

SENDING DATA FROM RASPBERRY-PI TO IBM WATSON

Team ID	PNT2022TMID53723
Project Name	Smart Waste Management Using for 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

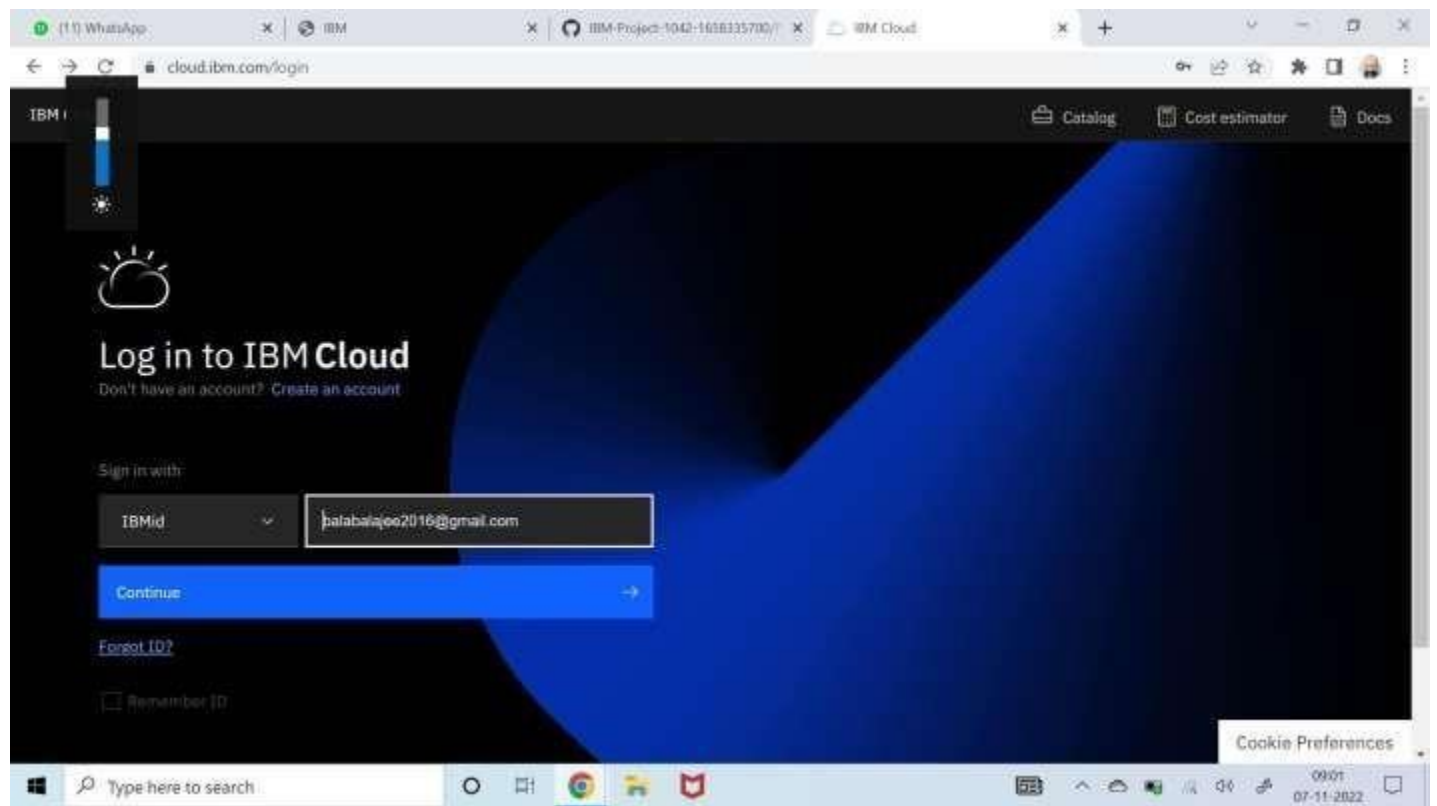
SOFTWARE:

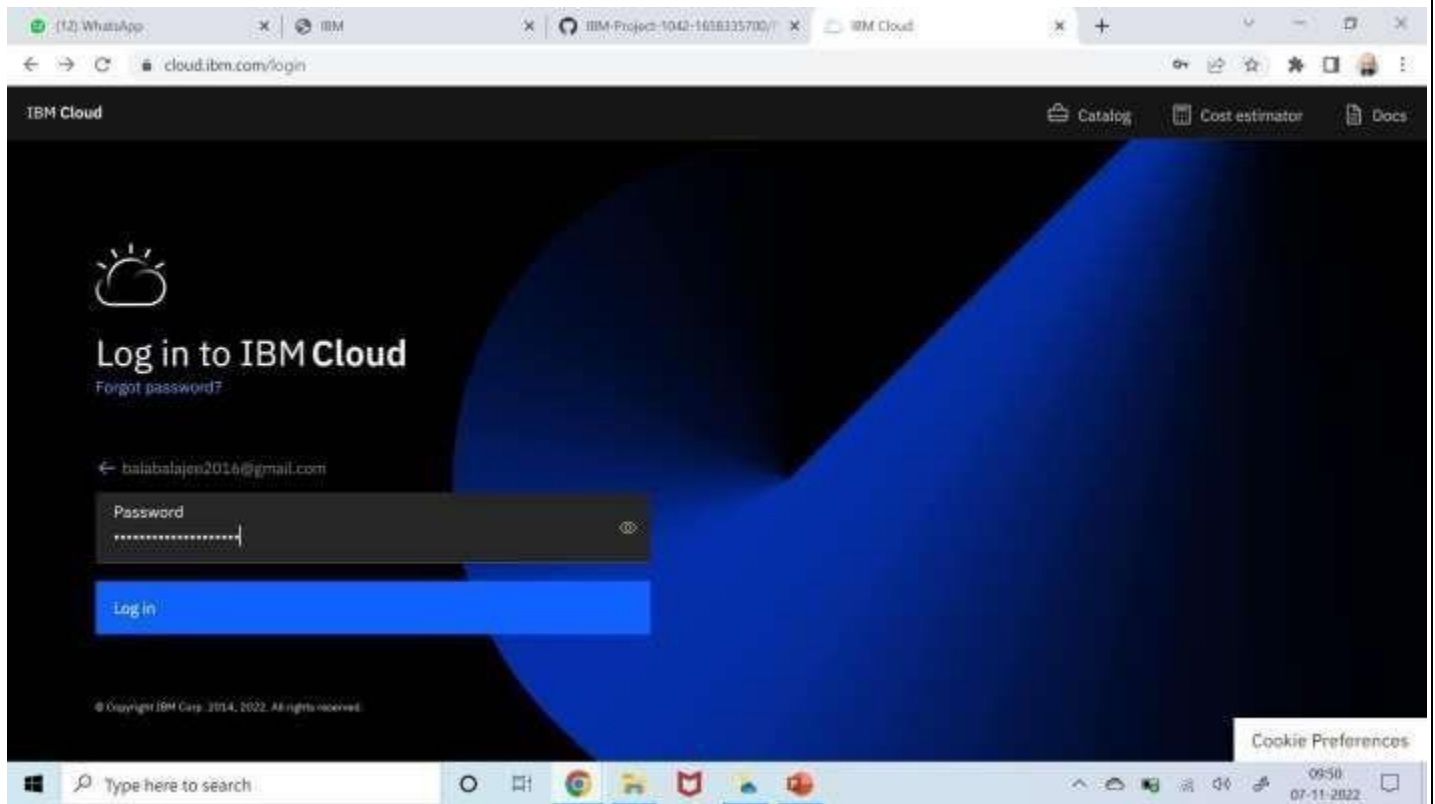
- IBM BLUEMIX ACCOUNT

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.

(12) WhatsAppIBMIBM Project-1042-1638335700IBM Cloud

cloud.ibm.com

IBM CloudSearch resources and products...CatalogManageBalajee B's Account

Dashboard

Edit dashboardUpgrade accountCreate resource

For you

Select an option

Build

Explore IBM Cloud with this selection of easy starter tutorials and services.

Set up your IBM Cloud account

Learn how to set up your IBM Cloud account, manage your account settings, organize resources, and control access to those resources.

Getting started10 min

Build a Virtual Private Cloud (VPC)

Upgrade to a paid account to create your own protected space in the IBM Cloud.

Getting started7 min

Get Started with Watson Studio

Get started with using AI and Cloud Object Storage in 15 minutes.

Popular2 hr

Architecture center

Learn best practices and leverage reference architectures for the cloud.

Recommended5 min

User accessManage users

NewsView all

Planned maintenanceView

Enter email addresses below to jump directly into

Unified Key Orchestrator Now Supports Easy

Type here to search

09:50 07-11-2022

Check all details and click on create.

The screenshot shows the IBM Cloud 'Internet of Things Platform' creation page. The browser address bar displays 'cloud.ibm.com/catalog/services/internet-of-things-platform'. The page header includes the IBM Cloud logo, a search bar, and navigation links for 'Catalog', 'Manage', and 'Balajee B's Account'. The main content area is titled 'Internet of Things Platform' and describes it as the hub for all things IBM IoT. It features a 'Create' button and an 'About' tab. A sidebar on the left lists service details: Type (Service), Provider (IBM), Last updated (08/15/2022), Category (Internet of Things), Compliance (IAM-enabled), and Location. The main form allows selecting a location (Frankfurt (eu-de)) and a pricing plan (Lite). A table lists the 'Lite' plan features: 'Includes up to 500 registered devices, and a maximum of 200 MB of each data metric. Maximum of 500 registered devices' and a 'Free' price. A right-hand summary panel shows the service name, location, and a 'Create' button. A checkbox indicates agreement to terms.

IBM Cloud

Search resources and products...

Catalog Manage Balajee B's Account

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.

Create About

Type Service

Provider IBM

Last updated: 08/15/2022

Category Internet of Things

Compliance IAM-enabled

Location

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

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

Add to estimate

The screenshot shows the IBM Cloud 'Internet of Things Platform-og' management page. The browser address bar displays 'cloud.ibm.com/services/iotf-service/cm%3Av1%3Abluemix%3Apublic%3Aiotf-service%3Aeu-de%3Aa%2F5d1e05e128ac4d40b960b9f2faefe14%3Ac...'. The page header includes the IBM Cloud logo, a search bar, and navigation links for 'Catalog', 'Manage', and 'Balajee B's Account'. The main content area is titled 'Internet of Things Platform-og' and shows it is 'Active'. It features a 'Manage' button and an 'Add tags' link. A sidebar on the left lists management options: Plan, Connections, and a 'Launch' button. The main content area includes a diagram of a device connected to a cloud, a 'Let's get started with IBM Watson IoT Platform' section with a 'Launch' button, and a 'Ready for the next level?' section with a 'Launch' button. A progress bar shows the 'Lite' plan is selected and 'Non-Production' is the environment.

IBM Cloud

Search resources and products...

Catalog Manage Balajee B's Account

Internet of Things Platform-og Active Add tags

Details Actions...

Manage

Plan

Connections

Launch

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 Docs

Ready for the next level?

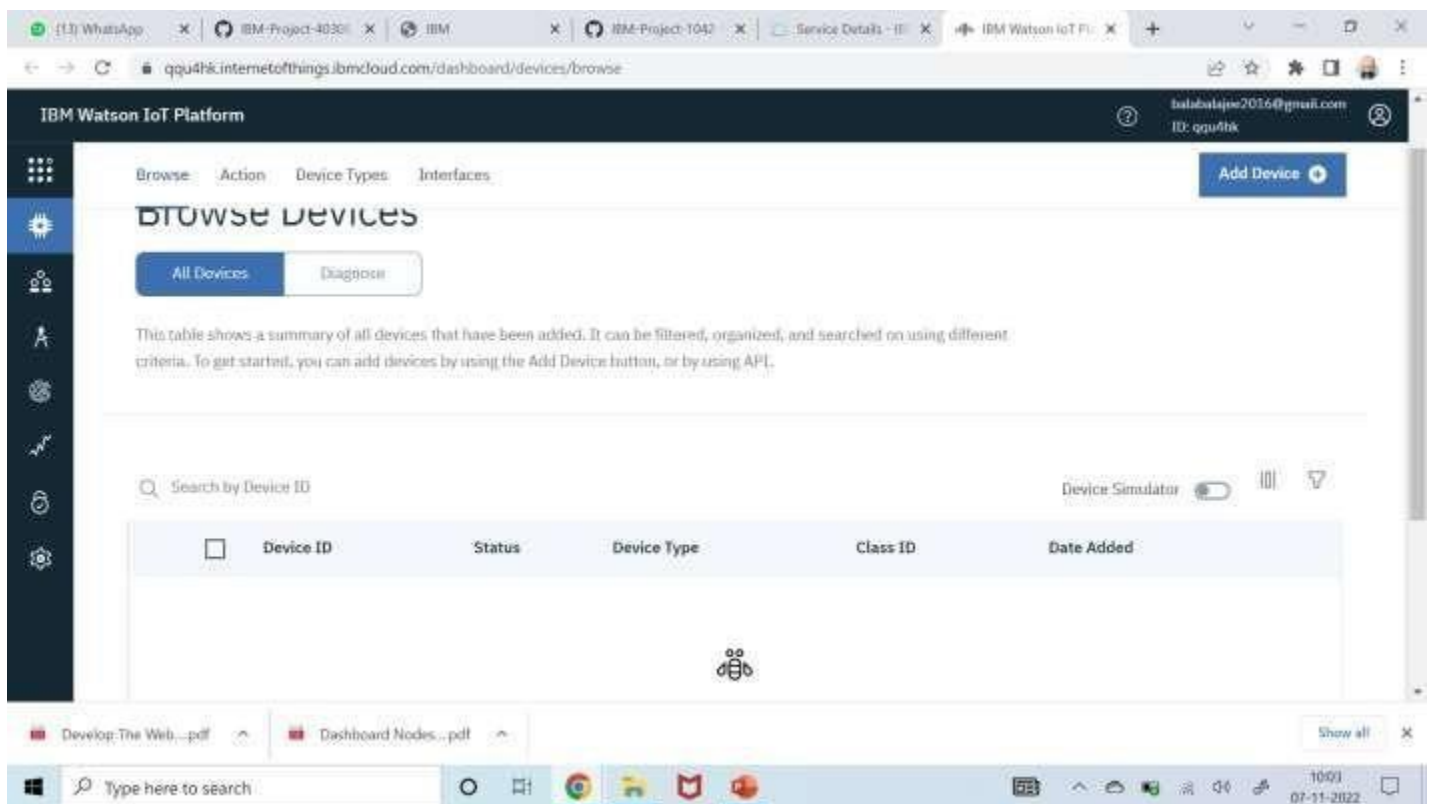
IBM Watson IoT Platform Journey

Lite Non-Production

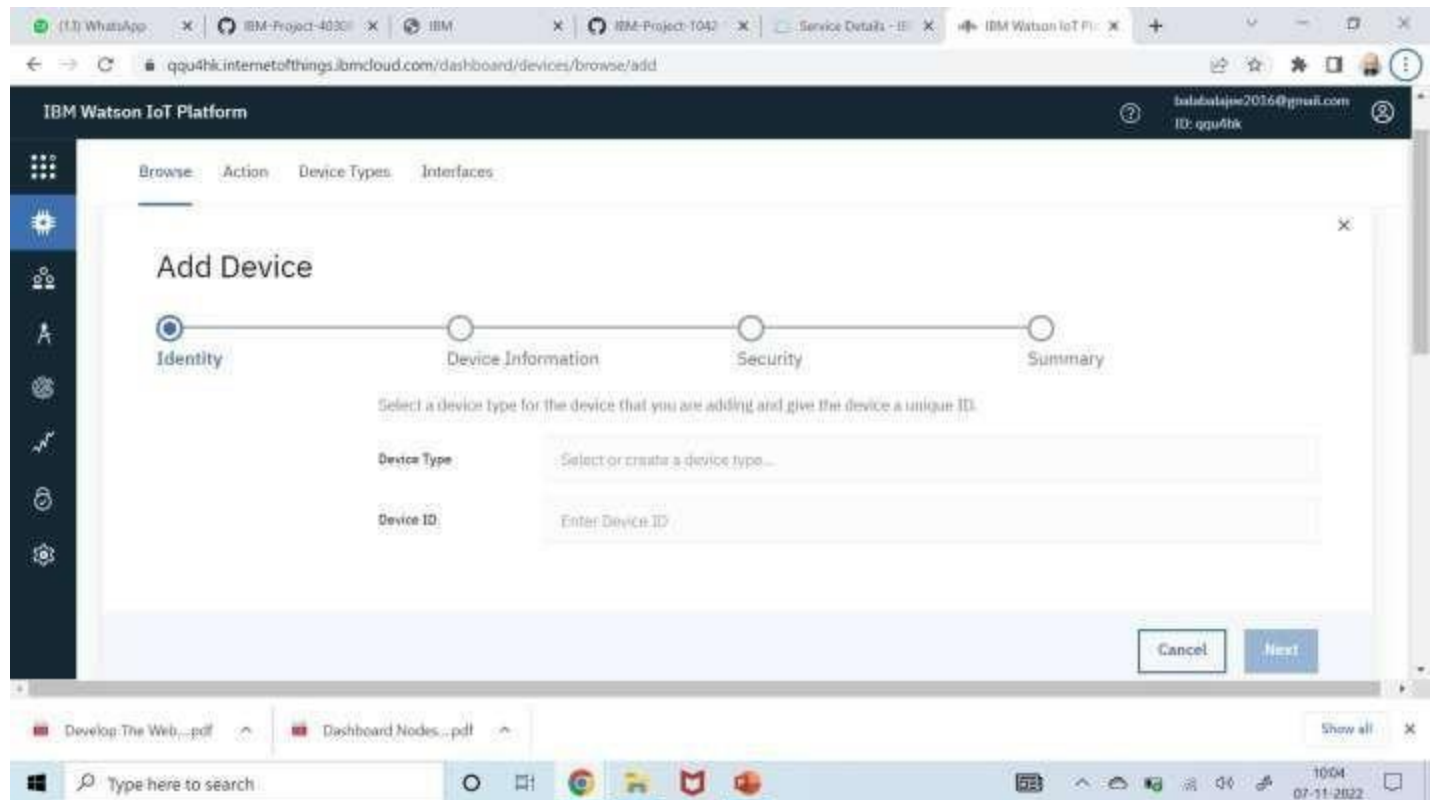
click on Launch

Dashboard of IBM Watson IoT platform,

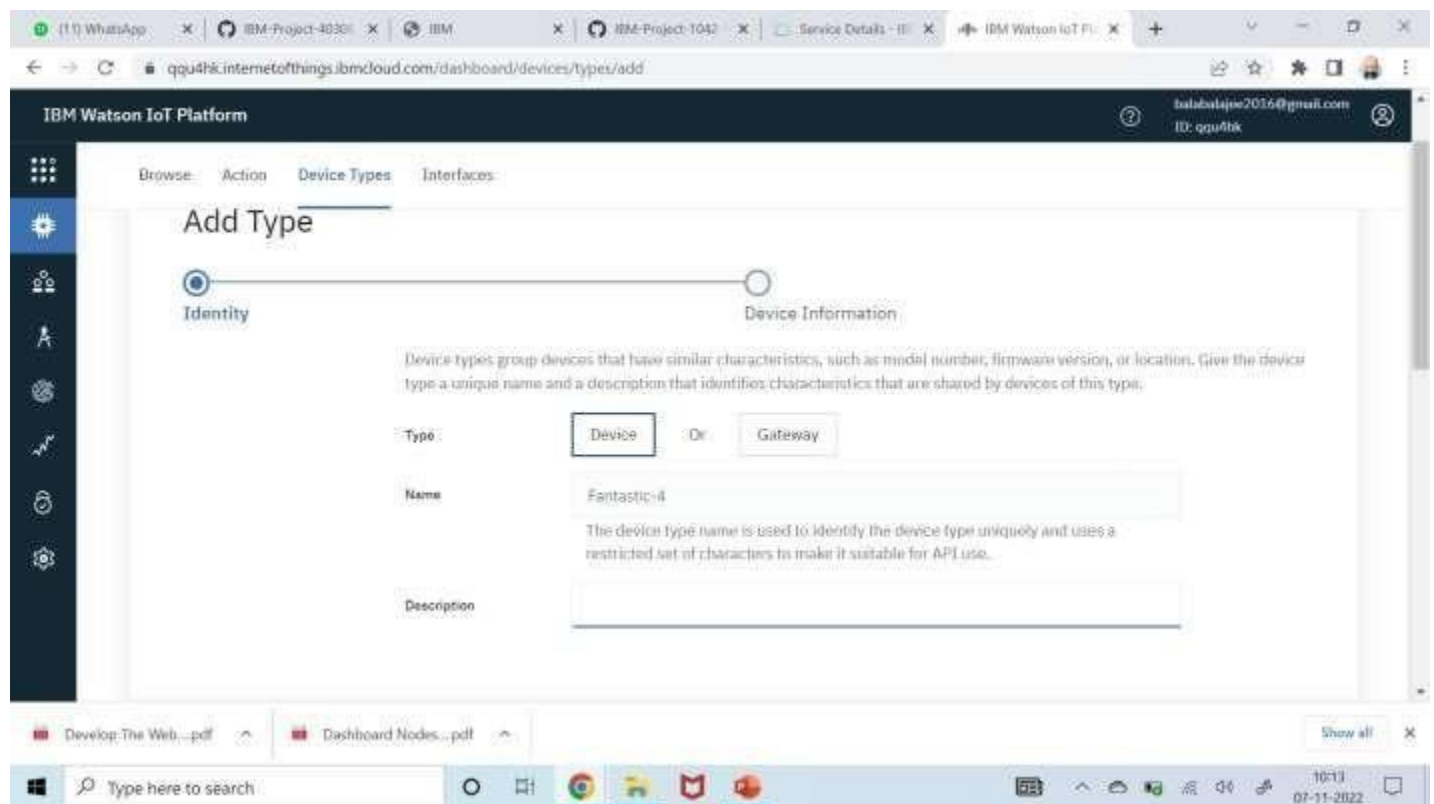
- Click on Add device



- After click on Add device this page will open



Go to device type and fill the details.



Click on Finish

(11) WhatsApp

IBM-Project-4030

IBM

IBM-Project-1042

Service Details - IB

IBM Watson IoT Pl

qqu4hk.internetofthings.ibmcloud.com/dashboard/devices/types/add

atalabaleje2016@gmail.com
ID: qqu4hk

IBM Watson IoT Platform

BrowseActionDevice TypesInterfaces

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

Device

Or

Gateway

Name

Fantastic-4

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

Show all

Type here to search

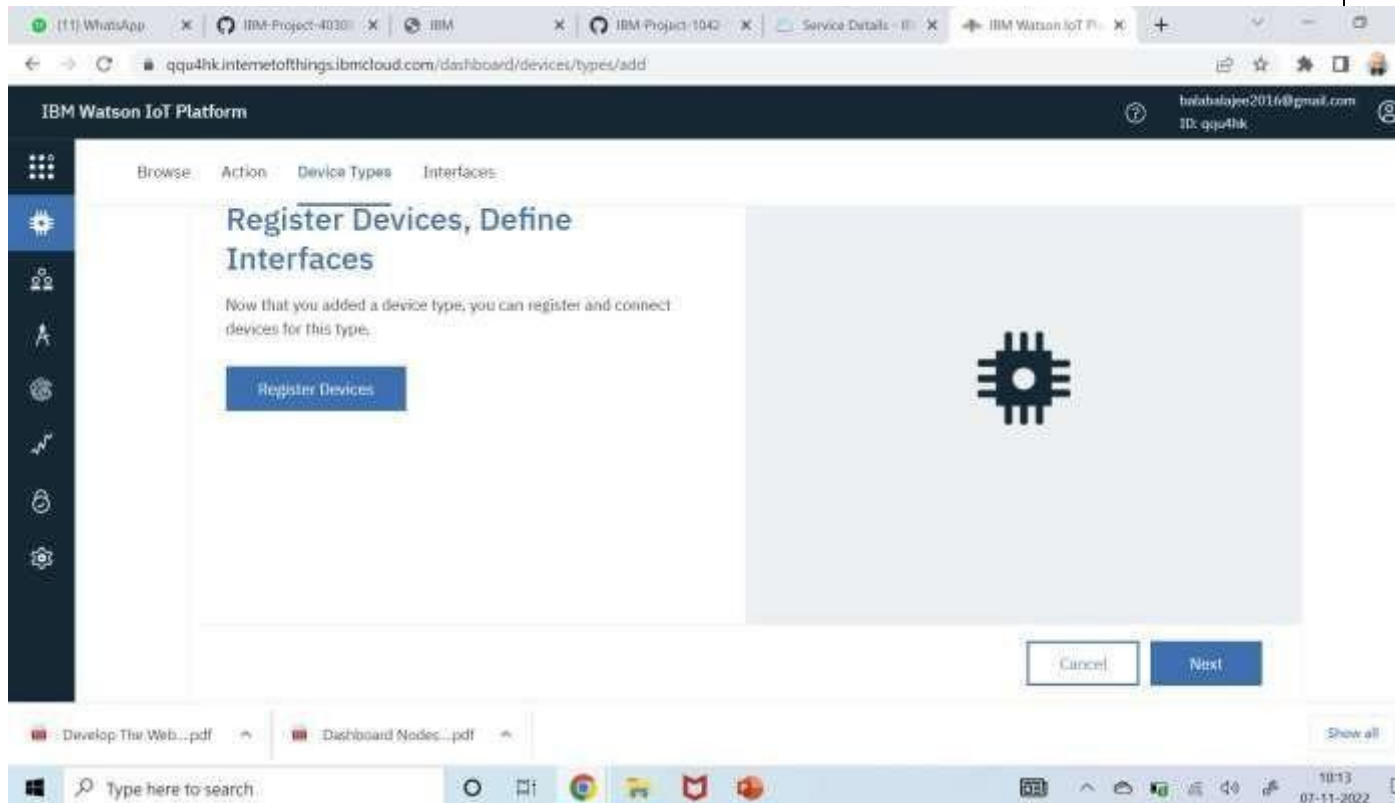
10:13

07-11-2022

● Click on

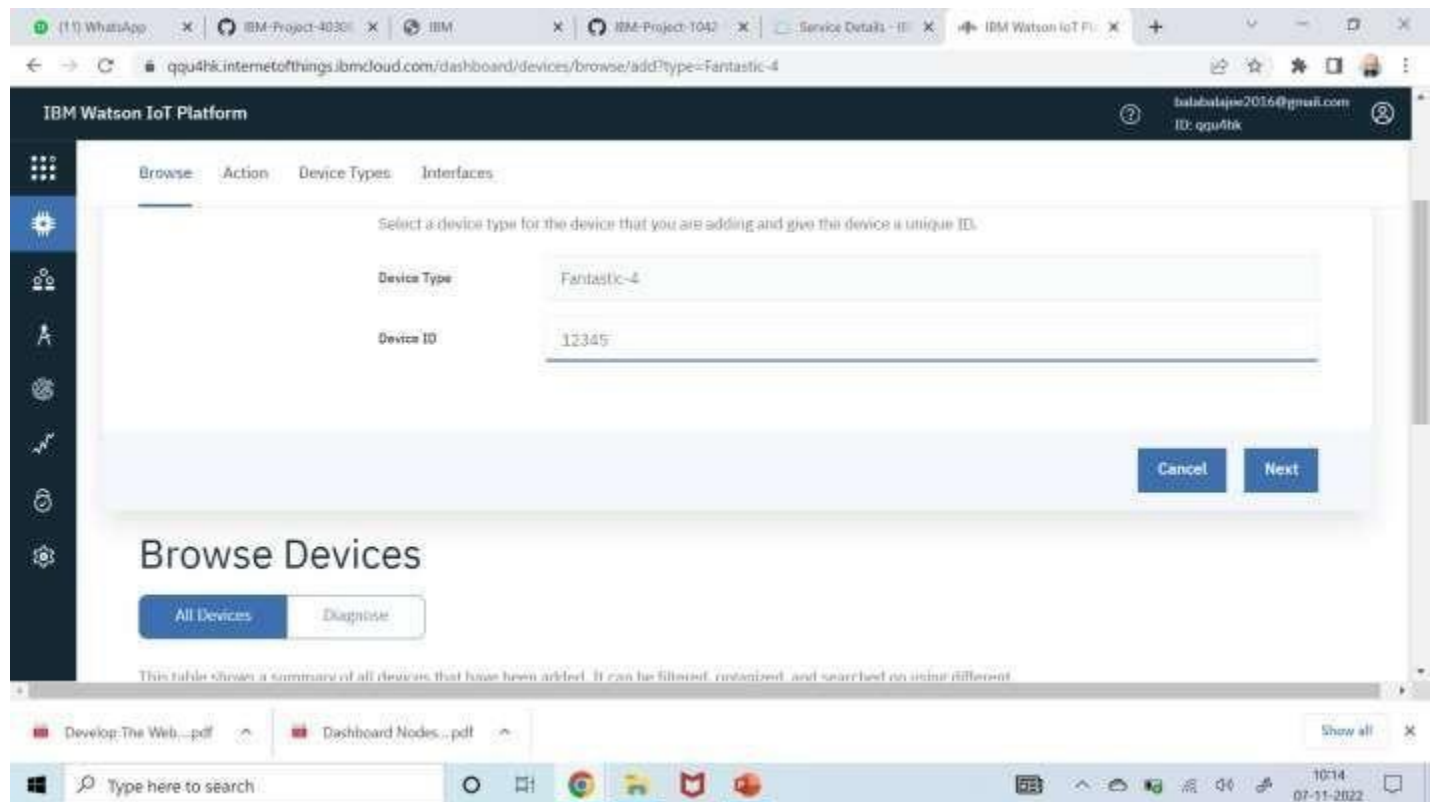
Register Device.

○ Click on



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

Next



○ Click on

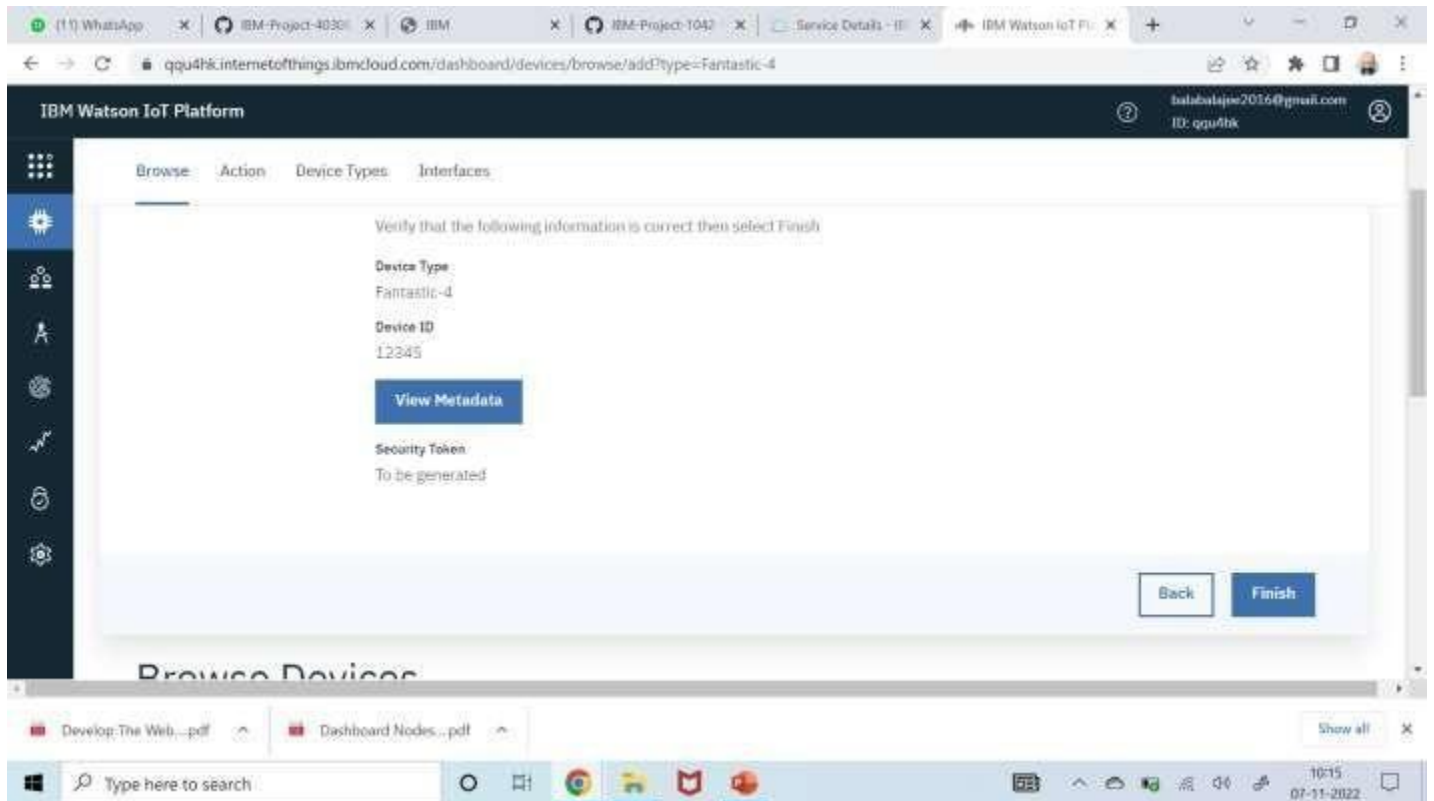
The screenshot shows the 'Add Metadata' form in the IBM Watson IoT Platform. The form is titled 'You can modify the default device information and enter more information about the device for identification purposes.' It contains several input fields for device identification: 'Serial Number', 'Model', 'Description', 'Hardware Version', 'Manufacturer', 'Device Class', 'Firmware Version', and 'Descriptive Location'. Each field has a placeholder text 'Enter [Field Name]'. Below these fields is an 'Add Metadata' button with a plus icon. At the bottom right of the form are 'Back' and 'Next' buttons. The browser's address bar shows the URL 'qqu4hk.internetofthings.ibmcloud.com/dashboard/devices/browse/add?type=Fantastic-4'. The taskbar at the bottom shows a search bar and several application icons.

○ Click on Next

The screenshot shows the 'Authentication Token' selection screen in the IBM Watson IoT Platform. It presents two options: 'Auto-generated authentication token (default)' and 'Self-provided authentication token'. The 'Auto-generated' option explains that the service will generate a 18-character token. The 'Self-provided' option requires the user to provide their own token, which must be between 8 and 36 characters and contain a mix of lowercase and uppercase letters, numbers, and symbols. Below these options is an 'Authentication Token' input field with a placeholder 'Enter an optional token'. A note below the field states: 'Make a note of the generated token. Lost authentication tokens cannot be recovered. Tokens are encrypted before being stored.' and 'Authentication token are encrypted before we store them.' The 'Next' button is not visible in this screenshot. The browser's address bar shows the same URL as the previous screenshot. The taskbar at the bottom shows a search bar and several application icons.

Finish

○ Click on



○ Device is created

Click on

The screenshot displays the IBM Watson IoT Platform dashboard. The top navigation bar includes tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains various icons for navigation. The main content area shows the details for a device named 'Fantastic-4' with ID '12345'. The device status is 'Disconnected' and it was last seen on 'Nov 7, 2022 10:15 AM'. Below this, there are tabs for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is active, showing a table of events. The table has columns for 'Event', 'Value', 'Format', and 'Last Received'. Three events are listed, all with the format 'json'. A message '1 Simulation running' is visible at the bottom of the events section. The bottom of the screen shows a Windows taskbar with the search bar and several application icons.

IBM Watson IoT Platform

12345 Disconnected Fantastic-4 Device Nov 7, 2022 10:15 AM

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
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

1 Simulation running

ibm.com

Type here to search

11:34 07-11-2022

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

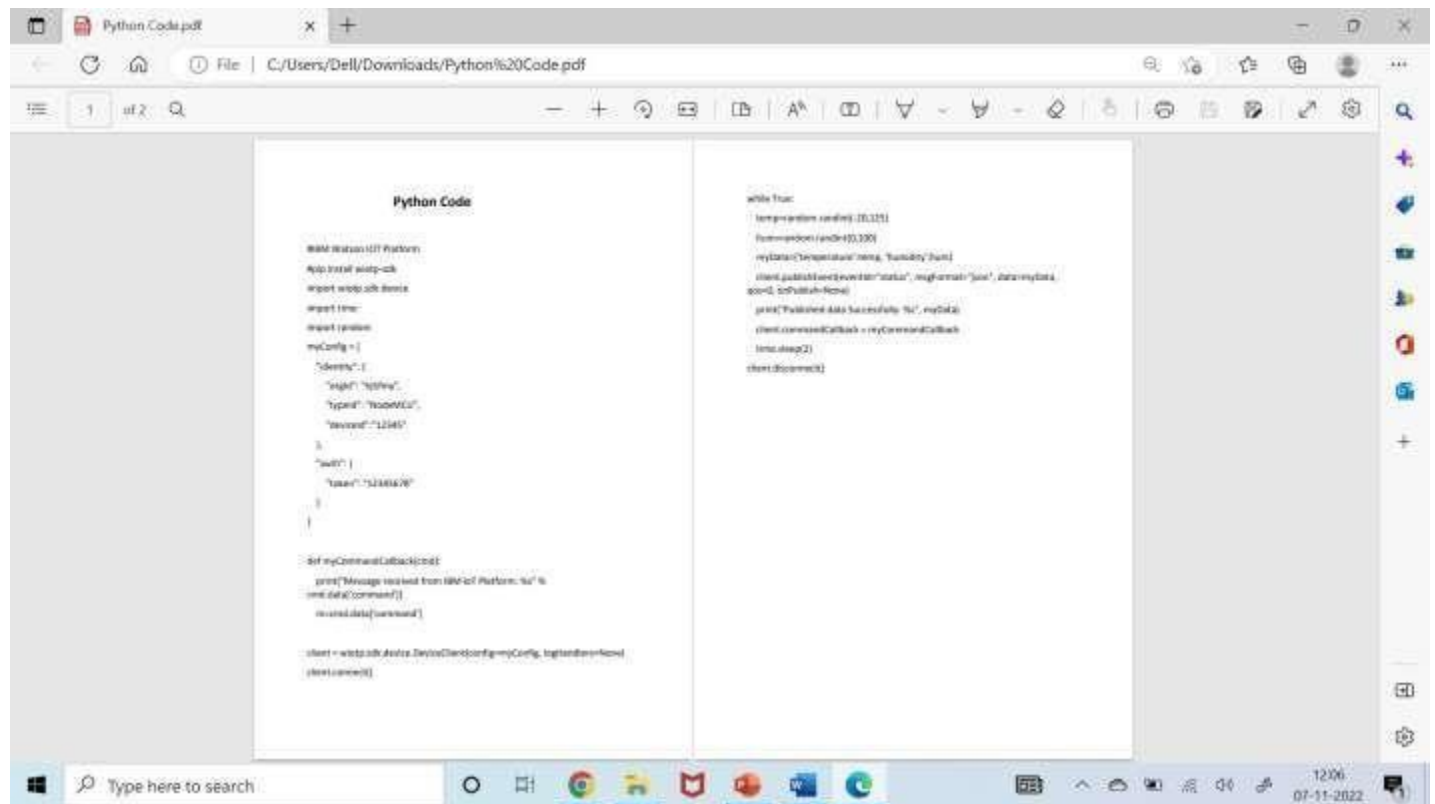
Following are the images as to what appears on your pi's terminal when u type these commands

[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:



The image shows a PDF viewer window titled 'Python Code.pdf' with the file path 'C:/Users/Dell/Downloads/Python%20Code.pdf'. The PDF content is titled 'Python Code' and contains two code snippets. The left snippet is for setting up the IBM Watson IoT Platform, and the right snippet is for a continuous data publishing loop.

```
Python Code

IBM Watson IoT Platform
App Portal setup-cb
import sys
import time
import json
myConfig = {
    "deviceId": "1",
    "type": "Temperature",
    "typeId": "Temperature",
    "deviceId": "12345"
}

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

client = WatsonIoTClient(myConfig, myCommandCallback)
client.connect()

while True:
    temperature = random.randint(10, 30)
    humidity = random.randint(40, 100)
    myData = {"temperature": temperature, "humidity": humidity}
    client.publish(myData, "status", myCommandCallback)
    print("Published Data Successfully: %s" % myData)
    client.disconnect()
    time.sleep(2)
    client.connect()
```

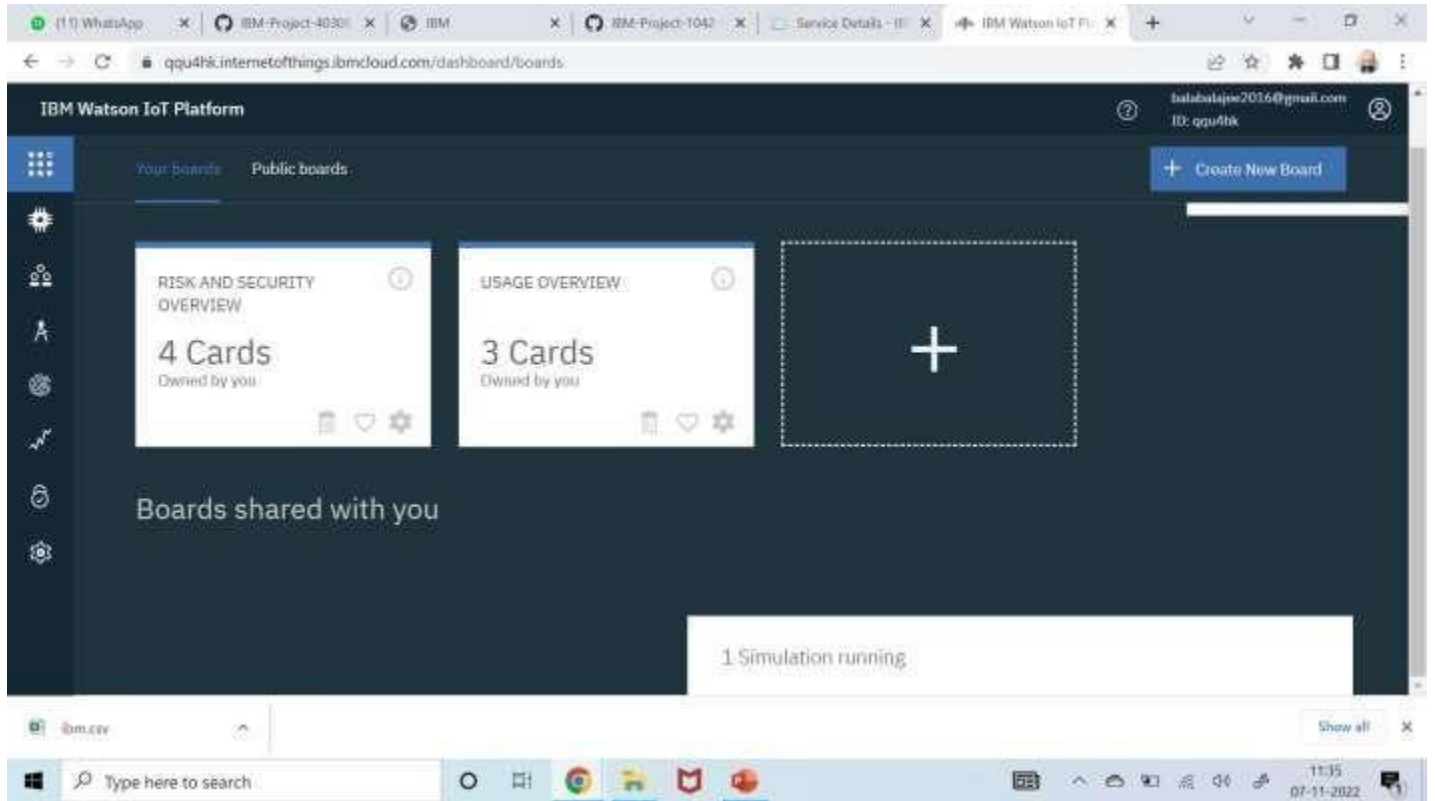
Step-3: checking your data sent on IBM Bluemix:

- 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 data is being received.

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

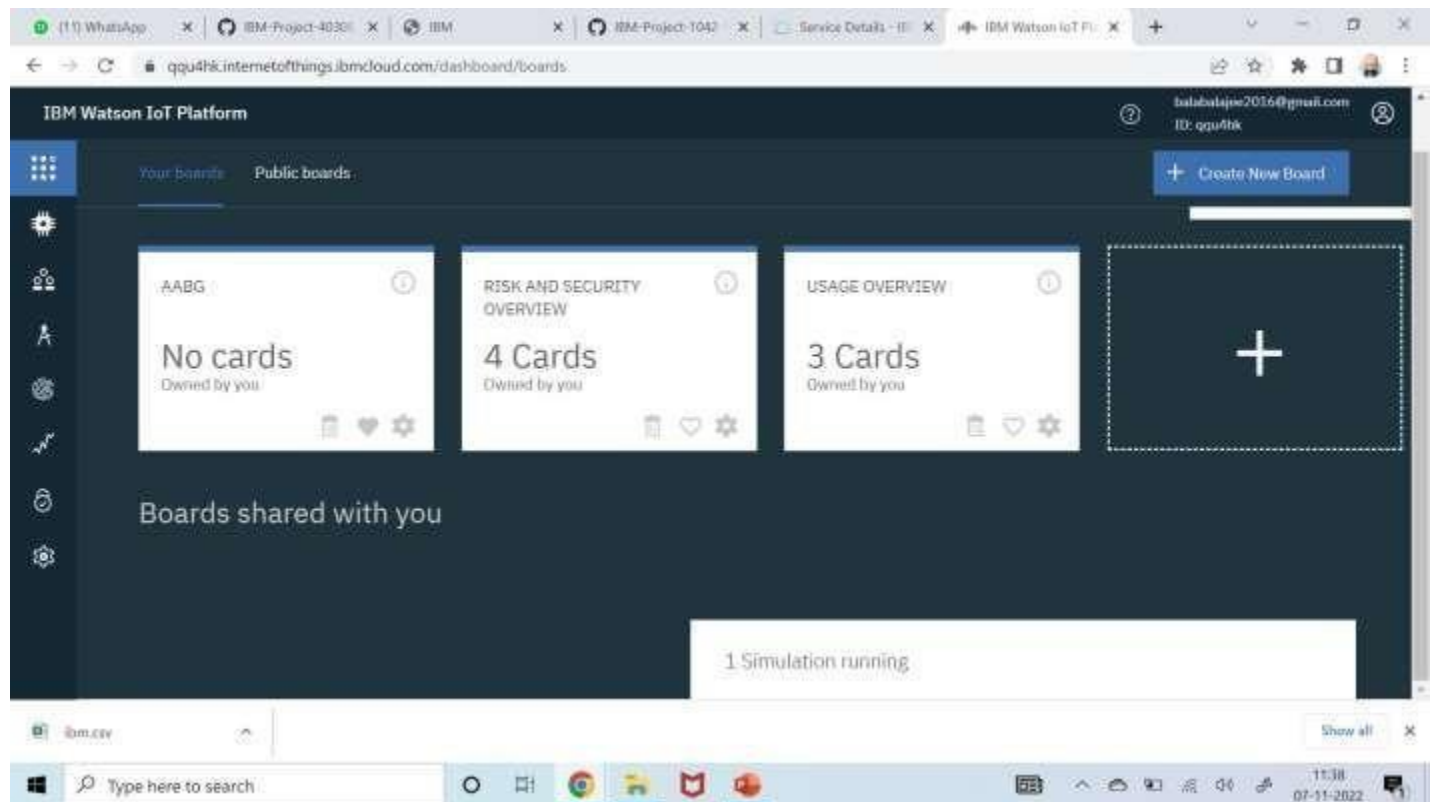
Step-4: Creating boards and cards for visualization of data:

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

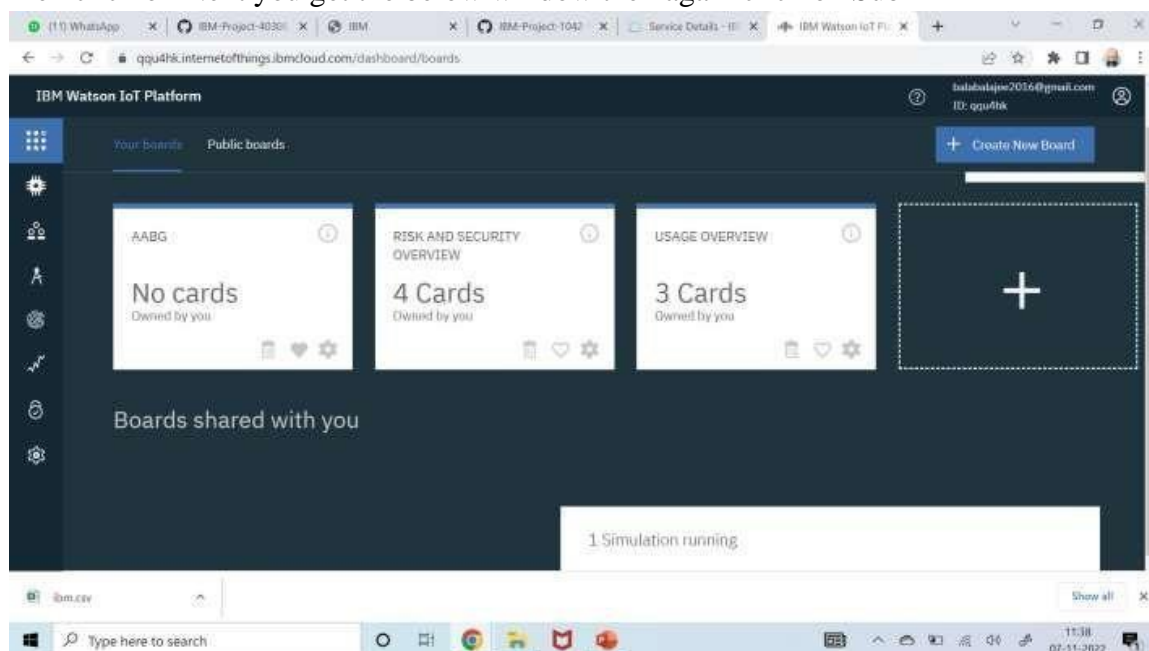


- Click on Create a new board to create a board .

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

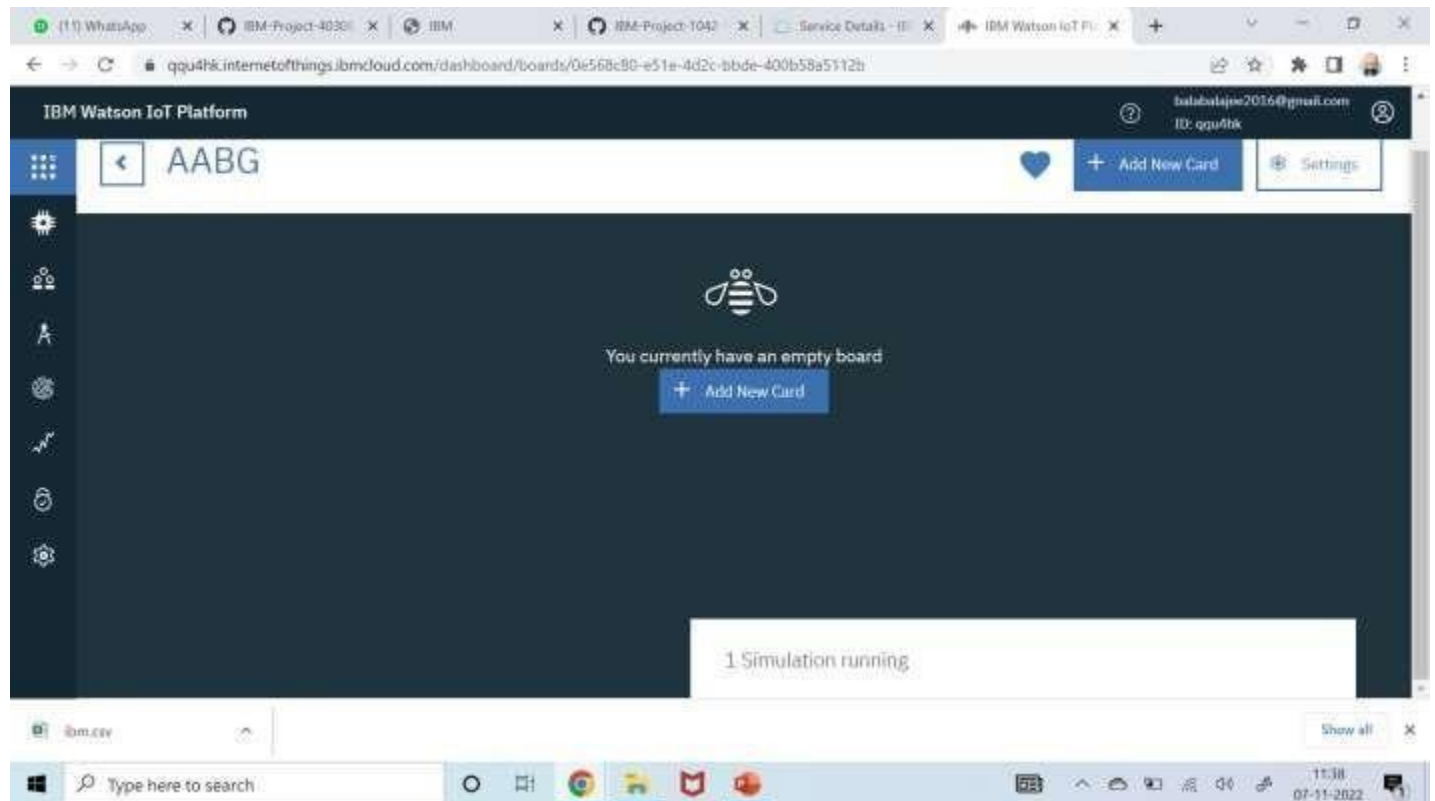


- Then click on Next you get the below window then again click on Sub

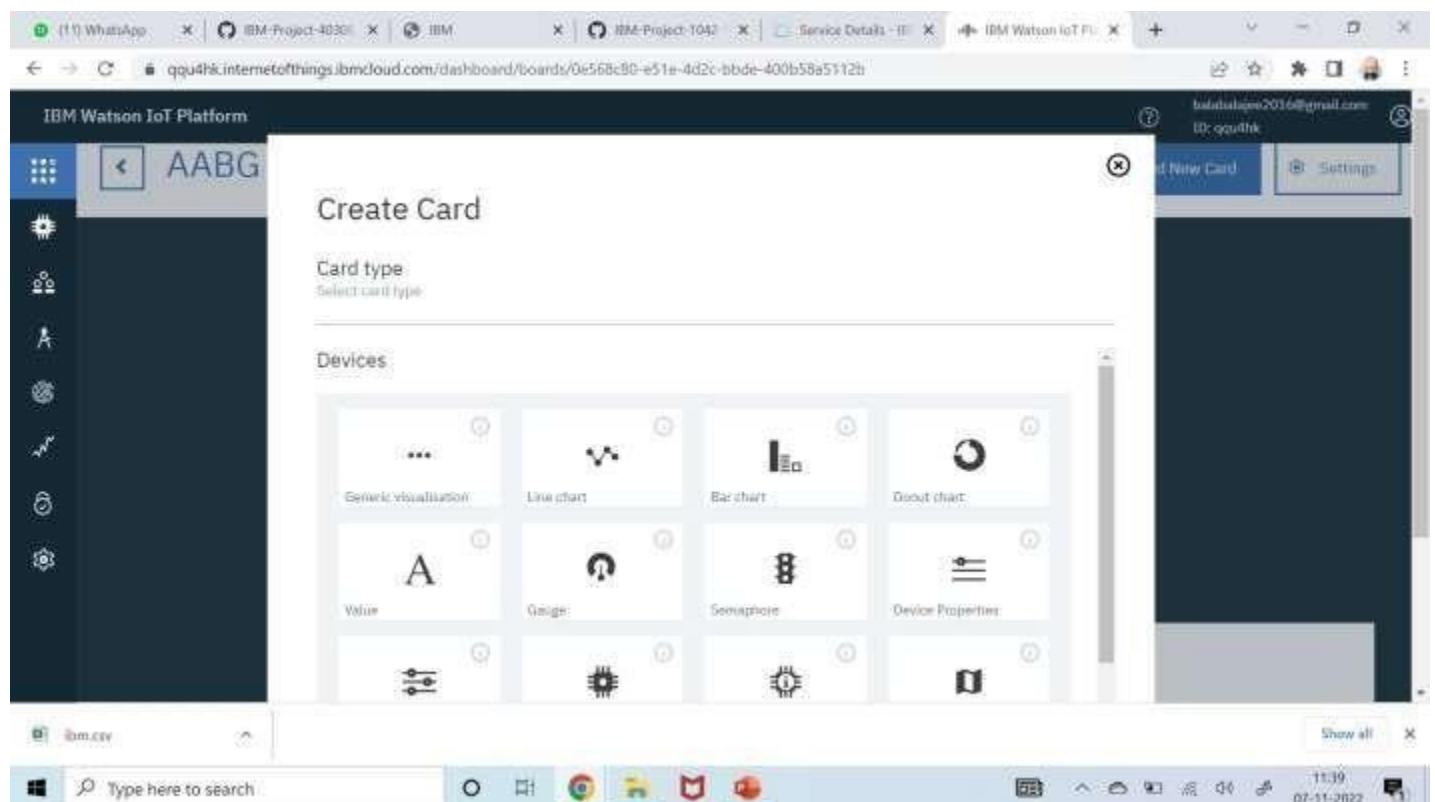


Then double click on your boards name which you have created.

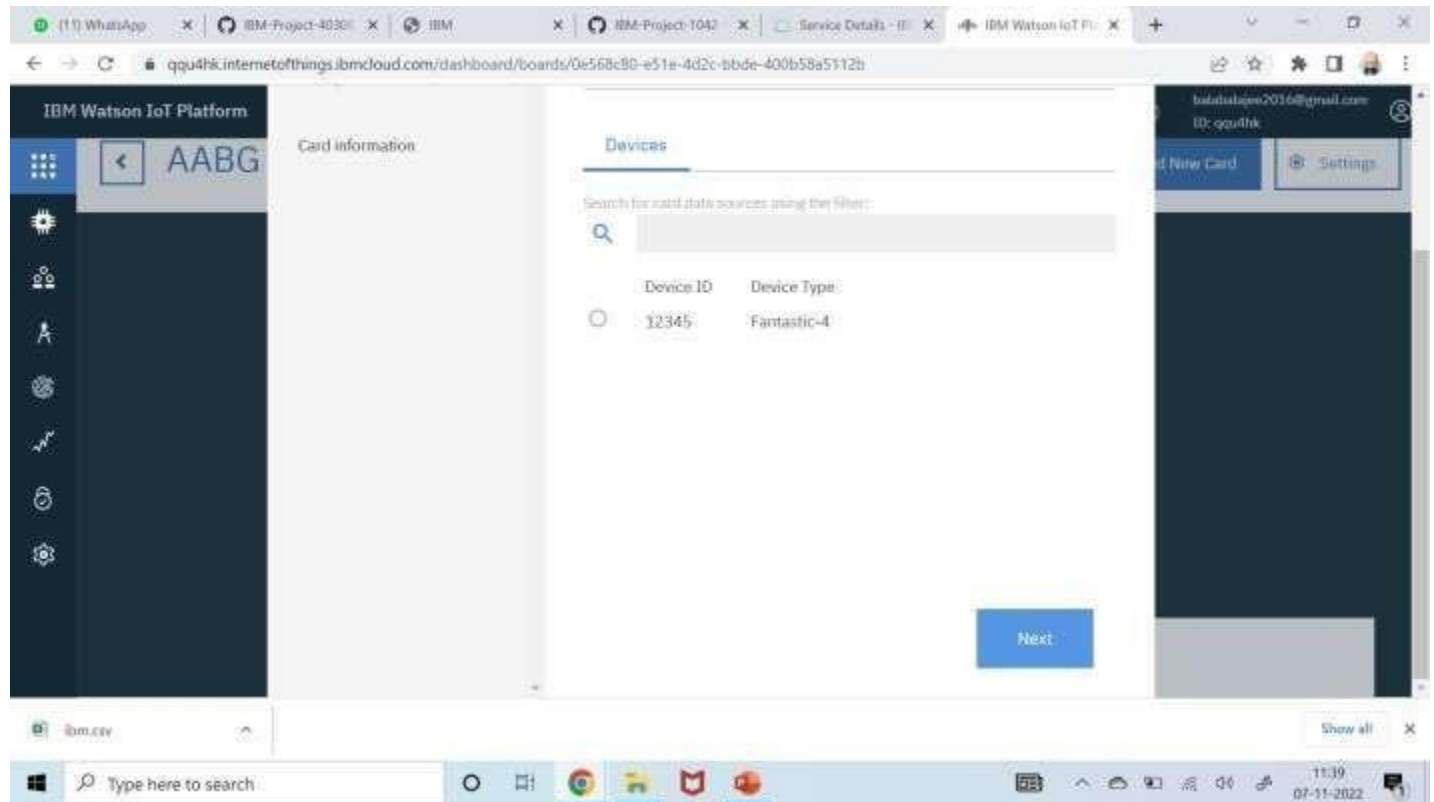
- Click on Add New Card



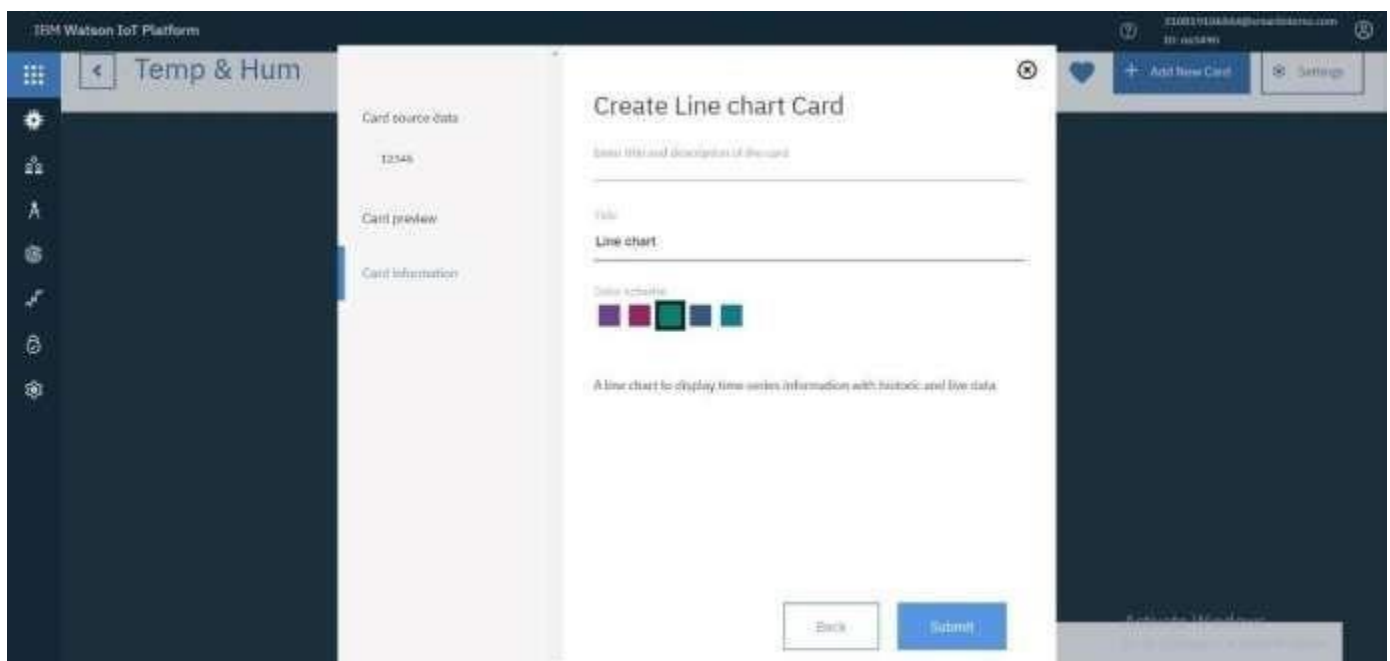
- Select the type of Graph u want accordingly and click next



- 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.

