

# SENDING DATA FROM RASPBERRY-PI TO IBM WATSON

Date	7 <sup>th</sup> November 2022
Team ID	PNT2022TMID53722
Project Name	Smart Waste Management Using IOT in Metropolitan cities

## AIM:

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

## REQUIREMENTS:

### HARDWARE:

- 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

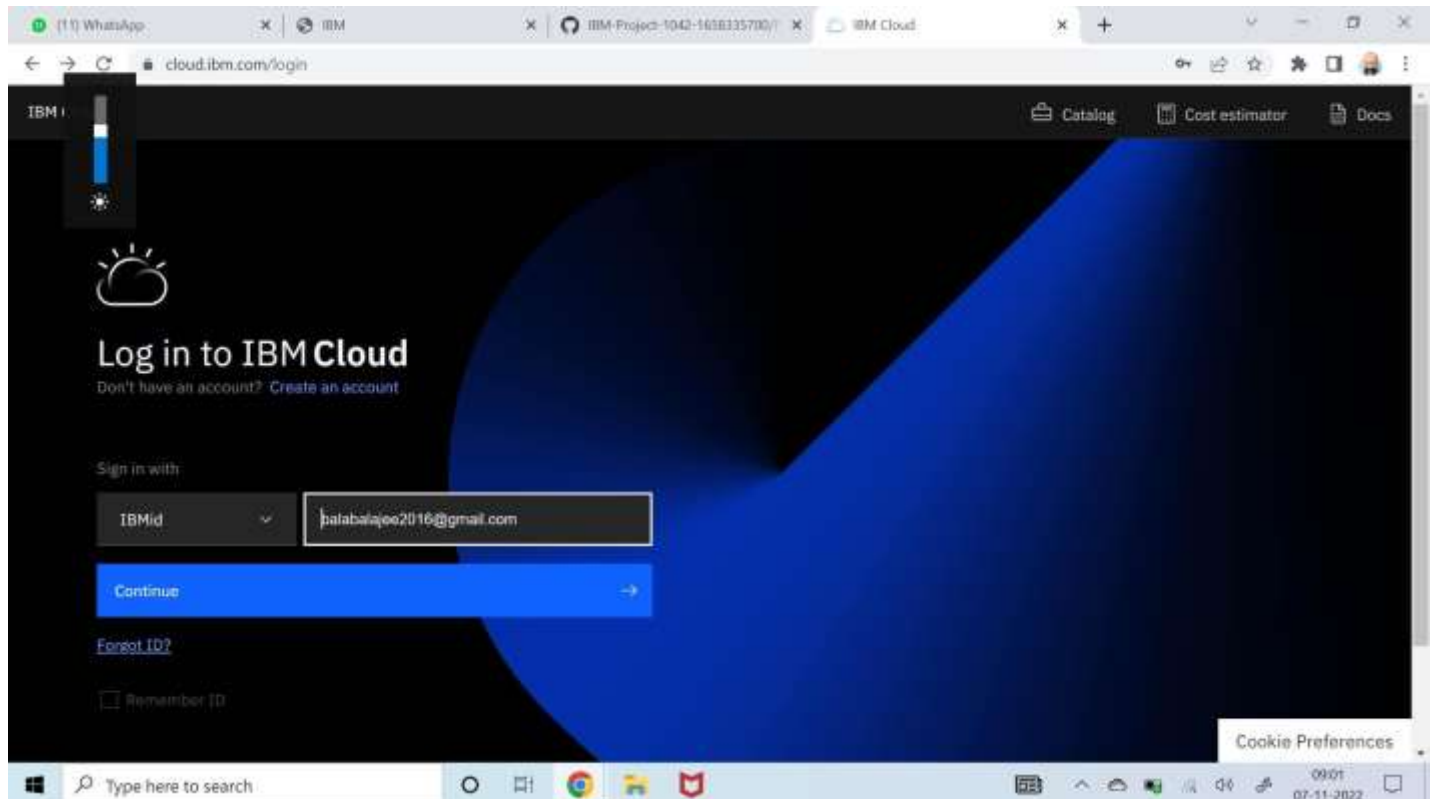
### SOFTWARE:

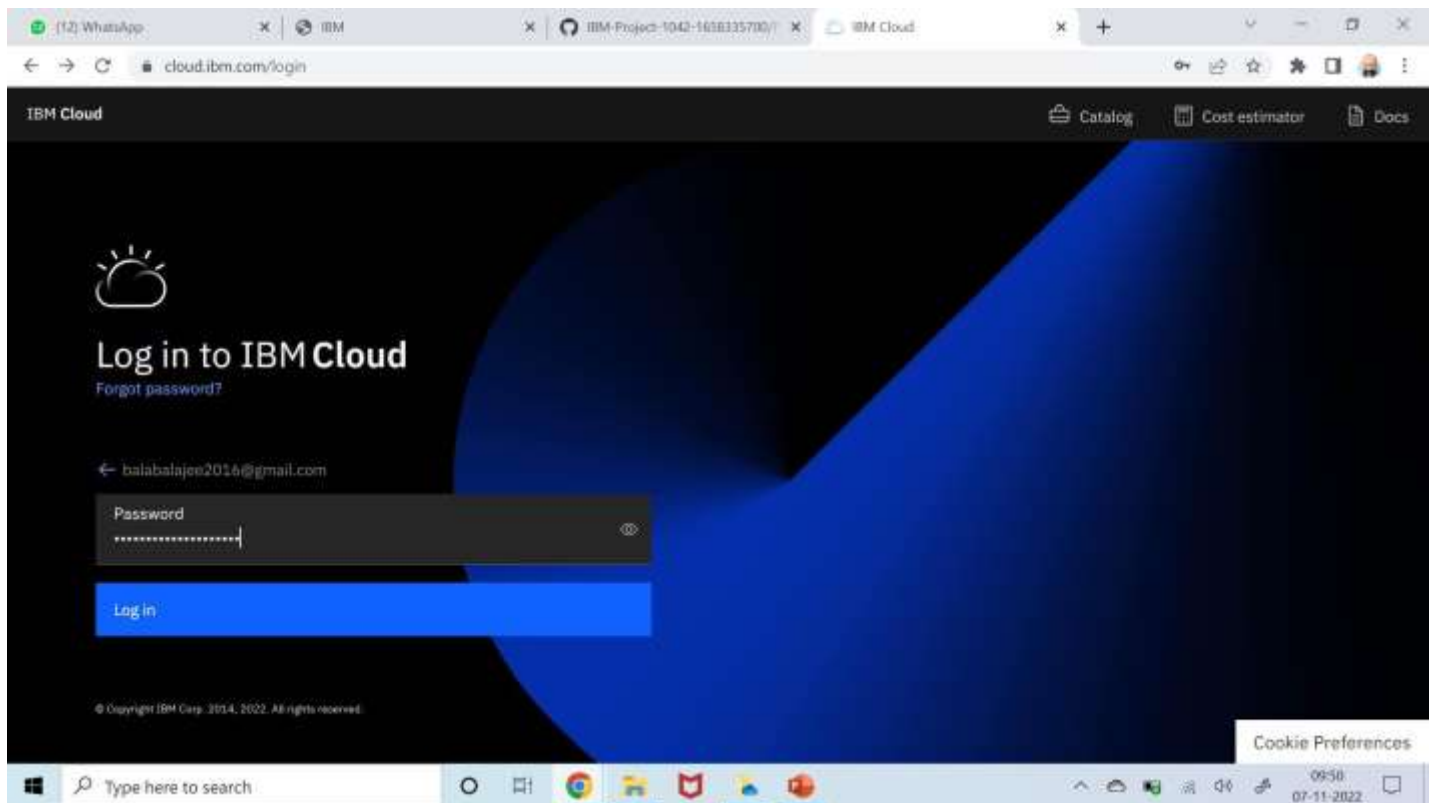
- IBM BLUEMIX ACCOUNT

## STEPS TO BE FOLLOWED

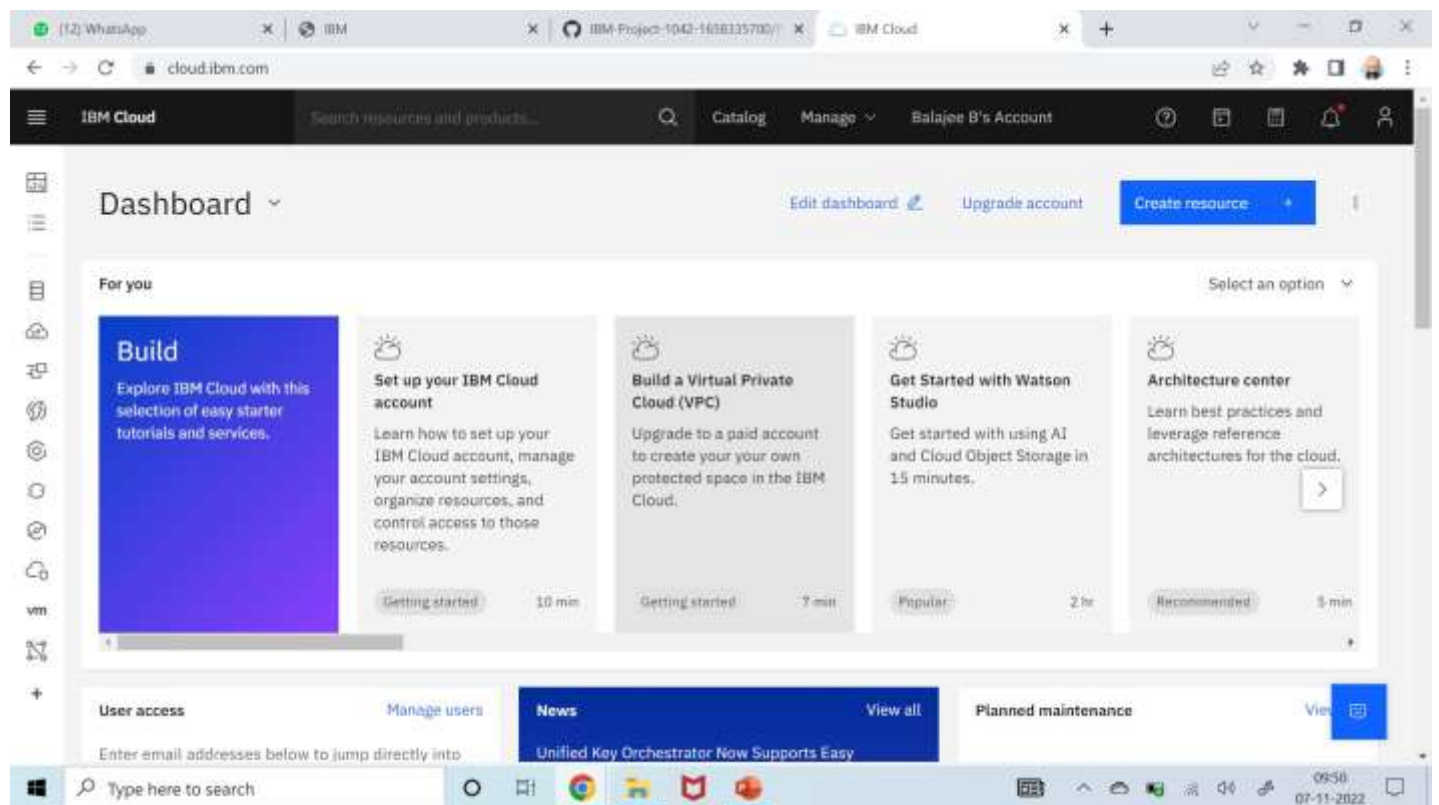
### Step-1: Create a device in IBM Watson:

- 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.



- Check all details and click on create.

The screenshot shows the IBM Cloud 'Internet of Things Platform' creation page. The URL is [cloud.ibm.com/catalog/services/internet-of-things-platform](https://cloud.ibm.com/catalog/services/internet-of-things-platform). The page has a dark header with 'IBM Cloud', a search bar, and navigation links for 'Catalog', 'Manage', and 'Balajee B's Account'. The main content area is divided into a left sidebar, a central form, and a right summary panel.

**Left Sidebar:**

- Type: Service
- Provider: IBM
- Last updated: 08/15/2022
- Category: Internet of Things
- Compliance: IAM-enabled
- Location: Frankfurt (eu-de)

**Central Form:**

- Create** (active) / About
- Select a location: Frankfurt (eu-de)
- 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.	Free

**Right Summary Panel:**

- Summary**
- Internet of Things Platform** **Free**
- Location: Frankfurt
- Plan: Lite
- Service name: Internet of Things Platform-og
- Resource group: Default
- ☒ I have read and agree to the following license agreements: [Terms](#)
- Create** (blue button)
- Add to estimate

- click on Launch

The screenshot shows the 'Service Details' page for the 'Internet of Things Platform-og' in the IBM Cloud console. The URL is [cloud.ibm.com/services/iotf-service/cm763Av1%3Abluemix%3Apublic%3AIotf-service%3Aeu-de%3Aa%2F5d1e05e128ac4d40b960b9f2faefe14%3Ac...](https://cloud.ibm.com/services/iotf-service/cm763Av1%3Abluemix%3Apublic%3AIotf-service%3Aeu-de%3Aa%2F5d1e05e128ac4d40b960b9f2faefe14%3Ac...). The page has a dark header with 'IBM Cloud', a search bar, and navigation links for 'Catalog', 'Manage', and 'Balajee B's Account'.

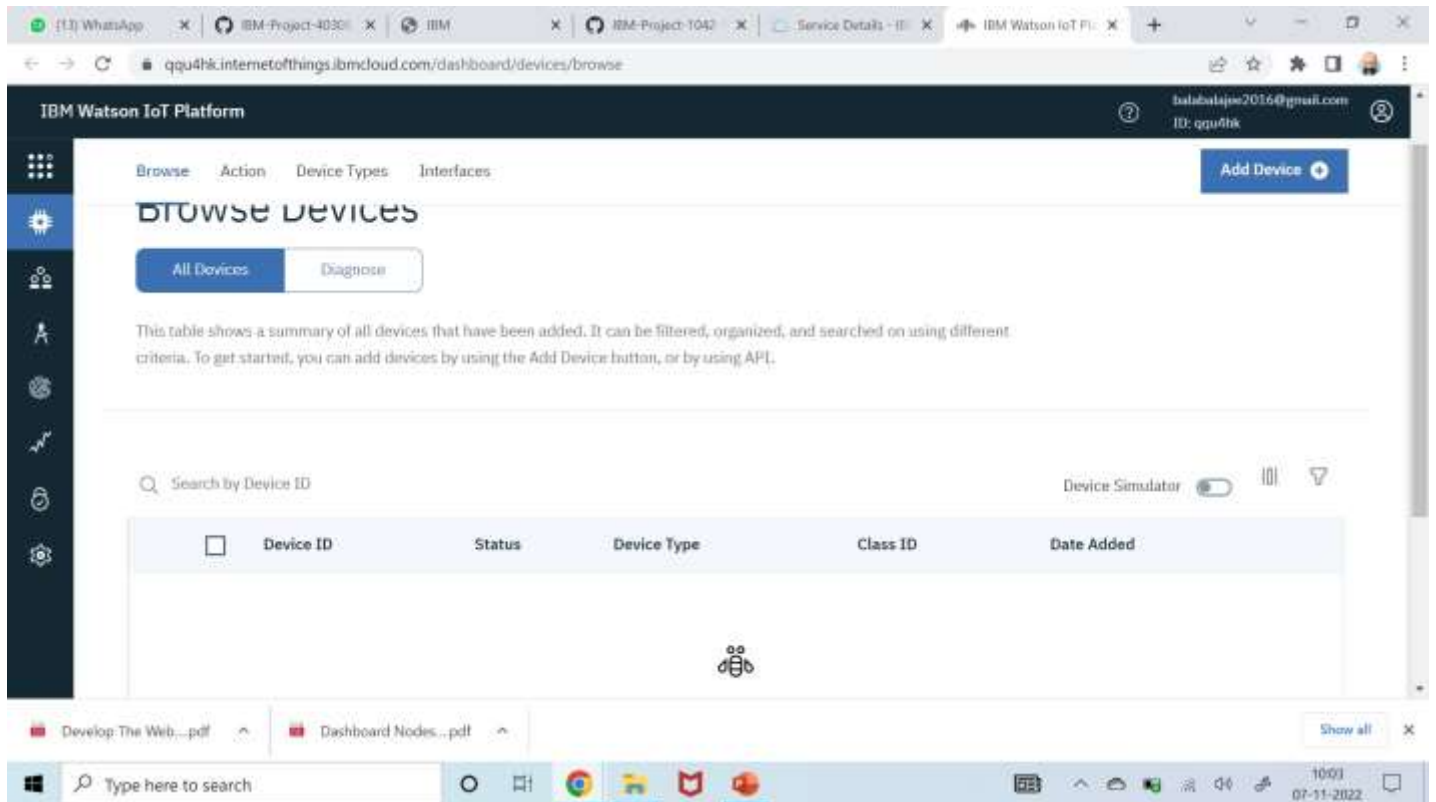
**Left Sidebar:**

- Manage** (active)
- Plan
- Connections

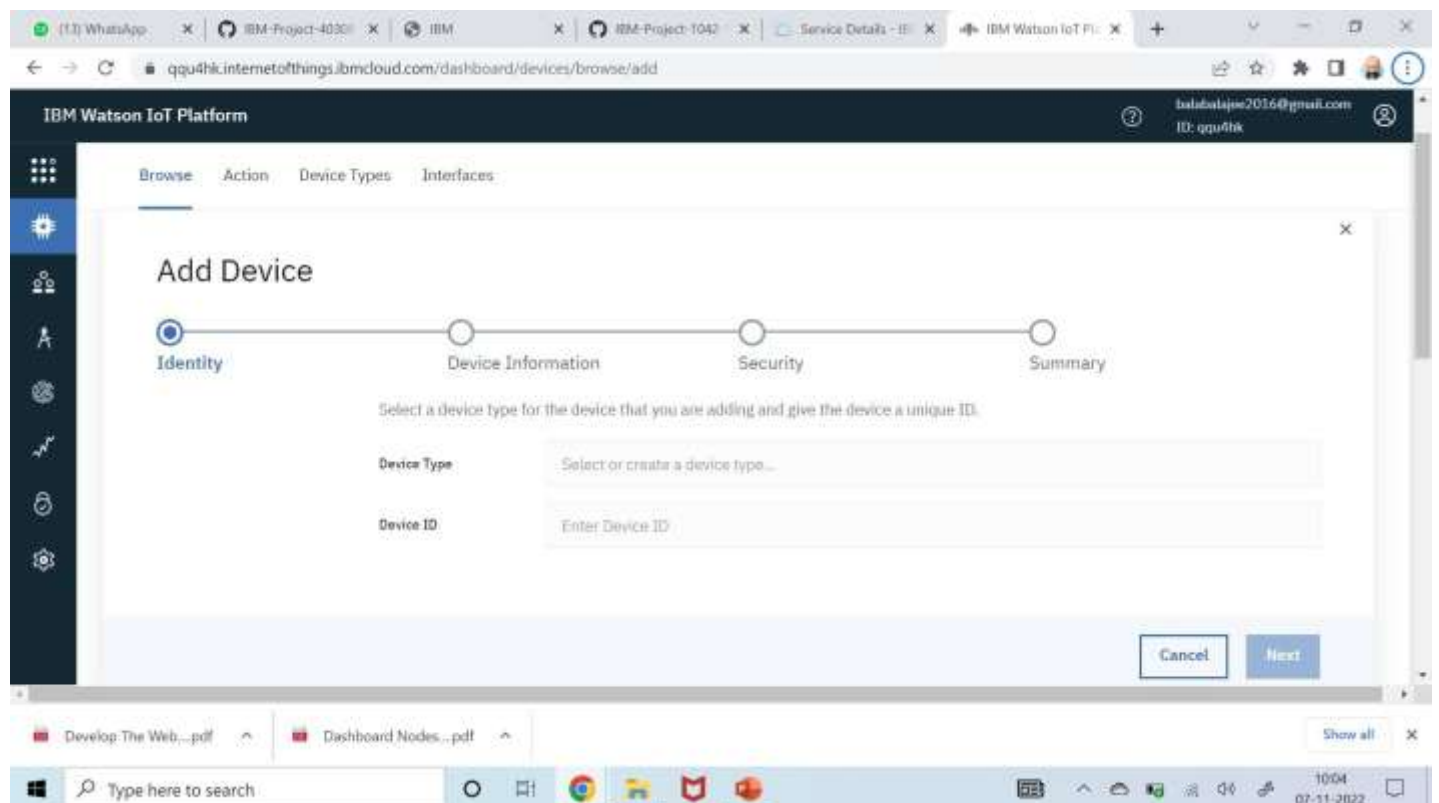
**Main Content Area:**

- Internet of Things Platform-og** Active [Add tags](#)
- [Details](#) [Actions...](#)
- 
- 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.
- Launch** (blue button) [Docs](#)
- Ready for the next level?**
- IBM Watson IoT Platform Journey**
- ☒ Lite ☐ Non-Production

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



- After click on Add device this page will open



- Go to device type and fill the details.

IBM Watson IoT Platform

balabala2016@gmail.com  
ID: qqu4hk

Browse Action **Device Types** Interfaces

## Add Type

Identity Device Information

Device-types group devices that have similar characteristics, such as model number, firmware version, or location. Give the device type a unique name and a description that identifies characteristics that are shared by devices of this type.

Type  Or

Name

The device type name is used to identify the device type uniquely and uses a restricted set of characters to make it suitable for API use.

Description

Develop: The Web...pdf Dashboard Nodes...pdf

Type here to search

10:13  
07-11-2022

- Click on Finish

IBM Watson IoT Platform

balabala2016@gmail.com  
ID: qqu4hk

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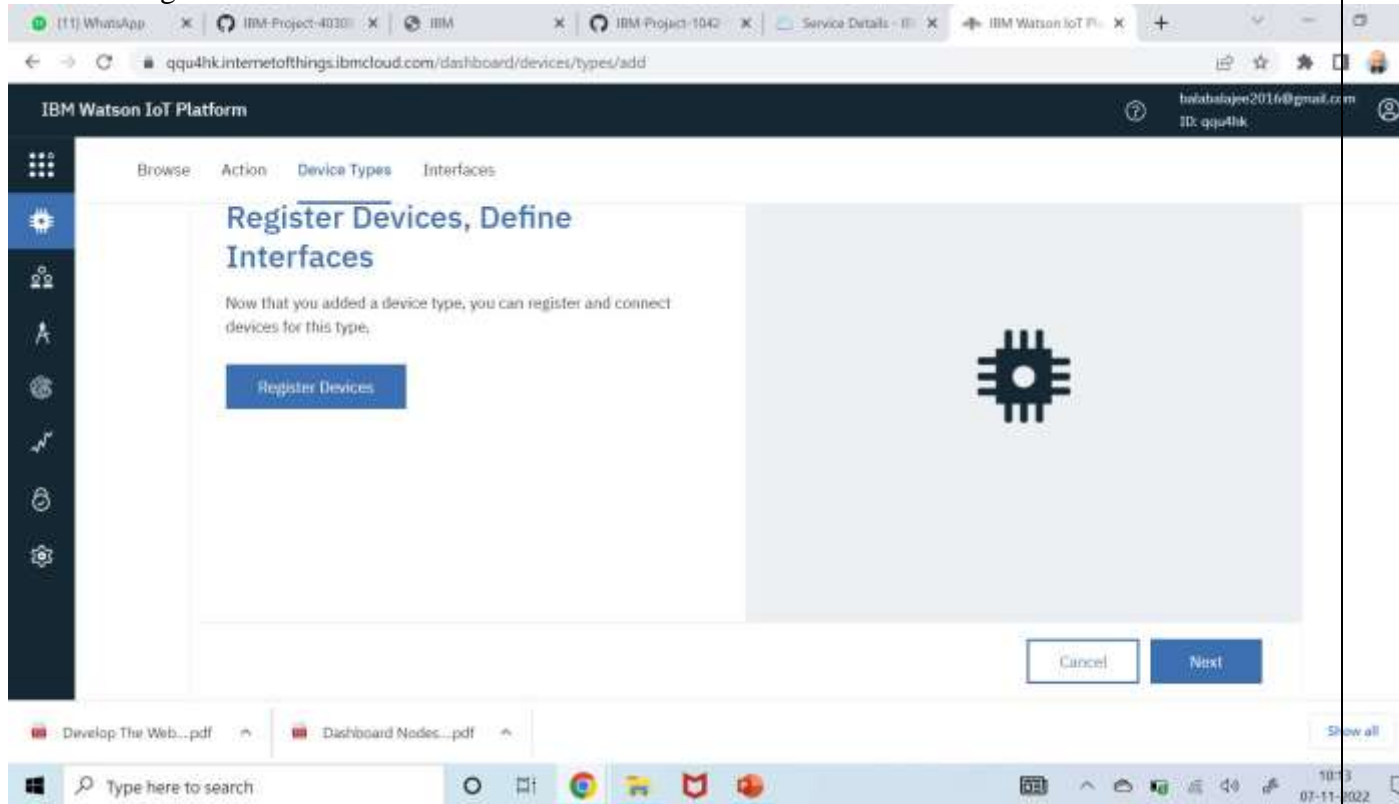
Description

Develop: The Web...pdf Dashboard Nodes...pdf

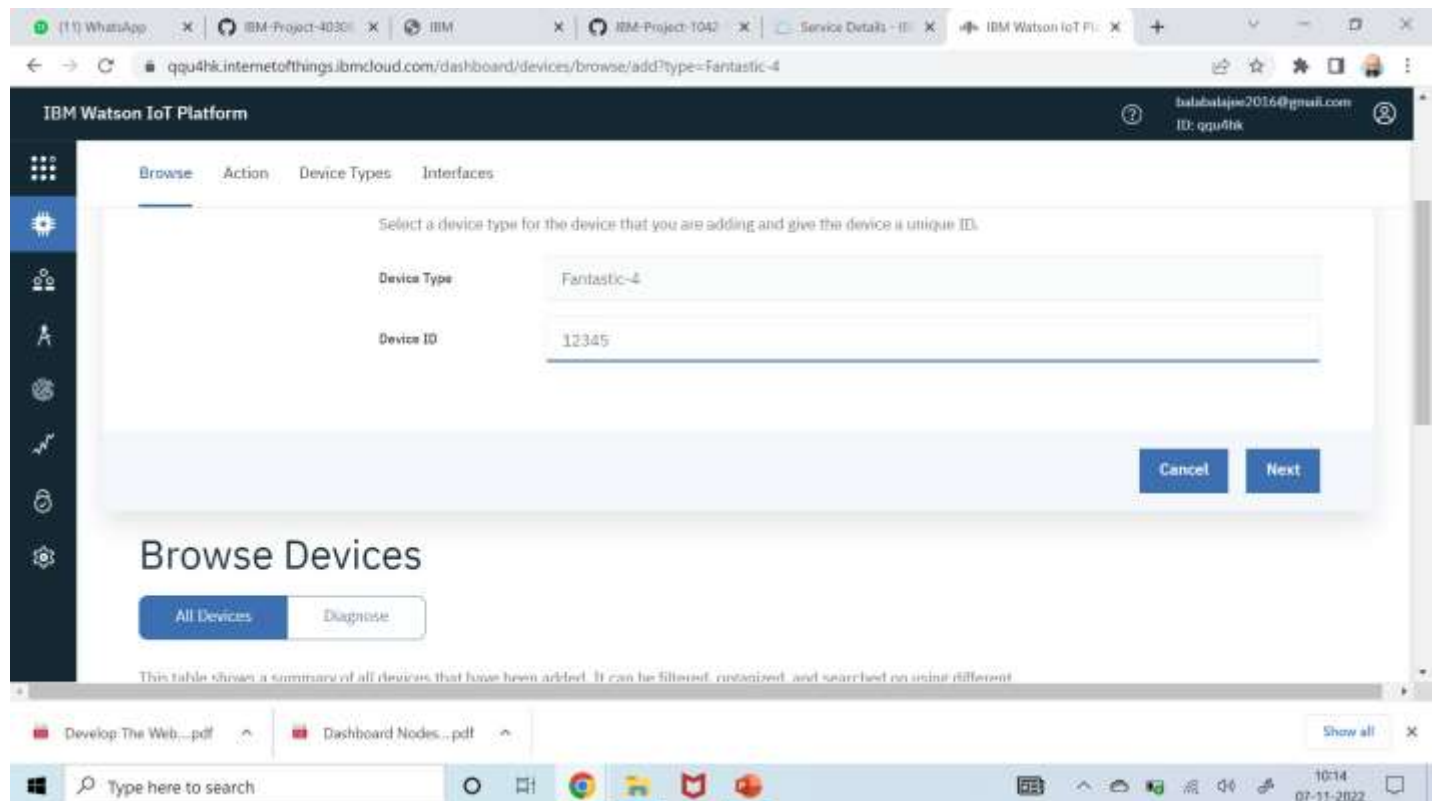
Type here to search

10:13  
07-11-2022

- Click on Register Device.



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



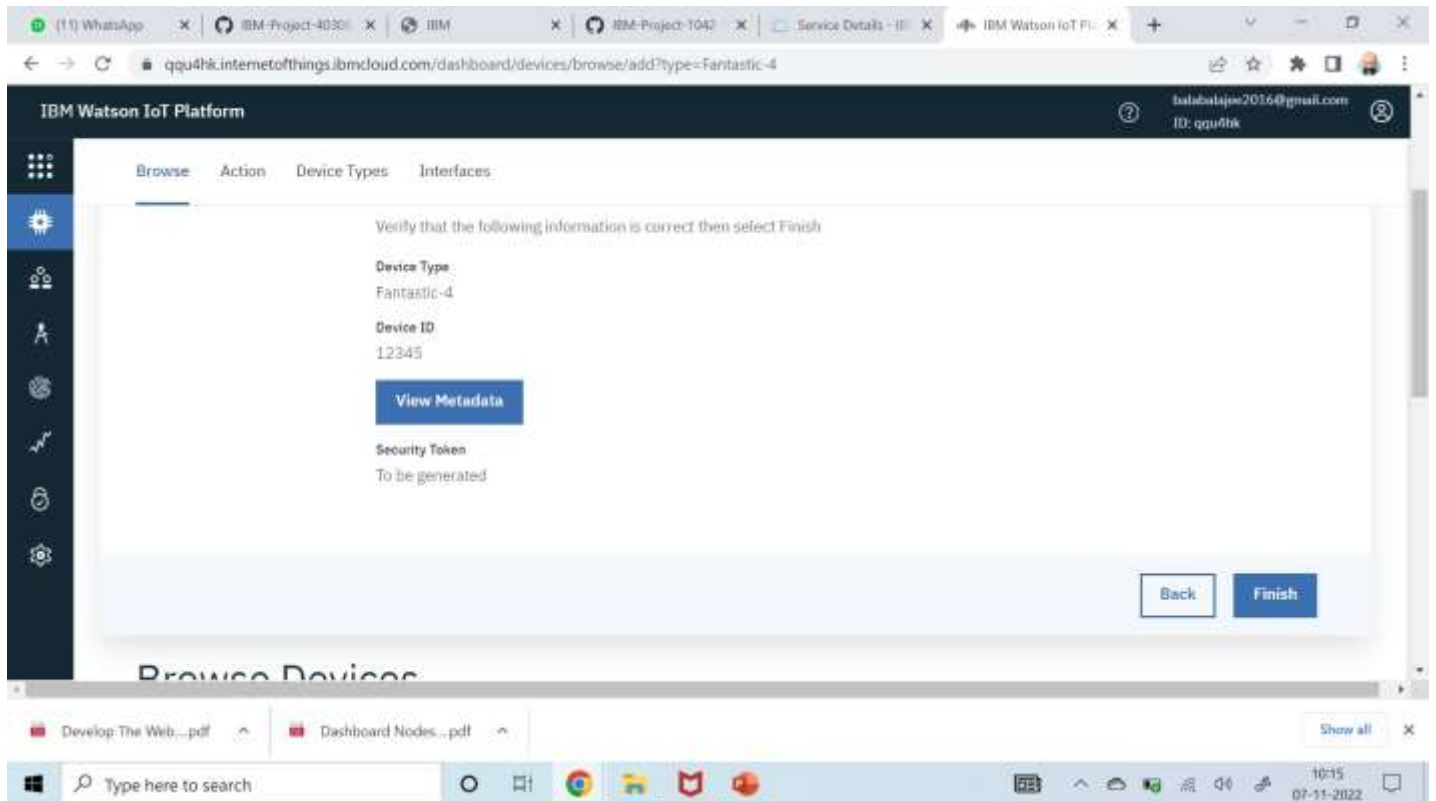
➤ Click on Next

The screenshot shows the 'Add Device' page in the IBM Watson IoT Platform. The page title is 'IBM Watson IoT Platform'. The user is logged in as 'balabala2016@gmail.com' with ID 'qgu4hk'. The page has a sidebar with icons for various functions. The main content area is titled 'You can modify the default device information and enter more information about the device for identification purposes.' It contains two columns of input fields: 'Serial Number', 'Model', 'Description', and 'Hardware Version' on the left; and 'Manufacturer', 'Device Class', 'Firmware Version', and 'Descriptive Location' on the right. Each field has a placeholder text 'Enter [field name]'. Below the fields is an 'Add Metadata' button with a plus icon. At the bottom right are 'Back' and 'Next' buttons. The browser's address bar shows the URL 'qgu4hk.internetofthings.ibmcloud.com/dashboard/devices/browse/add?type=Fantastic-4'. The Windows taskbar at the bottom shows the search bar and several application icons.

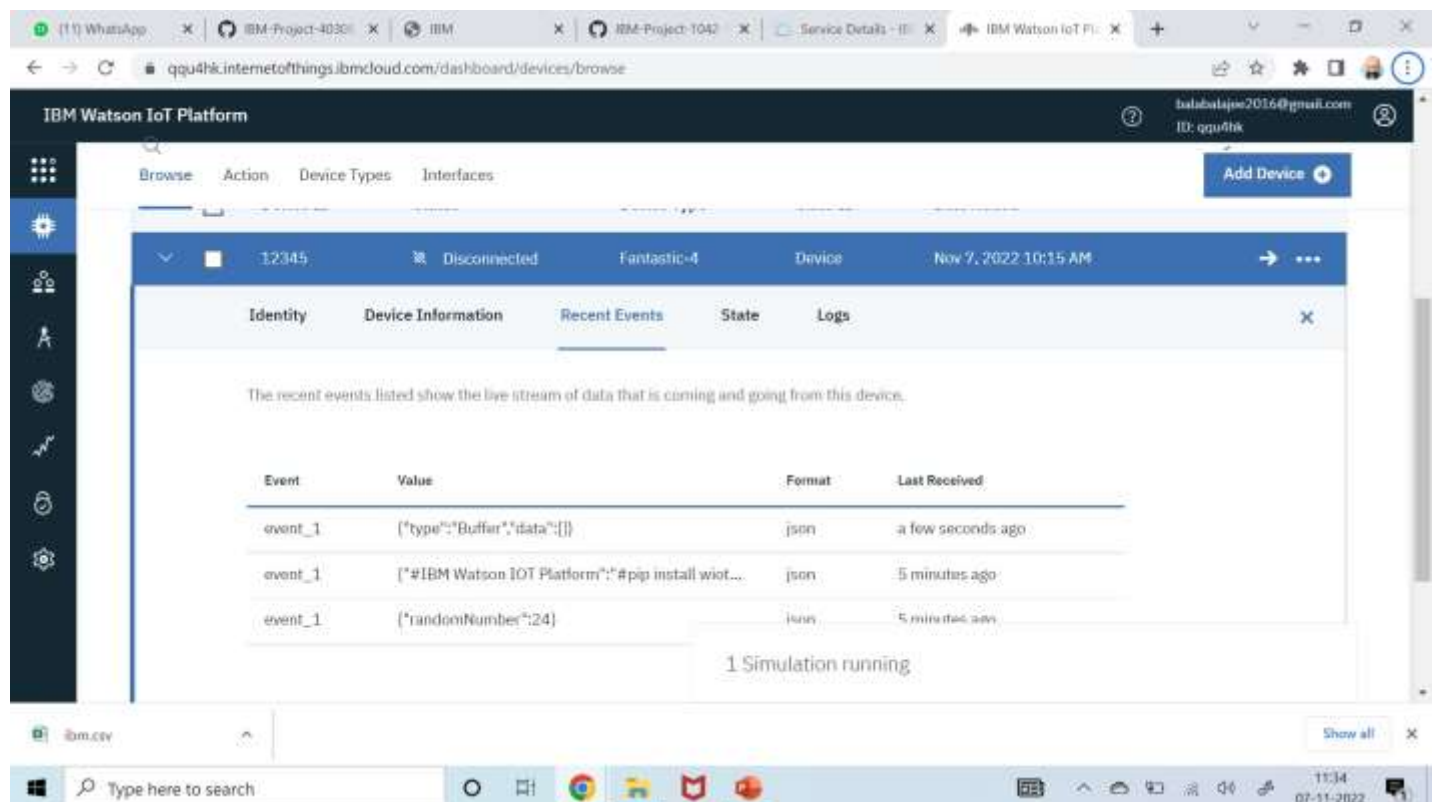
➤ Click on Next

The screenshot shows the 'Authentication Token' selection screen in the IBM Watson IoT Platform. The page title is 'IBM Watson IoT Platform'. The user is logged in as 'balabala2016@gmail.com' with ID 'qgu4hk'. The page has a sidebar with icons for various functions. The main content area is titled 'There are two options for selecting a device authentication token.' It contains two columns: 'Auto-generated authentication token (default)' and 'Self-provided authentication token'. The 'Auto-generated' column explains that the service will generate a token for the user, which is 18 characters long and contains a mix of alphanumeric characters and symbols. It also states that the token is returned to the user at the end of the device registration process. The 'Self-provided' column explains that the user must provide their own authentication token, which must be between 8 and 36 characters and contain a mix of lowercase and uppercase letters, numbers, and symbols. It also states that the token must not contain repeated characters, dictionary words, user names, or other predefined sequences. Below the columns is an 'Authentication Token' input field with a placeholder text 'Enter an optional token'. Below the input field is a note: 'Make a note of the generated token. Lost authentication tokens cannot be recovered. Tokens are encrypted before being stored.' and a statement: 'Authentication token are encrypted before we store them.' The browser's address bar shows the URL 'qgu4hk.internetofthings.ibmcloud.com/dashboard/devices/browse/add?type=Fantastic-4'. The Windows taskbar at the bottom shows the search bar and several application icons.

➤ Click on Finish



➤ Device is created



## 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/iot\\_1.0-2\\_armhf.deb](https://github.com/ibm-messaging/iot-raspberrypi/releases/download/1.0.2.1/iot_1.0-2_armhf.deb)

- `sudo dpkg -i iot_1.0-2_armhf.deb`
- `service iot status`

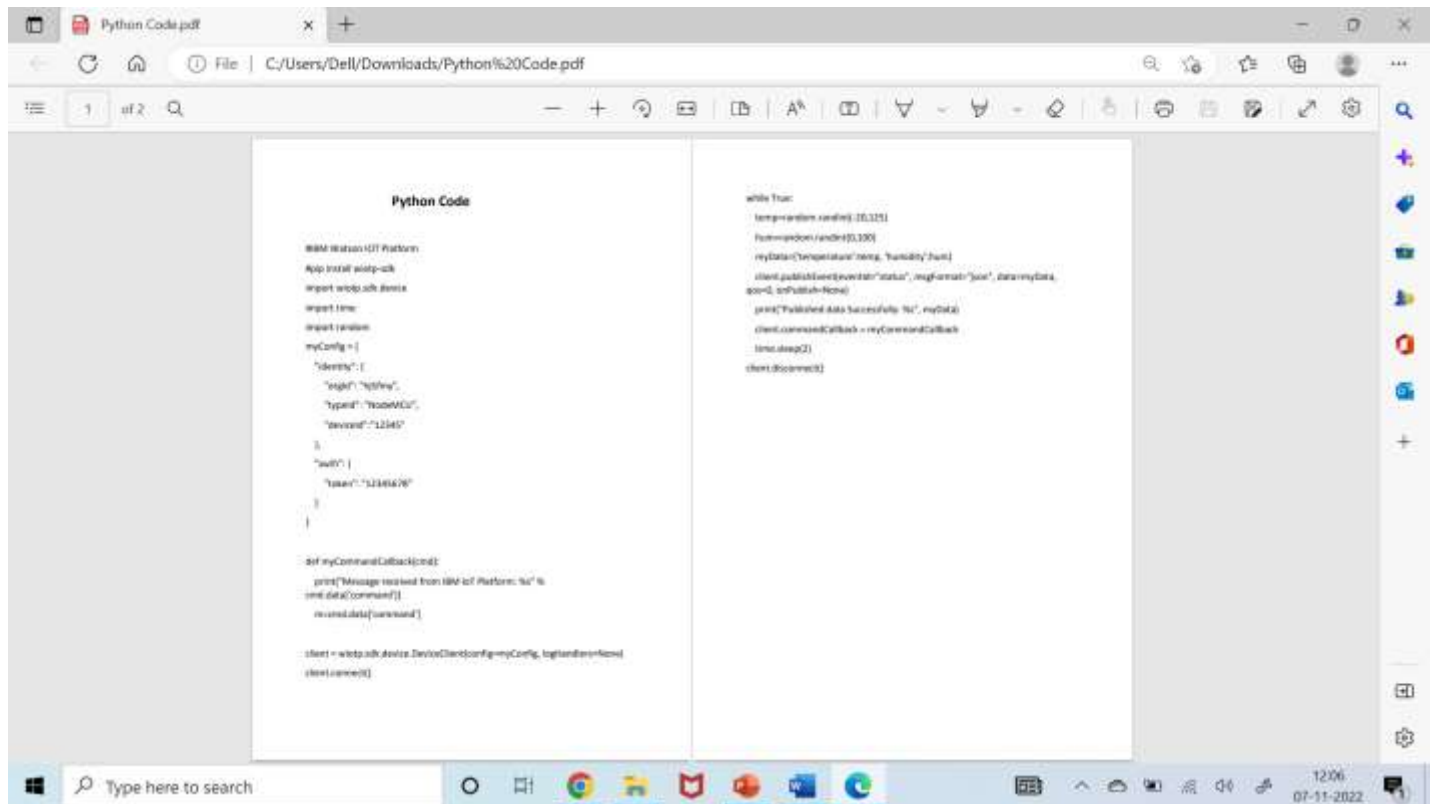
Following are the images as to what appears on your pi's terminal when u type these commands

[illegible]

- Then open your terminal and type `pip install ibmiotf`

[illegible]

- 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 Code

IBM Watson IoT Platform
App install pip3-wk
import sys,os,sys,sys
import time
import random
myConfig = {
    "identity": {
        "apikey": "apikey",
        "apikey": "apikey",
        "apikey": "apikey"
    },
    "apikey": {
        "apikey": "apikey"
    }
}

def myCommandCallback(cmd):
    print("Message received from IBM IoT Platform: %s" %
          cmd.data["command"])
    myConfig["apikey"]

client = WatsonDevice.DeviceClient(myConfig, logHandler=None)
client.connect()

while True:
    temperature = random.randint(0,100)
    humidity = random.randint(0,100)
    myData = {"temperature": temperature, "humidity": humidity}
    client.publish(event="status", myData=myData,
                  qos=0, onPublish=None)
    print("Published data successfully: %s" % myData)
    client.commandCallback = myCommandCallback
    time.sleep(2)
    client.disconnect()
```

### 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.

The screenshot displays the IBM Watson IoT Platform interface. At the top, the navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A user profile for 'satulalajee2016@gmail.com' is visible in the top right. The main content area shows a device named 'Fantastic-4' with ID '12345', which is currently 'Disconnected'. Below this, the 'Recent Events' tab is active, displaying a table of events:

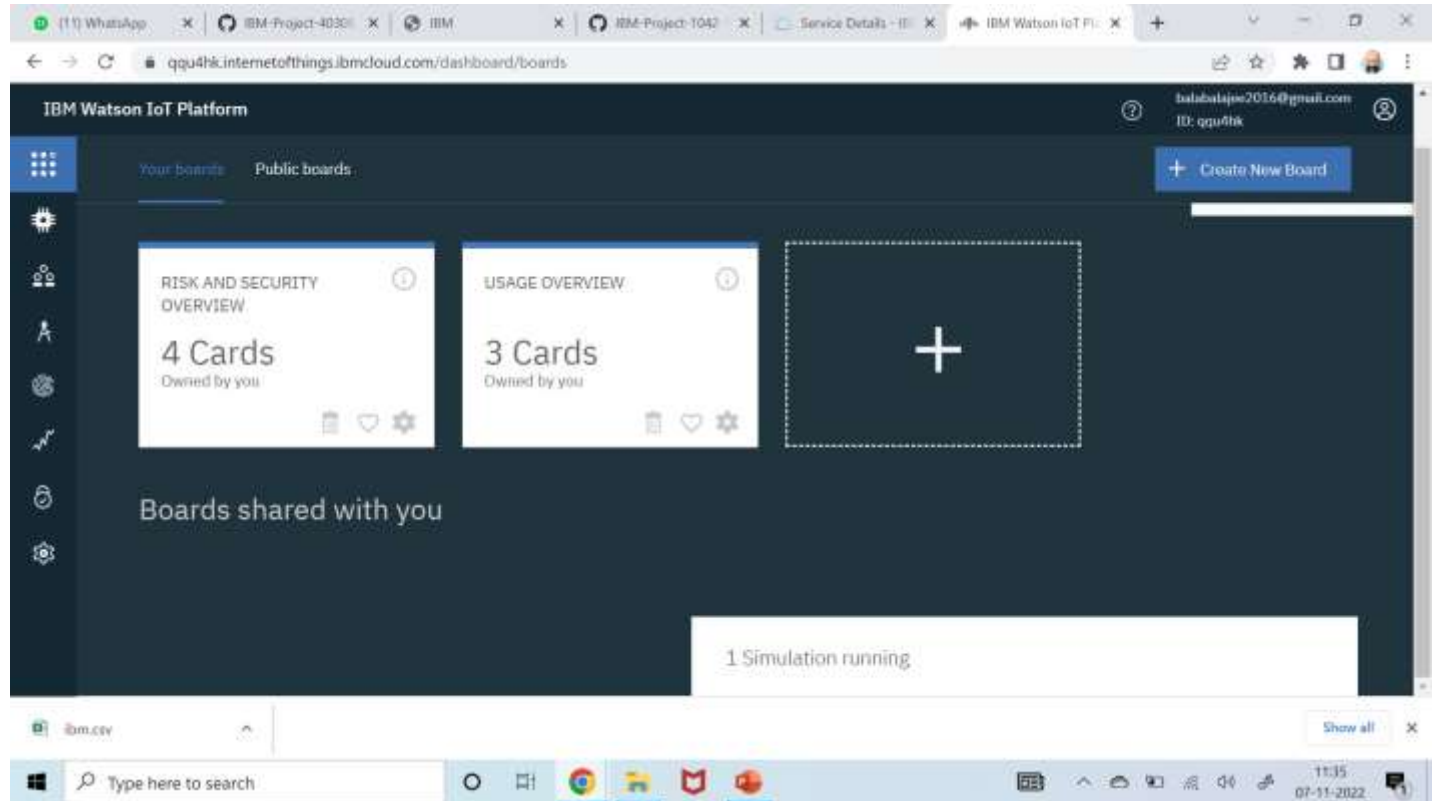
Event	Value	Format	Last Received
event_1	{"type":"Buffer","data":{}}	json	a few seconds ago
event_1	["#IBM Watson IOT Platform";"#pip install wiot..."]	json	5 minutes ago
event_1	{"randomNumber":24}	json	5 minutes ago

Below the table, a status indicator shows '1 Simulation running'. The bottom of the screen features a Windows taskbar with the search bar and several application icons.

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

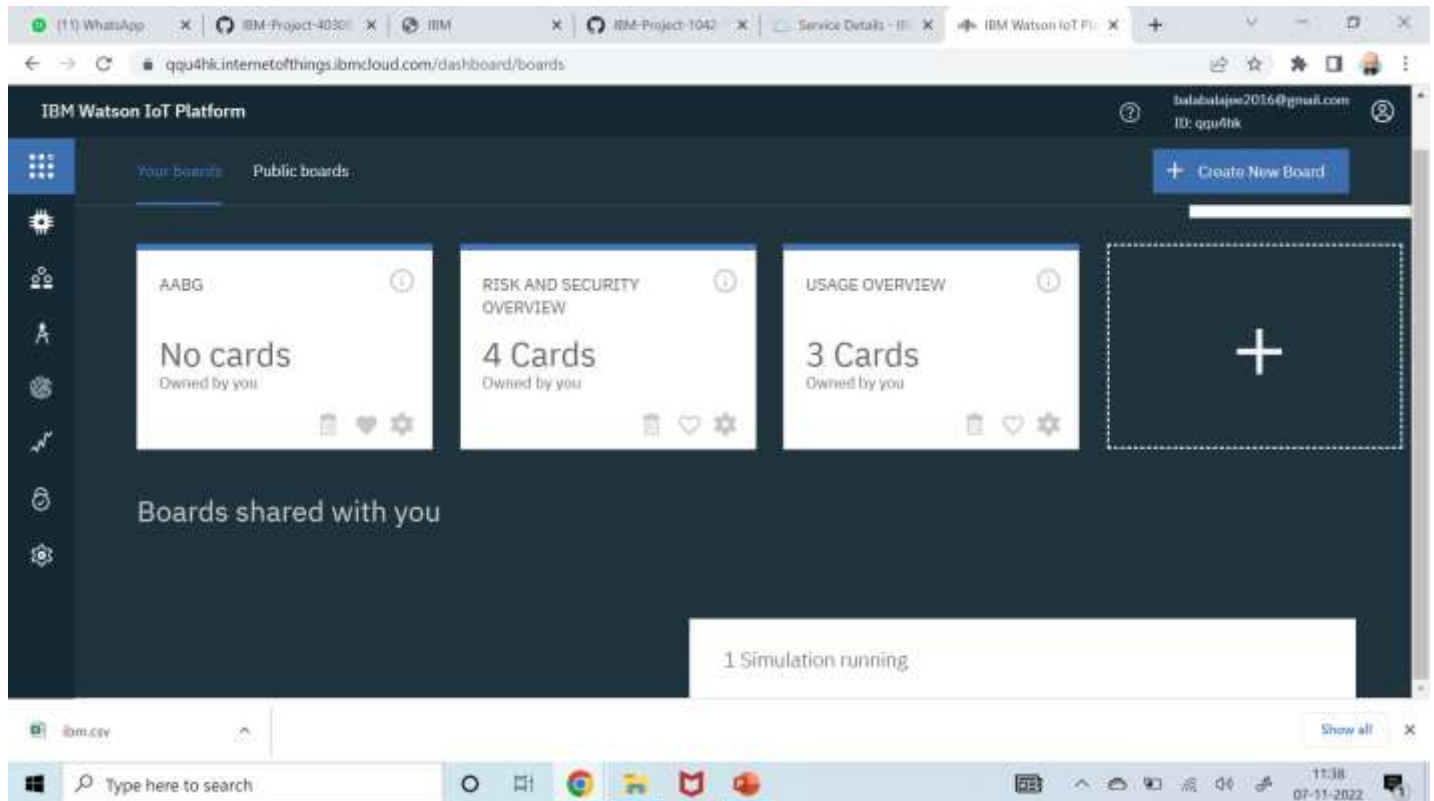
#### Step-4: Creating boards and cards for visualization of data:

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

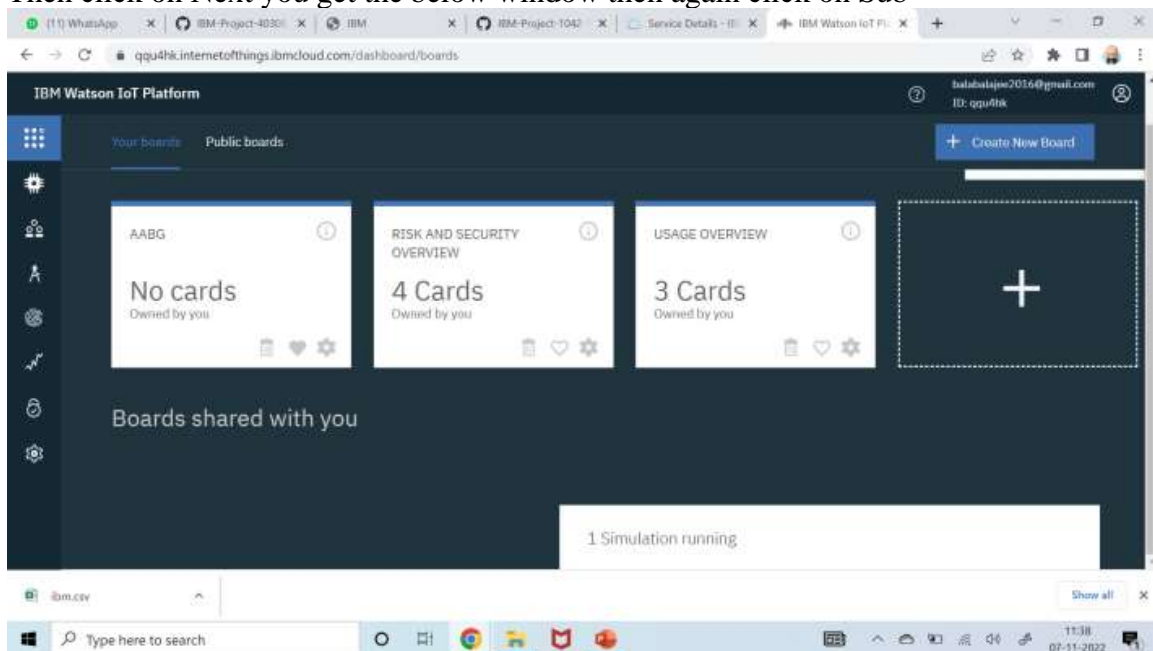


- Click on Create a new board to create a board .

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

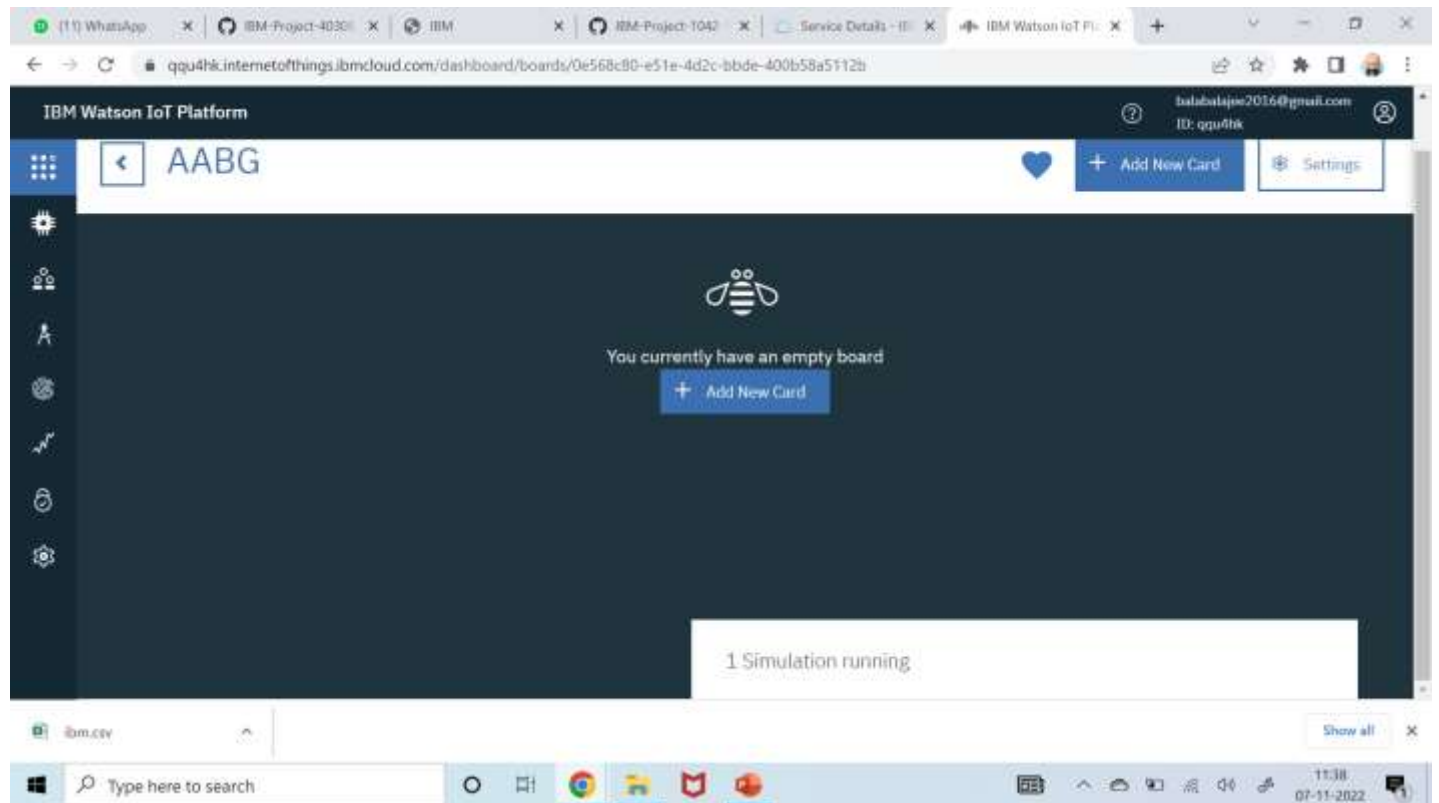


- Then click on Next you get the below window then again click on Sub

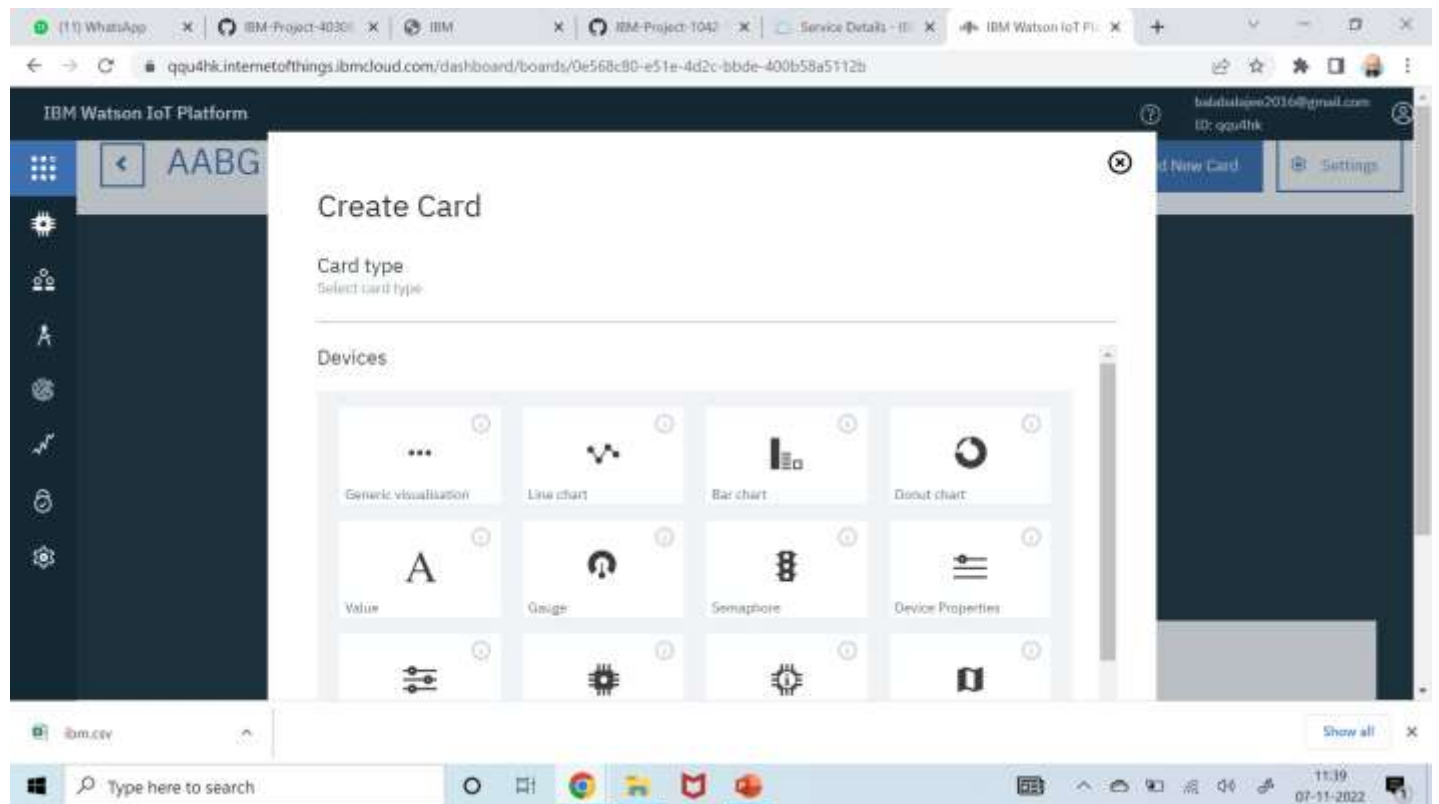


Then double click on your boards name which you have created.

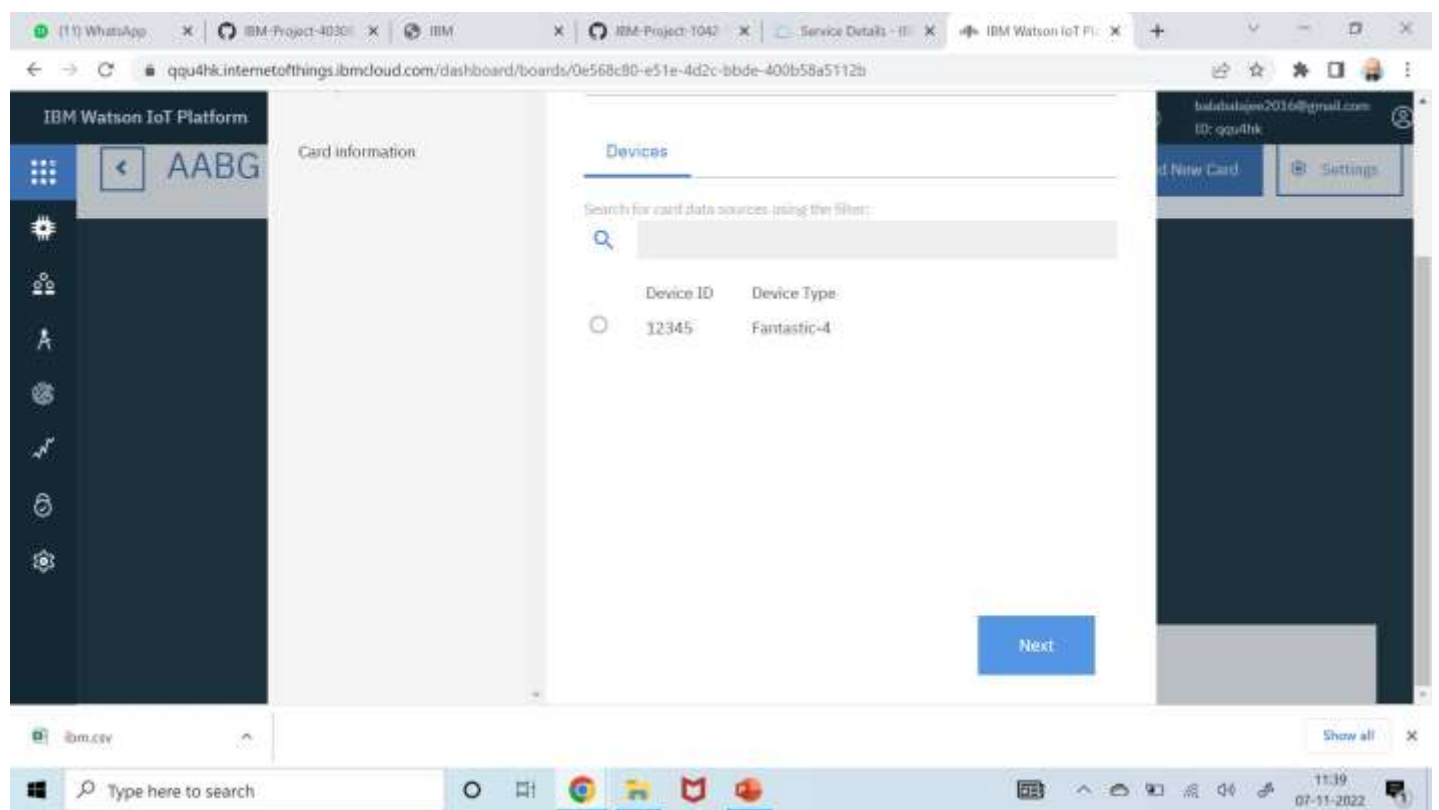
➤ Click on Add New Card



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

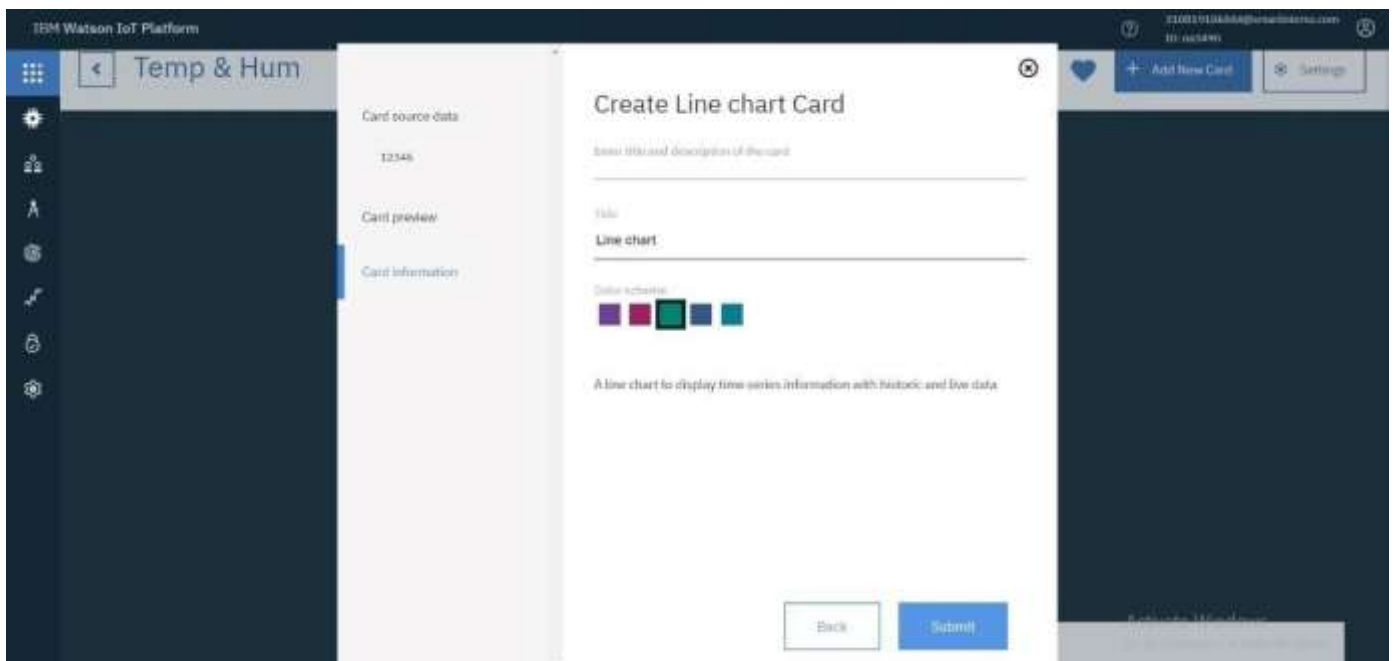


- You get the below window, choose the Device and click on Next.

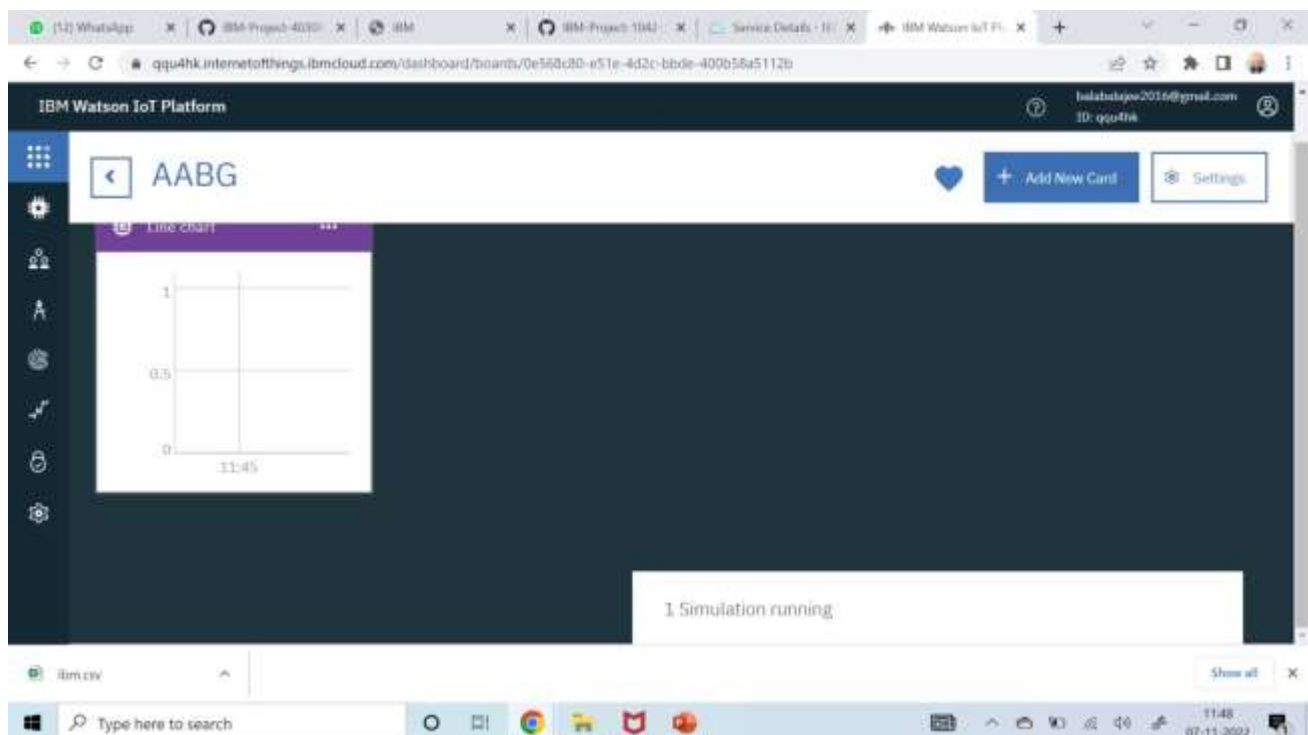


➤ Select the event, properly to be visualized on your graph and click next. In my case it is humidity

➤ 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.