization Id, Device type and Id, authentication token

PYTHON SCRIPT:

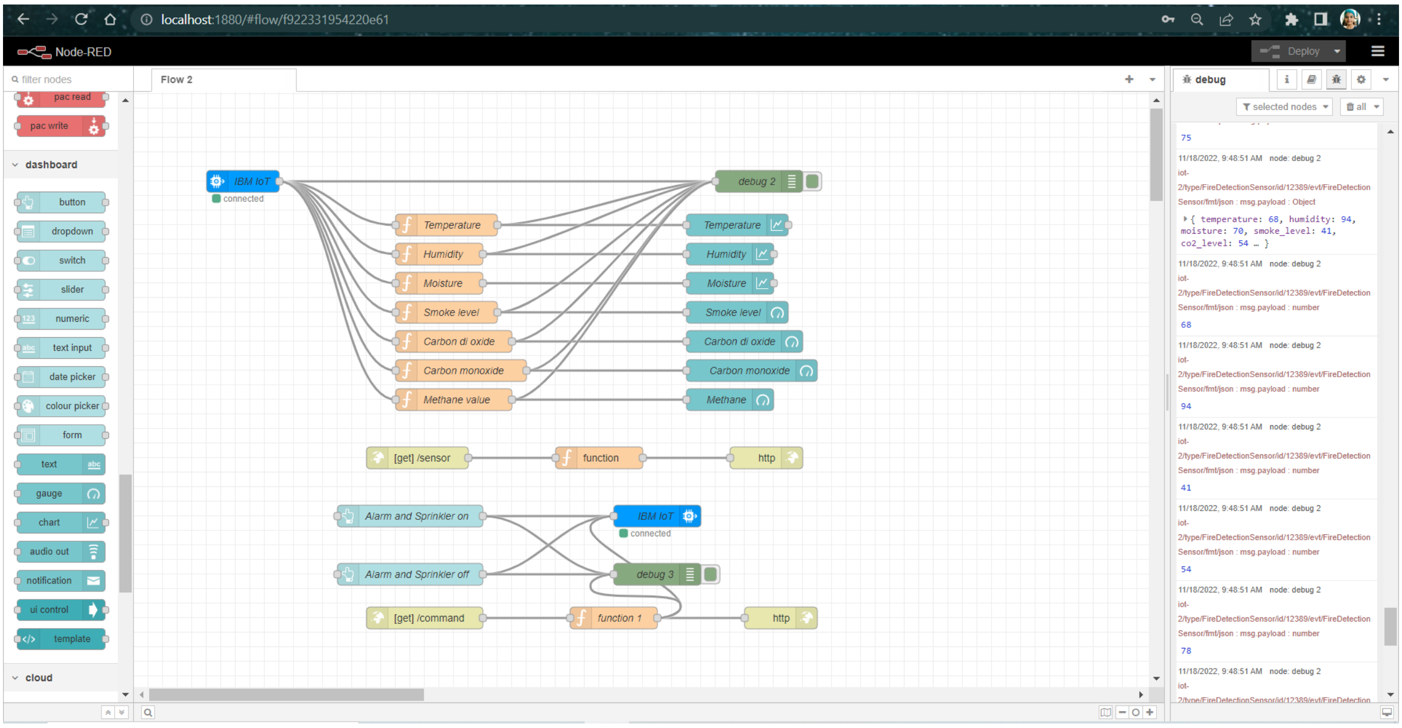
```
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random


#Provide your IBM Watson Device Credentials
organization = "5l22w9"
deviceType = "FireDetectionSensor"
```

```
deviceId = "12389"
authMethod = "token"
authToken = "123456789"

# Initialize GPIO



def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    status=cmd.data['command']
    if status=="alarmon":
        print ("\n\nALARM AND SPRINKLER IN ON CONDITION\n\n")
        data1 = {'command':'alarmon'}
        success = deviceCli.publishEvent("FireDetectionSensor", "json", data1, qos=1,
on_publish=myOnPublishCallback)
    else :
        print ("\n\nALARM AND SPRINKLER IN OFF CONDITION\n\n")
        data1 = {'command':'alarmoff'}
        success = deviceCli.publishEvent("FireDetectionSensor", "json", data1, qos=1,
on_publish=myOnPublishCallback)

    #print(cmd)




try:
            deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method":
authMethod, "auth-token": authToken}
            deviceCli = ibmiotf.device.Client(deviceOptions)
            #..............................................

except Exception as e:
            print("Caught exception connecting device: %s" % str(e))
            sys.exit()

deviceCli.connect()

while True:



        temperature=random.randint(20,80)
        humidity=random.randint(60,100)
        moisture = random.randint(50,100)
        smoke_level=random.randint(0,100)
        co2_level=random.randint(0,100)
        co_level=random.randint(0,100)
        methane=random.randint(0,100)

        data = { 'temperature' : temperature, 'humidity': humidity, 'moisture': moisture, 'smoke_level' : smoke_level, 'co2_level' : co2_level, 'co_level': co_level, 'methane': methane}
        #print data
        def myOnPublishCallback():
            print ("\nPublishing environmental readings to the IBM cloud:\n")
            print ("Temperature = %s C\n" % temperature, "Humidity = %s %%\n" % humidity,"Moisture = %s %%\n" % moisture,"Smoke value = %s %%\n" % smoke_level,"Carbondi oxide level = %s %%\n" % co2_level,"Carbon monoxide level = %s %%\n" % co_level,"Methane = %s %%\n" % methane, "to IBM Watson")

        success = deviceCli.publishEvent("FireDetectionSensor", "json", data, qos=0, on_publish=myOnPublishCallback)
        #sucess = deviceCli.publishEvent("FireDetectionSensor", "json", data1, qos=0, on_publish=myOnPublishCallback)
        if not success:
            print("Not connected to IoT Watson")
        time.sleep(10)

        deviceCli.commandCallback = myCommandCallback



# Disconnect the device and application from the cloud
deviceCli.disconnect()
```

OUTPUT SENDING DATA FROM NODE-RED TO PYTHON SCRIPT AND FROM PYTHON SCRIPT TO IBM CLOUD

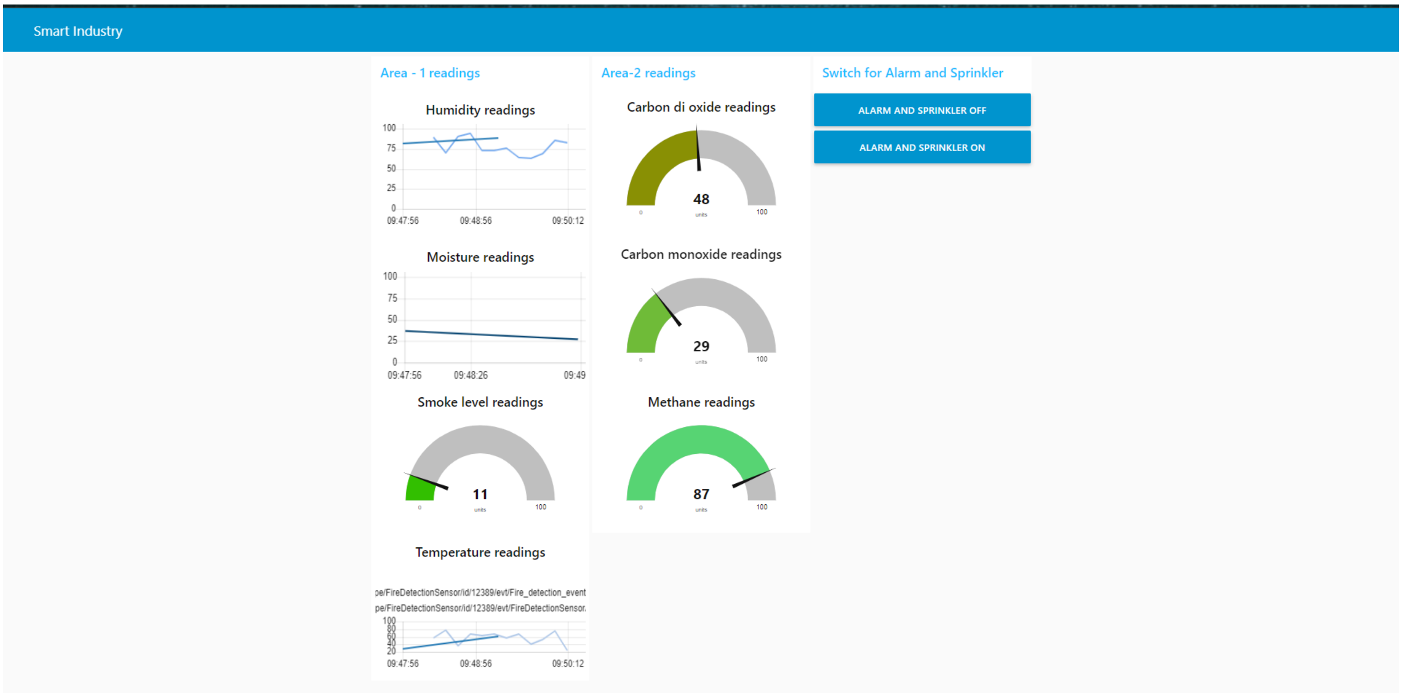
Step 4:

Node-Red UI using dashboard nodes connected with developed Python script and IBM Watson IOT

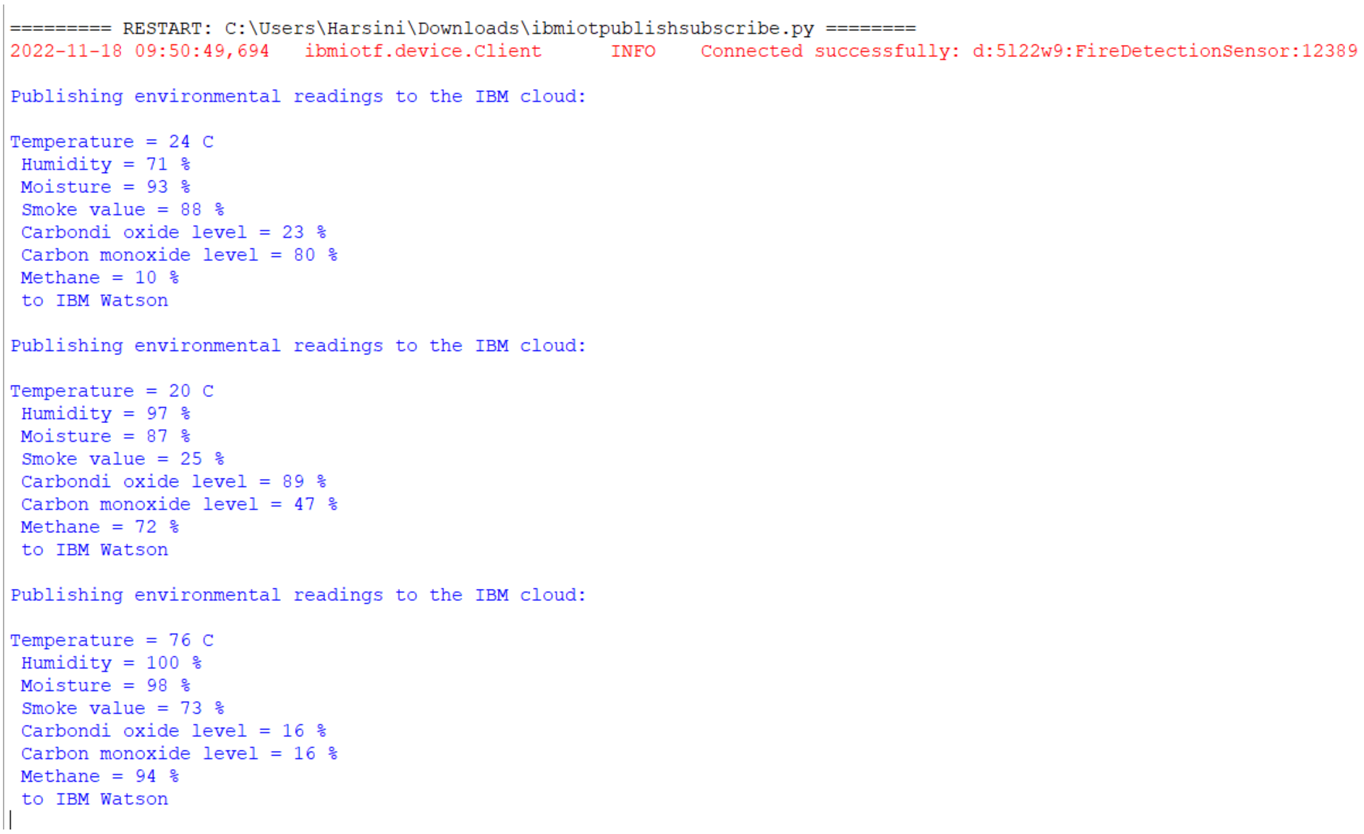


```
75
11/18/2022, 9:48:51 AM   node: debug 2
iot-2/type/FireDetectionSensor/id/12389/evt/FireDetectionSensor/fmt/json : msg.payload : Object
▸{ temperature: 68, humidity: 94, moisture: 70, smoke_level: 41, co2_level: 54 … }
11/18/2022, 9:48:51 AM   node: debug 2
iot-2/type/FireDetectionSensor/id/12389/evt/FireDetectionSensor/fmt/json : msg.payload : number
68
11/18/2022, 9:48:51 AM   node: debug 2
iot-2/type/FireDetectionSensor/id/12389/evt/FireDetectionSensor/fmt/json : msg.payload : number
94
11/18/2022, 9:48:51 AM   node: debug 2
iot-2/type/FireDetectionSensor/id/12389/evt/FireDetectionSensor/fmt/json : msg.payload : number
41
11/18/2022, 9:48:51 AM   node: debug 2
iot-2/type/FireDetectionSensor/id/12389/evt/FireDetectionSensor/fmt/json : msg.payload : number
54
11/18/2022, 9:48:51 AM   node: debug 2
iot-2/type/FireDetectionSensor/id/12389/evt/FireDetectionSensor/fmt/json : msg.payload : number
78
11/18/2022, 9:48:51 AM   node: debug 2
iot-2/type/FireDetectionSensor/id/12389/evt/FireDetection
```

NODE-RED UI

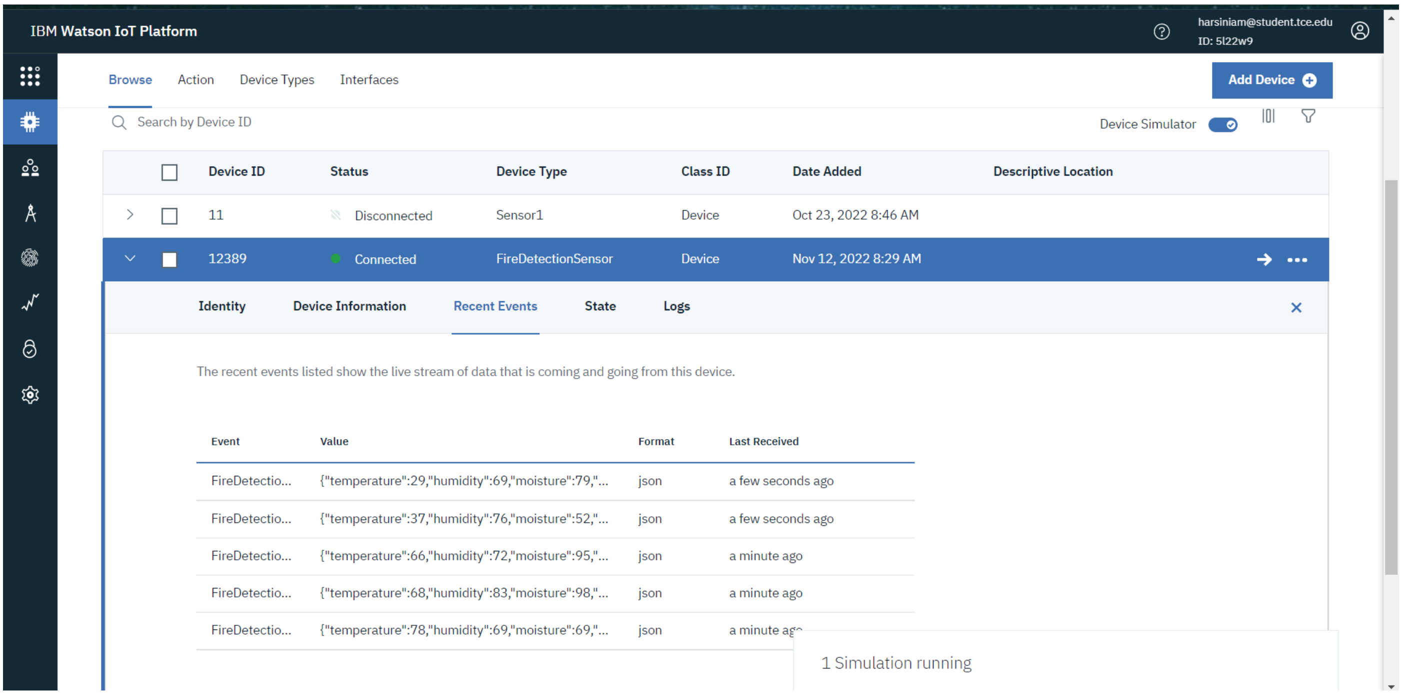


PYTHON SCRIPT:



```
========= RESTART: C:\Users\Harsini\Downloads\ibmiotpublishsubscribe.py ========
2022-11-18 09:50:49,694   ibmiotf.device.Client      INFO    Connected successfully: d:5122w9:FireDetectionSensor:12389

Publishing environmental readings to the IBM cloud:

Temperature = 24 C
 Humidity = 71 %
 Moisture = 93 %
 Smoke value = 88 %
 Carbondi oxide level = 23 %
 Carbon monoxide level = 80 %
 Methane = 10 %
 to IBM Watson

Publishing environmental readings to the IBM cloud:

Temperature = 20 C
 Humidity = 97 %
 Moisture = 87 %
 Smoke value = 25 %
 Carbondi oxide level = 89 %
 Carbon monoxide level = 47 %
 Methane = 72 %
 to IBM Watson

Publishing environmental readings to the IBM cloud:

Temperature = 76 C
 Humidity = 100 %
 Moisture = 98 %
 Smoke value = 73 %
 Carbondi oxide level = 16 %
 Carbon monoxide level = 16 %
 Methane = 94 %
 to IBM Watson
```

IBM -WATSON IOT



	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
□	11	Disconnected	Sensor1	Device	Oct 23, 2022 8:46 AM	
■	12389	● Connected	FireDetectionSensor	Device	Nov 12, 2022 8:29 AM	

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

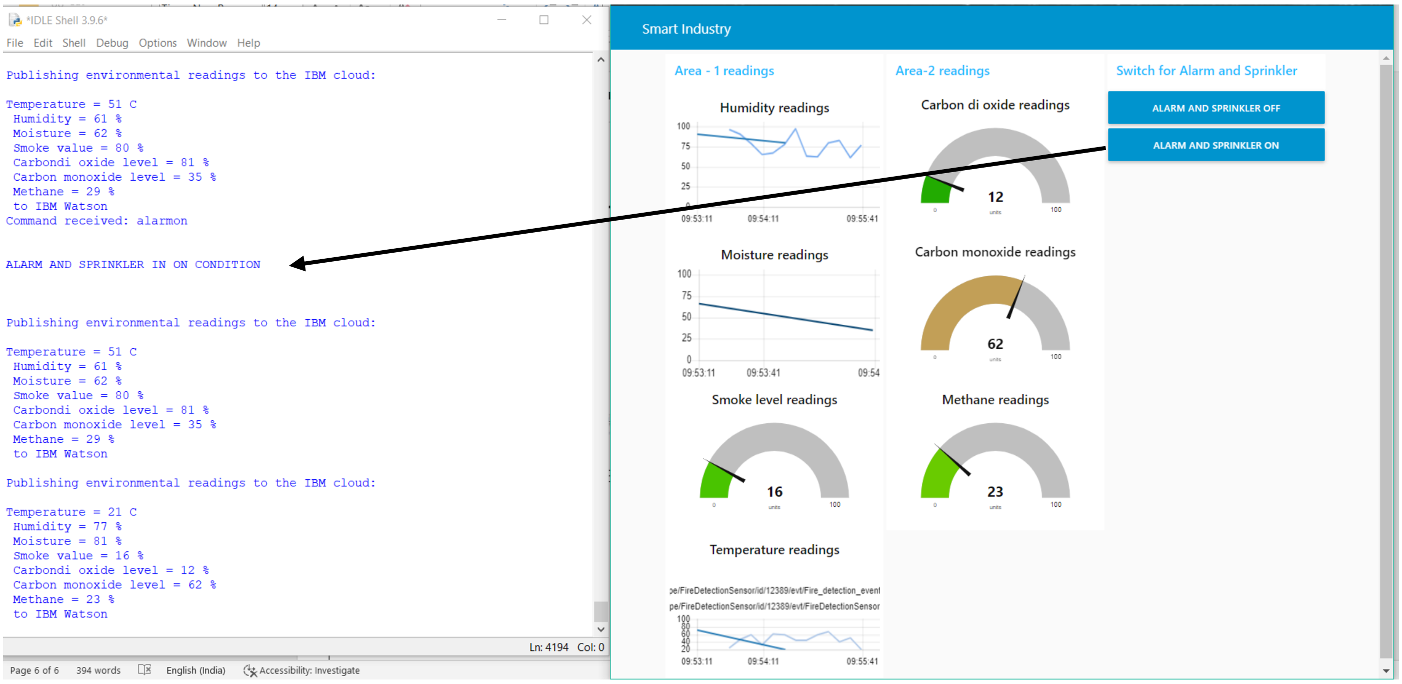
Event	Value	Format	Last Received
FireDetectio...	{"temperature":29,"humidity":69,"moisture":79,"...	json	a few seconds ago
FireDetectio...	{"temperature":37,"humidity":76,"moisture":52,"...	json	a few seconds ago
FireDetectio...	{"temperature":66,"humidity":72,"moisture":95,"...	json	a minute ago
FireDetectio...	{"temperature":68,"humidity":83,"moisture":98,"...	json	a minute ago
FireDetectio...	{"temperature":78,"humidity":69,"moisture":69,"...	json	a minute ago

1 Simulation running

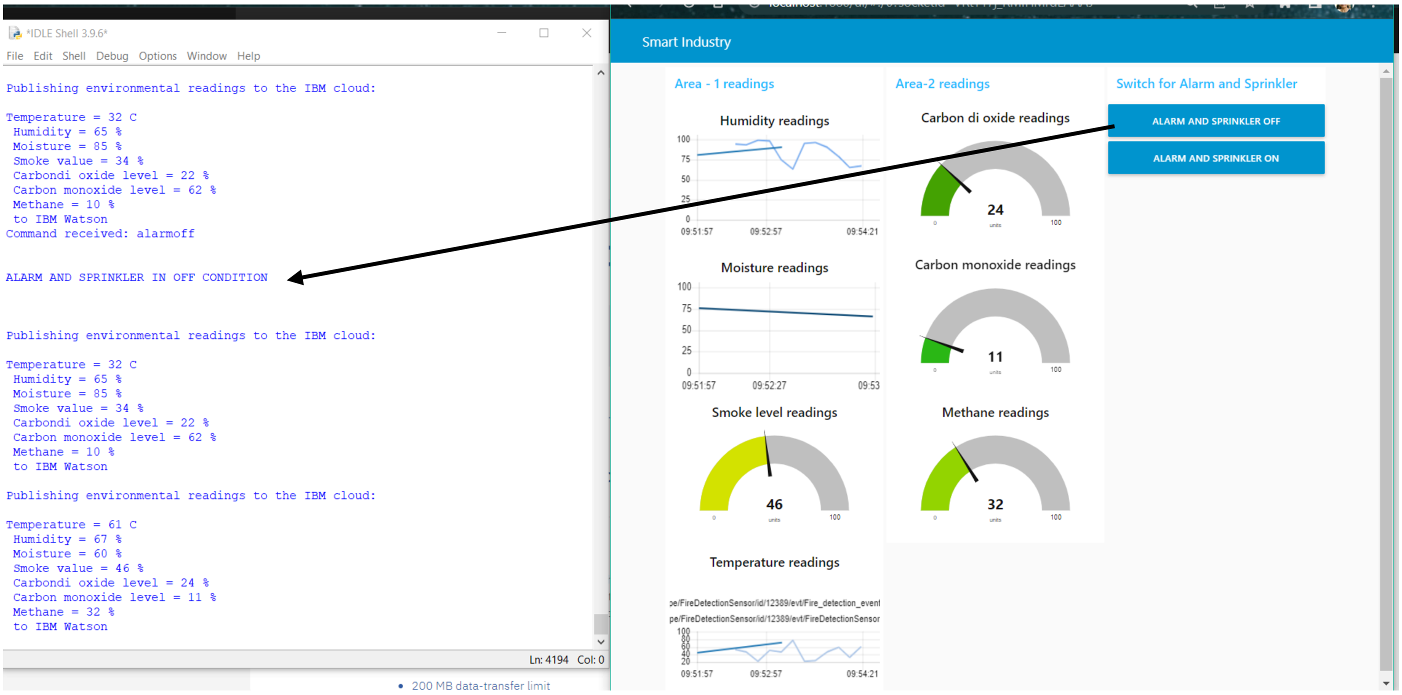
Step 5:

Based on the buttons pressed in the **NODE-RED UI** – ‘**Alarm and sprinkler on and off buttons**’ respective commands would be passed as json file to **python code** and to the **IBM CLOUD**.

NODE-RED UI AND PYTHON

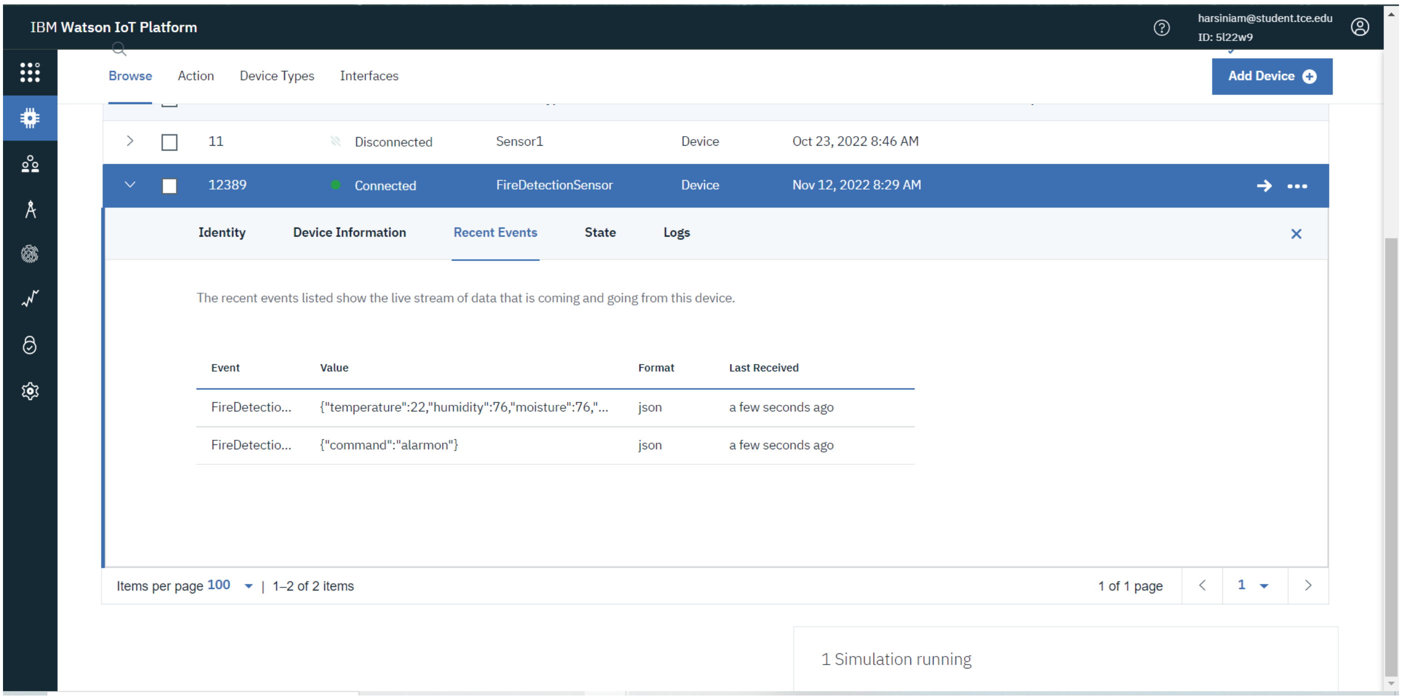


```
Publishing environmental readings to the IBM cloud:

Temperature = 51 C
 Humidity = 61 %
 Moisture = 62 %
 Smoke value = 80 %
 Carbondi oxide level = 81 %
 Carbon monoxide level = 35 %
 Methane = 29 %
 to IBM Watson
Command received: alarmon


ALARM AND SPRINKLER IN ON CONDITION



Publishing environmental readings to the IBM cloud:

Temperature = 51 C
 Humidity = 61 %
 Moisture = 62 %
 Smoke value = 80 %
 Carbondi oxide level = 81 %
 Carbon monoxide level = 35 %
 Methane = 29 %
 to IBM Watson

Publishing environmental readings to the IBM cloud:

Temperature = 21 C
 Humidity = 77 %
 Moisture = 81 %
 Smoke value = 16 %
 Carbondi oxide level = 12 %
 Carbon monoxide level = 62 %
 Methane = 23 %
 to IBM Watson
```



```
Publishing environmental readings to the IBM cloud:

Temperature = 32 C
 Humidity = 65 %
 Moisture = 85 %
 Smoke value = 34 %
 Carbondi oxide level = 22 %
 Carbon monoxide level = 62 %
 Methane = 10 %
 to IBM Watson
Command received: alarmoff


ALARM AND SPRINKLER IN OFF CONDITION



Publishing environmental readings to the IBM cloud:

Temperature = 32 C
 Humidity = 65 %
 Moisture = 85 %
 Smoke value = 34 %
 Carbondi oxide level = 22 %
 Carbon monoxide level = 62 %
 Methane = 10 %
 to IBM Watson

Publishing environmental readings to the IBM cloud:

Temperature = 61 C
 Humidity = 67 %
 Moisture = 60 %
 Smoke value = 46 %
 Carbondi oxide level = 24 %
 Carbon monoxide level = 11 %
 Methane = 32 %
 to IBM Watson
```

FROM PYTHON SCRIPT TO IBM WATSON IOT



11	Disconnected	Sensor1	Device	Oct 23, 2022 8:46 AM
12389	Connected	FireDetectionSensor	Device	Nov 12, 2022 8:29 AM

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

Event	Value	Format	Last Received
FireDetectio...	{"temperature":22,"humidity":76,"moisture":76,"...	json	a few seconds ago
FireDetectio...	{"command":"alarmon"}	json	a few seconds ago

Items per page 100 | 1–2 of 2 items

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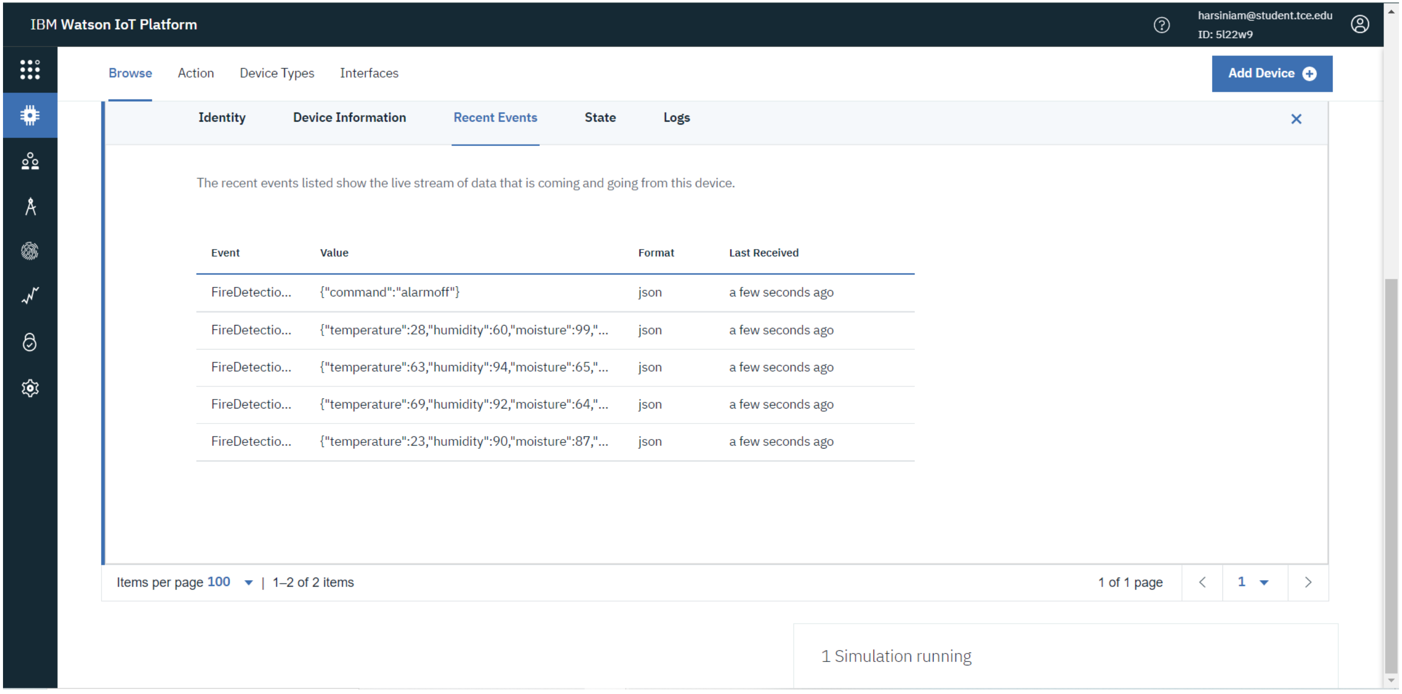
1 Simulation running



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

Event	Value	Format	Last Received
FireDetectio...	{"command":"alarmoff"}	json	a few seconds ago
FireDetectio...	{"temperature":28,"humidity":60,"moisture":99,"...	json	a few seconds ago
FireDetectio...	{"temperature":63,"humidity":94,"moisture":65,"...	json	a few seconds ago
FireDetectio...	{"temperature":69,"humidity":92,"moisture":64,"...	json	a few seconds ago
FireDetectio...	{"temperature":23,"humidity":90,"moisture":87,"...	json	a few seconds ago

Items per page 100 | 1–2 of 2 items

1 of 1 page 1

1 Simulation running