SENDING DATA FROM

RASPBERRY-PITO

IBM WATSON

Date	3 NOVEMBER 2022
Team ID	PNT2022TMID20267
Project Name	GAS LEAKAGE MONITORING AND ALERTING SYSTEM FORINDUSTRIES

AIM:

To send sensor data (or any dummy data) from Raspberry –Pi to IBM Watson .In our case it is DHT sensorsData.

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E:

- RASPBERRY-PI (3B)(WITH ETHERNET CABLE OR WIFI CONNECTED)
- USB MOUSE
- USB KEYBOARD
- VGA TO HDMI CABLE
- A MONITOR
- RASPBERRY'S POWER SUPPLY
- DHT-11 Sensor
- Connecting Wires

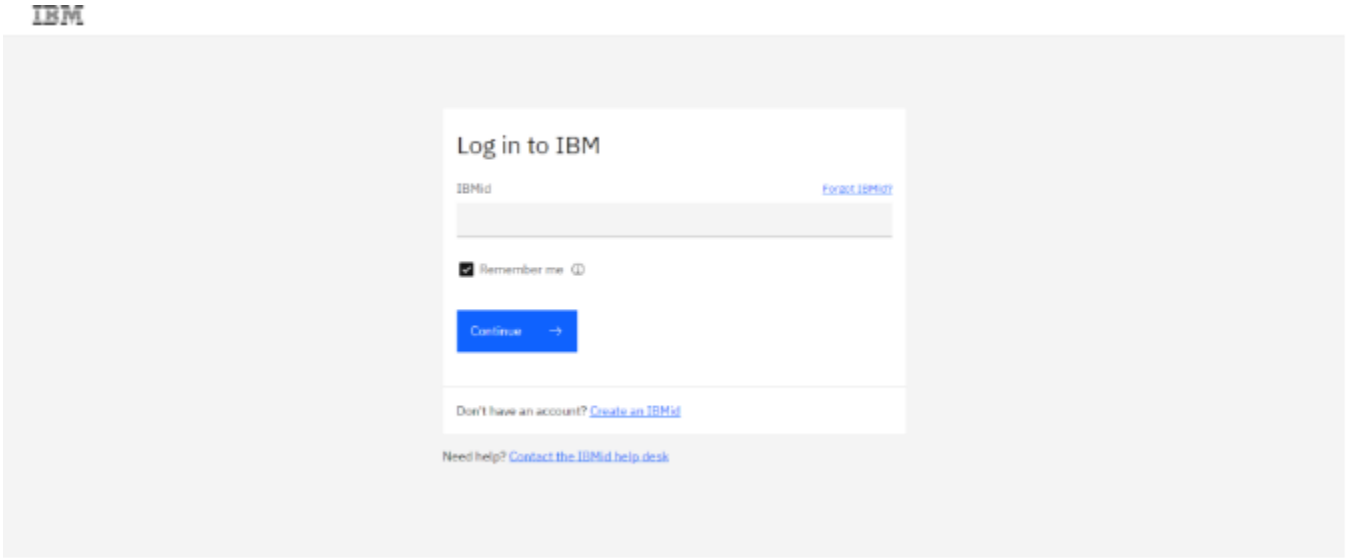
SOFTWARE:

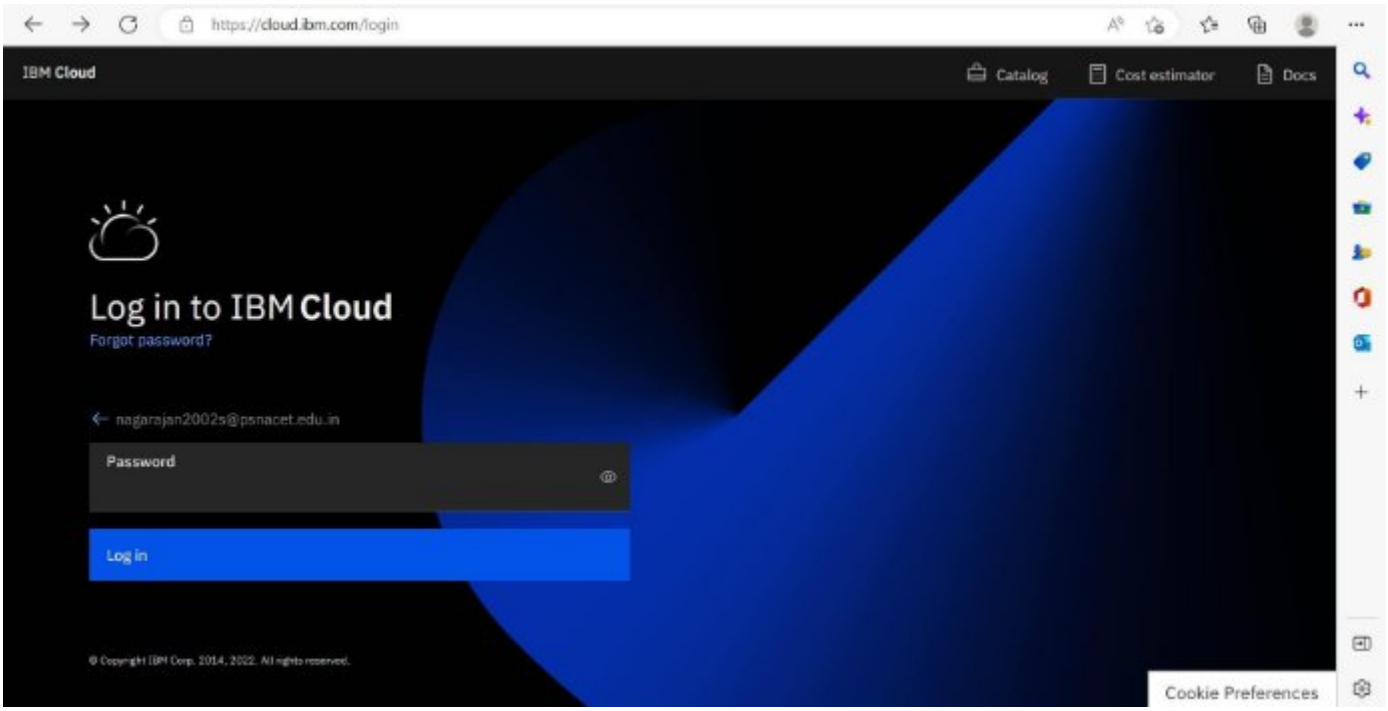
- IBM BLUEMIX ACCOUNT

STEPS TO BE FOLLOWED

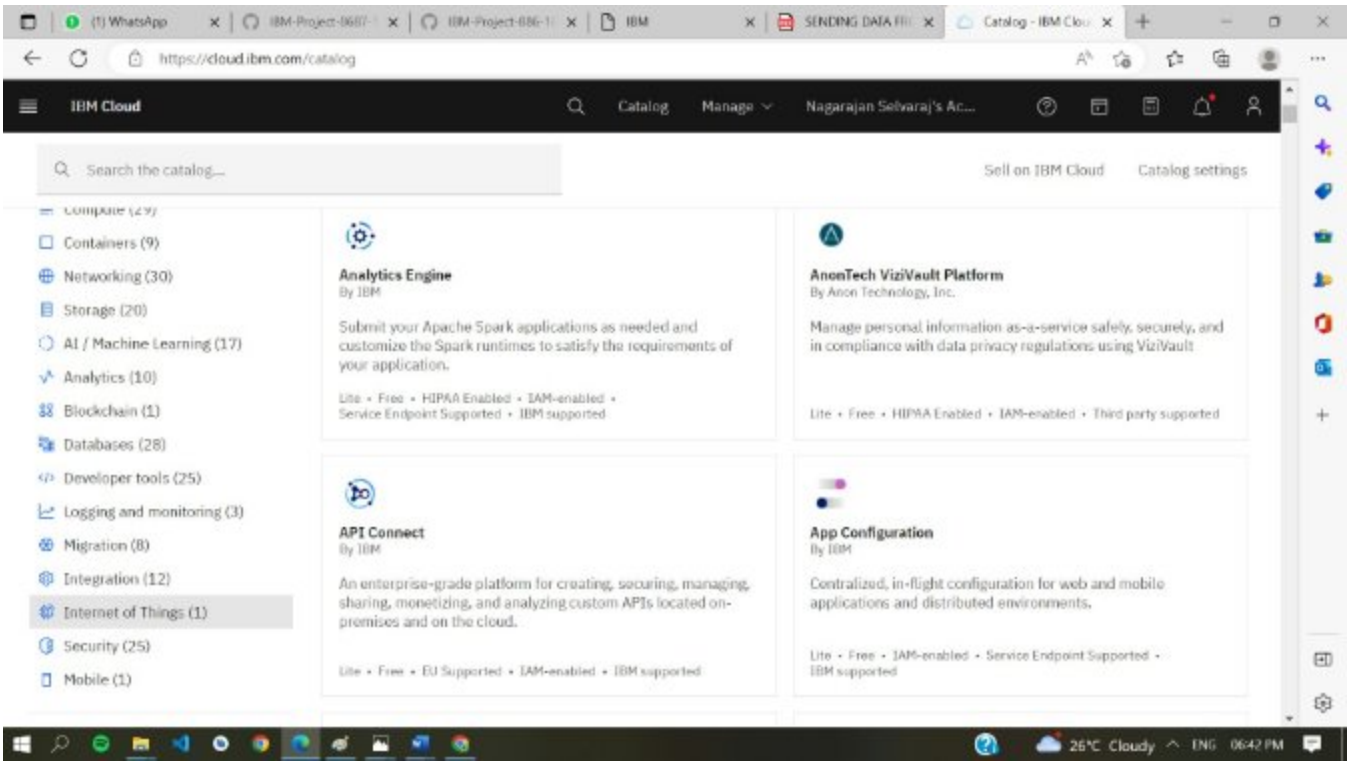
Step-1: Create a device in IBM Watson:

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

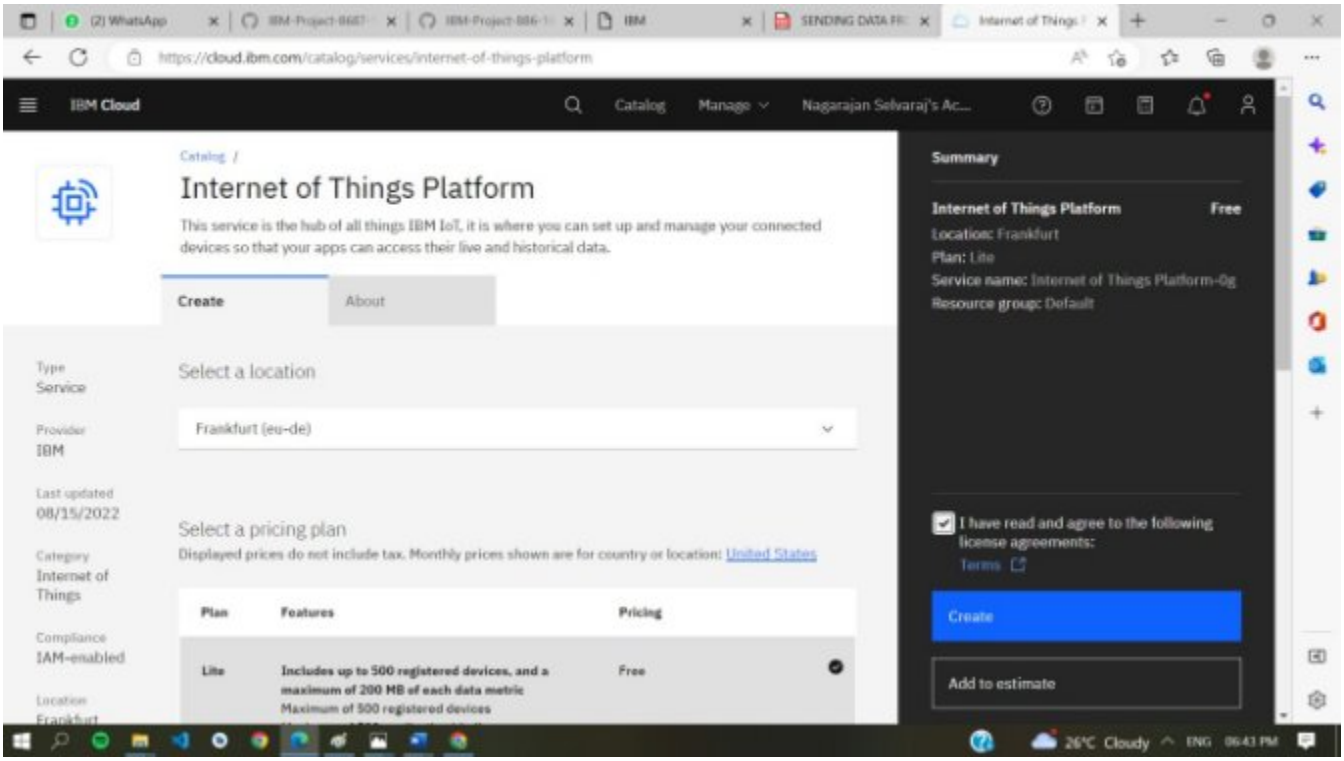




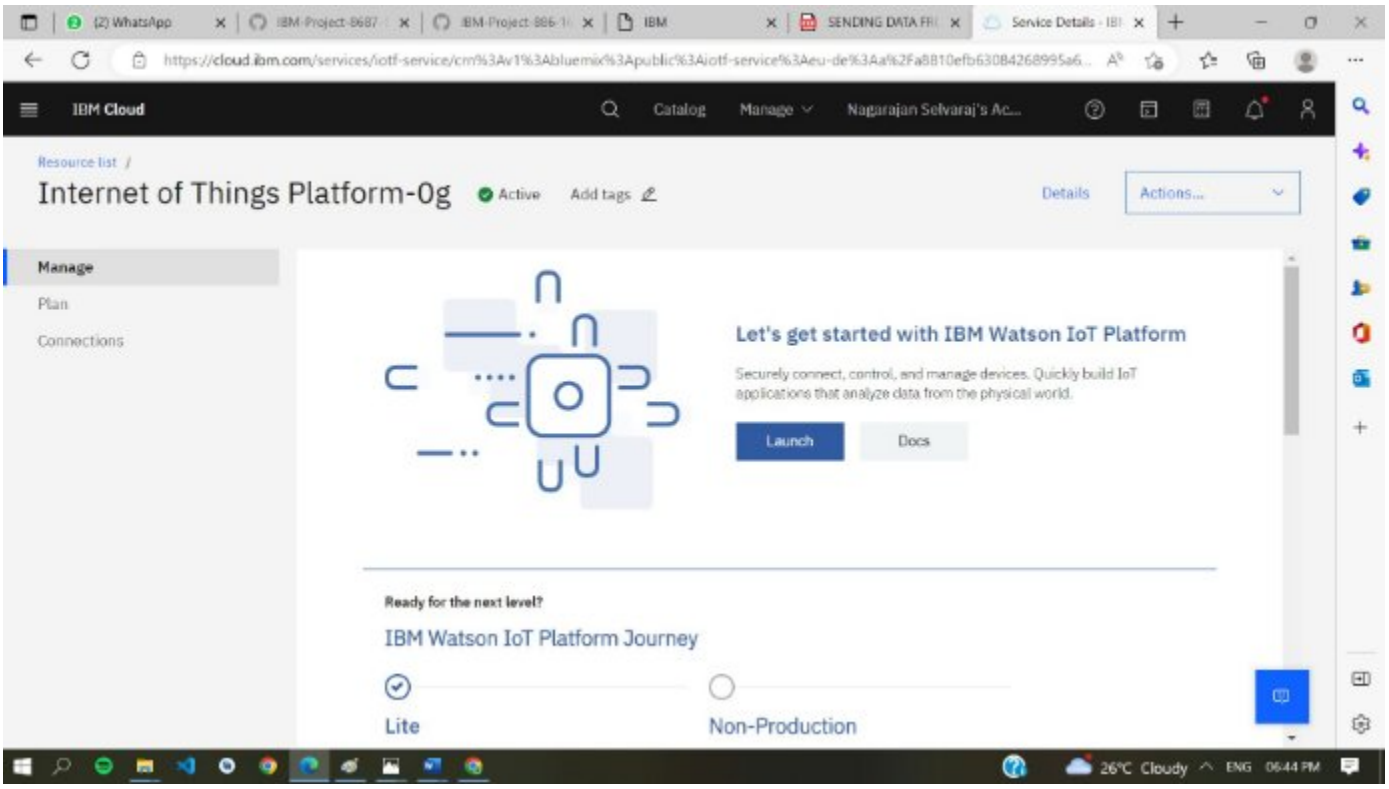
- ➢ Click on catalog on your dashboard screen, then under platform go IoT.


IBM Cloud
Catalog
Manage
Nagarajan Selvaraj's Ac...
Search the catalog...
Sell on IBM Cloud
Catalog settings
Containers (9)
Networking (30)
Storage (20)
AI / Machine Learning (17)
Analytics (10)
Blockchain (1)
Databases (28)
Developer tools (25)
Logging and monitoring (3)
Migration (8)
Integration (12)
Internet of Things (1)
Security (25)
Mobile (1)
Analytics Engine
By IBM
Submit your Apache Spark applications as needed and customize the Spark runtimes to satisfy the requirements of your application.
Lite • Free • HIPAA Enabled • IAM-enabled • Service Endpoint Supported • IBM supported
AnonTech ViziVault Platform
By Anon Technology, Inc.
Manage personal information as-a-service safely, securely, and in compliance with data privacy regulations using ViziVault
Lite • Free • HIPAA Enabled • IAM-enabled • Third party supported
API Connect
By IBM
An enterprise-grade platform for creating, securing, managing, sharing, monetizing, and analyzing custom APIs located on-premises and on the cloud.
Lite • Free • EU Supported • IAM-enabled • IBM supported
App Configuration
By IBM
Centralized, in-flight configuration for web and mobile applications and distributed environments.
Lite • Free • IAM-enabled • Service Endpoint Supported • IBM supported
26°C Cloudy
ENG
06:42 PM

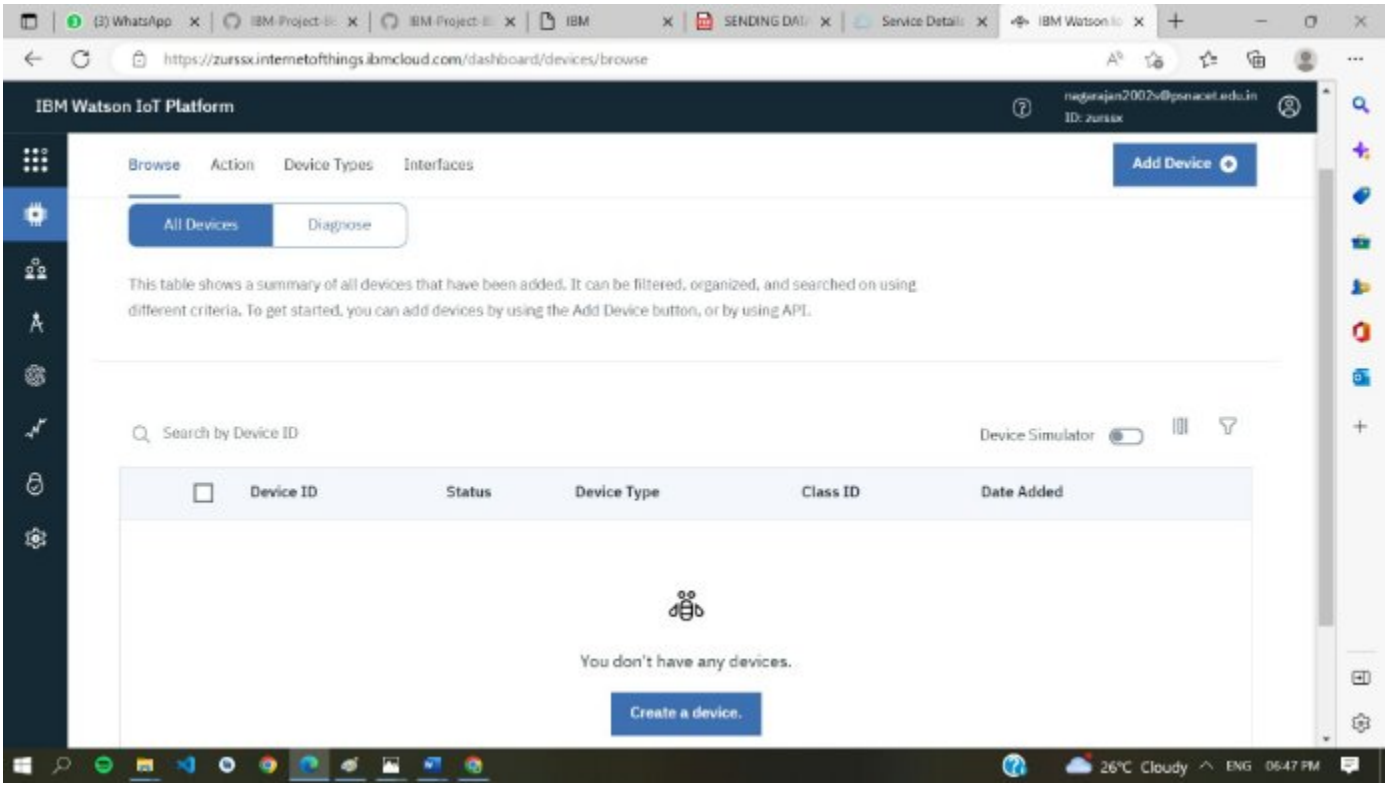
➢ ➢ Check all details and click on create.



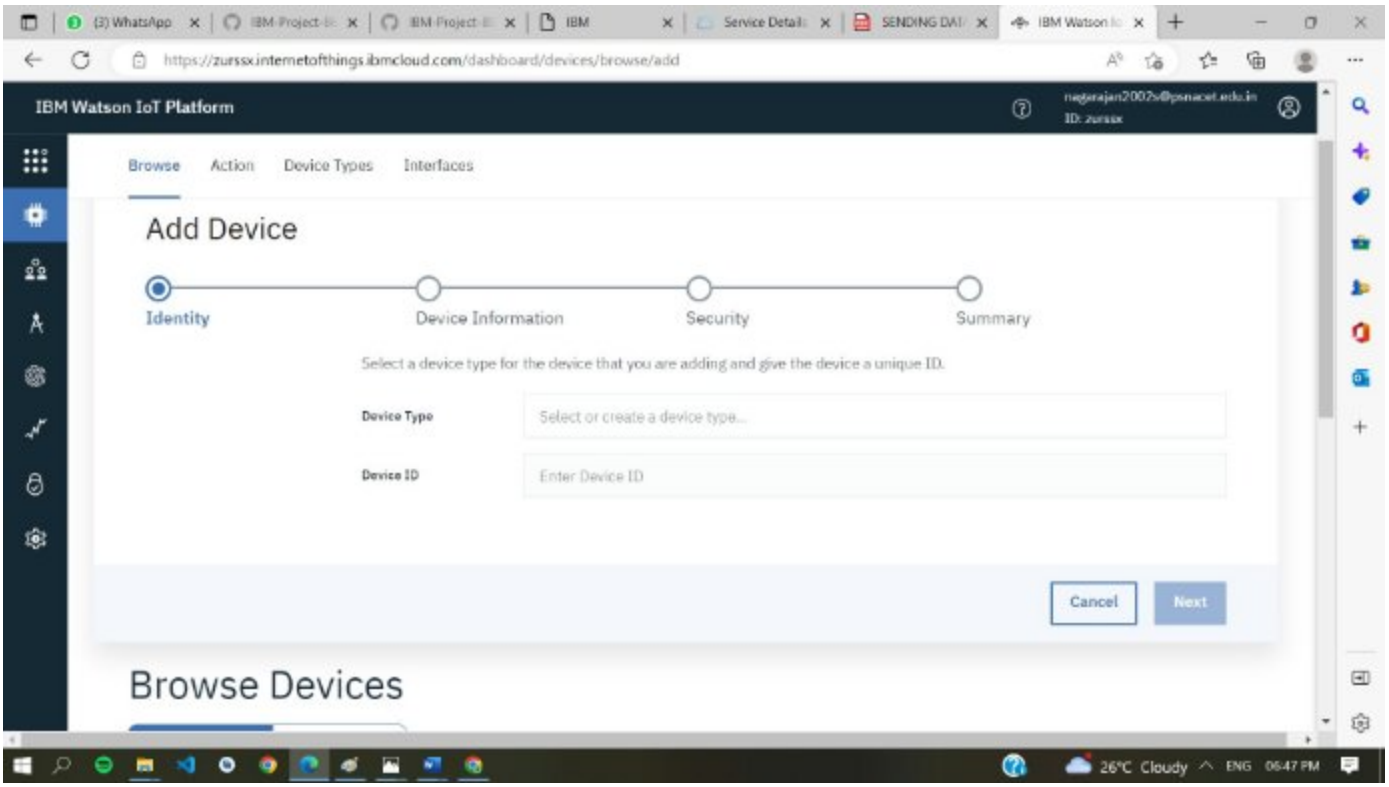
➢ ➢ click on Launch



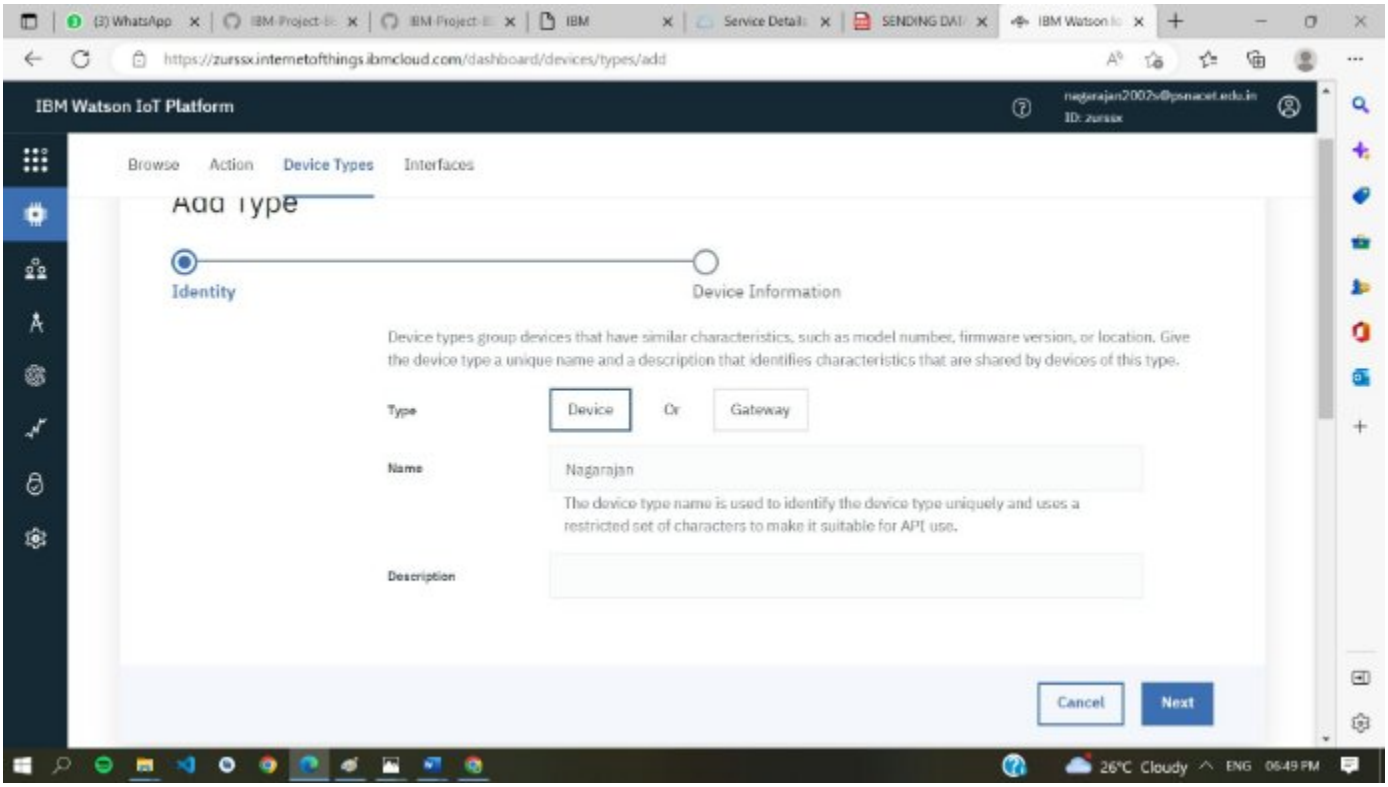
- Dashboard of IBM Watson IoT platform,
- Click on Add device



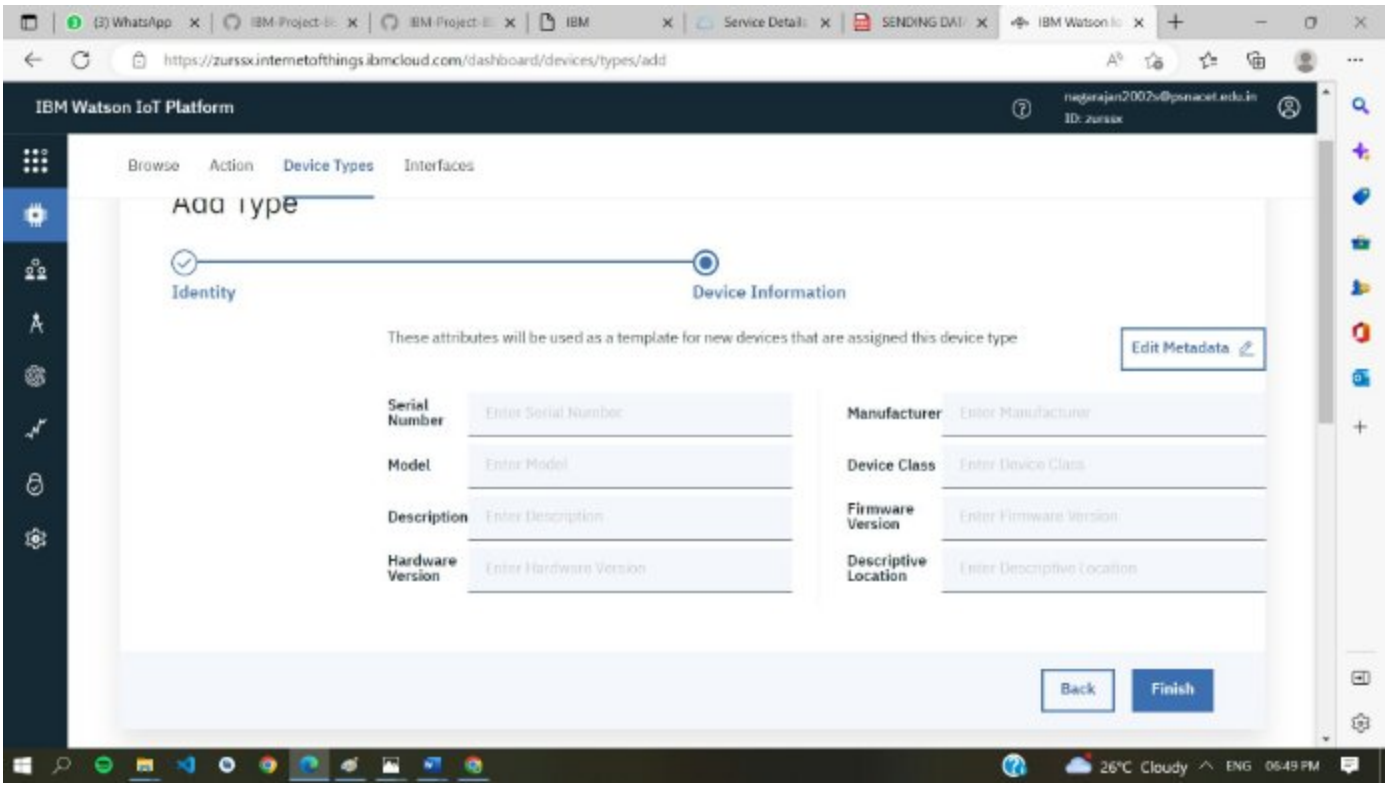
- After click on Add device this page will open


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Security
Summary
Select a device type for the device that you are adding and give the device a unique ID.
Device Type
Select or create a device type...
Device ID
Enter Device ID
Cancel
Next
Browse Devices

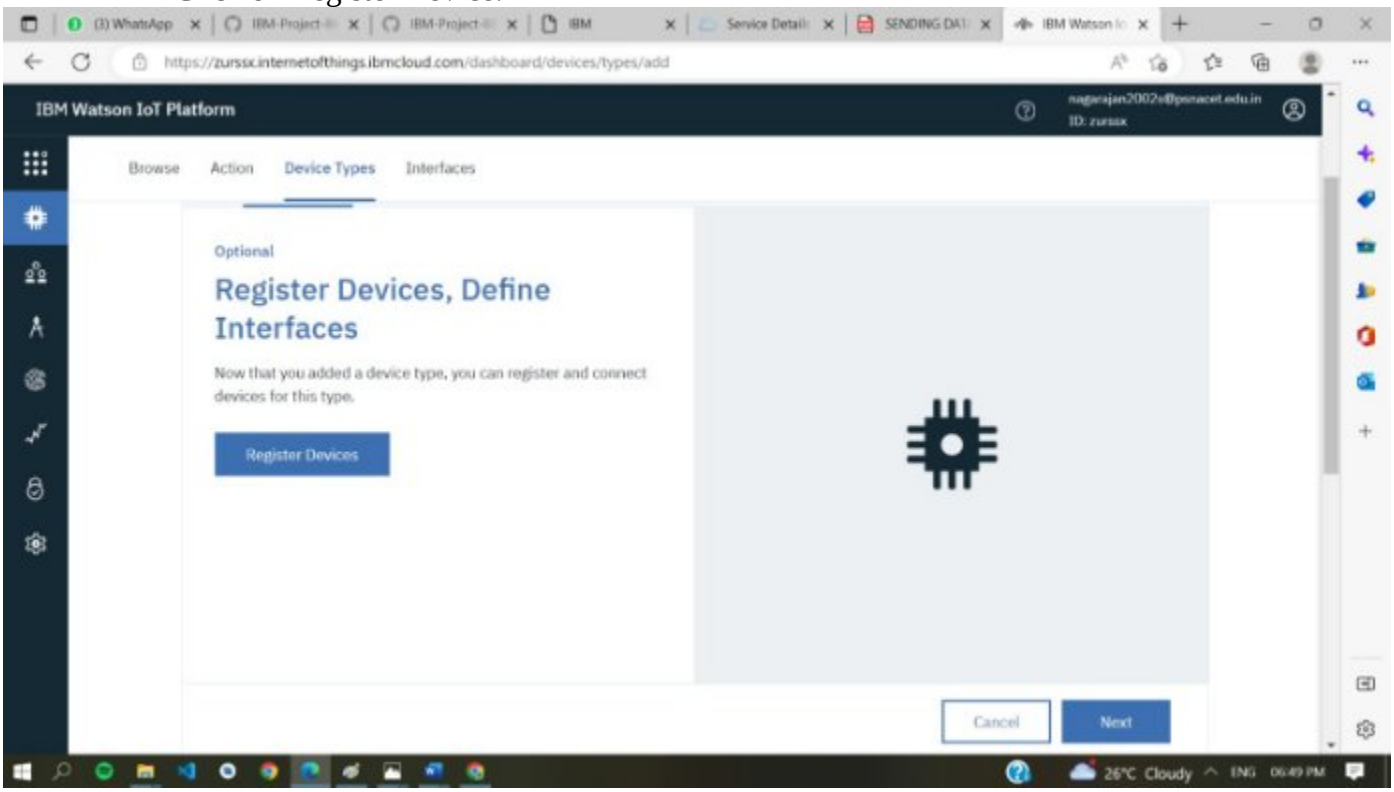
➢ ➢ Go to device type and fill the details.



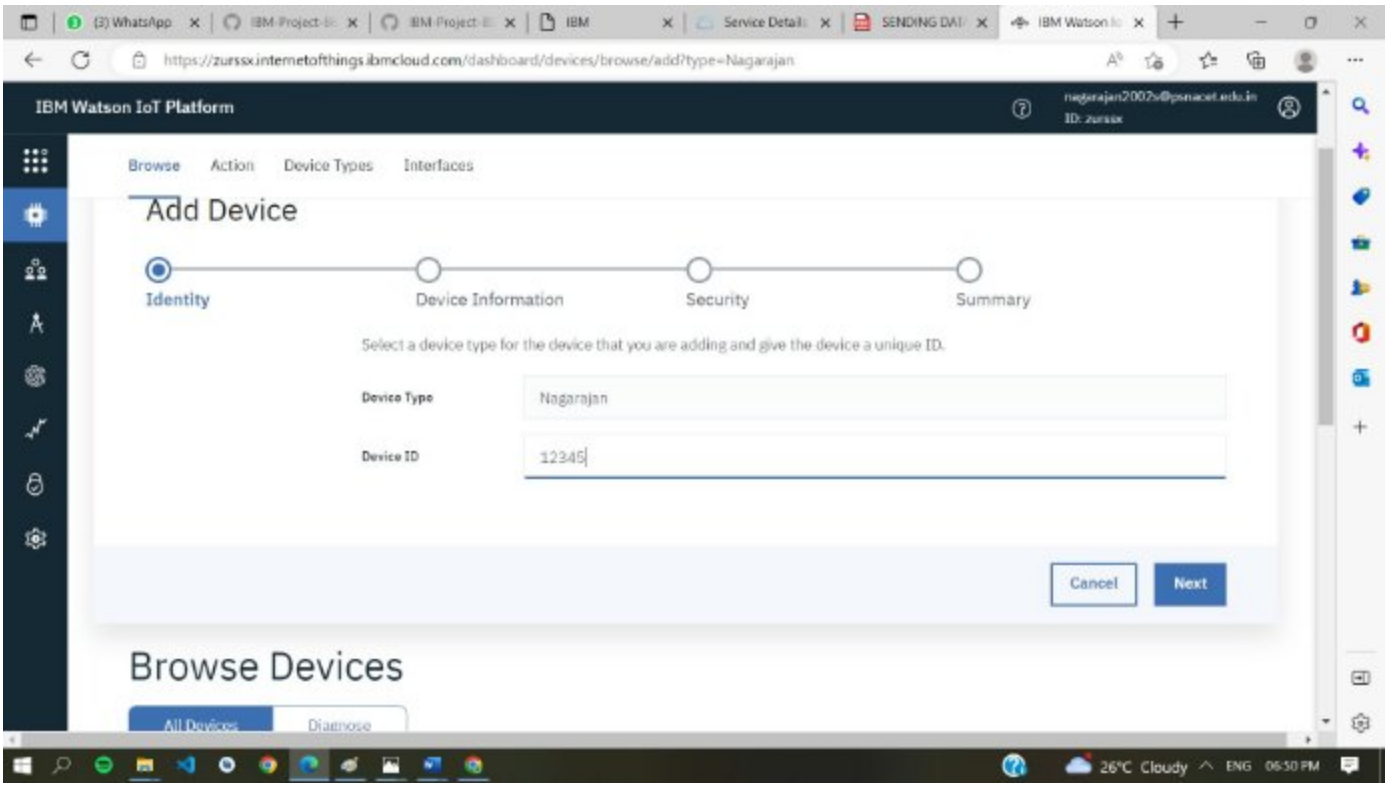
➢ ➢ Click on Finish


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Type
Identity
Device Information
These attributes will be used as a template for new devices that are assigned this device type
Edit Metadata
Serial Number
Model
Description
Hardware Version
Manufacturer
Device Class
Firmware Version
Descriptive Location
Back
Finish

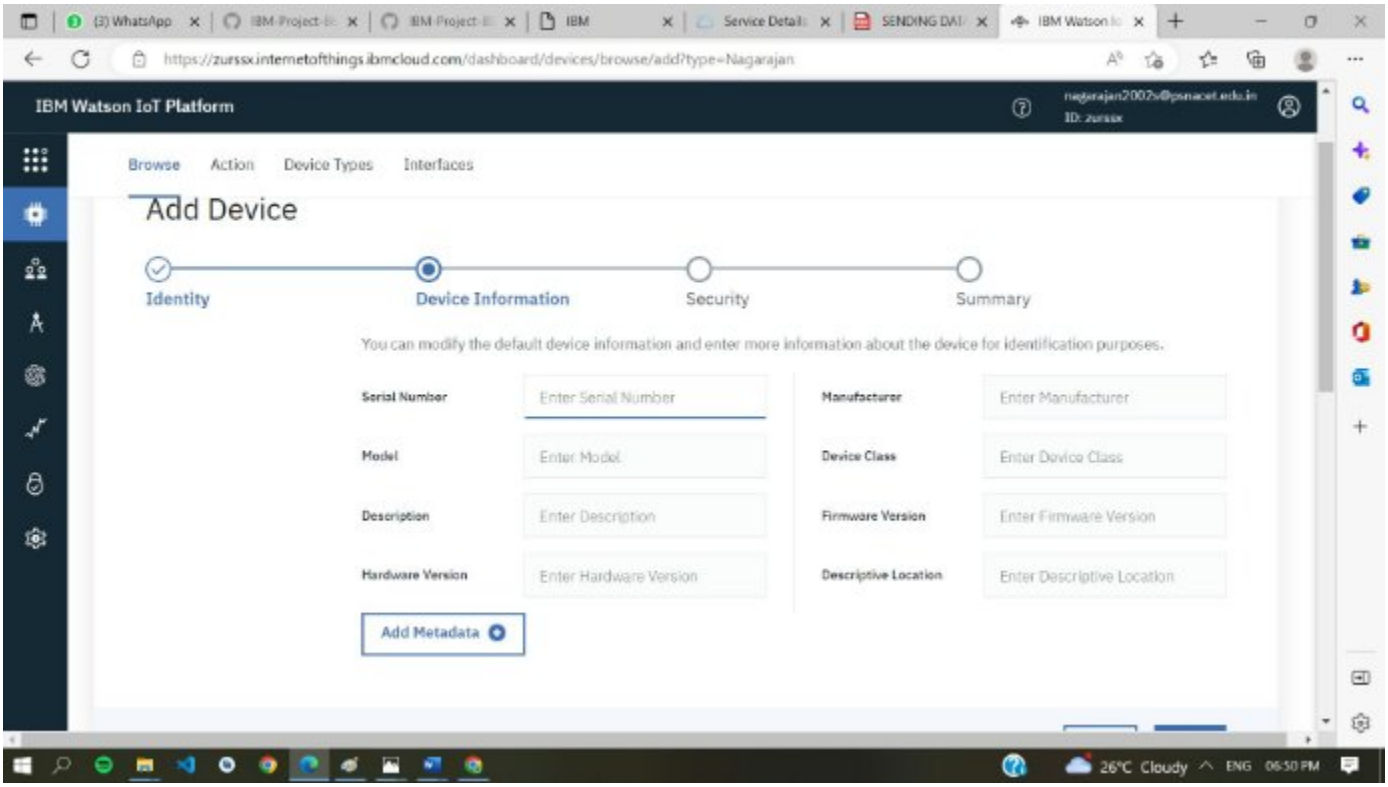
- Click on Register Device.



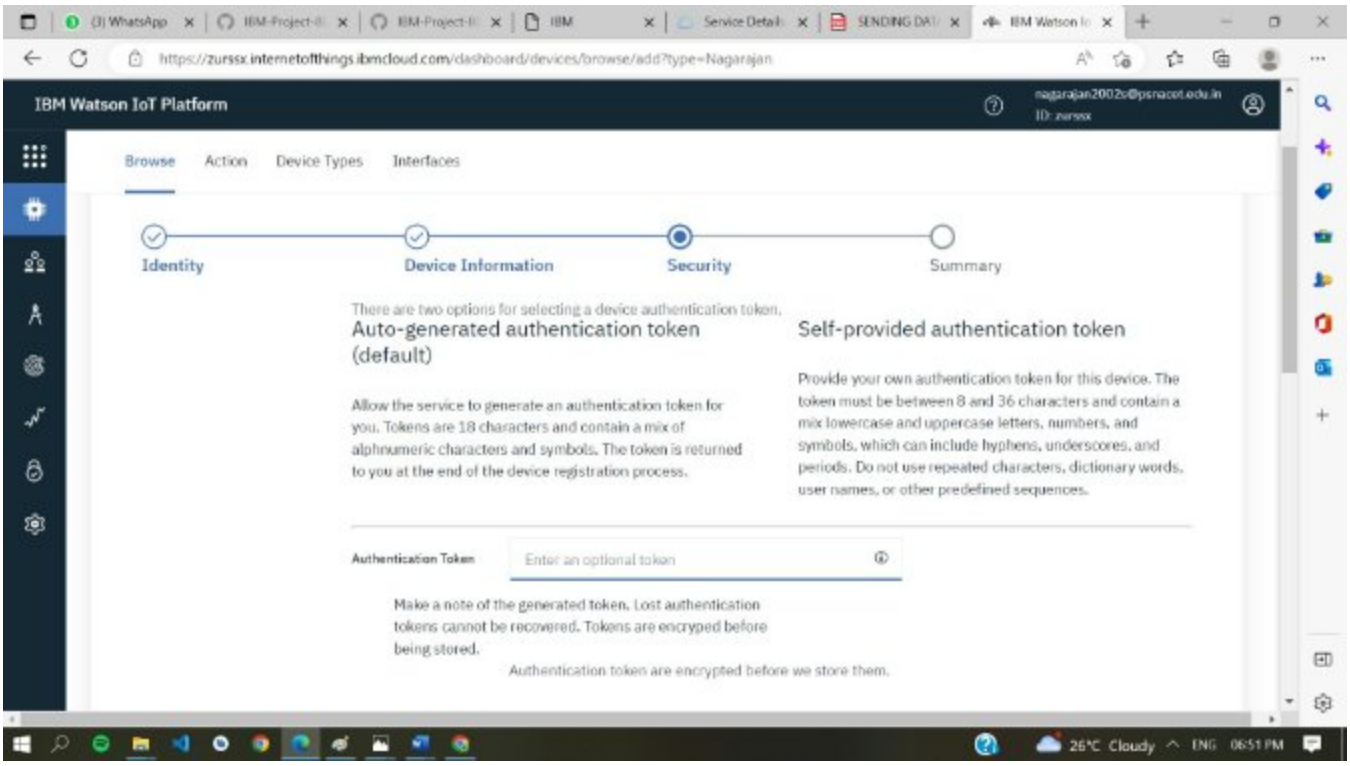
- Choose the device and give device ID and then click on next.


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Security
Summary
Select a device type for the device that you are adding and give the device a unique ID.
Device Type
Nagarajan
Device ID
12345
Cancel
Next
Browse Devices
All Devices
Diagnose

➢ ➢ Click on Next



➢ ➢ Click on Next


IBM Watson IoT Platform
nagarajan2002cs@psnacet.edu.in
ID: zurssx
Browse
Action
Device Types
Interfaces
Identity
Device Information
Security
Summary
There are two options for selecting a device authentication token.
Auto-generated authentication token (default)
Allow the service to generate an authentication token for you. Tokens are 18 characters and contain a mix of alphnumeric characters and symbols. The token is returned to you at the end of the device registration process.
Self-provided authentication token
Provide your own authentication token for this device. The token must be between 8 and 36 characters and contain a mix lowercase and uppercase letters, numbers, and symbols, which can include hyphens, underscores, and periods. Do not use repeated characters, dictionary words, user names, or other predefined sequences.
Authentication Token
Enter an optional token
Make a note of the generated token. Lost authentication tokens cannot be recovered. Tokens are encryped before being stored.
Authentication token are encrypted before we store them.
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ENG
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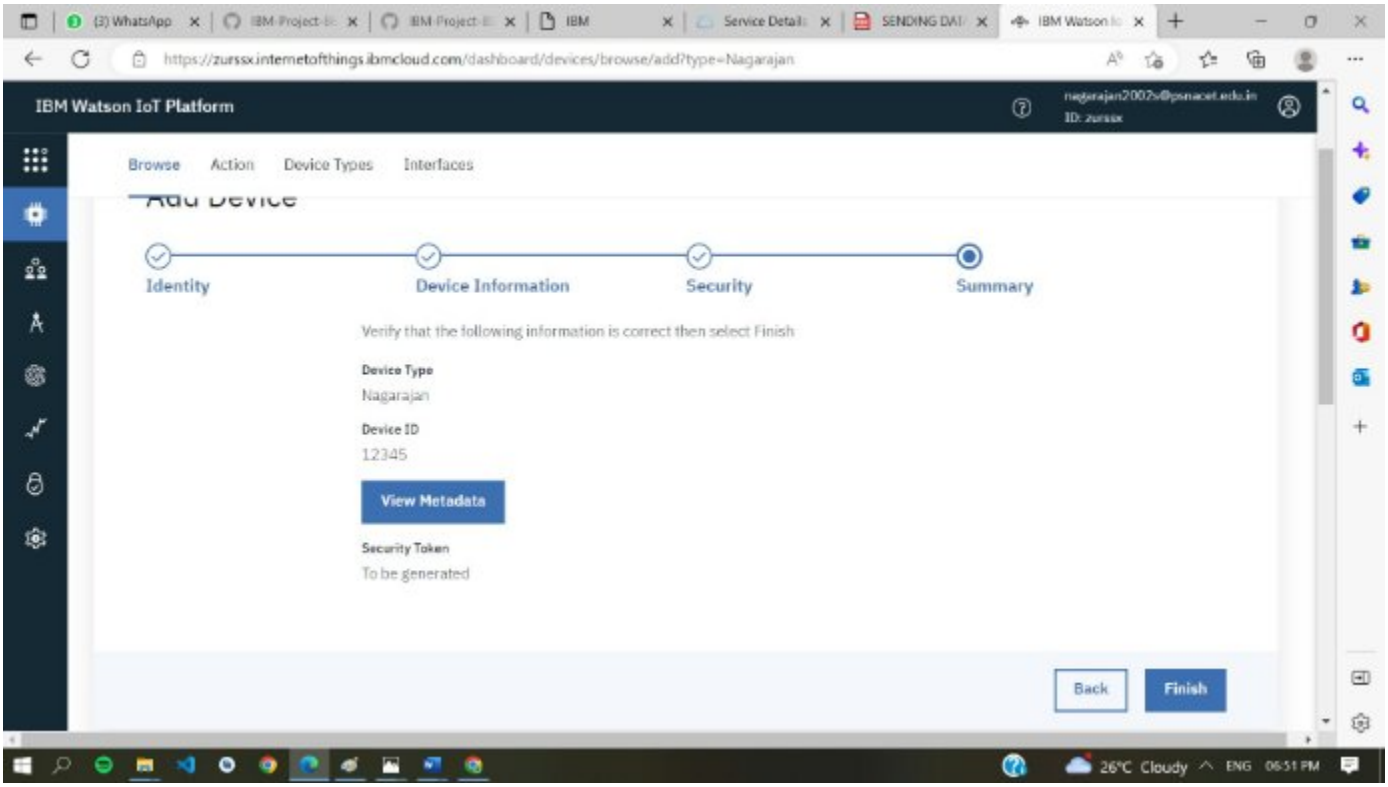
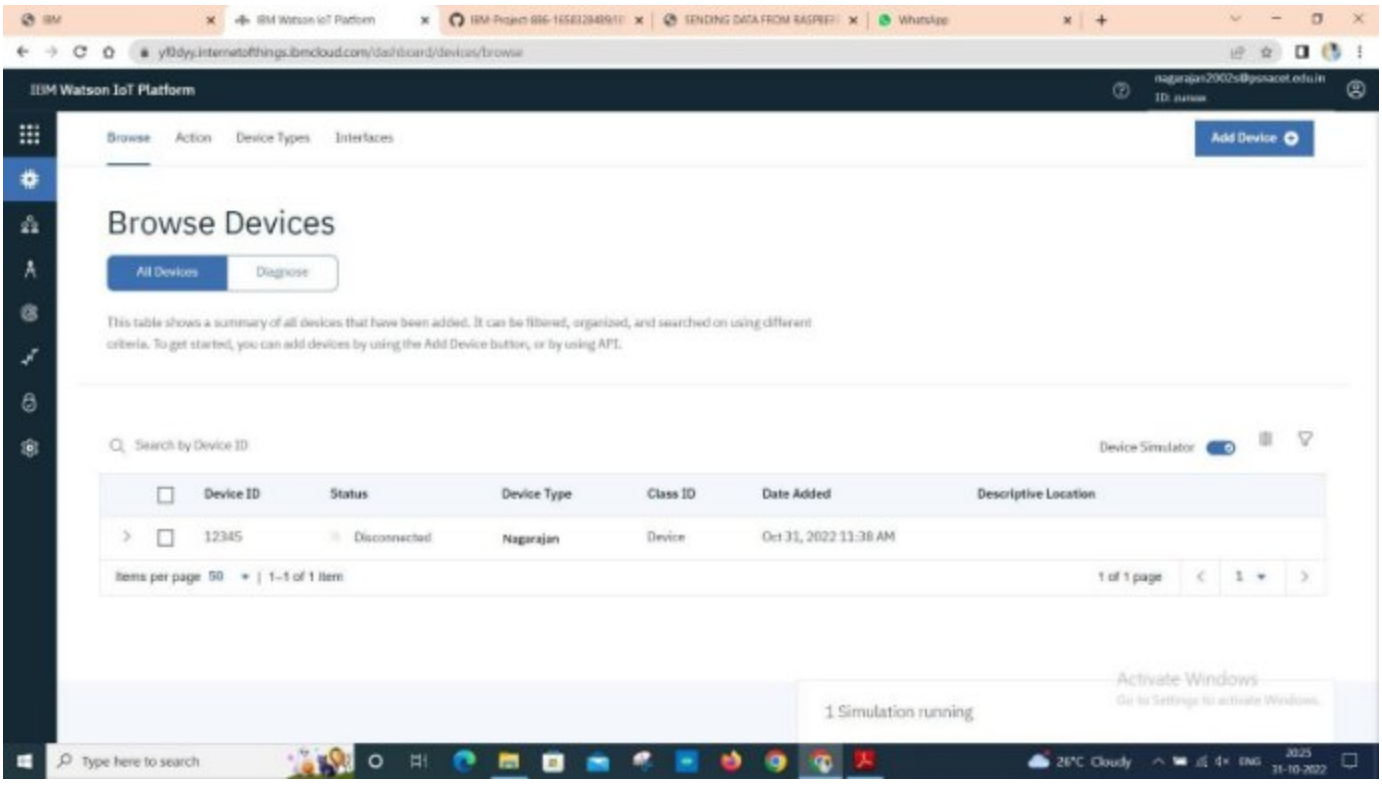
➢ ➢ Click on Finish



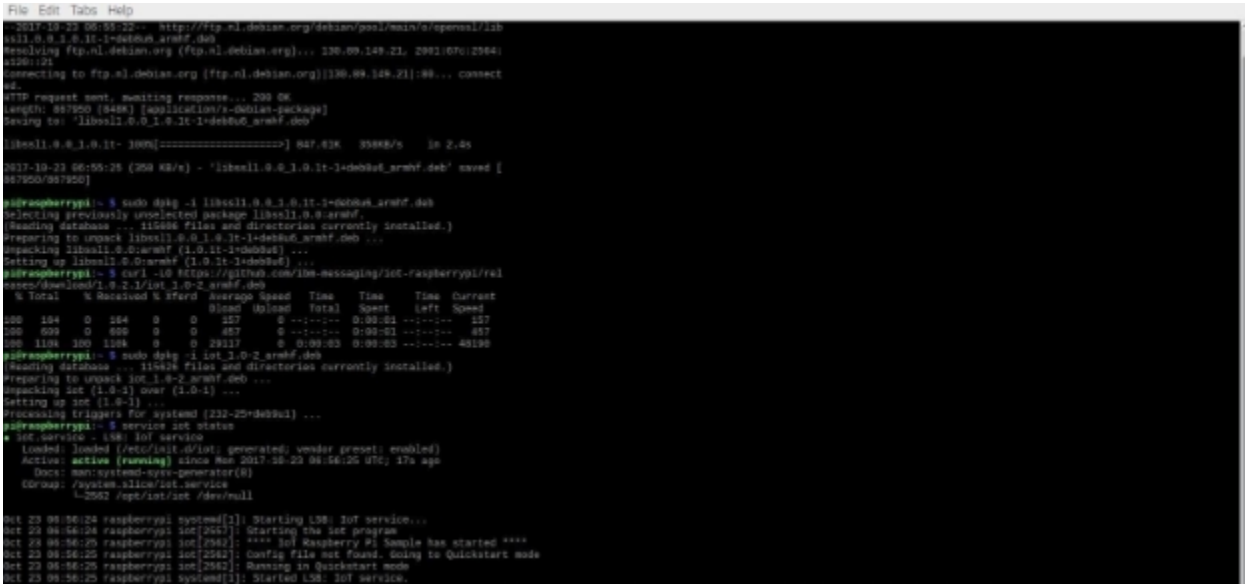
➢ ➢ Device is created


IBM Watson IoT Platform
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
Descriptive Location
12345
Disconnected
Nagarajan
Device
Oct 31, 2022 11:38 AM
Items per page: 50
1–1 of 1 item
1 of 1 page
1 Simulation running
Activate Windows
Type here to search
26°C Cloudy
ENG
2025
31-10-2022

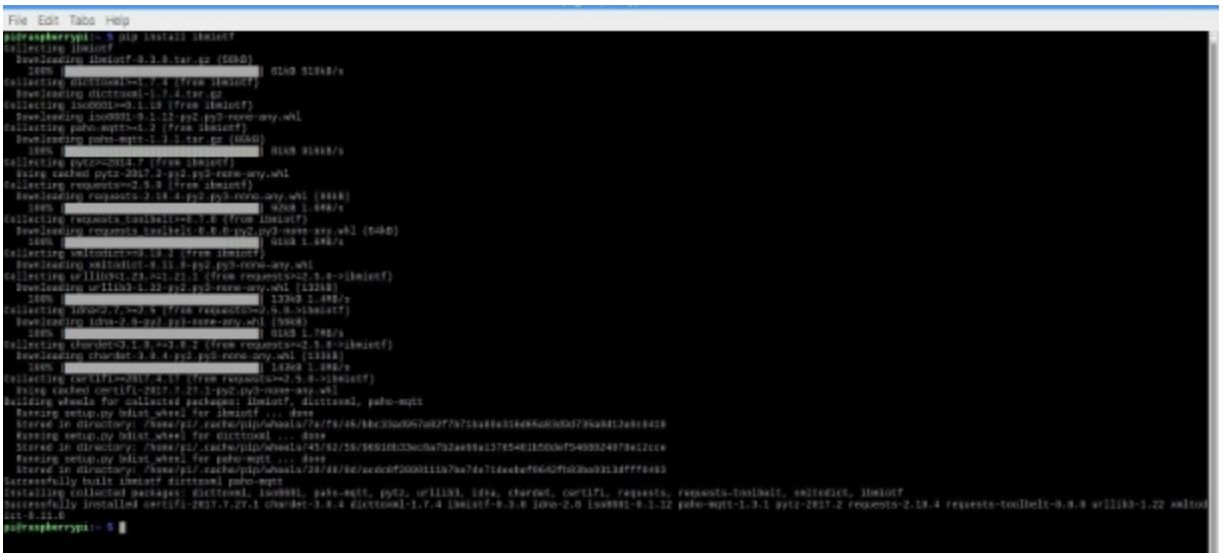
STEP-2: INSTALLING NECESSARY PACKAGES ON YOUR PI:

- 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

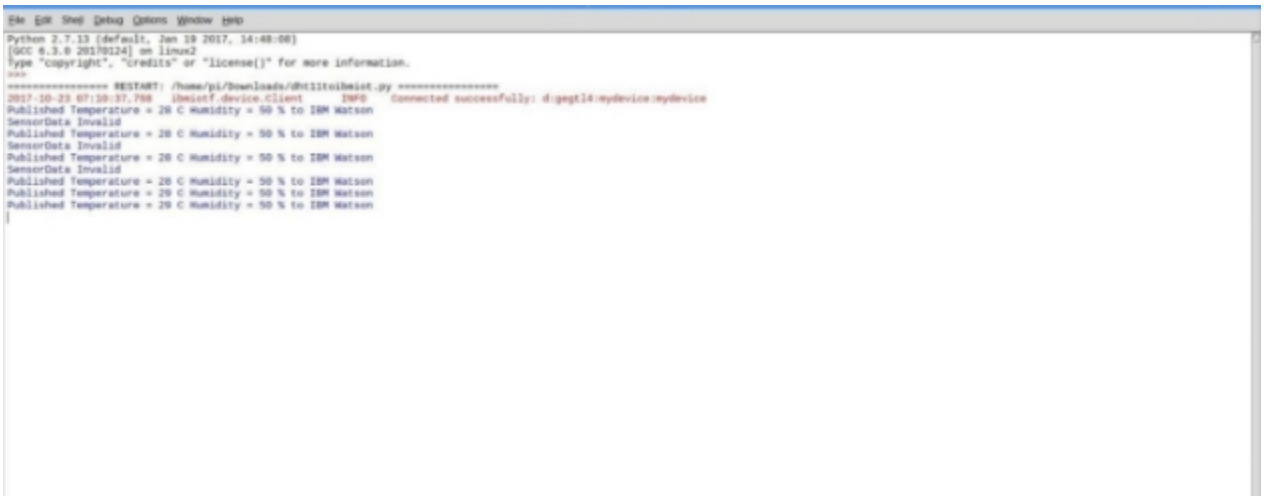
Following are the images as to what appears on your pi's terminal when u type these commands



- Then open your terminal and type pip install ibmiotf

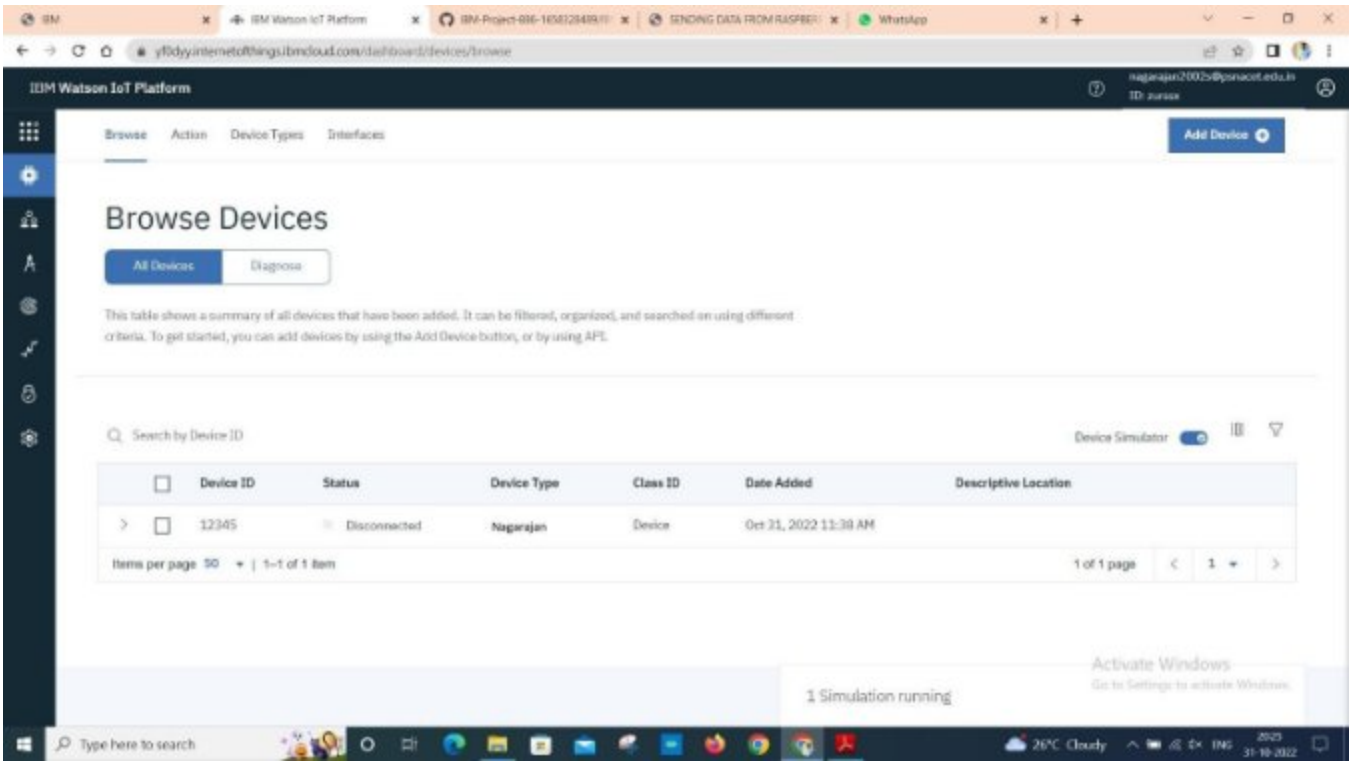

File Edit Tabs Help
pi@raspberrypi:~ $ pip install ibmiotf
Collecting ibmiotf
Downloading ibmiotf-0.3.0.tar.gz (50kB)
100% | 51kB 519kB/s
Collecting dicttoxml>=1.7.4 (from ibmiotf)
Downloading dicttoxml-1.7.4.tar.gz
Collecting iso8601>=0.1.10 (from ibmiotf)
Downloading iso8601-0.1.12-py2.py3-none-any.whl
Collecting paho-mqtt>=1.2 (from ibmiotf)
Downloading paho-mqtt-1.3.1.tar.gz (66kB)
100% | 61kB 916kB/s
Collecting pytz>=2014.7 (from ibmiotf)
Using cached pytz-2017.2-py2.py3-none-any.whl
Collecting requests>=2.5.0 (from ibmiotf)
Downloading requests-2.18.4-py2.py3-none-any.whl (88kB)
100% | 92kB 1.6MB/s
Collecting requests_toolbelt>=0.5.0 (from ibmiotf)
Downloading requests_toolbelt-0.8.0-py2.py3-none-any.whl (54kB)
100% | 61kB 1.6MB/s
Collecting xmltodict>=0.10.2 (from ibmiotf)
Downloading xmltodict-0.11.0-py2.py3-none-any.whl
Collecting urllib3<1.23,>=1.21.1 (from requests>=2.5.0->ibmiotf)
Downloading urllib3-1.22-py2.py3-none-any.whl (132kB)
100% | 133kB 1.4MB/s
Collecting idna<2.7,>=2.5 (from requests>=2.5.0->ibmiotf)
Downloading idna-2.6-py2.py3-none-any.whl (56kB)
100% | 61kB 1.7MB/s
Collecting chardet<3.1.0,>=3.0.2 (from requests>=2.5.0->ibmiotf)
Downloading chardet-3.0.4-py2.py3-none-any.whl (133kB)
100% | 143kB 1.8MB/s
Collecting certifi>=2017.4.17 (from requests>=2.5.0->ibmiotf)
Using cached certifi-2017.7.27.1-py2.py3-none-any.whl
Building wheels for collected packages: ibmiotf, dicttoxml, paho-mqtt
Running setup.py bdist_wheel for ibmiotf ... done
Stored in directory: /home/pi/.cache/pip/wheels/7a/f9/a6/bbc35a8967a0f2f7b71ba88e316d64a836dd7d6a4d12a8c641
Running setup.py bdist_wheel for dicttoxml ... done
Stored in directory: /home/pi/.cache/pip/wheels/45/82/59/5691038339e6a8a1378544818508e5490892487941e12cce
Running setup.py bdist_wheel for paho-mqtt ... done
Stored in directory: /home/pi/.cache/pip/wheels/20/39/6d/ae6c6f2000111b7ba7dc7daebef0642fb03ba0313dfff8493
Successfully built ibmiotf dicttoxml paho-mqtt
Installing collected packages: dicttoxml, iso8601, paho-mqtt, pytz, urllib3, idna, chardet, certifi, requests, requests-toolbelt, xmltodict, ibmiotf
Successfully installed certifi-2017.7.27.1 chardet-3.0.4 dicttoxml-1.7.4 ibmiotf-0.3.0 idna-2.6 iso8601-0.1.12 paho-mqtt-1.3.1 pytz-2017.2 requests-2.18.4 requests-toolbelt-0.8.0 urllib3-1.22 xmltodict-0.11.0
pi@raspberrypi:~ $

- 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:



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 thenyour data is being received.


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Browse Devices
All Devices
Diagnose
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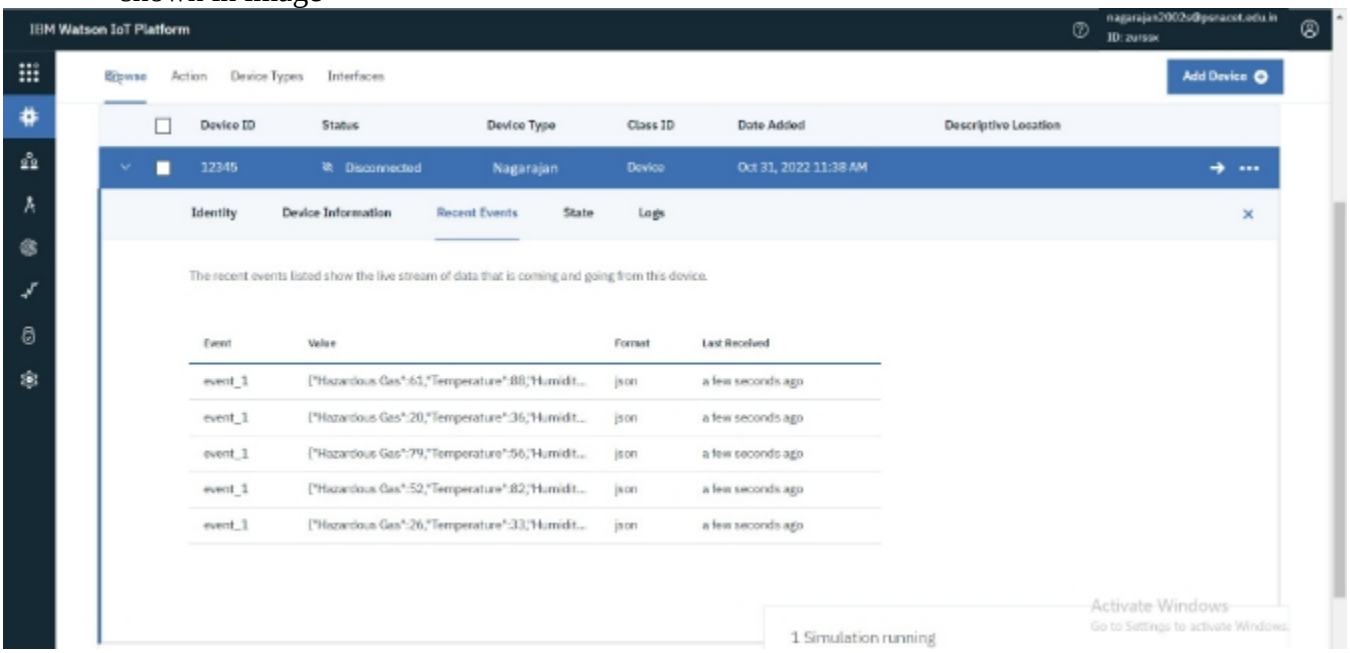
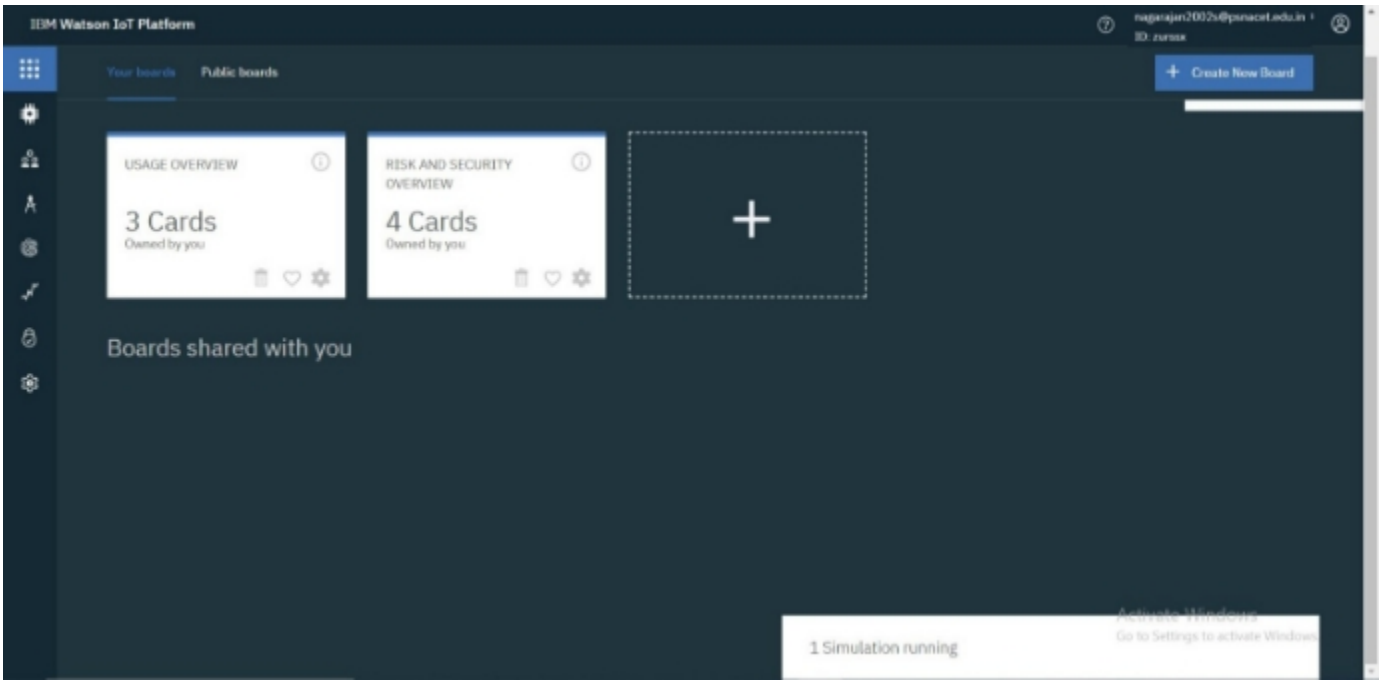
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
12345
Disconnected
Nagarajan
Device
Oct 31, 2022 11:38 AM
Items per page 50
1–1 of 1 item
1 of 1 page
1 Simulation running
Activate Windows
Type here to search
26°C Cloudy

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



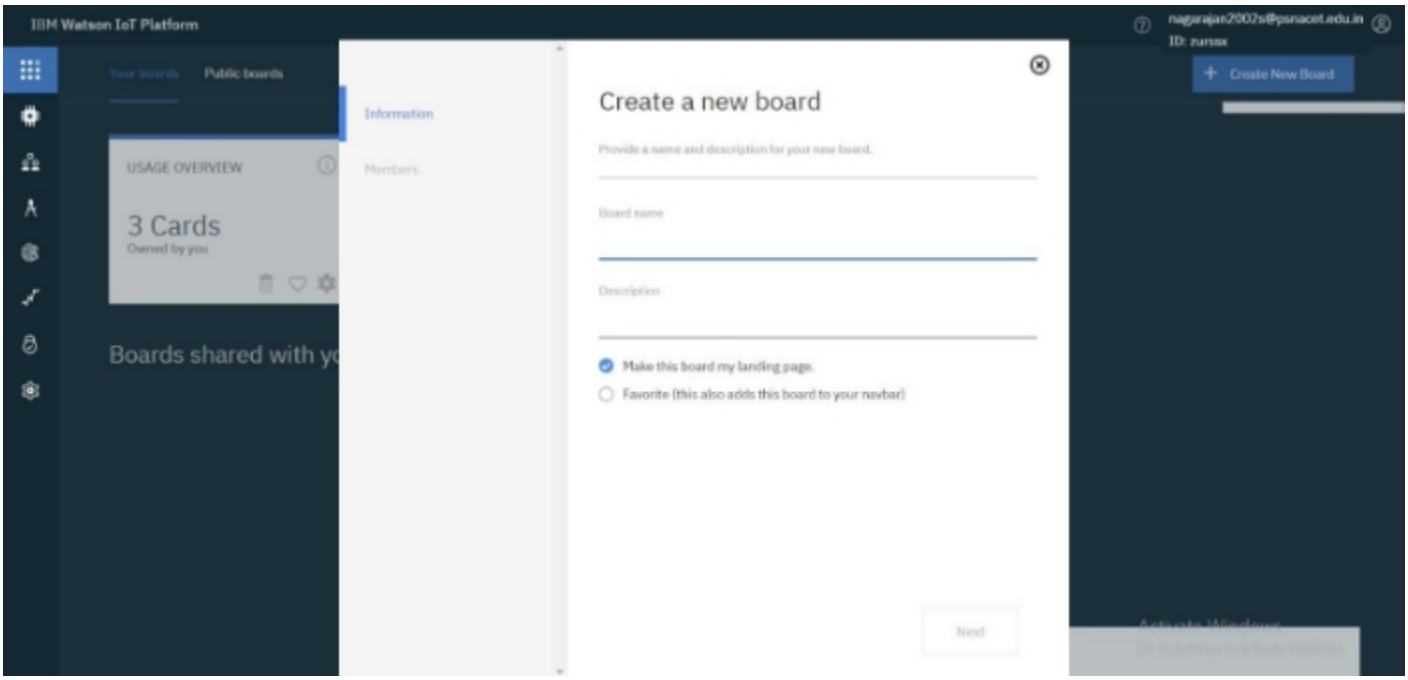
Step-4: Creating boards and cards for visualization of data:

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

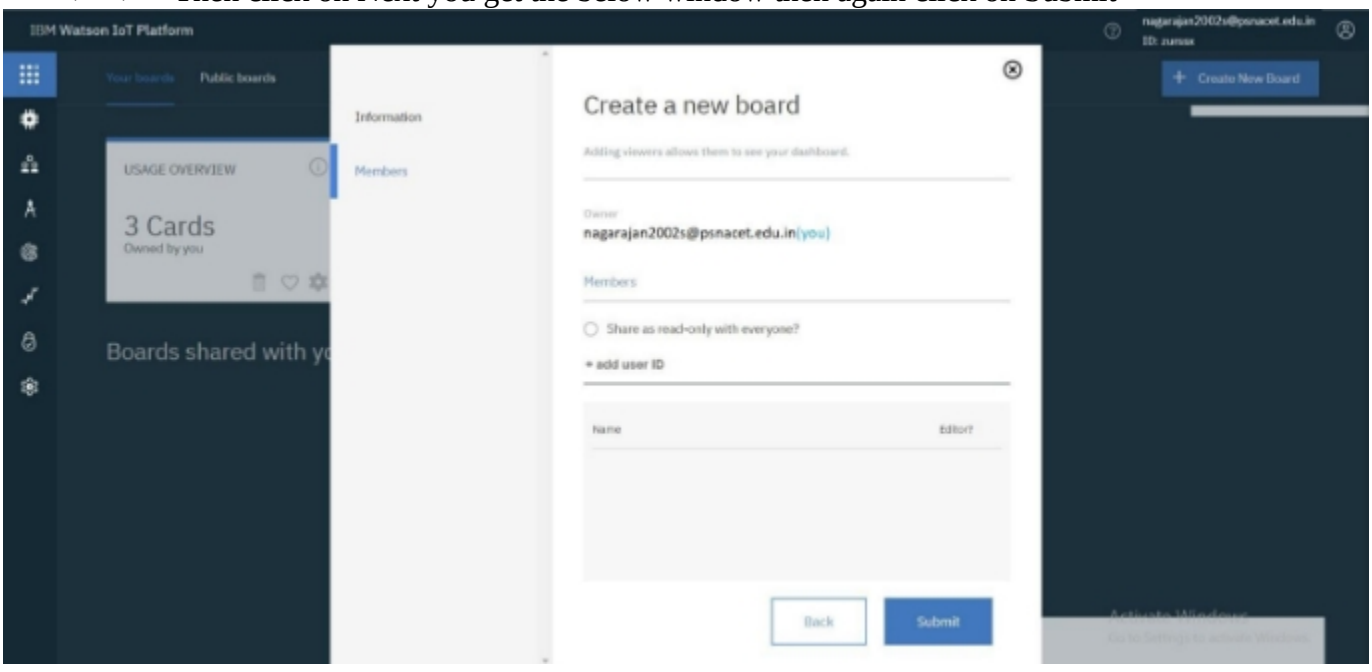


- Click on Create a new board to create a board .

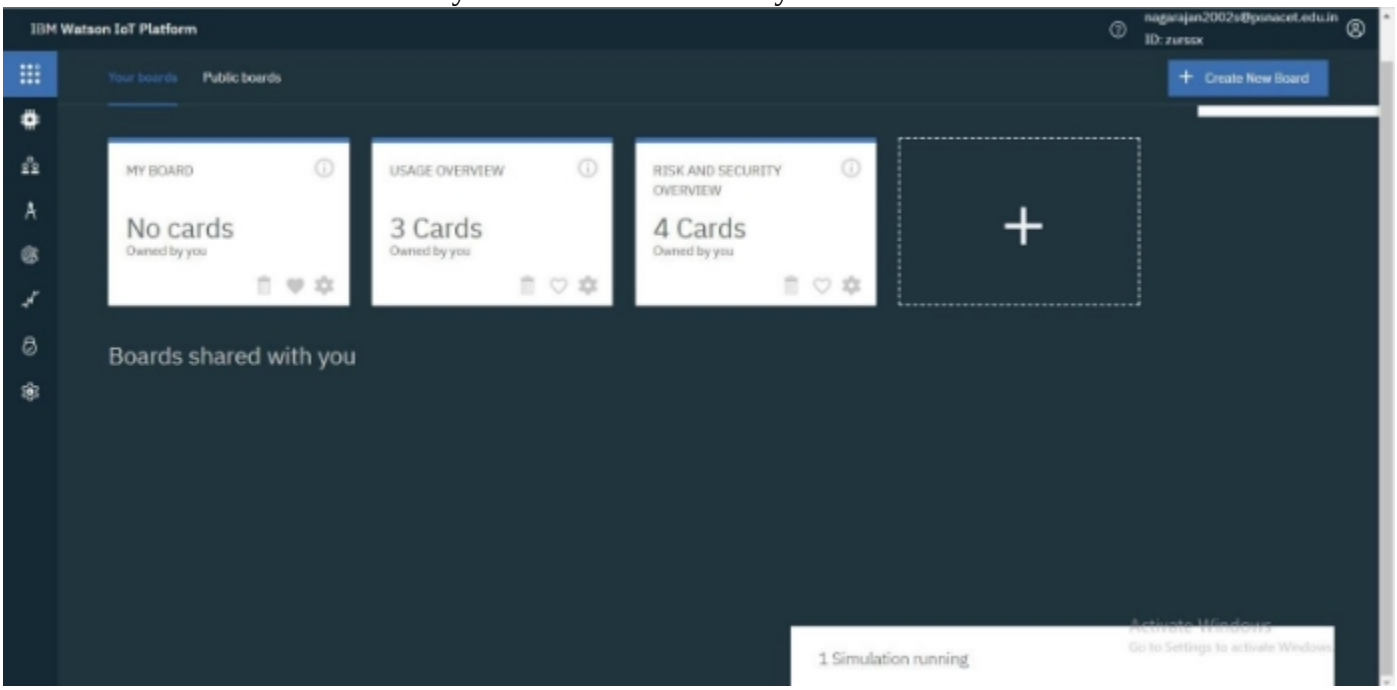
The given below window appears give a name and description to your board as shown in the windowbelow.



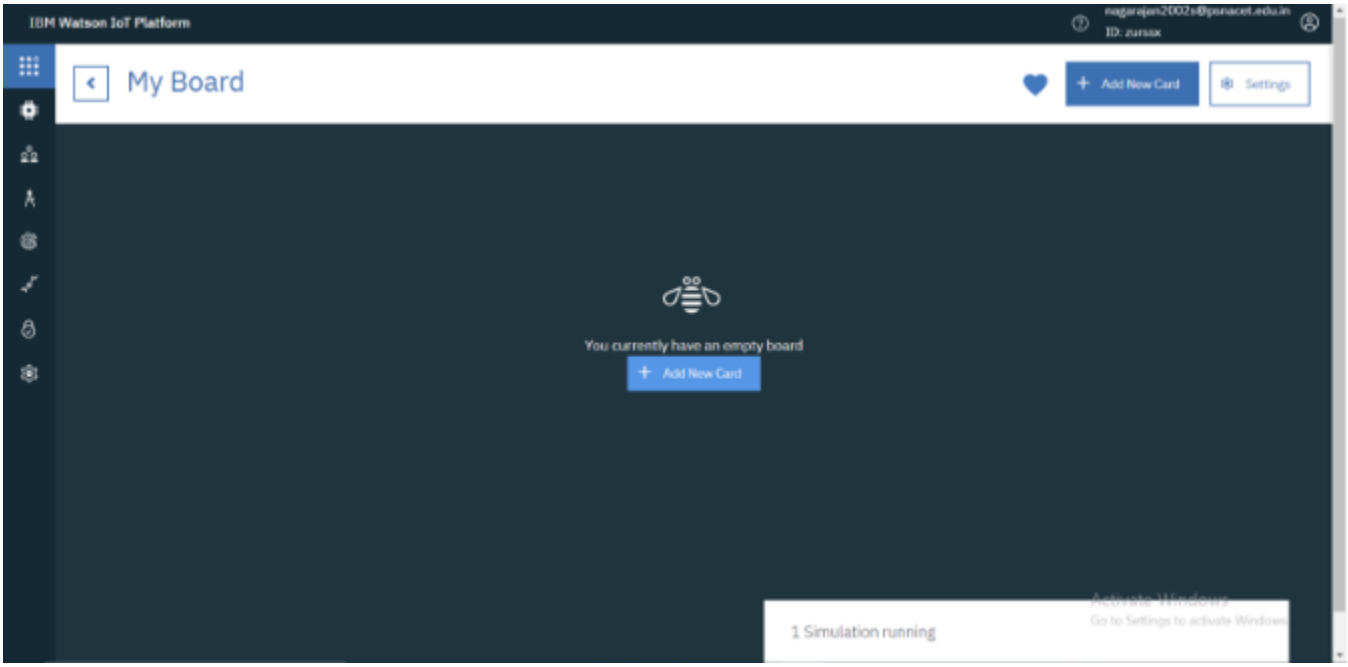
- Then click on Next you get the below window then again click on Submit



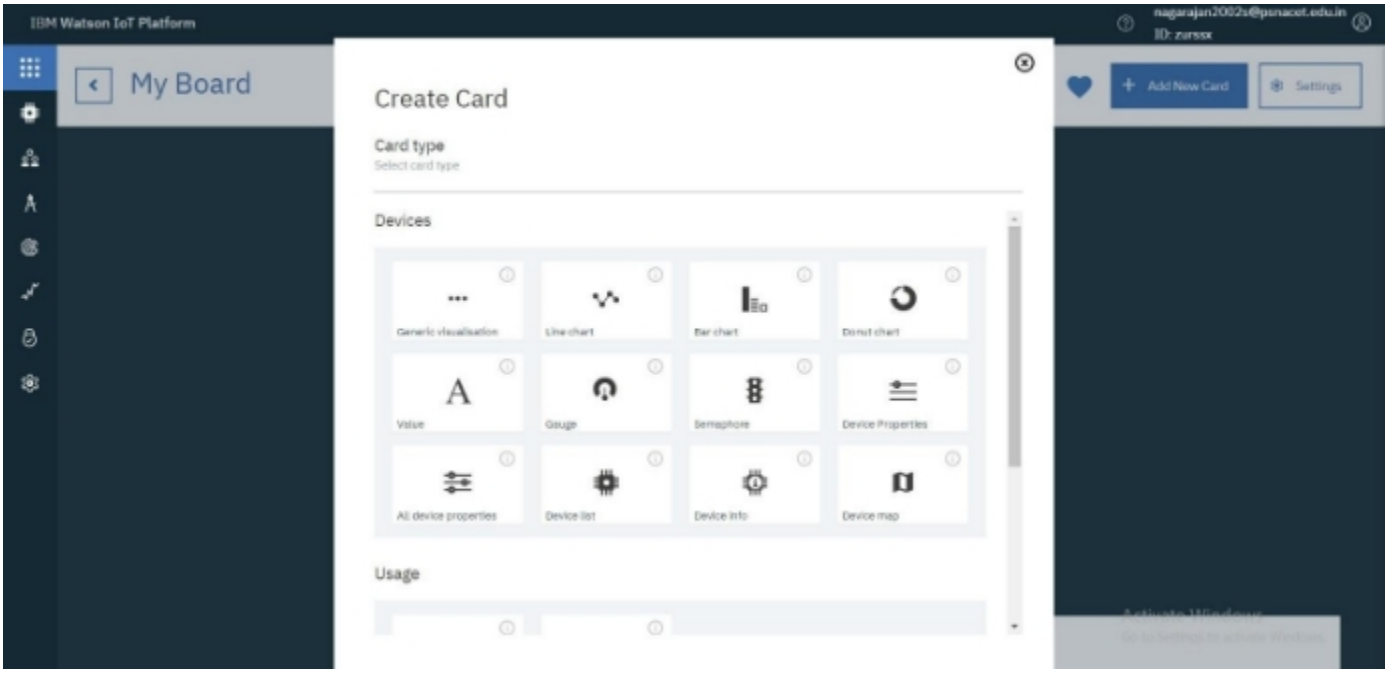
➢ ➢ Then double click on your boards name which you have created.



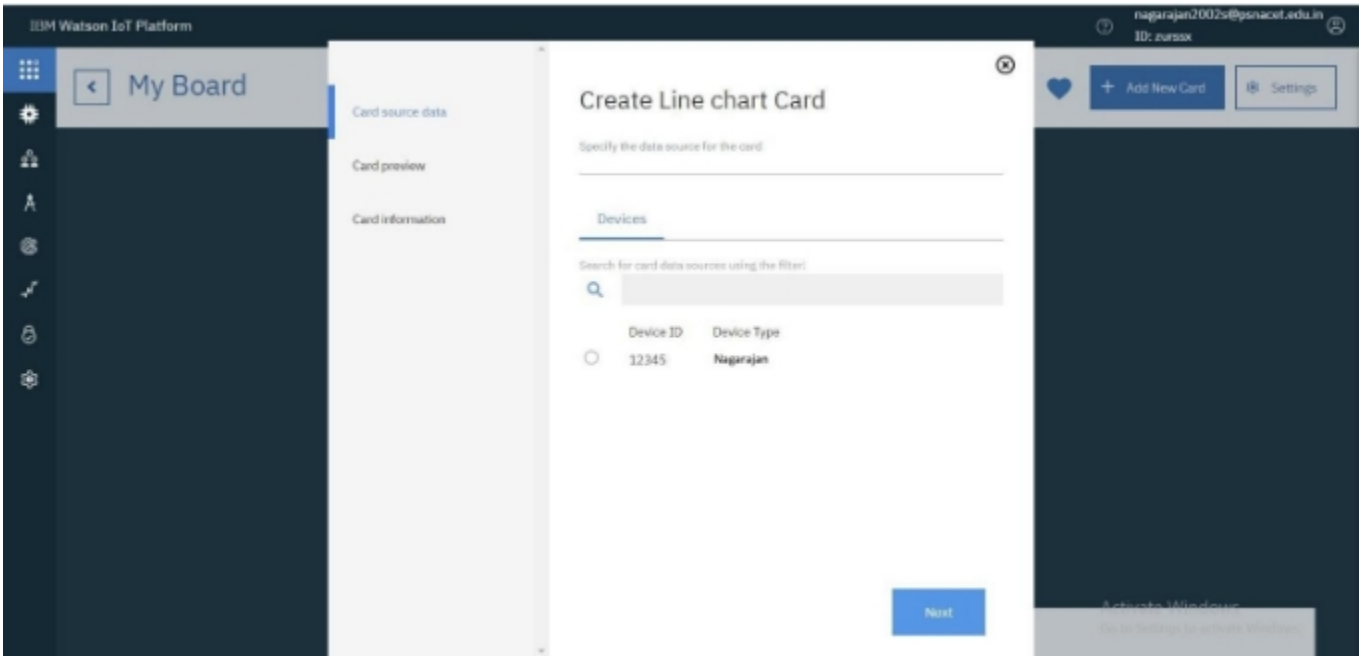
➢ ➢ Click on Add New Card



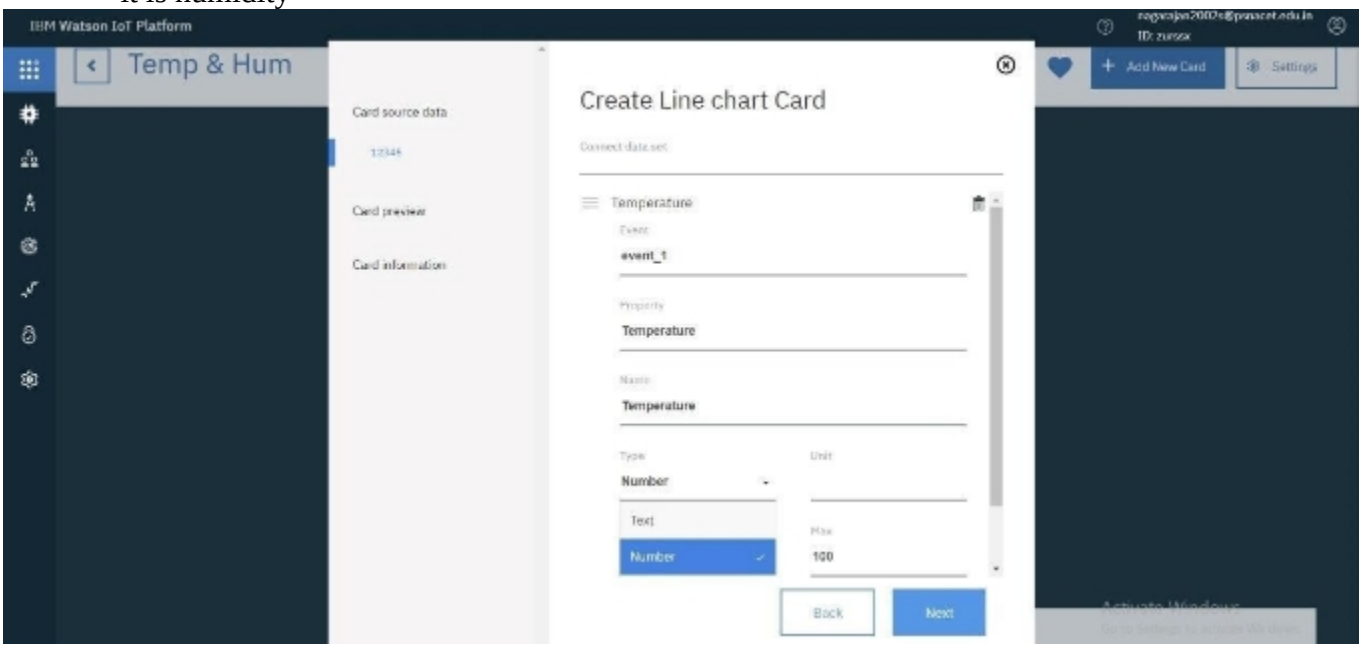
- Select the type of Graph u want accordingly and click next



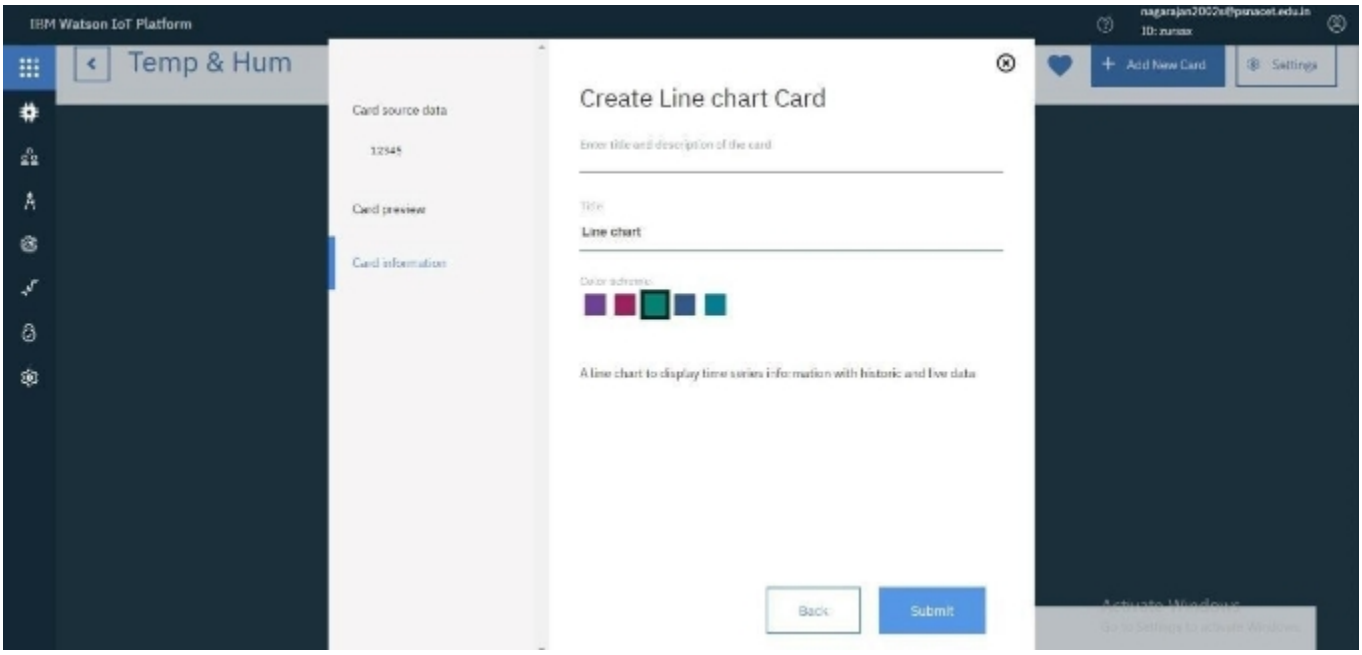
- You get the below window, choose the Device and click on Next.



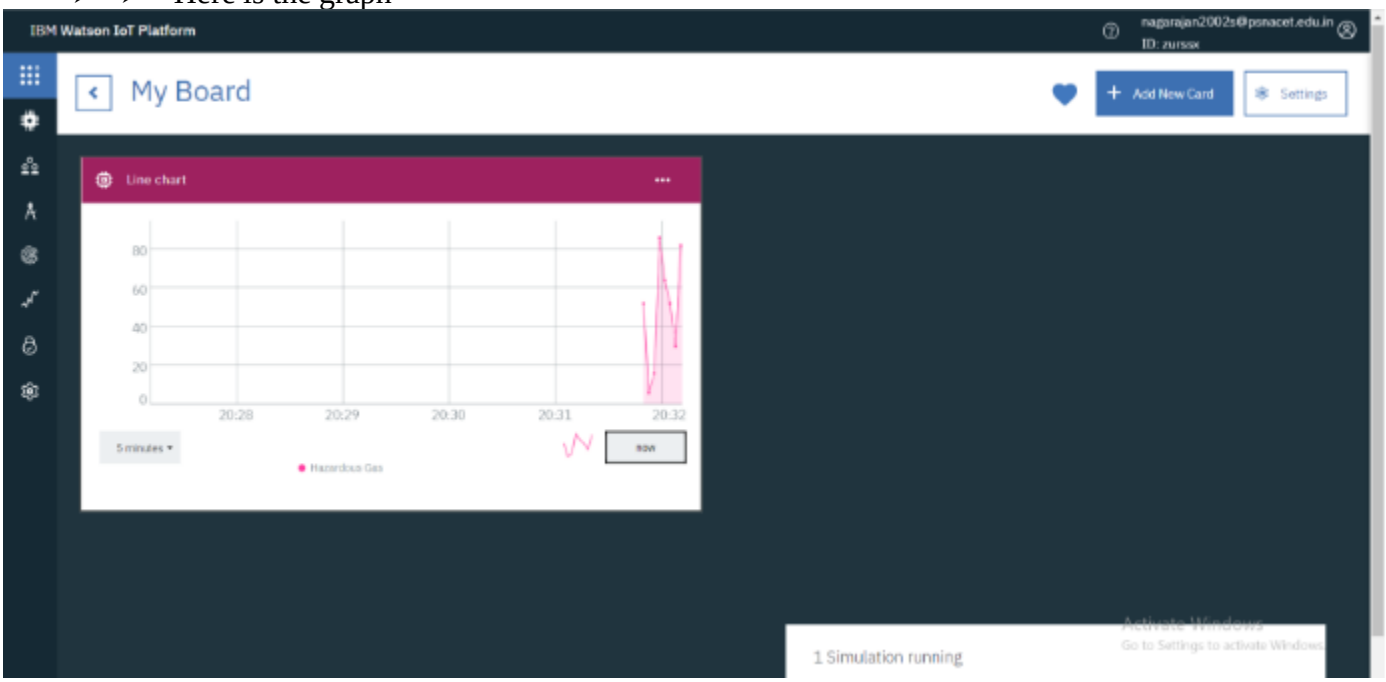
- ➢ Select the event, properly to be visualized on your graph and click next. In my case it is humidity



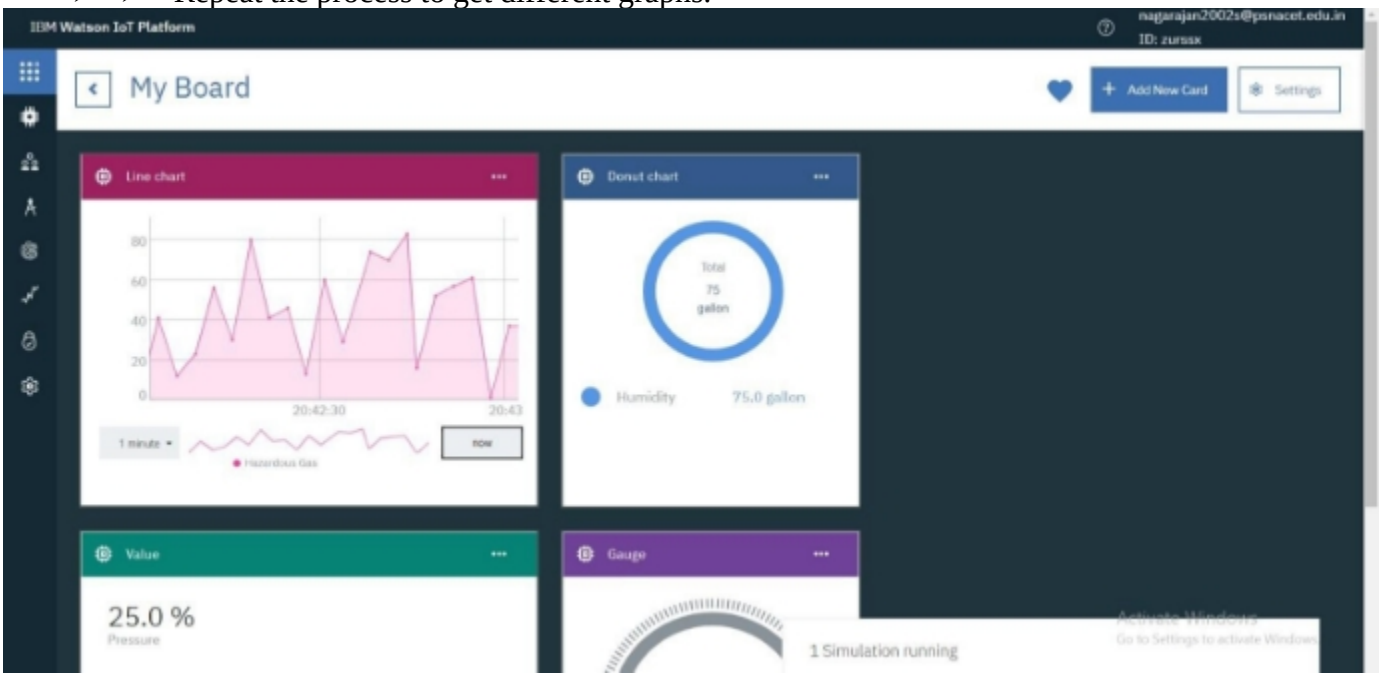
- ➢ Then select the size of the graph and color of the graph board you want and click next

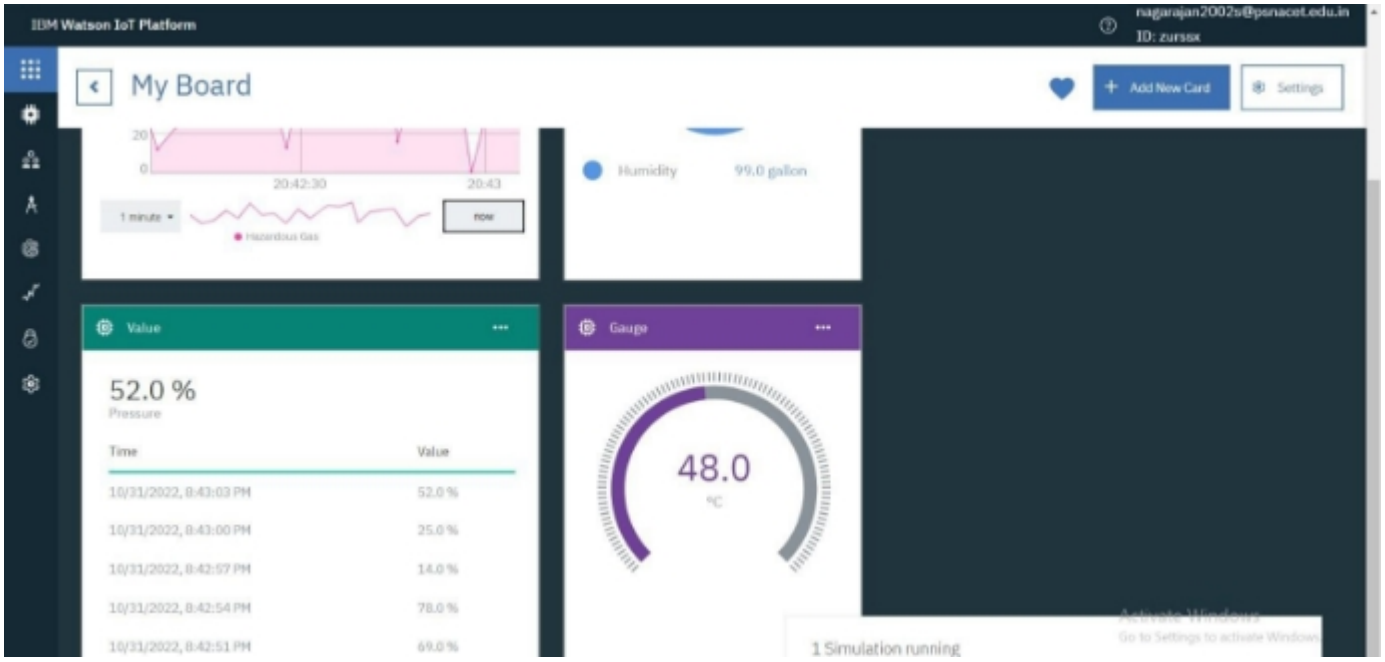


➢ ➢ Here is the graph



➢ ➢ Repeat the process to get different graphs.





RESULT:

Hence, we were able to send data from our pi to IBM Watson and visualize it on a graph.