Develop a Python Script

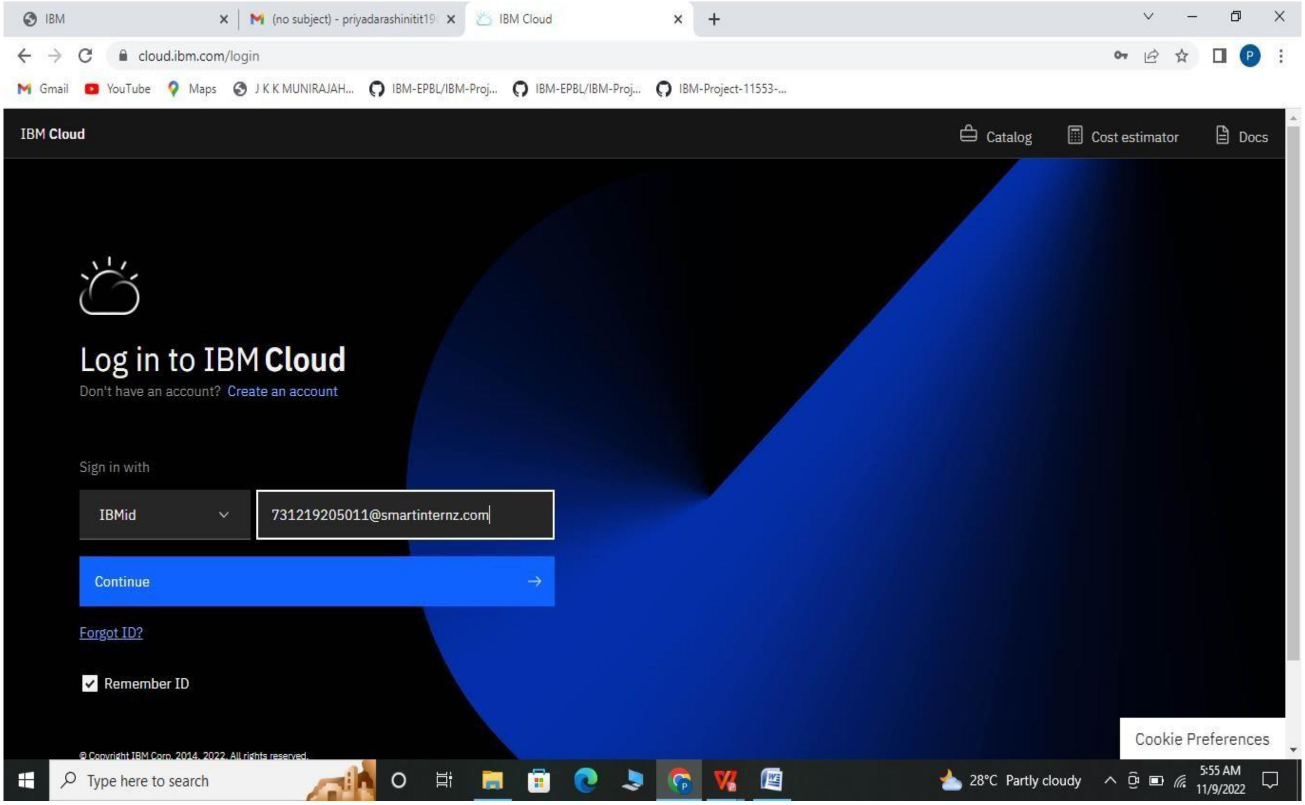
Publish Data to the IBM Cloud

Team ID	PNT2022TMID53733
Project Name	Project Name - Signs with Smart Connectivity for better Road Safety.
Mentor	REMYA K R

STEPS INVOLVED

Step-1: Create a device in IBM Watson:

- Firstly, login into your IBM-Bluemix account with your e-mail ID and Password.



cloud.ibm.com/login

Log in to IBM Cloud

Don't have an account? Create an account

Sign in with

IBMid

731219205011@smartinternz.com

☑ Remember ID

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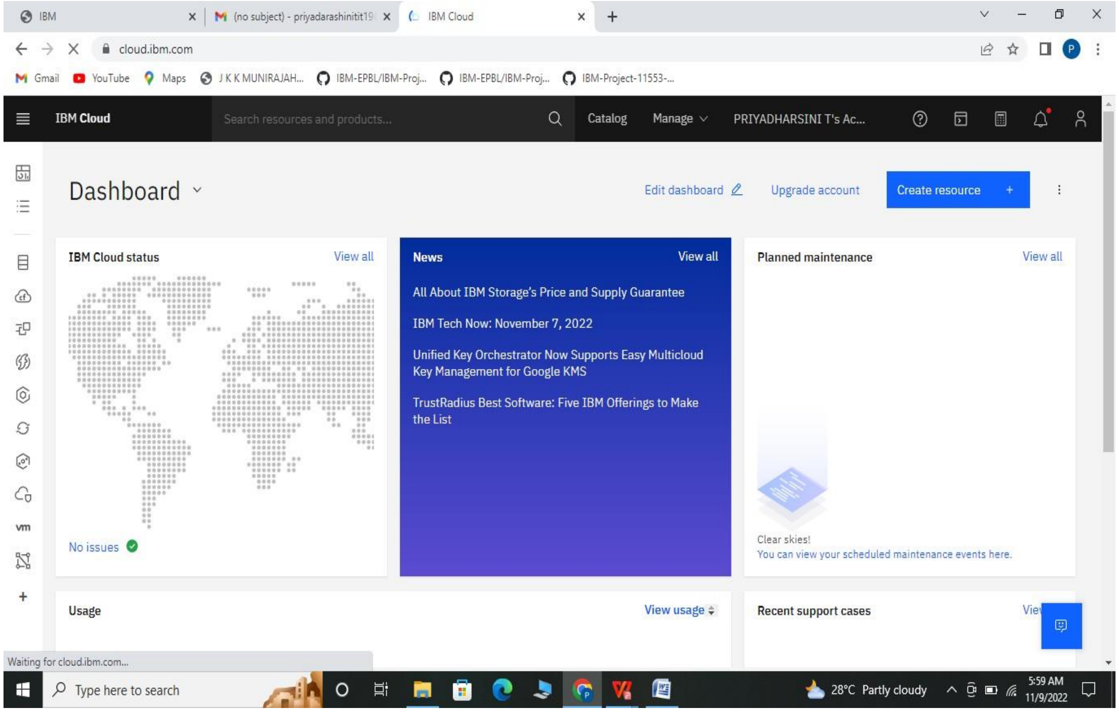
- Click on catalog on your dashboard screen



All About IBM Storage's Price and Supply Guarantee

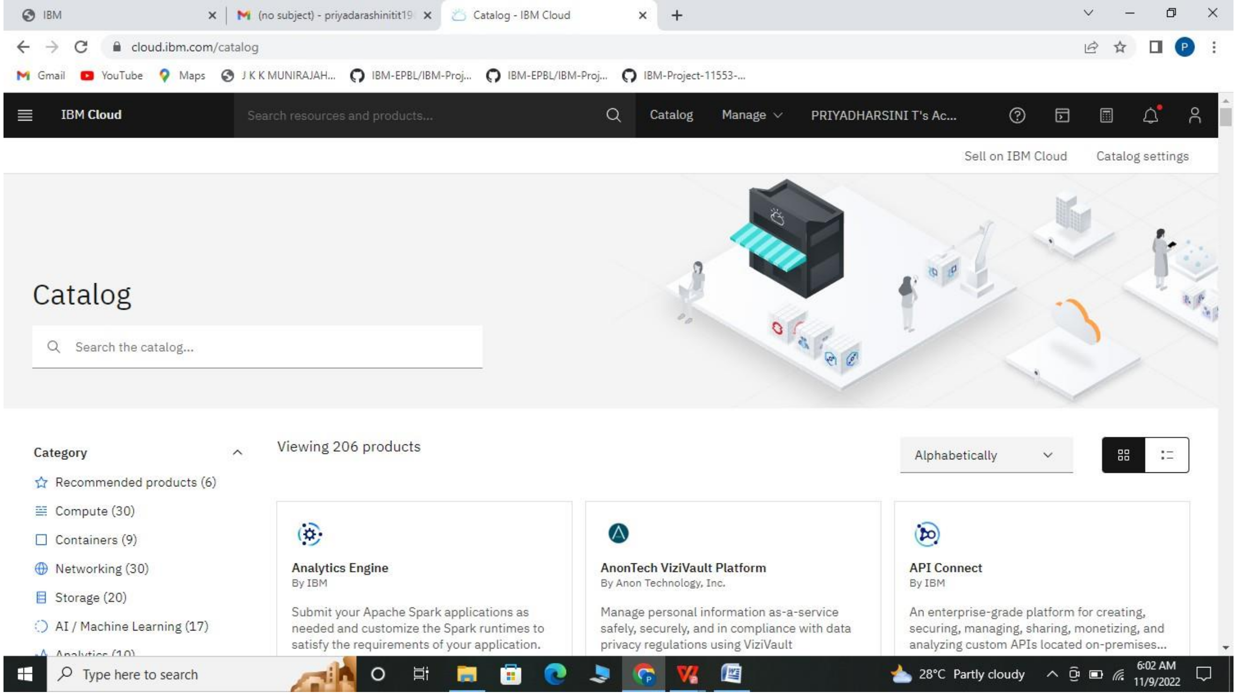
IBM Tech Now: November 7, 2022

Unified Key Orchestrator Now Supports Easy Multicloud Key Management for Google KMS

TrustRadius Best Software: Five IBM Offerings to Make the List

Clear skies!
You can view your scheduled maintenance events here.

- Under Platforms Go to Internet of Things.

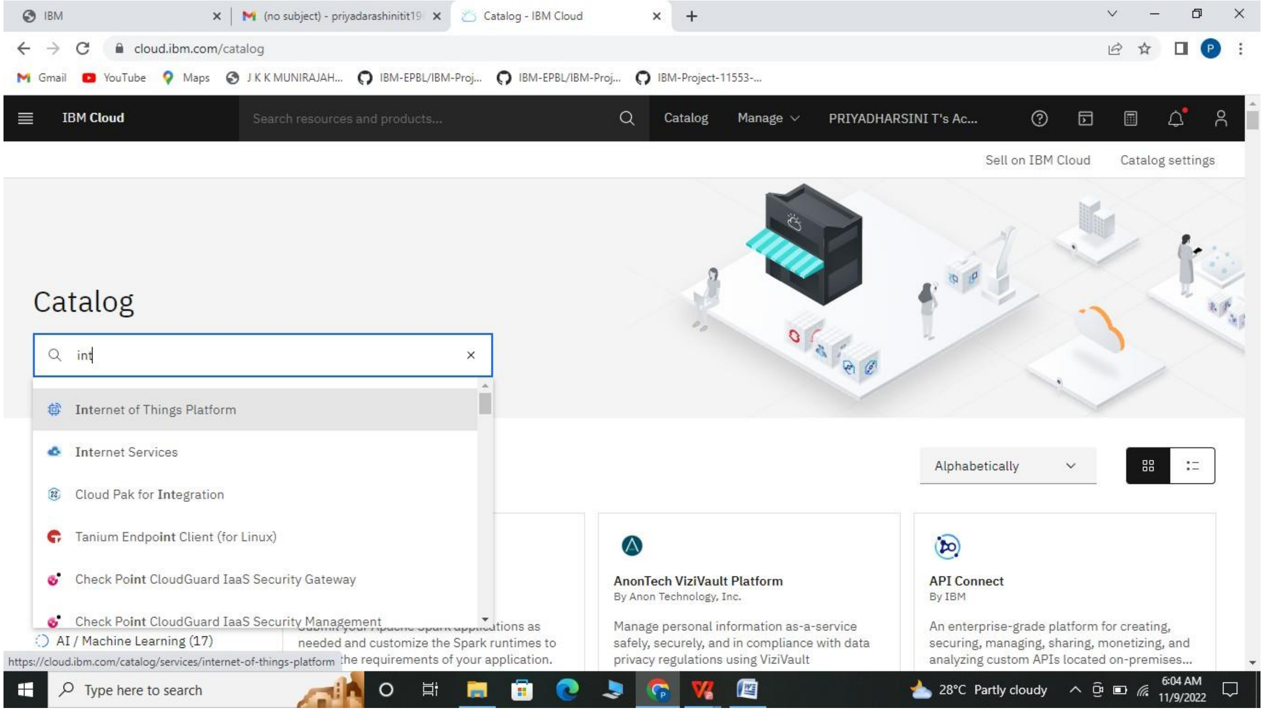


Submit your Apache Spark applications as needed and customize the Spark runtimes to satisfy the requirements of your application.

Manage personal information as-a-service safely, securely, and in compliance with data privacy regulations using ViziVault

An enterprise-grade platform for creating, securing, managing, sharing, monetizing, and analyzing custom APIs located on-premises...

- Under Internet of Things Internet of Things Platform



Catalog

int

Internet of Things Platform

Internet Services

Cloud Pak for Integration

Tanium Endpoint Client (for Linux)

Check Point CloudGuard IaaS Security Gateway

Check Point CloudGuard IaaS Security Management

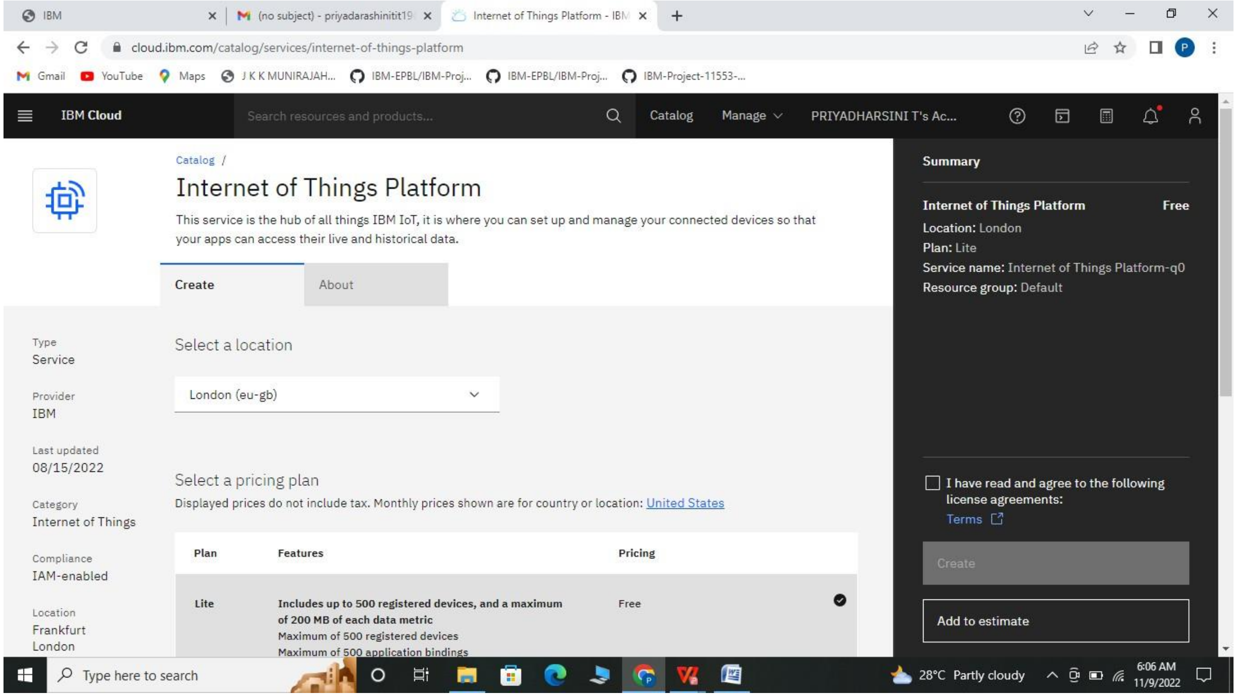
https://cloud.ibm.com/catalog/services/internet-of-things-platform

...applications as needed and customize the Spark runtimes to the requirements of your application.

AnonTech ViziVault Platform
By Anon Technology, Inc.
Manage personal information as-a-service safely, securely, and in compliance with data privacy regulations using ViziVault

API Connect
By IBM
An enterprise-grade platform for creating, securing, managing, sharing, monetizing, and analyzing custom APIs located on-premises...

- Then give a name for your Service name and click on Create



Internet of Things Platform

This service is the hub of all things IBM IoT, it is where you can set up and manage your connected devices so that your apps can access their live and historical data.

Type: Service
Provider: IBM
Last updated: 08/15/2022
Category: Internet of Things
Compliance: IAM-enabled
Location: Frankfurt, London

Select a location

London (eu-gb)

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or location: United States

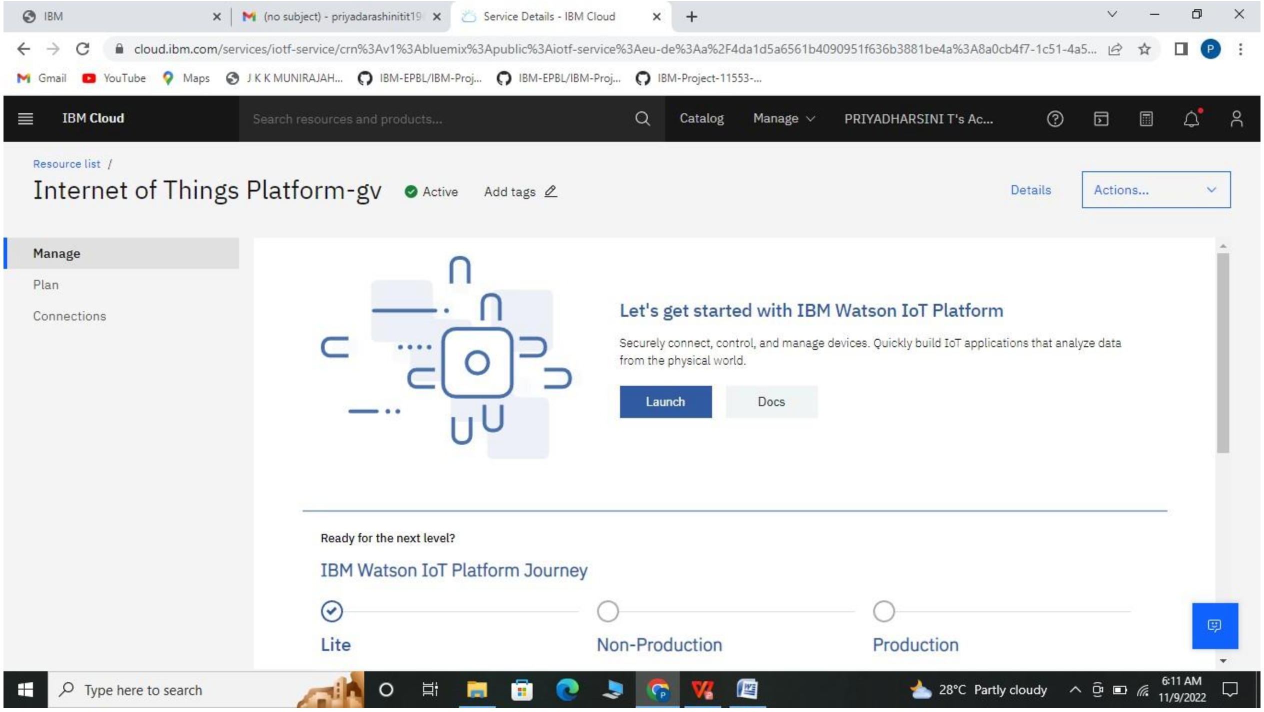
Plan	Features	Pricing
Lite	Includes up to 500 registered devices, and a maximum of 200 MB of each data metric Maximum of 500 registered devices Maximum of 500 application bindings	Free

Summary

Internet of Things Platform — Free
Location: London
Plan: Lite
Service name: Internet of Things Platform-q0
Resource group: Default

□ I have read and agree to the following license agreements: Terms

- After getting into your service click on Launch



Internet of Things Platform-gv ● Active Add tags

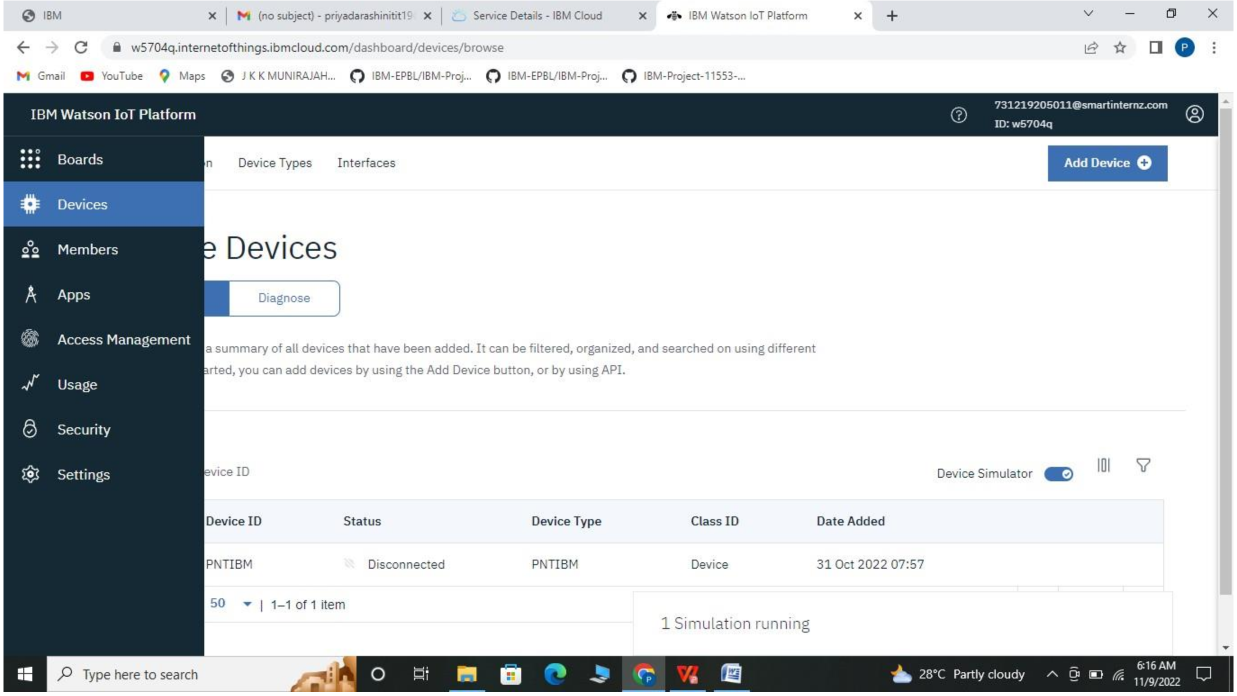
Let's get started with IBM Watson IoT Platform

Securely connect, control, and manage devices. Quickly build IoT applications that analyze data from the physical world.

Ready for the next level?

IBM Watson IoT Platform Journey

- Then you get into IBM Watson Platform .Then click on Devices



e Devices

a summary of all devices that have been added. It can be filtered, organized, and searched on using different
arted, you can add devices by using the Add Device button, or by using API.

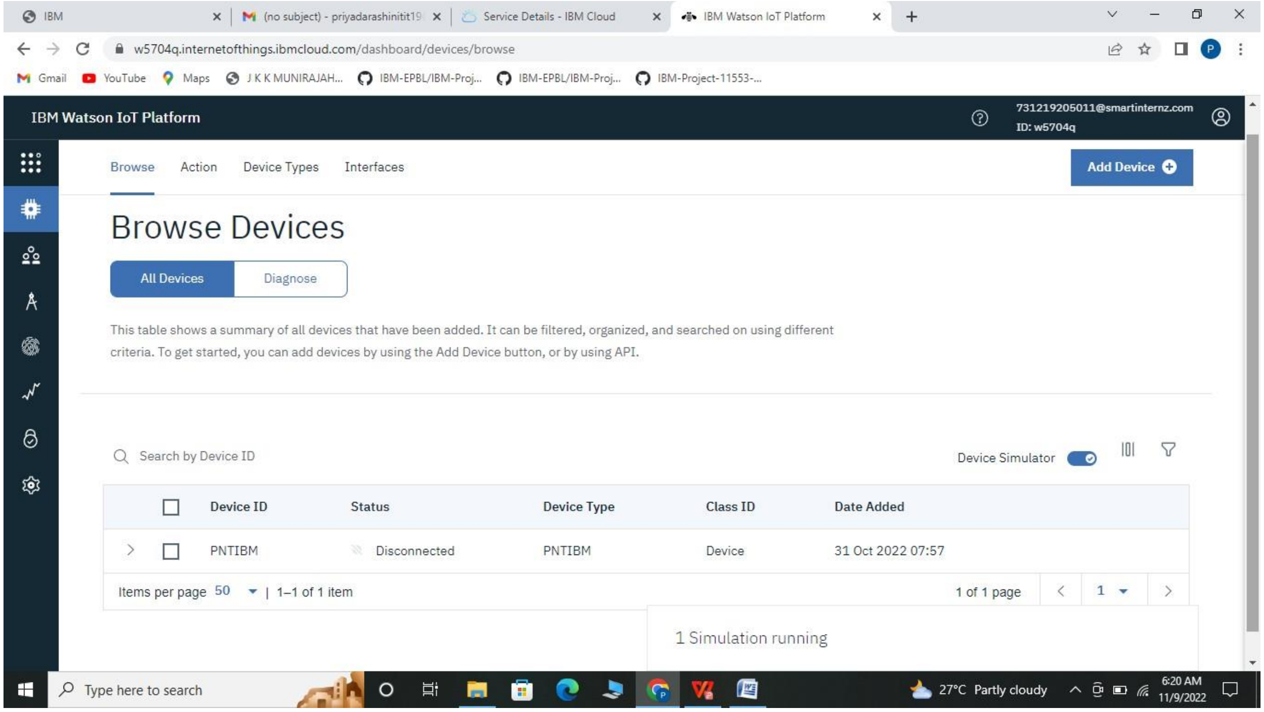
evice ID

Device ID	Status	Device Type	Class ID	Date Added
PNTIBM	Disconnected	PNTIBM	Device	31 Oct 2022 07:57

50 ▾ | 1–1 of 1 item

1 Simulation running

- When you get into Devices you find a button called +Add Device click on it.



Browse Devices

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.

Device ID	Status	Device Type	Class ID	Date Added
PNTIBM	Disconnected	PNTIBM	Device	31 Oct 2022 07:57

Items per page 50 | 1–1 of 1 item   1 of 1 page 1

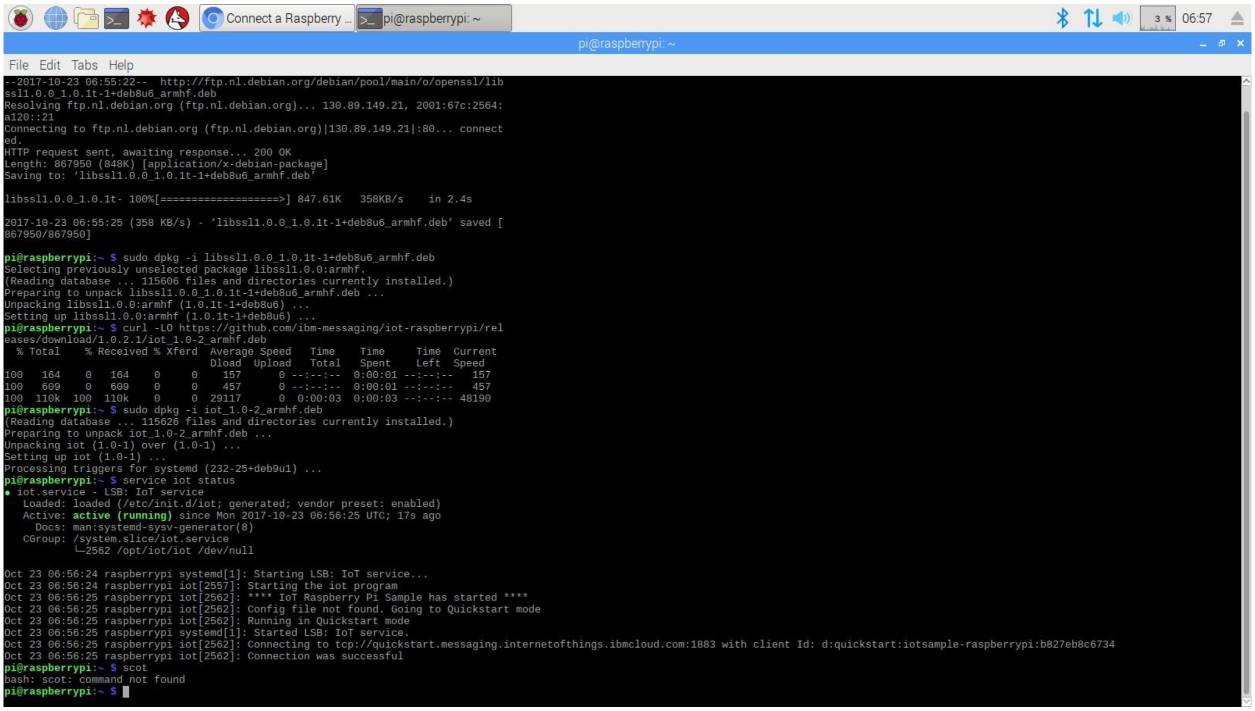
1 Simulation running

- If successfully created Device Then Finally you get your device Credentials which you can use later. Copy them and paste them in a notepad for future uses.

STEP-2: INSTALLING NECESSARY PACKAGES ON YOUR PI:

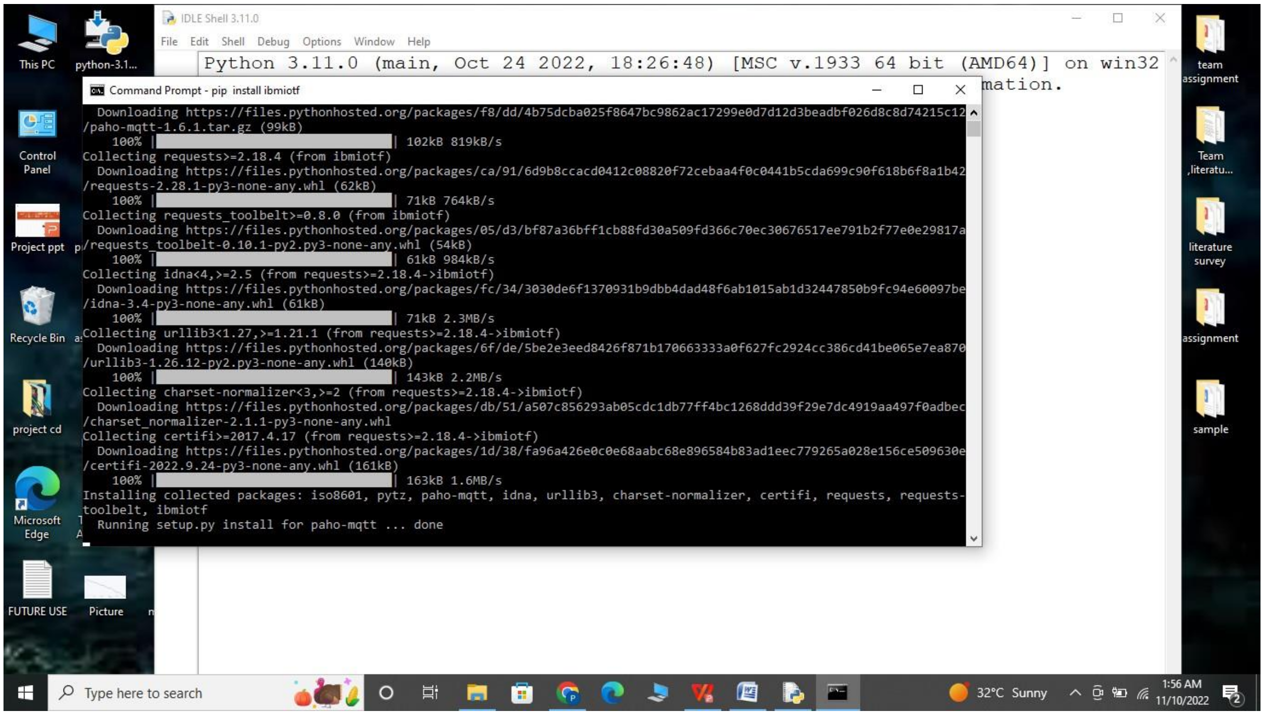
- Now we are going to install necessary packages on your pi.
- Open your terminal in your pi and type the following commands
- curl -LO https://github.com/ibm-messaging/iot-raspberrypi/releases/download/1.0.2.1/io t_1.0-2_armhf.deb
  - sudo dpkg -i iot_1.0-2_armhf.deb service iot status Following are the images as to what appears on your pi’s terminal when u type

these commands:



```
--2017-10-23 06:55:22--  http://ftp.nl.debian.org/debian/pool/main/o/openssl/lib
ssl1.0.0_1.0.1t-1+deb8u6_armhf.deb
Resolving ftp.nl.debian.org (ftp.nl.debian.org)... 130.89.149.21, 2001:67c:2564:
a120::21
Connecting to ftp.nl.debian.org (ftp.nl.debian.org)|130.89.149.21|:80... connect
ed.
HTTP request sent, awaiting response... 200 OK
Length: 867950 (848K) [application/x-debian-package]
Saving to: 'libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb'

libssl1.0.0_1.0.1t- 100%[===================>] 847.61K   358KB/s    in 2.4s

2017-10-23 06:55:25 (358 KB/s) - 'libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb' saved [
867950/867950]

pi@raspberrypi:~ $ sudo dpkg -i libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb
Selecting previously unselected package libssl1.0.0:armhf.
(Reading database ... 115606 files and directories currently installed.)
Preparing to unpack libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb ...
Unpacking libssl1.0.0:armhf (1.0.1t-1+deb8u6) ...
Setting up libssl1.0.0:armhf (1.0.1t-1+deb8u6) ...
pi@raspberrypi:~ $ curl -LO https://github.com/ibm-messaging/iot-raspberrypi/rel
eases/download/1.0.2.1/iot_1.0-2_armhf.deb
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   164    0   164    0     0    157      0 --:--:--  0:00:01 --:--:--   157
100   609    0   609    0     0    457      0 --:--:--  0:00:01 --:--:--   457
100  110k  100  110k    0     0  29117      0  0:00:03  0:00:03 --:--:-- 48190
pi@raspberrypi:~ $ sudo dpkg -i iot_1.0-2_armhf.deb
(Reading database ... 115626 files and directories currently installed.)
Preparing to unpack iot_1.0-2_armhf.deb ...
Unpacking iot (1.0-1) over (1.0-1) ...
Setting up iot (1.0-1) ...
Processing triggers for systemd (232-25+deb9u1) ...
pi@raspberrypi:~ $ service iot status
● iot.service - LSB: IoT service
   Loaded: loaded (/etc/init.d/iot; generated; vendor preset: enabled)
   Active: active (running) since Mon 2017-10-23 06:56:25 UTC; 17s ago
     Docs: man:systemd-sysv-generator(8)
   CGroup: /system.slice/iot.service
           └─2562 /opt/iot/iot /dev/null

Oct 23 06:56:24 raspberrypi systemd[1]: Starting LSB: IoT service...
Oct 23 06:56:24 raspberrypi iot[2557]: Starting the iot program
Oct 23 06:56:25 raspberrypi iot[2562]: **** IoT Raspberry Pi Sample has started ****
Oct 23 06:56:25 raspberrypi iot[2562]: Config file not found. Going to Quickstart mode
Oct 23 06:56:25 raspberrypi iot[2562]: Running in Quickstart mode
Oct 23 06:56:25 raspberrypi systemd[1]: Started LSB: IoT service.
Oct 23 06:56:25 raspberrypi iot[2562]: Connecting to tcp://quickstart.messaging.internetofthings.ibmcloud.com:1883 with client Id: d:quickstart:iotsample-raspberrypi:b827eb8c6734
Oct 23 06:56:25 raspberrypi iot[2562]: Connection was successful
pi@raspberrypi:~ $ scot
bash: scot: command not found
pi@raspberrypi:~ $
```

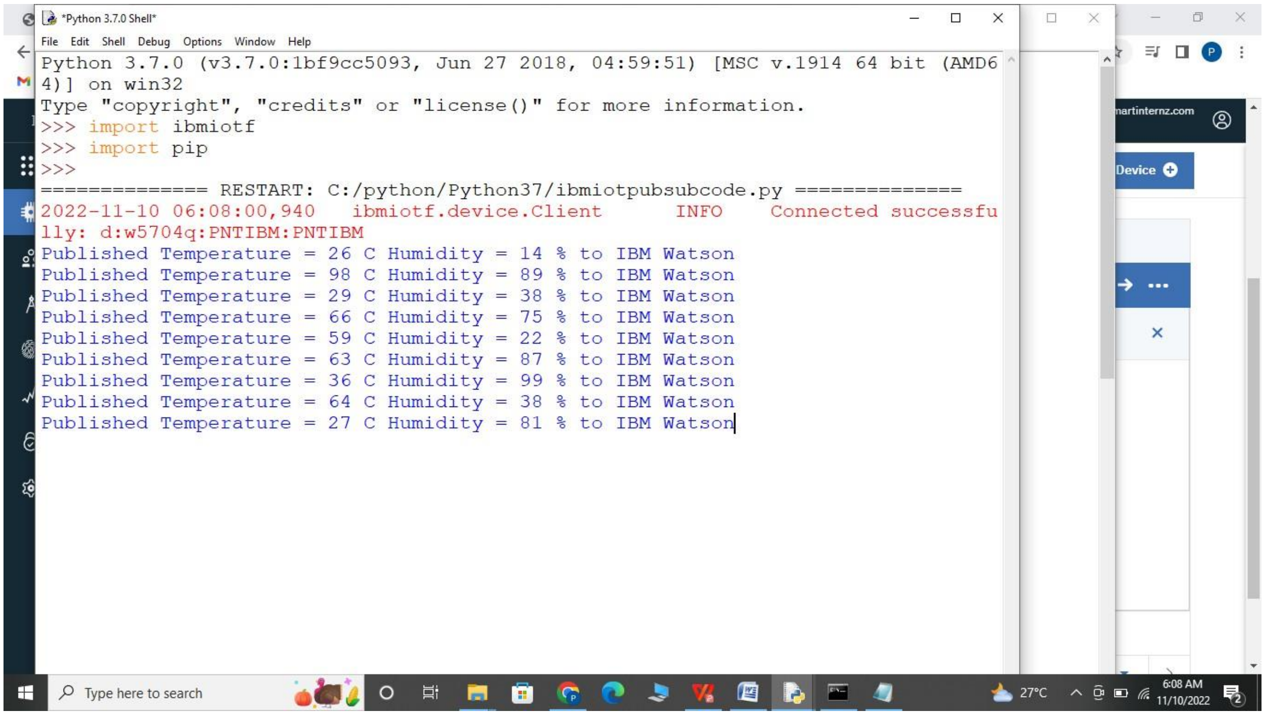
- Then open your terminal and type pip install ibmiotf



```
Python 3.11.0 (main, Oct 24 2022, 18:26:48) [MSC v.1933 64 bit (AMD64)] on win32
mation.
```

```
  Downloading https://files.pythonhosted.org/packages/f8/dd/4b75dcba025f8647bc9862ac17299e0d7d12d3beadbf026d8c8d74215c12
/paho-mqtt-1.6.1.tar.gz (99kB)
    100% |████████████████████████████████| 102kB 819kB/s
Collecting requests>=2.18.4 (from ibmiotf)
  Downloading https://files.pythonhosted.org/packages/ca/91/6d9b8ccacd0412c08820f72cebaa4f0c0441b5cda699c90f618b6f8a1b42
/requests-2.28.1-py3-none-any.whl (62kB)
    100% |████████████████████████████████| 71kB 764kB/s
Collecting requests_toolbelt>=0.8.0 (from ibmiotf)
  Downloading https://files.pythonhosted.org/packages/05/d3/bf87a36bff1cb88fd30a509fd366c70ec30676517ee791b2f77e0e29817a
/requests_toolbelt-0.10.1-py2.py3-none-any.whl (54kB)
    100% |████████████████████████████████| 61kB 984kB/s
Collecting idna<4,>=2.5 (from requests>=2.18.4->ibmiotf)
  Downloading https://files.pythonhosted.org/packages/fc/34/3030de6f1370931b9dbb4dad48f6ab1015ab1d32447850b9fc94e60097be
/idna-3.4-py3-none-any.whl (61kB)
    100% |████████████████████████████████| 71kB 2.3MB/s
Collecting urllib3<1.27,>=1.21.1 (from requests>=2.18.4->ibmiotf)
  Downloading https://files.pythonhosted.org/packages/6f/de/5be2e3eed8426f871b170663333a0f627fc2924cc386cd41be065e7ea870
/urllib3-1.26.12-py2.py3-none-any.whl (140kB)
    100% |████████████████████████████████| 143kB 2.2MB/s
Collecting charset-normalizer<3,>=2 (from requests>=2.18.4->ibmiotf)
  Downloading https://files.pythonhosted.org/packages/db/51/a507c856293ab05cdc1db77ff4bc1268ddd39f29e7dc4919aa497f0adbec
/charset_normalizer-2.1.1-py3-none-any.whl
Collecting certifi>=2017.4.17 (from requests>=2.18.4->ibmiotf)
  Downloading https://files.pythonhosted.org/packages/1d/38/fa96a426e0c0e68aabc68e896584b83ad1eec779265a028e156ce509630e
/certifi-2022.9.24-py3-none-any.whl (161kB)
    100% |████████████████████████████████| 163kB 1.6MB/s
Installing collected packages: iso8601, pytz, paho-mqtt, idna, urllib3, charset-normalizer, certifi, requests, requests-
toolbelt, ibmiotf
  Running setup.py install for paho-mqtt ... done
```

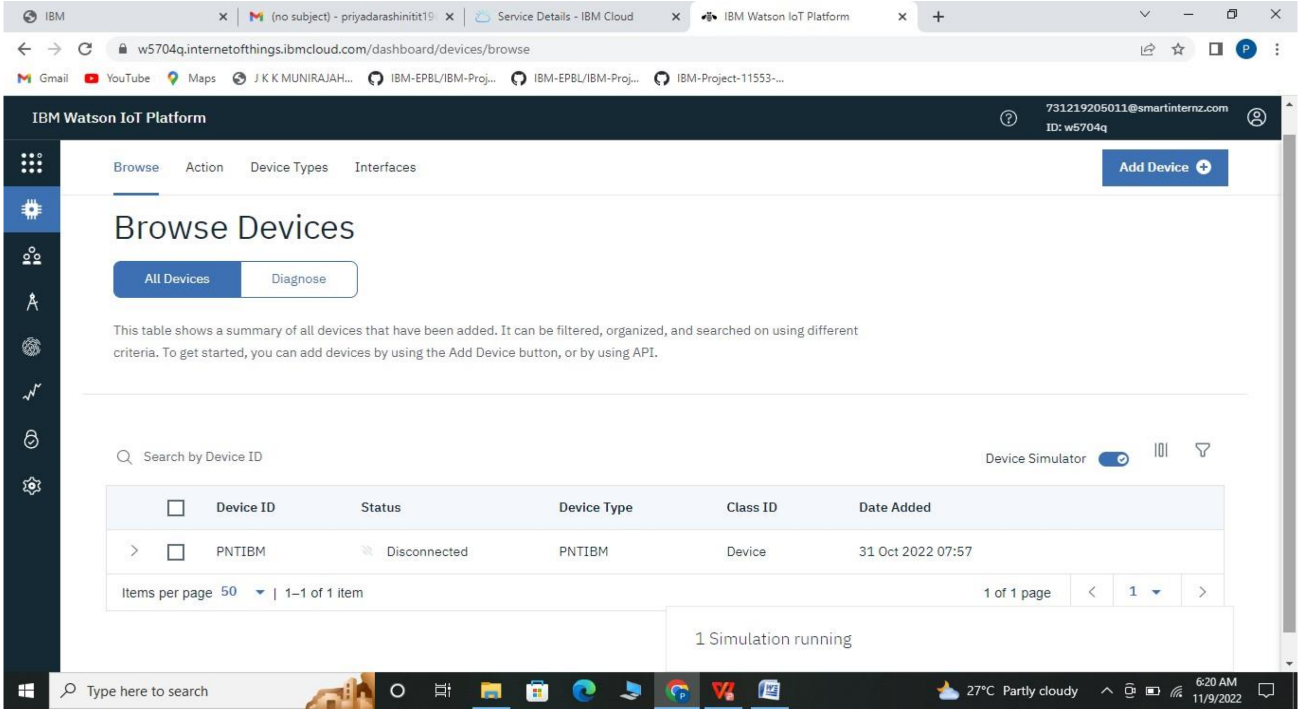
- I have sent DHT-11 Sensors data to ibm bluemix .To get the code u need to login into IOT GYAN.
- Then I get the image as follows in my pi's shell:



```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD6
4)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> import ibmiotf
>>> import pip
>>>
============== RESTART: C:/python/Python37/ibmiotpubsubcode.py ==============
2022-11-10 06:08:00,940   ibmiotf.device.Client      INFO    Connected successfu
lly: d:w5704q:PNTIBM:PNTIBM
Published Temperature = 26 C Humidity = 14 % to IBM Watson
Published Temperature = 98 C Humidity = 89 % to IBM Watson
Published Temperature = 29 C Humidity = 38 % to IBM Watson
Published Temperature = 66 C Humidity = 75 % to IBM Watson
Published Temperature = 59 C Humidity = 22 % to IBM Watson
Published Temperature = 63 C Humidity = 87 % to IBM Watson
Published Temperature = 36 C Humidity = 99 % to IBM Watson
Published Temperature = 64 C Humidity = 38 % to IBM Watson
Published Temperature = 27 C Humidity = 81 % to IBM Watson
```

Step-3: checking your data sent on IBM Bluemix:

- After you have sent your sensors data you can check whether it is received at your iot platform Just look at the image below and if u see the same wifi kind of symbol on your created device then your dta is being received.



Browse Devices

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.

	☐	Device ID	Status	Device Type	Class ID	Date Added
>	☐	PNTIBM	Disconnected	PNTIBM	Device	31 Oct 2022 07:57

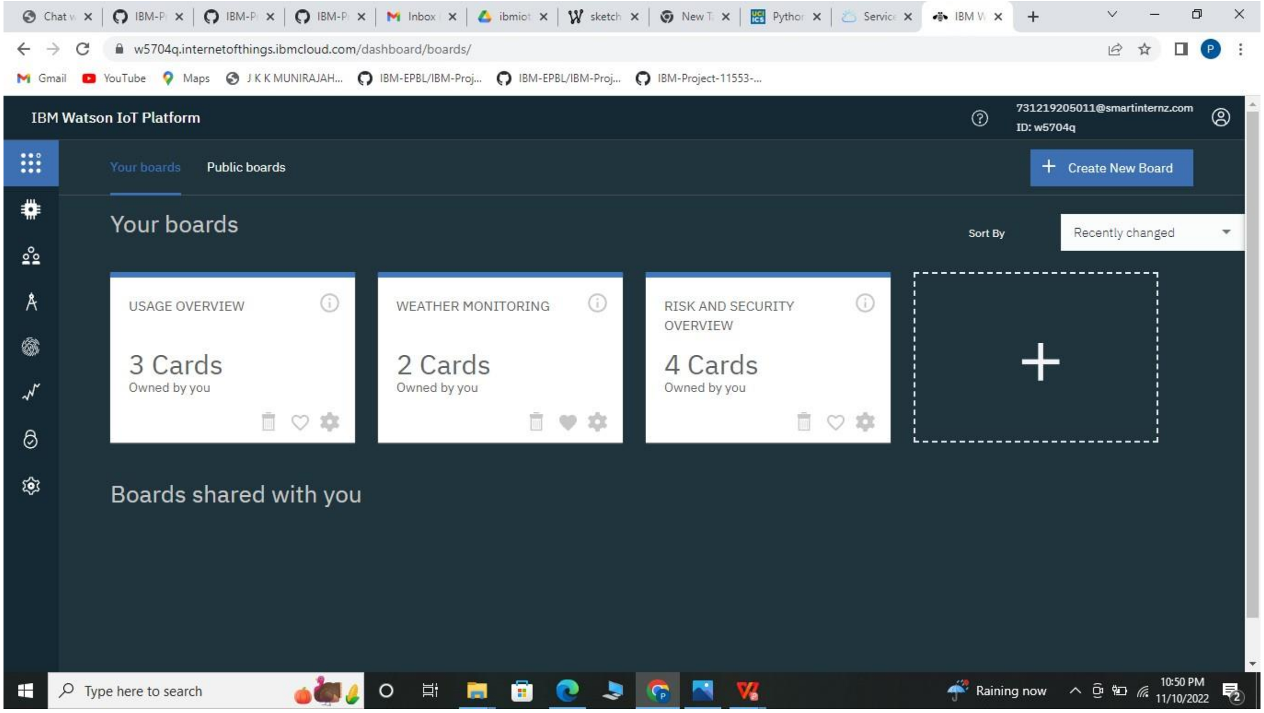
Items per page 50 | 1–1 of 1 item   1 of 1 page   1

1 Simulation running

- After double clicking on your created device you can see the received data as shown in image

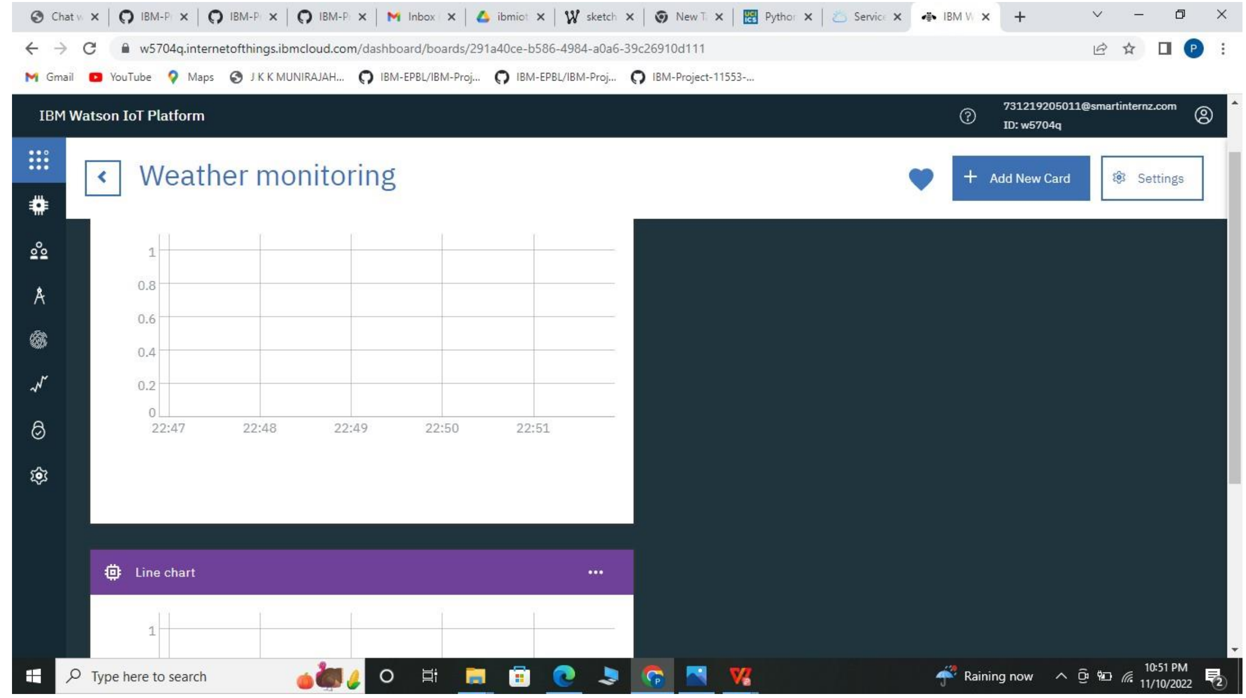
Step-4:Creating boards and cards for visualization of data:

- In your Watson platform you have an option called board. Click on it and you get the following window on your screen

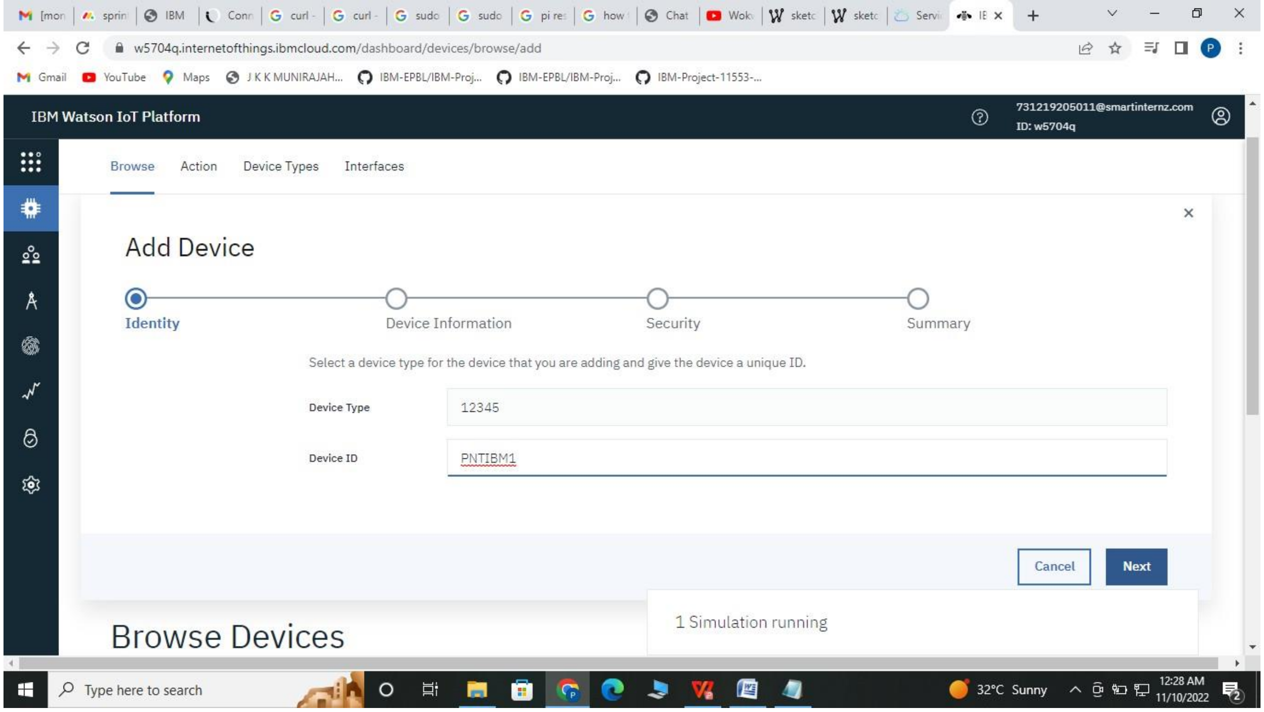


- **Click on Create a new board to create a board .**

The given below window appears give a name and description to your board as shown in the window below



- Then click on Next you get the below window then again click on ADD
- Select the type of Graph u want accordingly and Click next
- You get the below window



IBM Watson IoT Platform

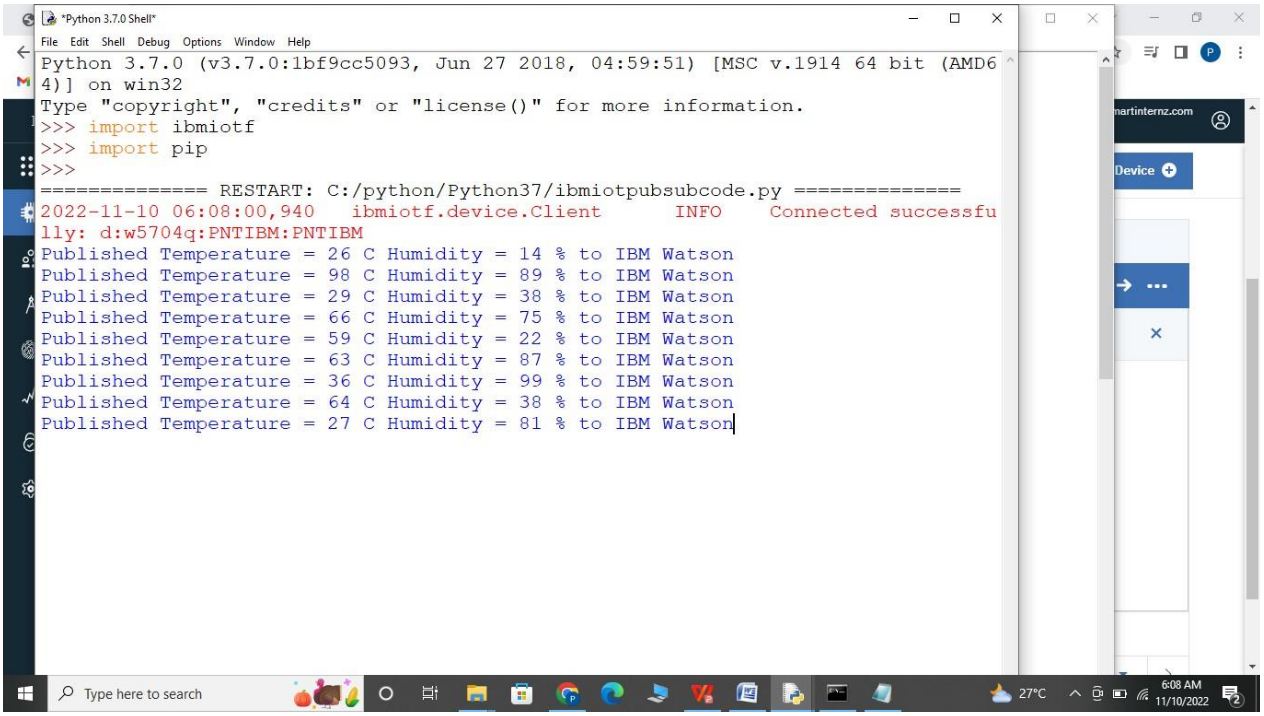
Add Device

Select a device type for the device that you are adding and give the device a unique ID.

Device Type: 12345

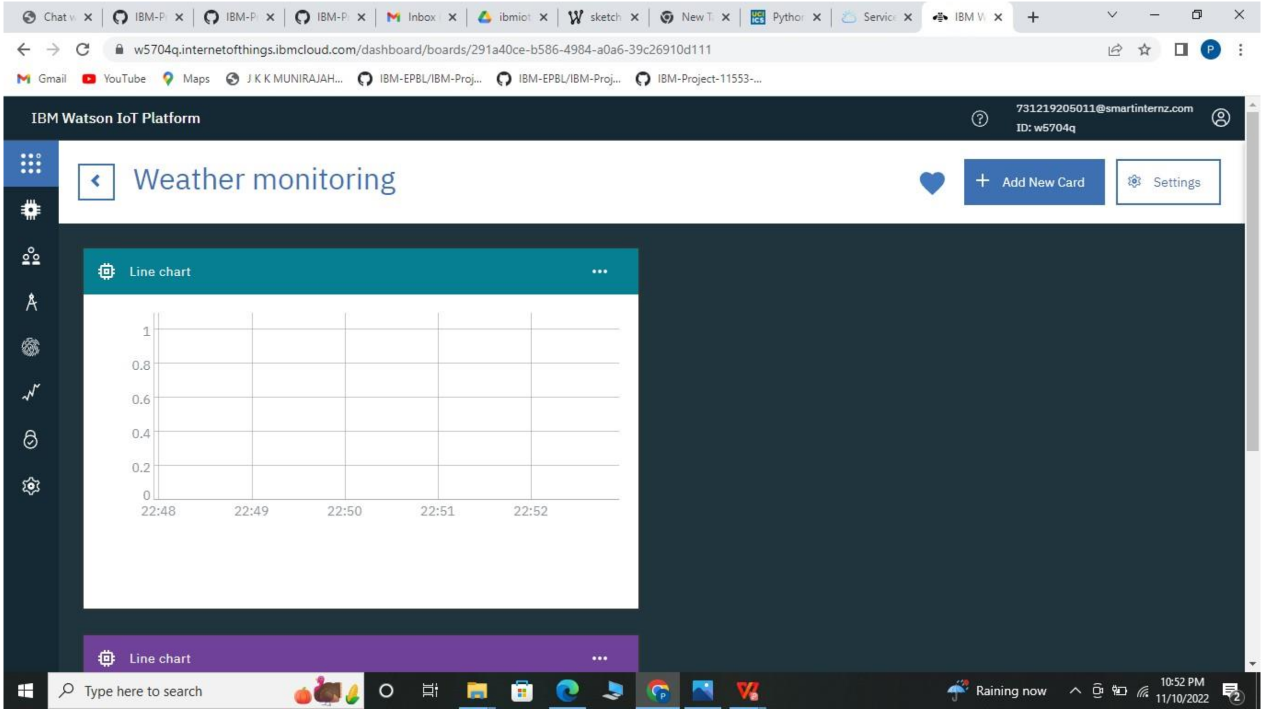
Device ID: PNTIBM1

- Tick mark your device name as shown above and then click on next.
- Select the event ,property to be visualized on your graph and click next .In my case it is humidity

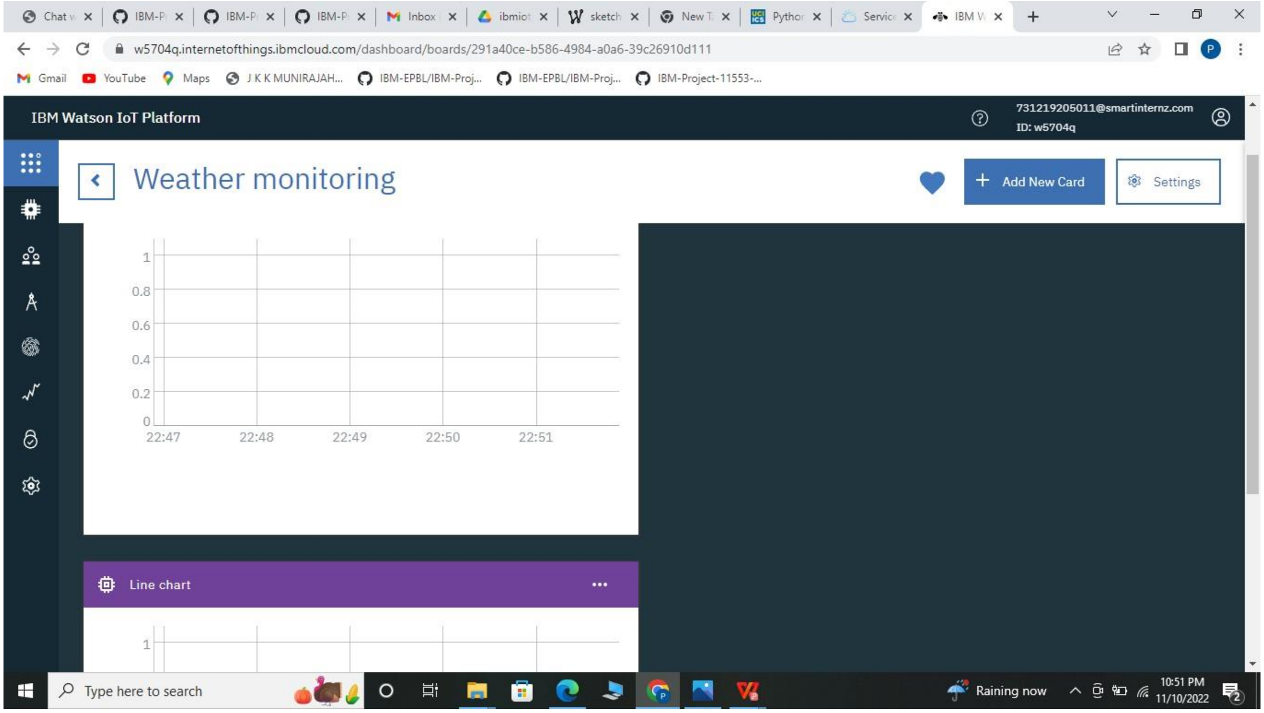


```
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD6
4)] on win32
Type "copyright", "credits" or "license()" for more information.
>>> import ibmiotf
>>> import pip
>>>
============== RESTART: C:/python/Python37/ibmiotpubsubcode.py ==============
2022-11-10 06:08:00,940   ibmiotf.device.Client      INFO    Connected successfu
lly: d:w5704q:PNTIBM:PNTIBM
Published Temperature = 26 C Humidity = 14 % to IBM Watson
Published Temperature = 98 C Humidity = 89 % to IBM Watson
Published Temperature = 29 C Humidity = 38 % to IBM Watson
Published Temperature = 66 C Humidity = 75 % to IBM Watson
Published Temperature = 59 C Humidity = 22 % to IBM Watson
Published Temperature = 63 C Humidity = 87 % to IBM Watson
Published Temperature = 36 C Humidity = 99 % to IBM Watson
Published Temperature = 64 C Humidity = 38 % to IBM Watson
Published Temperature = 27 C Humidity = 81 % to IBM Watson
```

- Then select the size of the graph and color of the graph board you want and click next



- You get your desired data in the form of a graph as shown below



Conclusion: Hence, we were able to send data from our pi to IBM Watson andvisualize it on a graph