

SENDING DATA FROM RASPBERRY-PI TO IBM WATSON

Date	18 /11/2022
Team ID	PNT2022TMID48655
Project Name	Gas Leakage Monitoring and Alerting System for Industries

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
- Connecting Wires’ DHT-11 Sensor

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’

Welcome to xIBM xIoT-B1-1M xSENDING xIBM Create Your xIBM Cloud xIBM Watson xNew Tab xNew Tab x

cloud.ibm.com/login

IBM CloudCatalogCost estimatorDocs



Log in to IBM Cloud

Don't have an account? [Create an account](#)

Sign in with

IBMId

username@example.com


Continue

[Forgot ID?](#)

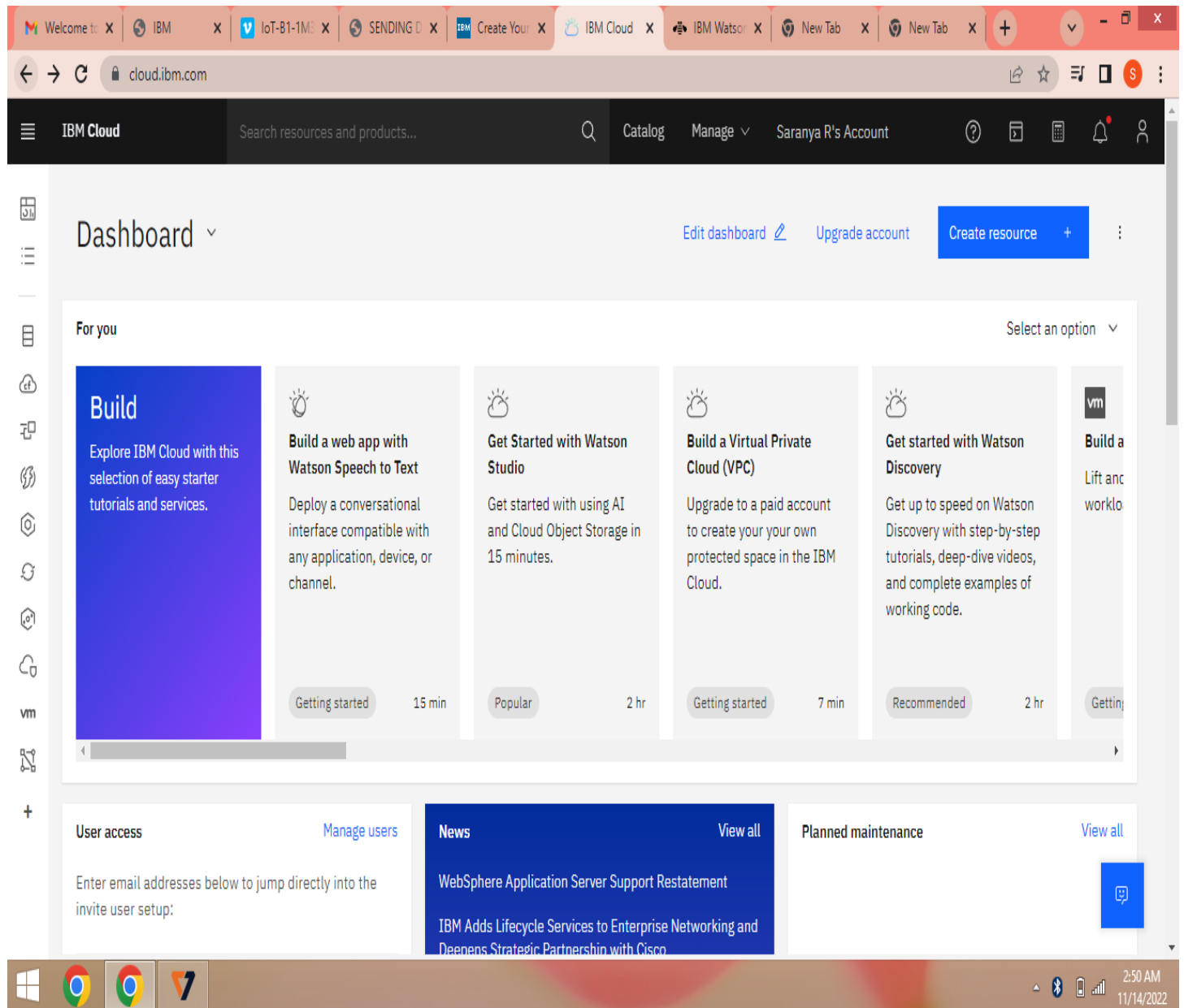
☐ Remember ID

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Cookie Preferences



2:50 AM
11/14/2022



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

Welcome to: xIBM xIoT-B1-1M3 xSENDING I xCreate Your xCatalog - IE xIBM Watson xNew Tab xNew Tab x


cloud.ibm.com/catalog

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Sell on IBM CloudCatalog settings

Catalog

Search the catalog...



Category ^Viewing 206 products

Alphabetically

Grid view

☆ Recommended products (6)

≡ Compute (30)

☐ Containers (9)


🌐 Networking (30)

📁 Storage (20)

🧠 AI / Machine Learning (17)

📊 Analytics (10)

🔗 Blockchain (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 •




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 •



API Connect

By IBM

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

Lite • Free • EU Supported • IAM-enabled •

Windows taskbar with icons for Chrome, Edge, and VS Code.


System tray showing time 2:49 AM and date 11/14/2022.

Welcome to xIBM xIoT-B1-1M: xSENDING D xIBM Create Your xInternet of xIBM Watson xNew Tab xNew Tab x

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

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Catalog /



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.

CreateAbout

TypeService

ProviderIBM

Last updated08/15/2022

CategoryInternet of Things

ComplianceIAM-enabled

LocationFrankfurtLondonDallasWashington DC

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 Maximum of 500 application bindings Maximum of 200 MB of each of data exchanged, data analyzed and edge data analyzed.	Free

Summary

Internet of Things PlatformFree

Location: Frankfurt

Plan: Lite

Service name: Internet of Things Platform-vh





Resource group: Default

Existing Lite plan instance

You can have only 1 Lite plan instance of this service per resource group. [Delete](#) your current Lite plan instance in Default resource group to create a new one, or [view the existing instance](#)

☐ I have read and agree to the following license agreements:
[Terms](#)

Create



2:49 AM

11/14/2022

Browser tabs: Welcome to x, IBM x, IoT-B1-1M x, SENDING D x, IBM Create Your x, Service Det x, IBM Watson x, New Tab x, New Tab x.

Address bar: cloud.ibm.com/services/iotf-service/crn%3Av1%3Abluemix%3Apublic%3Aiotf-service%3Aeu-de%3Aa%2F47eac19a5b474b64bea1945b323882eb%3Ab750822a-ba...


IBM Cloud header: Search resources and products... Catalog Manage v Saranya R's Account

Resource list / Internet of Things Platform-a1 Active Add tags [Details](#) [Actions...](#)

Manage

Plan

Connections



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	Production
The Lite service plan provides a lightweight development environment to get you started	The Non-Production service plan is a full-featured, fully-integrated offering that enables	The Production service is a fully managed SaaS offering that enables you to manage and analyze



Windows taskbar: 2:48 AM, 11/14/2022

- Click on launch




Welcome to: X IBM X IoT-B1-1M: X SENDING D X IBM Create Your X Service Del: X IBM Watson X New Tab X New Tab X


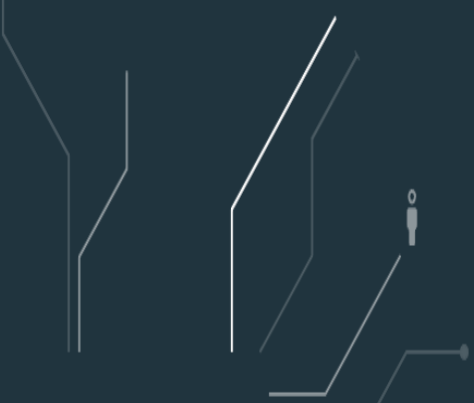
internetofthings.ibmcloud.com

920819104032@smartin... ID: (select org)






Collect data from







and make value from it



Equipment

Learn More



2:48 AM
11/14/2022






Welcome to xIBMxIoT-B1-1M3xSENDING D xIBM Create Your xService Det xIBM Watson xNew Tab xNew Tab x

internetofthings.ibmcloud.com



920819104032@smartin...
ID: (select org)

IBM Watson IoT Platform







Collect data from




Cars



and make value from it

Learn More





2:47 AM
11/14/2022

IBM Watson IoT Platform

920819104032@smartinternz.com
ID: ts1sj3

Browse Action **Device Types** Interfaces

Add Device Type

Device Types

This table lists all device types that are defined. You can filter the list and search for the name and description. You can modify and configure existing device types and add new device types.

Q Type the name to search f...

<input type="checkbox"/>	Name	Description	Number of Devices	Class ID	Date Added
> <input type="checkbox"/>	PNT2022TMID48655		1	Device	Nov 14, 2022 1:12 AM

Items per page 10 | 1-1 of 1 item

1 of 1 page < 1 >

- Create Device Type as what you like

Welcome to xIBM xIoT-B1-1M xSENDING D xIBM Create Your xService Det xIBM Watson xNew Tab xNew Tab x

ts1sj3.internetofthings.ibmcloud.com/dashboard/devices/types/add

920819104032@smartinternz.comID: ts1sj3

IBM Watson IoT Platform

BrowseActionDevice TypesInterfaces

You added the new device type: PNT2022TMID48655


Register DeviceAdvanced Flow





Optional


Register Devices, Define Interfaces

Now that you added a device type, you can register and connect devices for this type.

Register Devices





2:46 AM
11/14/2022

The screenshot displays the IBM Watson IoT Platform interface. At the top, there's a navigation bar with the platform name and user information. Below it, a sidebar contains icons for various functions like Browse, Action, Device Types, and Interfaces. The main area shows a list of devices, with one device selected and its details expanded.

Device ID	Status	Device Type	Class ID	Date Added
PNT2022TMID48655	Disconnected	PNT2022TMID48655	Device	Nov 14, 2022 1:14 AM

Identity	Device Information	Recent Events	State	Logs
Device ID	PNT2022TMID48655			
Device Type	PNT2022TMID48655			
Date Added	Nov 14, 2022 1:14 AM			
Added By	920819104032@smartinternz.com			
Connection Status	Disconnected			

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:

```
--2017-10-23 00:55:22-- http://ftp.nl.debian.org/debian/pool/main/o/openssl/libssl1.0.0_1.0.1f-2+deb8u_armhf.deb
Resolving ftp.nl.debian.org (ftp.nl.debian.org)... 130.09.340.21, 2001:07f::2964:a320::21
Connecting to ftp.nl.debian.org (ftp.nl.debian.org)|130.09.340.21|:80... connect
ed.
HTTP request sent, awaiting response... 200 OK
Length: 807050 (848K) [application/x-debian-package]
Saving to: 'libssl1.0.0_1.0.1f-2+deb8u_armhf.deb'

libssl1.0.0_1.0.1f-2+deb8u_armhf.deb 100%[=====] 847.61K 368KB/s in 2.4s

2017-10-23 00:55:26 (268 KB/s) - 'libssl1.0.0_1.0.1f-2+deb8u_armhf.deb' saved [
847050/847050]

pi@raspberrypi:~$ sudo dpkg -i libssl1.0.0_1.0.1f-2+deb8u_armhf.deb
Selecting previously unselected package libssl1.0.0-armhf.
(Reading database ... 119998 files and directories currently installed.)
Preparing to unpack libssl1.0.0_1.0.1f-2+deb8u_armhf.deb ...
Unpacking libssl1.0.0-armhf (1.0.1f-2+deb8u) ...
Setting up libssl1.0.0-armhf (1.0.1f-2+deb8u) ...

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
0 0 0 0 0 0 0 0 --:--:-- 0:00:01 --:--:-- 0
300 100 0 100 0 0 0 0 --:--:-- 0:00:01 --:--:-- 300
300 600 0 600 0 0 0 0 --:--:-- 0:00:01 --:--:-- 450
100 1100 100 1100 0 0 0 0 0:00:00 0:00:00 --:--:-- 45100

pi@raspberrypi:~$ sudo dpkg -i iot_1.0-2_armhf.deb
(Reading database ... 119998 files and directories currently installed.)
Preparing to unpack iot_1.0-2_armhf.deb ...
Unpacking iot (1.0-2) over (1.0-1) ...
Setting up iot (1.0-2) ...
Processing triggers for systemd (232-06+deb8u) ...

pi@raspberrypi:~$ service iot status
* iot.service - IoT service
Loaded: loaded (/etc/systemd/system; generated; vendor preset: enabled)
```

- 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 (56kB)
    100% |#####| 61kB 510kB/s
Collecting distro~=1.7.4 (from ibmiotf)
  Downloading distro-1.7.4.tar.gz
Collecting iso8601==0.1.13 (from ibmiotf)
  Downloading iso8601-0.1.13-py2.py3-none-any.whl
Collecting paho-mqtt==1.2 (from ibmiotf)
  Downloading paho-mqtt-1.3.1.tar.gz (60kB)
    100% |#####| 61kB 910kB/s
Collecting pytz==2017.2 (from ibmiotf)
  Using cached pytz-2017.2-py2.py3-none-any.whl
Collecting requests==2.5.3 (from ibmiotf)
  Downloading requests-2.18.4-py2.py3-none-any.whl (109kB)
    100% |#####| 92kB 1.0MB/s
Collecting requests-toolbelt==0.7.0 (from ibmiotf)
  Downloading requests-toolbelt-0.8.0-py2.py3-none-any.whl (54kB)
    100% |#####| 61kB 1.0MB/s
Collecting smtplib2==0.12.2 (from ibmiotf)
  Downloading smtplib2-0.11.0-py2.py3-none-any.whl
Collecting urllib3>=1.22, <=1.21.1 (from requests==2.5.0->ibmiotf)
  Downloading urllib3-1.22-py2.py3-none-any.whl (113kB)
    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% |#####| 41kB 1.7MB/s
Collecting charset==3.1.0, <=3.0.3 (from requests==2.5.0->ibmiotf)
  Downloading charset-3.0.4-py2.py3-none-any.whl (113kB)
    100% |#####| 143kB 1.0MB/s
Collecting certifi==2017.4.17 (from requests==2.5.0->ibmiotf)
  Using cached certifi-2017.7.27.2-py2.py3-none-any.whl
Building wheels for collected packages: ibmiotf, distro, paho-mqtt
Running setup.py bdist_wheel for ibmiotf ... done
Stored in directory: /home/pi/.cache/pip/wheels/7a/f9/45/b1c33a3457e02f7071b0b0e31605a0349d736a012edc0418
Running setup.py bdist_wheel for distro ... done
Stored in directory: /home/pi/.cache/pip/wheels/45/62/59/96010b13ec6a7b2ae66a13795401b50de75460024078e12ce
Running setup.py bdist_wheel for paho-mqtt ... done
Stored in directory: /home/pi/.cache/pip/wheels/25/40/0d/acc8f289611b7be7de71de8ef0642f882be0313efff0493
Successfully built ibmiotf distro paho-mqtt
Installing collected packages: distro, iso8601, paho-mqtt, pytz, urllib3, idna, charset, certifi, requests, requests-toolbelt, smtplib2, ibmiotf
Successfully installed certifi-2017.7.27.2 charset-3.0.4 distro-1.7.4 ibmiotf-0.3.0 idna-2.6 iso8601-0.1.13 paho-mqtt-1.3.1 pytz-2017.2 requests-2.18.4 requests-toolbelt-0.8.0 urllib3-1.22
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:

```

File Edit View Debug Console Window Help
Python 2.7.13 (default, Jan 10 2017, 14:48:08)
[GCC 6.3.0 20170124] on linux2
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: /home/pi/Downloads/dht11toibmiot.py =====
2017-10-25 07:20:37,788 ibmiot device client INFO Connected successfully: d:dgat18-mydevice-mydevice
Published Temperature = 28 C Humidity = 50 % to IBM Watson
SensorData Invalid
Published Temperature = 28 C Humidity = 50 % to IBM Watson
SensorData Invalid
Published Temperature = 28 C Humidity = 50 % to IBM Watson
SensorData Invalid
Published Temperature = 28 C Humidity = 50 % to IBM Watson
SensorData Invalid
Published Temperature = 28 C Humidity = 50 % 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.

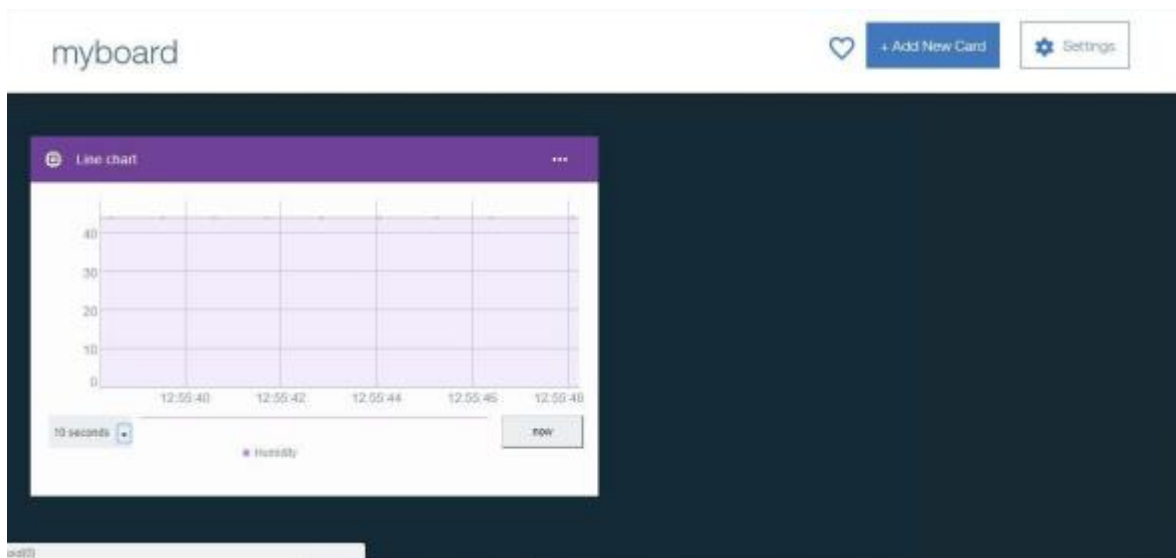
The screenshot shows the IBM Watson IoT Platform dashboard. The left sidebar contains navigation links: Connection Information, Recent Events, Sensor Information, **Metadata**, Device Information, Diagnostic Logs, and Error Codes. The main content area displays a table of recent events and a section for sensor information.

Event	Format	Time Received
DHT11	json	Oct 23, 2017 12:49:40 PM
DHT11	json	Oct 23, 2017 12:49:42 PM
DHT11	json	Oct 23, 2017 12:49:43 PM
DHT11	json	Oct 23, 2017 12:49:44 PM

Event	Datapoint	Value	Time Received
DHT11	Temperature	27	Oct 23, 2017 12:49:44 PM
DHT11	Humidity	45	Oct 23, 2017 12:49:44 PM

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



Conclusion :

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