Name: **Swarup Tripathy** Assignment Number: **3**
Course: **ECE3502: IoT Domain Analyst** Date: March 6, 2022

Reg No: 19BEE0167

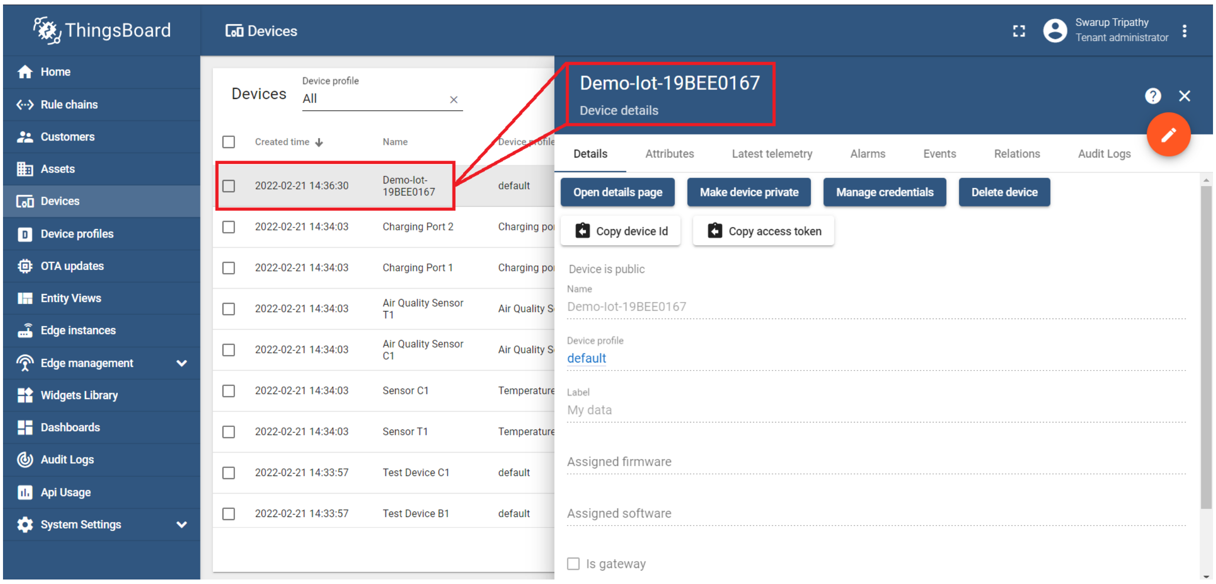
1 Problem 2

Online Dashboard creation and to push the data into Thingsboard using http protocol.

B. To push the data into Thingsboard using mqtt protocol and Create Dashboard in Thingsboard using MQTT. Also create two devices and feed data through python and compare the values of the devices using various widgets in thingsboard

Configuration of Thingsboard

1. Creating an account on Thingsboard
2. First we need to create a device
   - Name → Demo-Iot-19BEE0167
   - Device type → default
   - Label → my data
3. When clicked on 'Device', and when we select 'latest telemetry' it provides the last data recorded
4. We make sure that we copy the 'token'
5. Creating a Dashboard
   - In the dashboards section we create a new dashboard for our device named 'Demo-Iot-19BEE0167'
   - Click on 'Open Dashboard'
   - Now we add a new widget where our data will be displayed
   - For this experiment, i have added a digital guage and a graph to show the data simultaneously on both.
6. Now it is time to look at the python code for pushing the data to thingsboard for visualisation.



Devices

Device profile
All

□	Created time ↓	Name	Device profile
□	2022-02-21 14:36:30	Demo-Iot-19BEE0167	default
□	2022-02-21 14:34:03	Charging Port 2	Charging po
□	2022-02-21 14:34:03	Charging Port 1	Charging po
□	2022-02-21 14:34:03	Air Quality Sensor T1	Air Quality S
□	2022-02-21 14:34:03	Air Quality Sensor C1	Air Quality S
□	2022-02-21 14:34:03	Sensor C1	Temperature
□	2022-02-21 14:34:03	Sensor T1	Temperature
□	2022-02-21 14:33:57	Test Device C1	default
□	2022-02-21 14:33:57	Test Device B1	default

Demo-Iot-19BEE0167
Device details

Device is public

Name
Demo-Iot-19BEE0167

Device profile
default

Label
My data

Assigned firmware

Assigned software

□ Is gateway

2 Python Code

1. Installing paho on google colab with the following code

```
pip install paho-mqtt
```

2. Importing the necessary libraries

```
################################################################################
import os
import time
import sys
import paho.mqtt.client as mqtt
import json
import random

Thingsboard_host = ’demo.thingsboard.io’
################################################################################
```

3. Now we need to push random data in the range between 0 to 180 for which we are inserting it in between a while loop to send data after every 5 seconds of delay.

```
################################################################################
access_token = ’JVW6vmIzxX0YSJ0eqYzv’
sensor_data = {’Mysensor’:0}

# for i in range(10):
#   sensor_data={’Mysensor’:random.randint()}

# client = mqtt.Client(’python’)
client = mqtt.Client()
client.username_pw_set(access_token)
client.connect(Thingsboard_host, 1883, 60)
client.loop_start() # starting a connection to the devices

try:
  while True:
    senval = random.randrange(0,180)  # randomly selected element from the
                                        specified range.
    print(senval)
    sensor_data['Mysensor']=senval    # since 'Mysensor' is the key so we access
                                        the key to feed the value
    client.publish('v1/devices/me/telemetry',json.dumps(sensor_data),1)
    time.sleep(3)   # giving a time delay of 5s

except KeyboardInterrupt:
  pass

client.loop_stop()
client.disconnect()
################################################################################
```

4. In Python, pass is a null statement. The interpreter does not ignore a pass statement, but nothing happens and the statement results into no operation.The pass statement is useful when you don't write the implementation of a function but you want to implement it in the future.

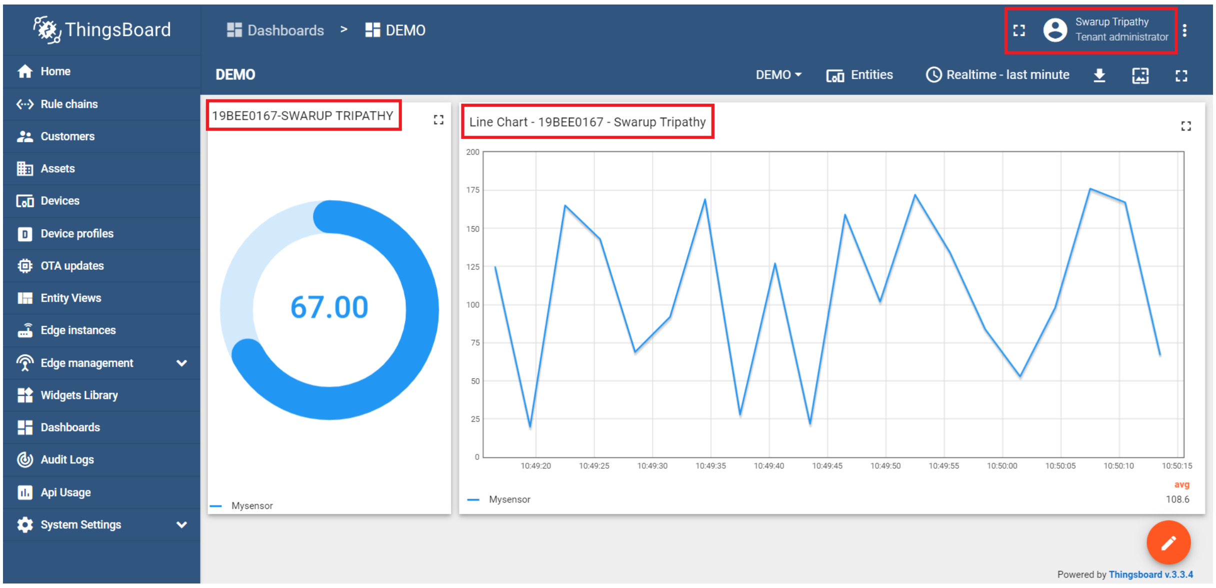
2.1 Code output

```
51
83
71
125
20
165
143
69
92
169
28
127
22
159
102
172
134
84
.
.
.
32
152
49
151
```

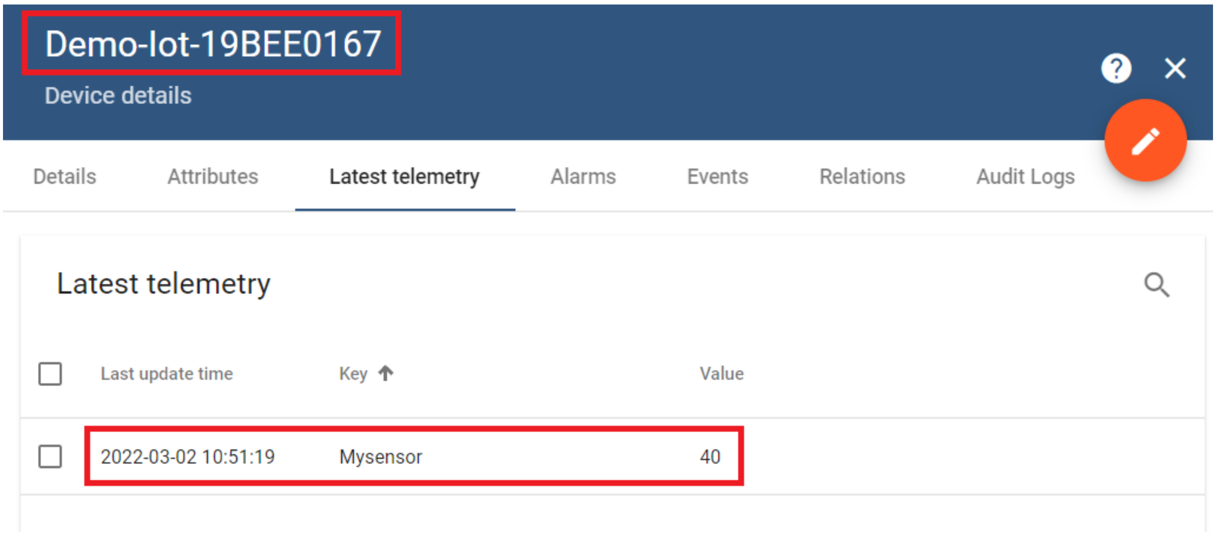
```
76
144
73
40
```

1. Below you can see the output graph that is updating realtime when we run the code

2. Following, 2 widgets have been displayed i.e., a digital guage and a line chart and the code output can be compared with the data on line chart for relevancy



3. Below I have also displated the ’latest telemetry’



Latest telemetry

□	Last update time	Key ↑	Value
□	2022-03-02 10:51:19	Mysensor	40