Connected Devices

Lab Module Assignment – Final Project

Name and Course

- Name: Dharani Thirumalaisamy
- Course: Connected Devices
- Semester and Year: Spring’19

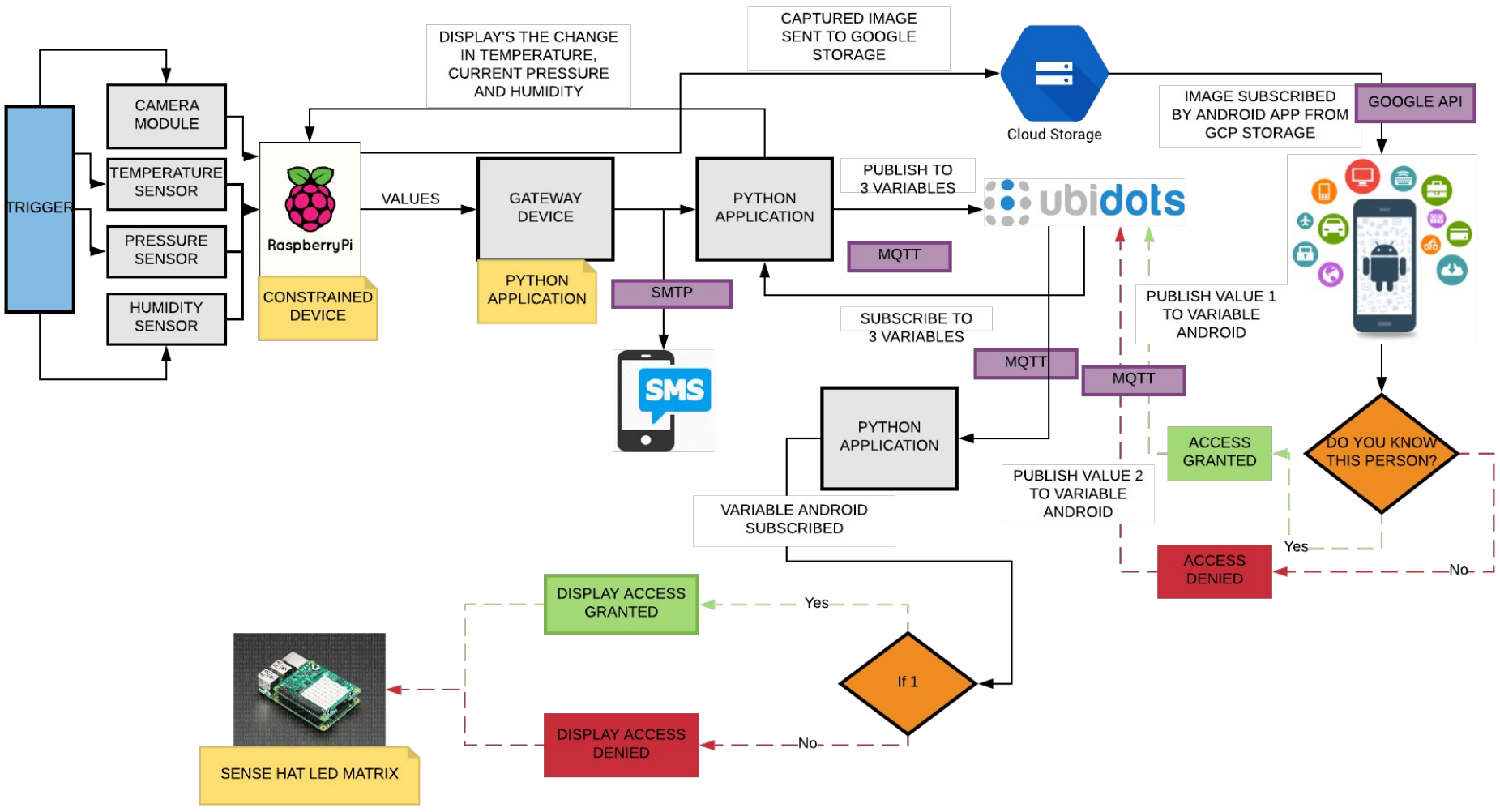
Description

- Description: An End-to-End Facial Recognition based Security System.

URL TO PROJECT DEMO：https://youtu.be/LZh16xVoErY

URL TO PROJECT SCRIPTS AND REPORT : https://github.com/Dharani-Thirumalaisamy/IOT-Workspace/tree/master

FLOW DIAGRAM



Problem Statement :

Robery has become a common incident in many places around the world today. As IOT is trying to solve many problems that is present in the society, my idea is to implement a IOT based security door which will be able to capture pictures of people who stand outside the door and send a warm welcome message to the owner and will notify the owner that there is a intruder and ask if it should provide access or not.

Protocols Used :

1. Mqtt

2. SMTP

Sensors Used :

1. Raspberry pi camera module/sensor

2. Humidity Sensor

3. Temperature Sensor

4. Presssure Sensor

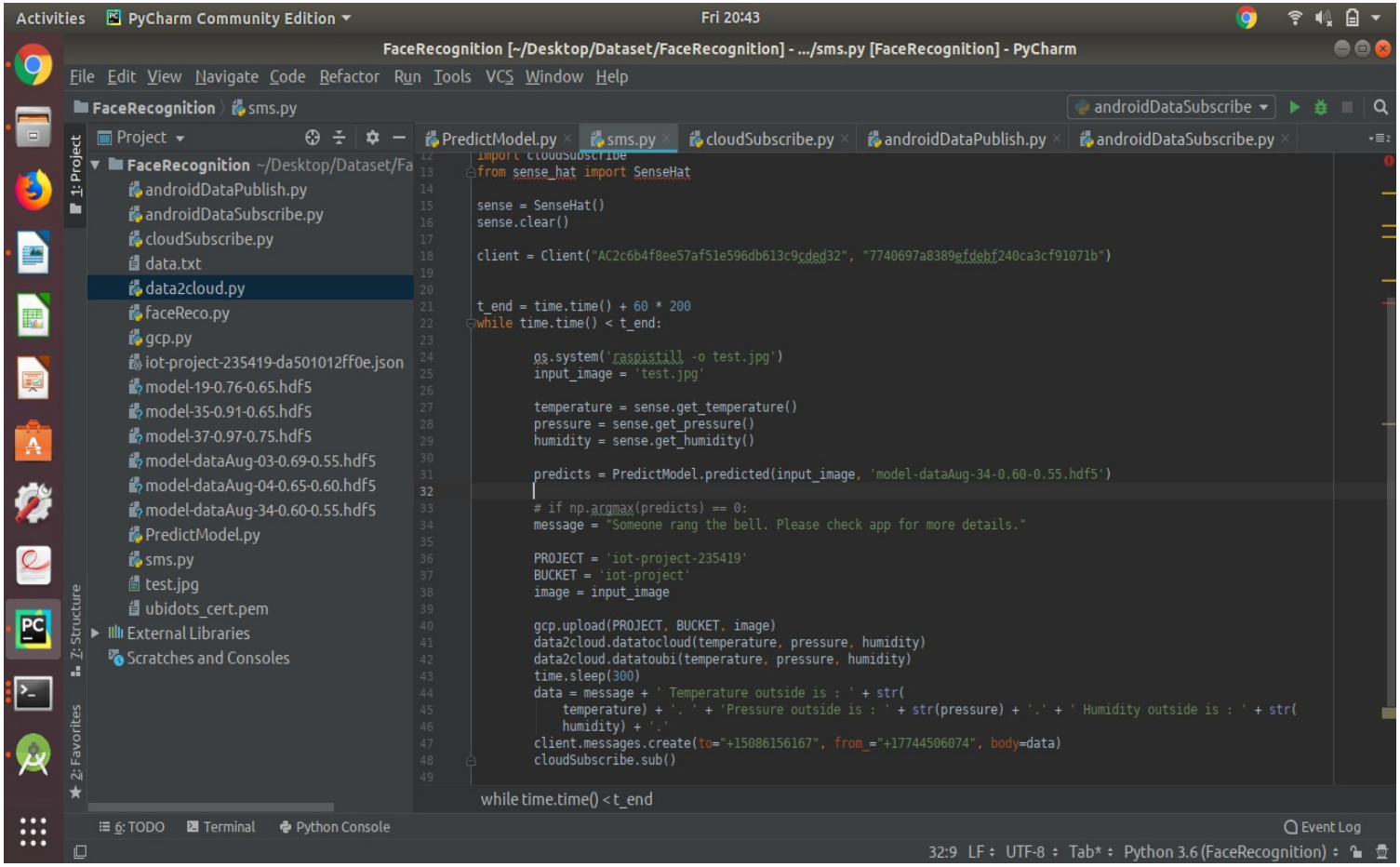
Cloud Services:

1. Google Cloud Platform

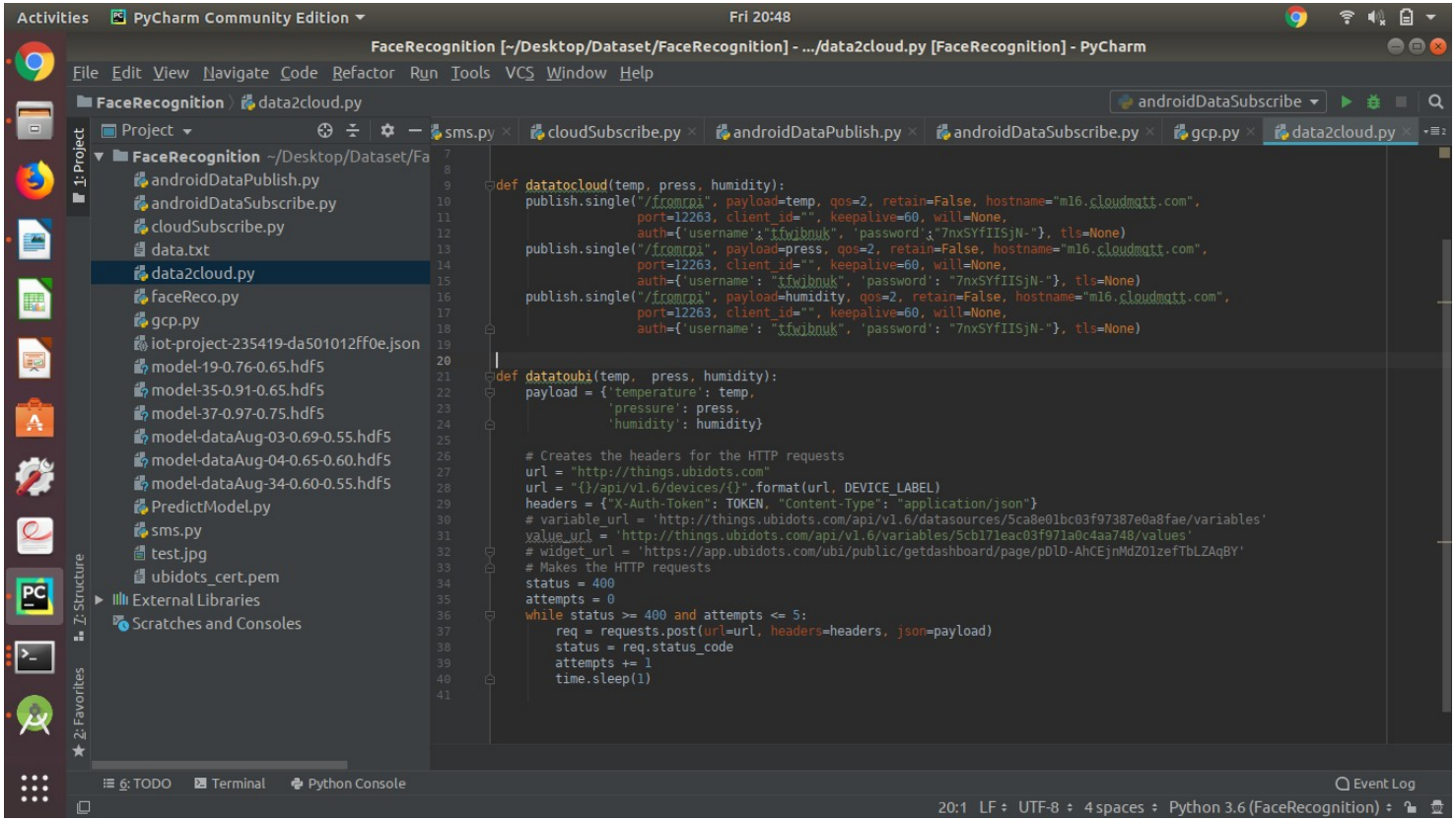
2. UBIDOTS

Application Script :

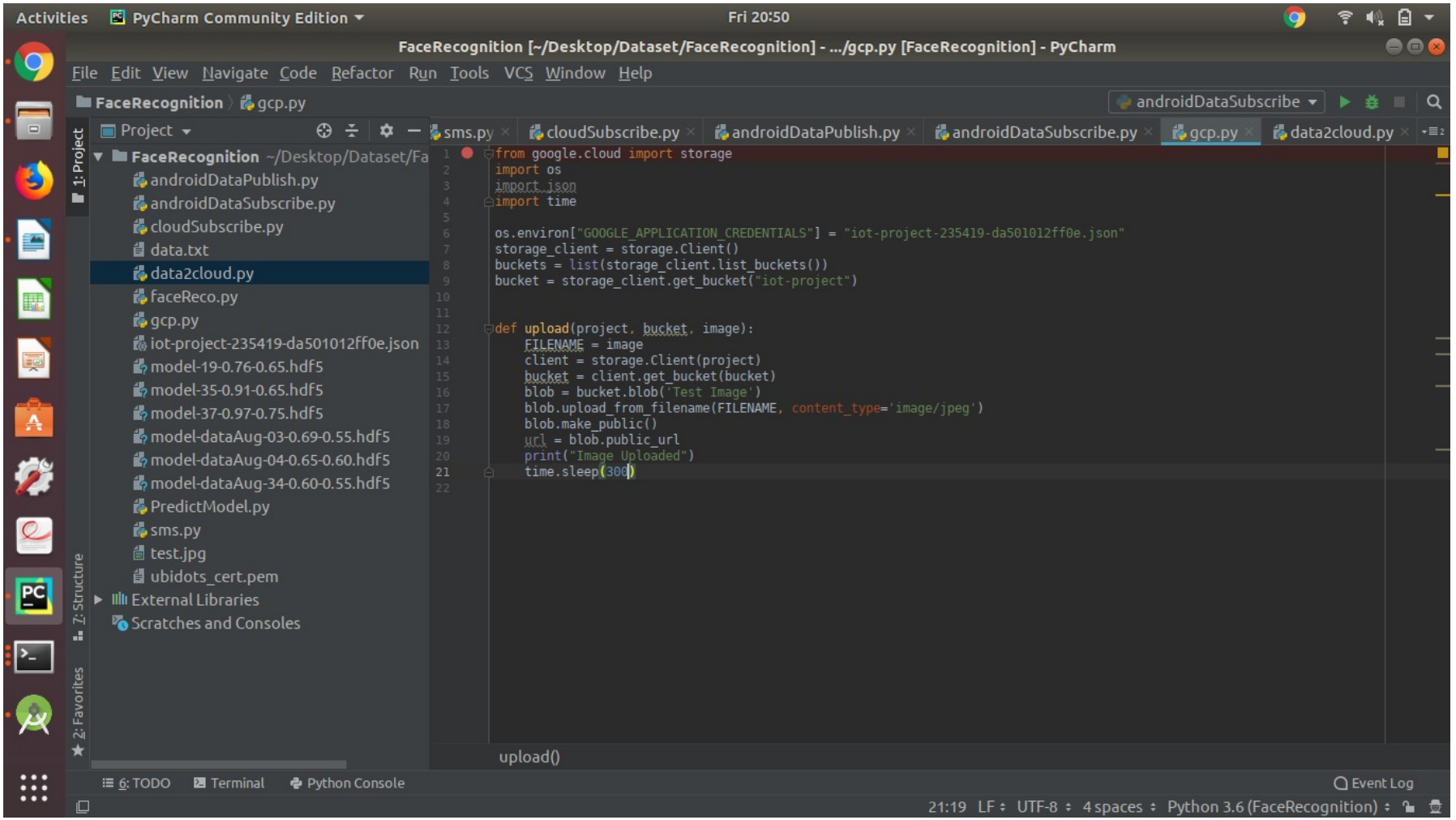
1. Trigger the sensor



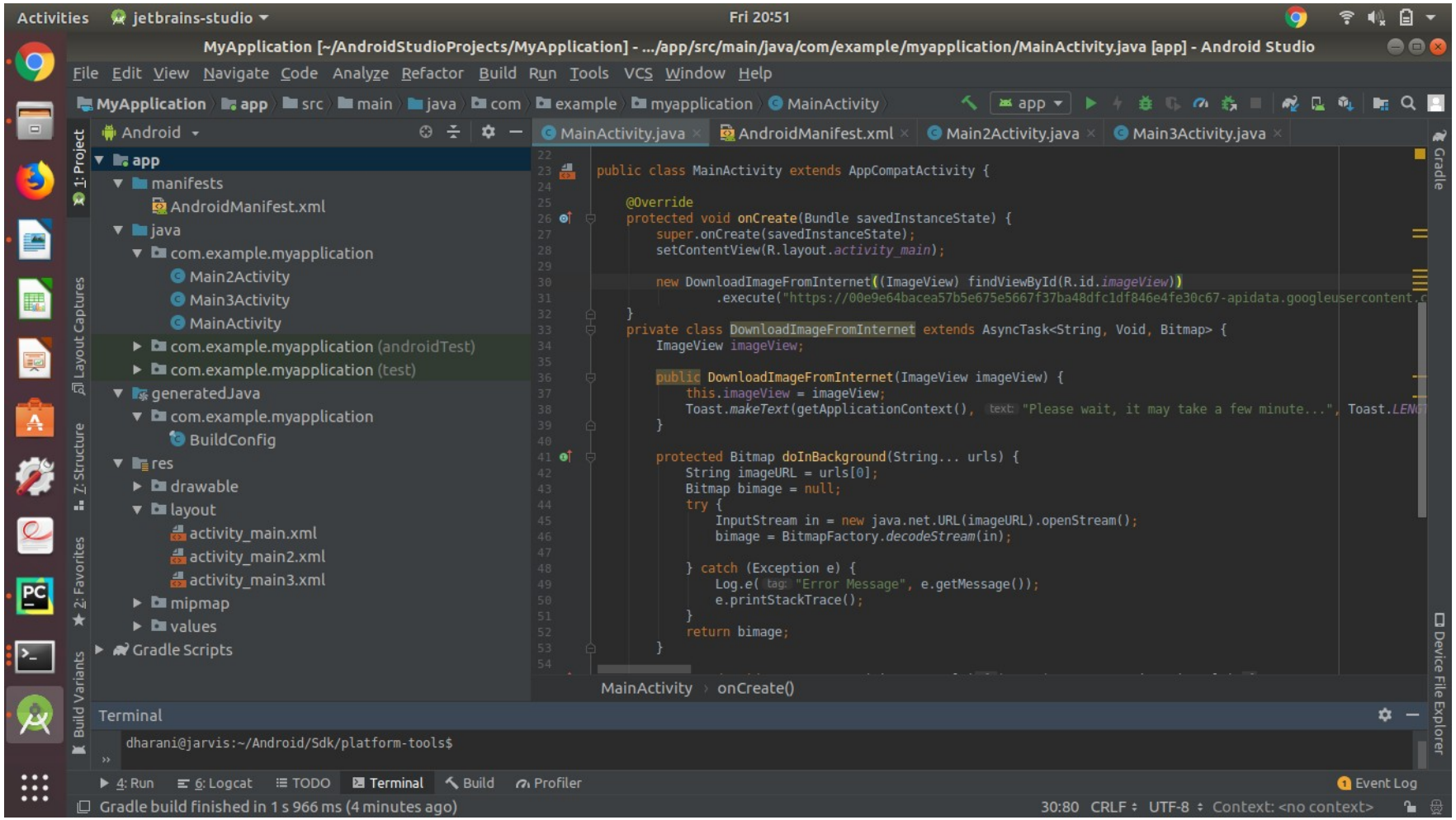
2. Send data to gateway and cloud :

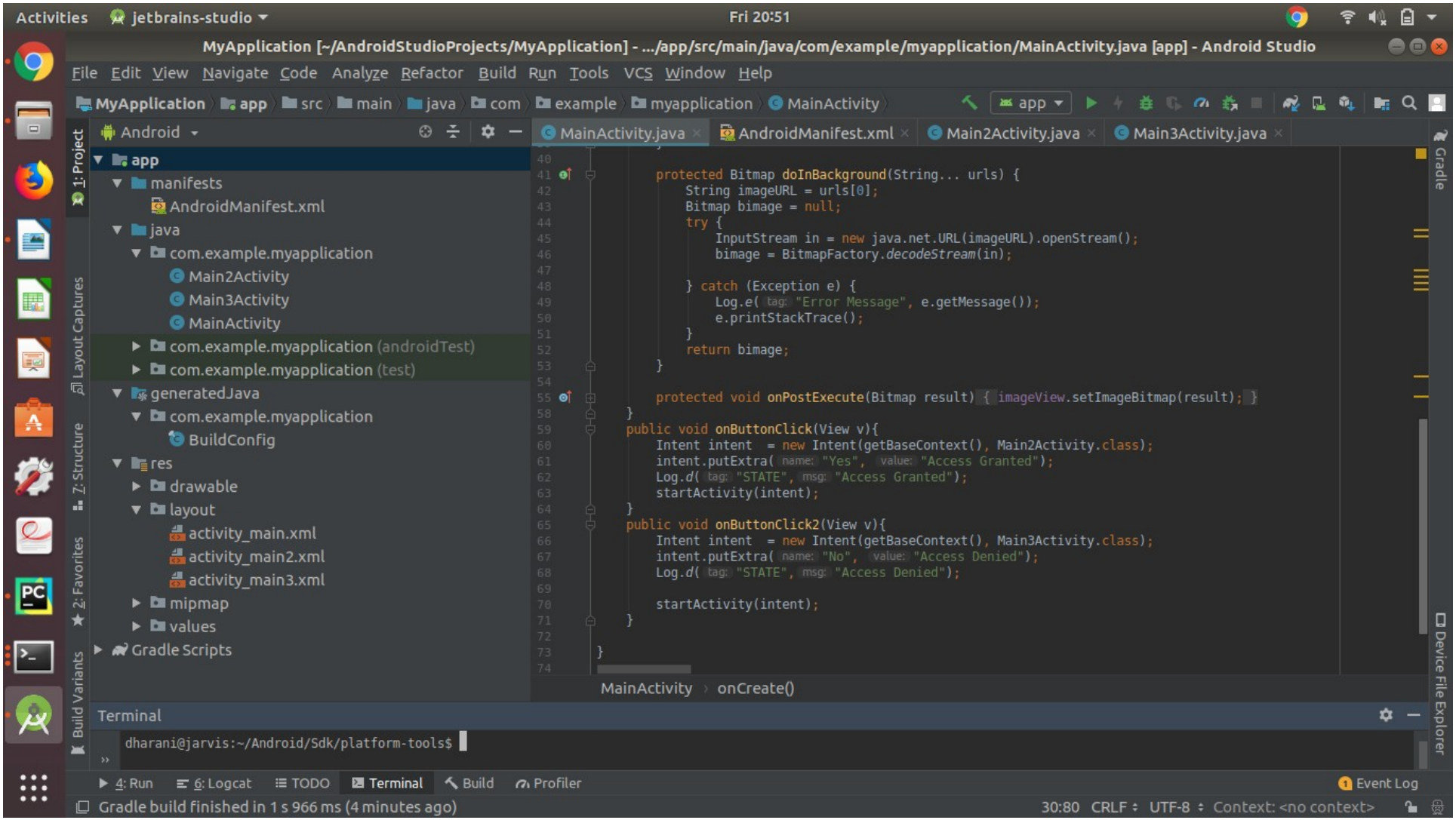


3. Image to Google Cloud :

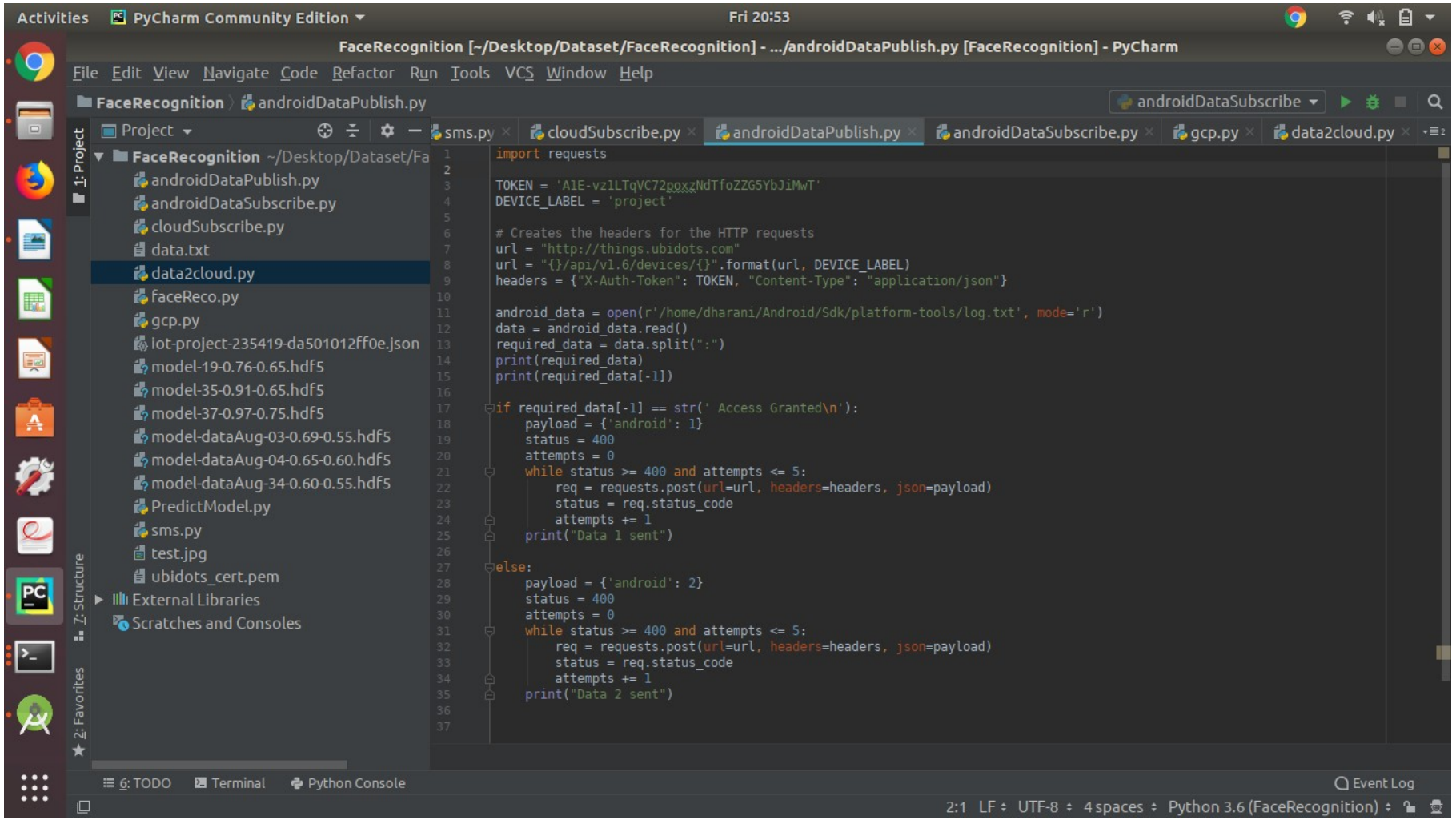


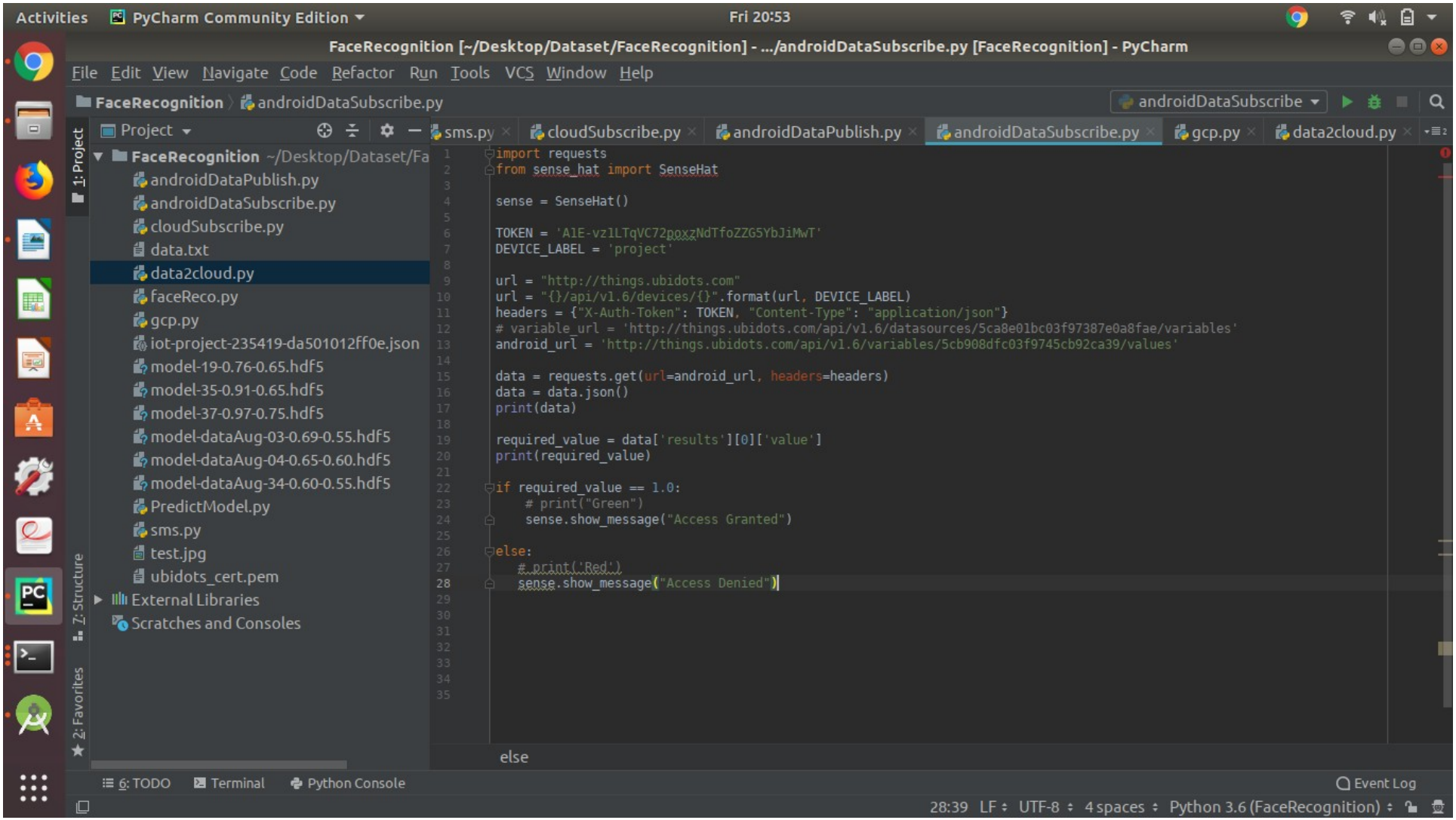
4. Image to Android App:




Activities
jetbrains-studio
Fri 20:51
MyApplication [~/AndroidStudioProjects/MyApplication] - .../app/src/main/java/com/example/myapplication/MainActivity.java [app] - Android Studio
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
MyApplication app src main java com example myapplication MainActivity
app
Android
app
manifests
AndroidManifest.xml
java
com.example.myapplication
Main2Activity
Main3Activity
MainActivity
com.example.myapplication (androidTest)
com.example.myapplication (test)
generatedJava
com.example.myapplication
BuildConfig
res
drawable
layout
activity_main.xml
activity_main2.xml
activity_main3.xml
mipmap
values
Gradle Scripts
MainActivity.java
AndroidManifest.xml
Main2Activity.java
Main3Activity.java
protected Bitmap doInBackground(String... urls) {
String imageURL = urls[0];
Bitmap bimage = null;
try {
InputStream in = new java.net.URL(imageURL).openStream();
bimage = BitmapFactory.decodeStream(in);
} catch (Exception e) {
Log.e(tag: "Error Message", e.getMessage());
e.printStackTrace();
}
return bimage;
}
protected void onPostExecute(Bitmap result) { imageView.setImageBitmap(result); }
}
public void onButtonClick(View v){
Intent intent = new Intent(getBaseContext(), Main2Activity.class);
intent.putExtra(name: "Yes", value: "Access Granted");
Log.d(tag: "STATE", msg: "Access Granted");
startActivity(intent);
}
public void onButtonClick2(View v){
Intent intent = new Intent(getBaseContext(), Main3Activity.class);
intent.putExtra(name: "No", value: "Access Denied");
Log.d(tag: "STATE", msg: "Access Denied");
startActivity(intent);
}
}
MainActivity onCreate()
Terminal
dharani@jarvis:~/Android/Sdk/platform-tools$
4: Run
6: Logcat
TODO
Terminal
Build
Profiler
Event Log
Gradle build finished in 1 s 966 ms (4 minutes ago)
30:80 CRLF UTF-8 Context: <no context>

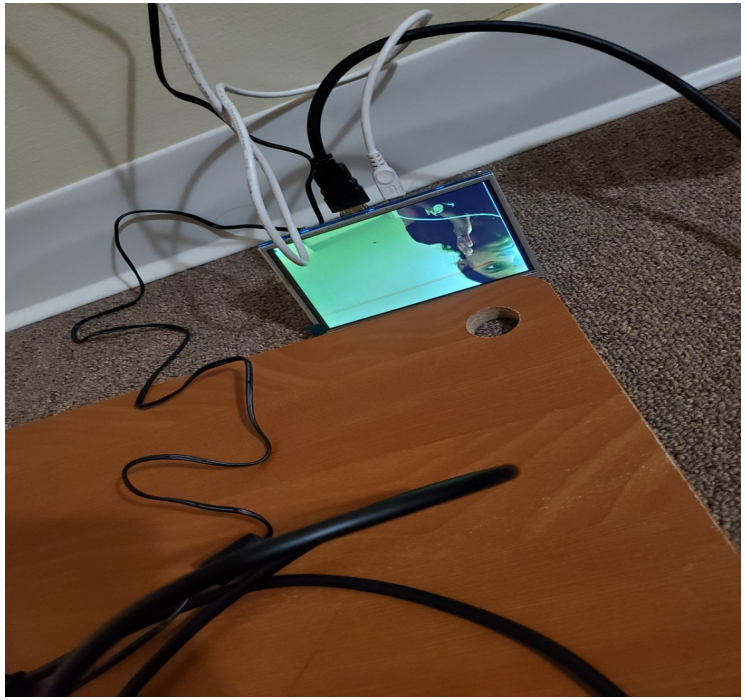
5. Android data publish and subscribe :



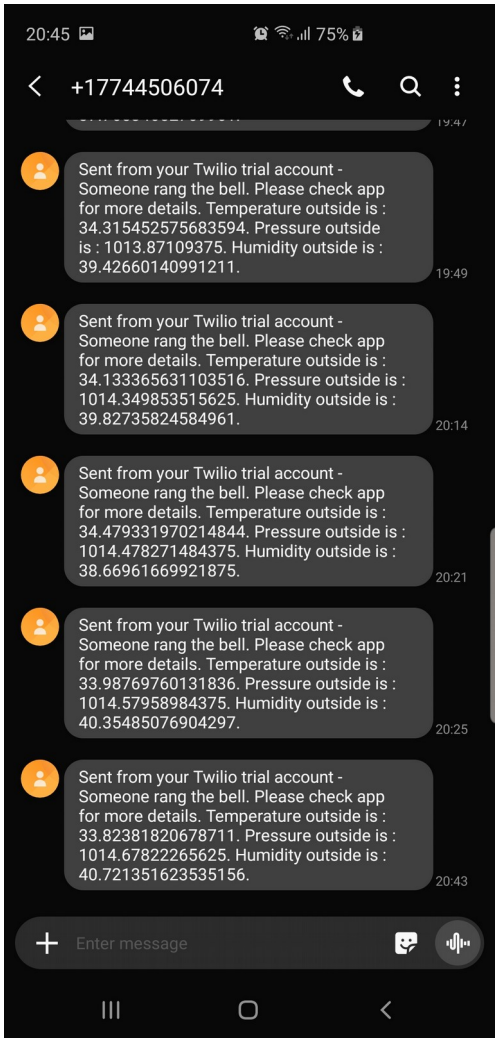

Activities
PyCharm Community Edition
Fri 20:53
FaceRecognition [~/Desktop/Dataset/FaceRecognition] - .../androidDataSubscribe.py [FaceRecognition] - PyCharm
File Edit View Navigate Code Refactor Run Tools VCS Window Help
FaceRecognition androidDataSubscribe.py
androidDataSubscribe
Project
FaceRecognition ~/Desktop/Dataset/Fa
androidDataPublish.py
androidDataSubscribe.py
cloudSubscribe.py
data.txt
data2cloud.py
faceReco.py
gcp.py
iot-project-235419-da501012ff0e.json
model-19-0.76-0.65.hdf5
model-35-0.91-0.65.hdf5
model-37-0.97-0.75.hdf5
model-dataAug-03-0.69-0.55.hdf5
model-dataAug-04-0.65-0.60.hdf5
model-dataAug-34-0.60-0.55.hdf5
PredictModel.py
sms.py
test.jpg
ubidots_cert.pem
External Libraries
Scratches and Consoles
sms.py
cloudSubscribe.py
androidDataPublish.py
androidDataSubscribe.py
gcp.py
data2cloud.py
import requests
from sense_hat import SenseHat
sense = SenseHat()
TOKEN = 'A1E-vz1LTqVC72poxzNdTfoZZG5YbJiMwT'
DEVICE_LABEL = 'project'
url = "http://things.ubidots.com"
url = "{}/api/v1.6/devices/{}".format(url, DEVICE_LABEL)
headers = {"X-Auth-Token": TOKEN, "Content-Type": "application/json"}
# variable_url = 'http://things.ubidots.com/api/v1.6/datasources/5ca8e01bc03f97387e0a8fae/variables'
android_url = 'http://things.ubidots.com/api/v1.6/variables/5cb908dfc03f9745cb92ca39/values'
data = requests.get(url=android_url, headers=headers)
data = data.json()
print(data)
required_value = data['results'][0]['value']
print(required_value)
if required_value == 1.0:
# print("Green")
sense.show_message("Access Granted")
else:
# print('Red')
sense.show_message("Access Denied")
else
1: Project
7: Structure
2: Favorites
6: TODO
Terminal
Python Console
Event Log
28:39 LF UTF-8 4 spaces Python 3.6 (FaceRecognition)

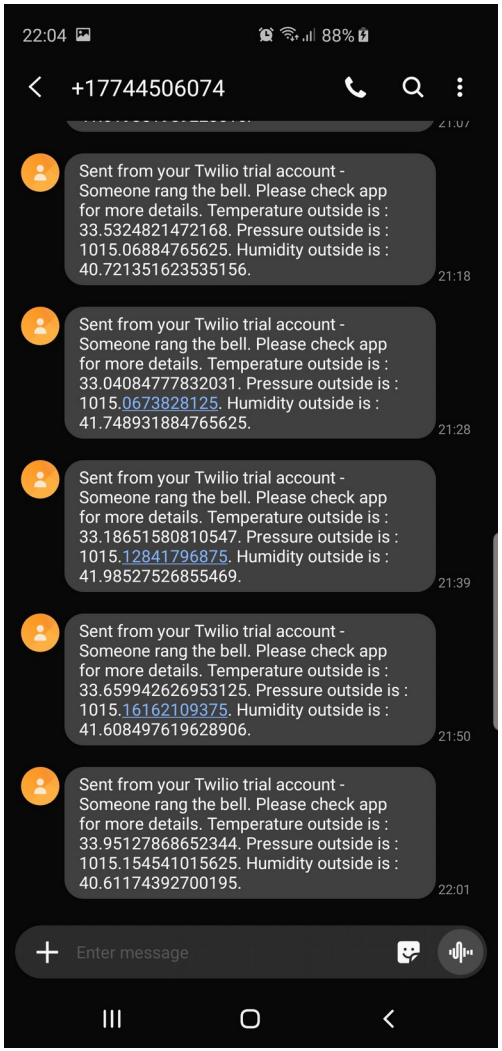
OUTPUT : (2 hours) :

1. Activating Camera module

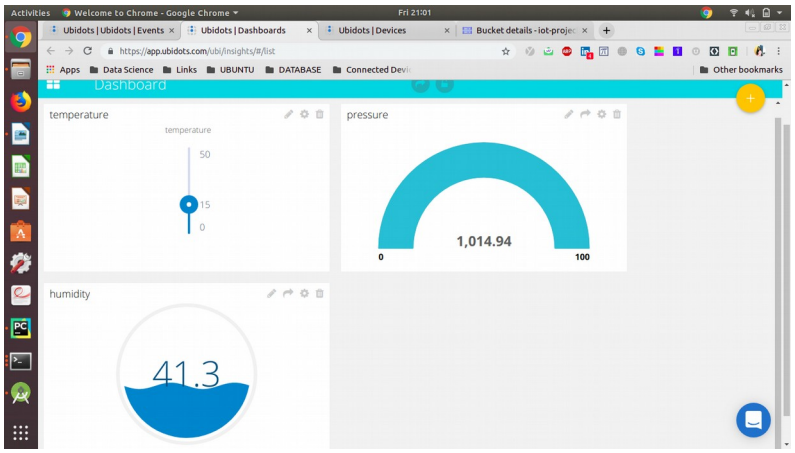


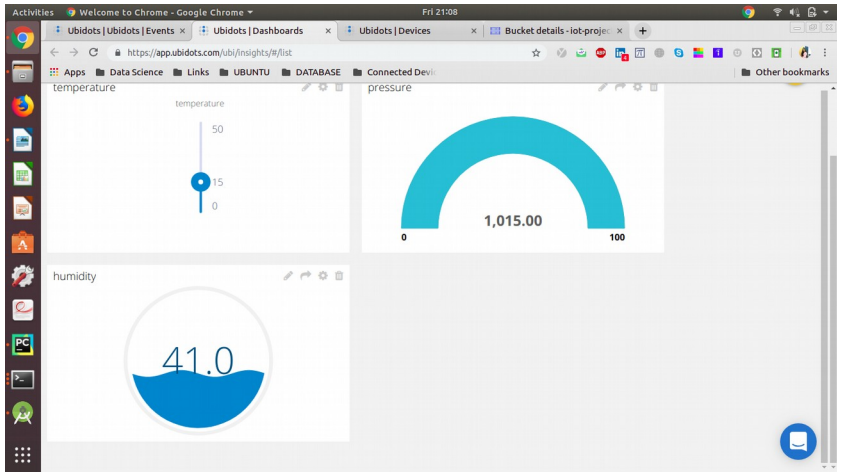
2. Sending Text Message :

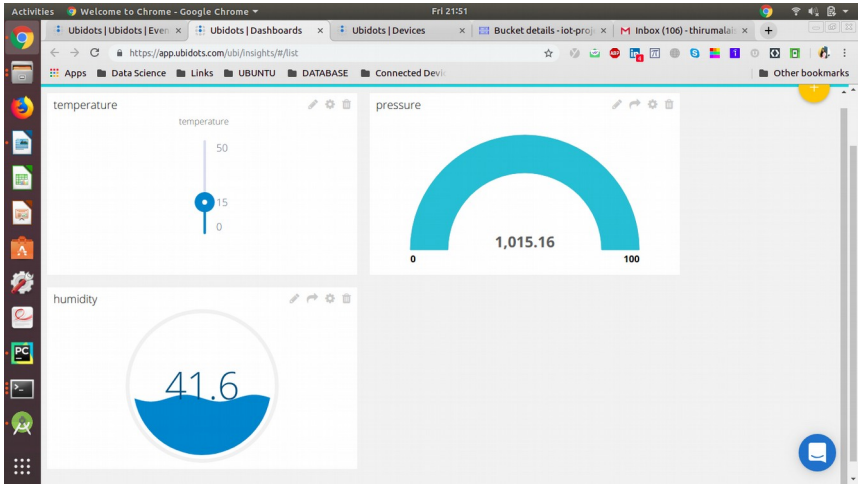


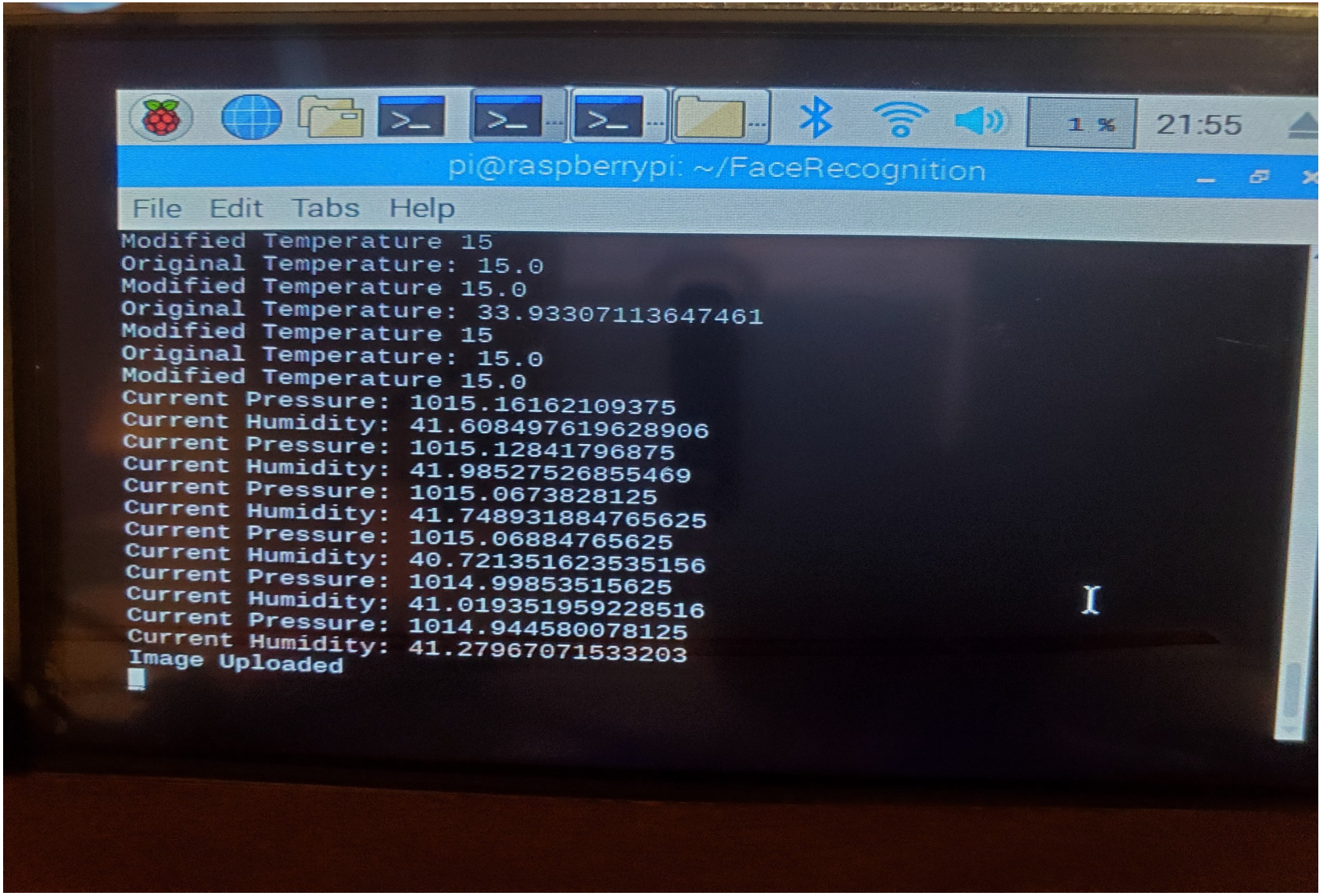


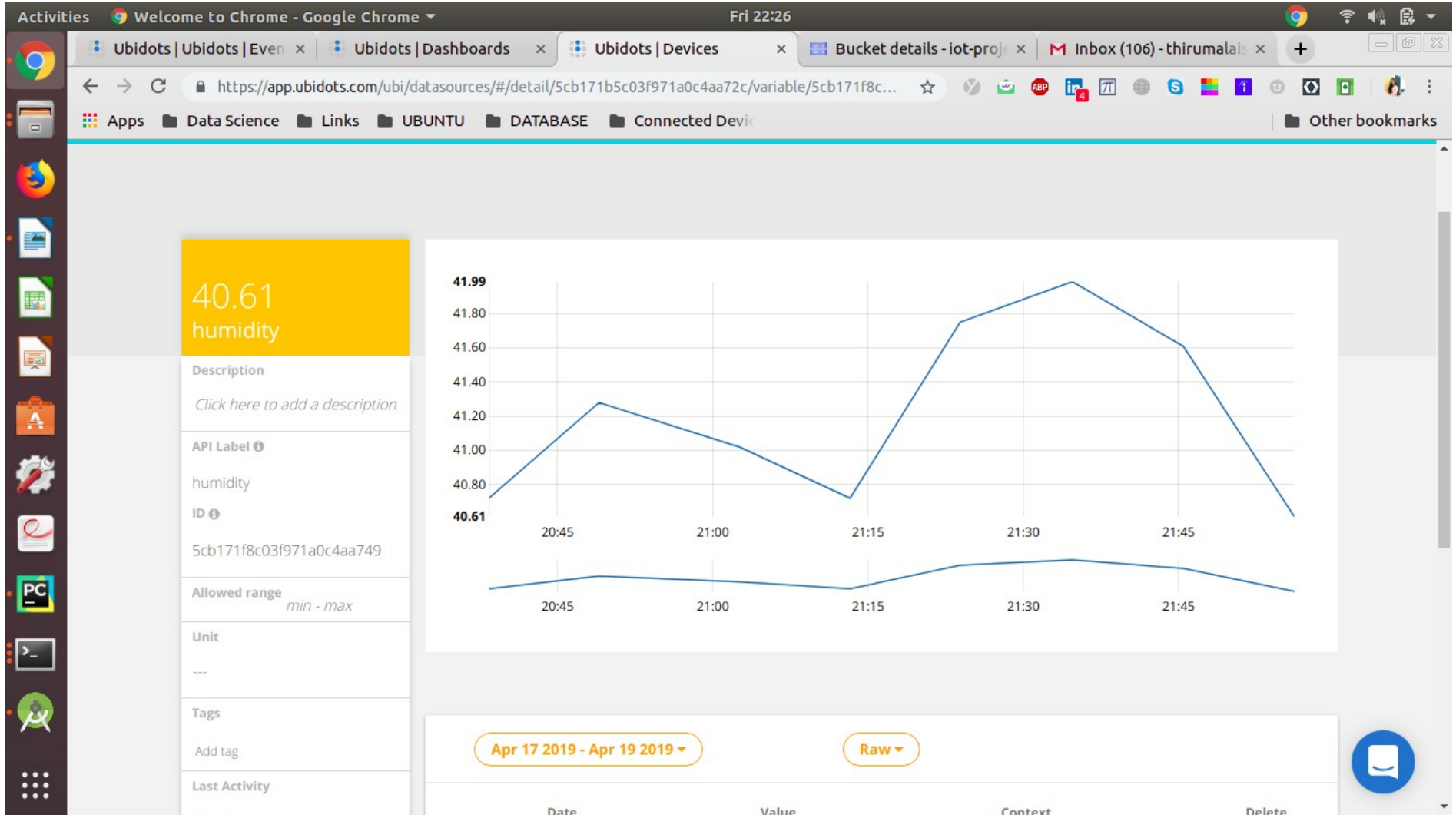
3. Sending data to ubidots and back:



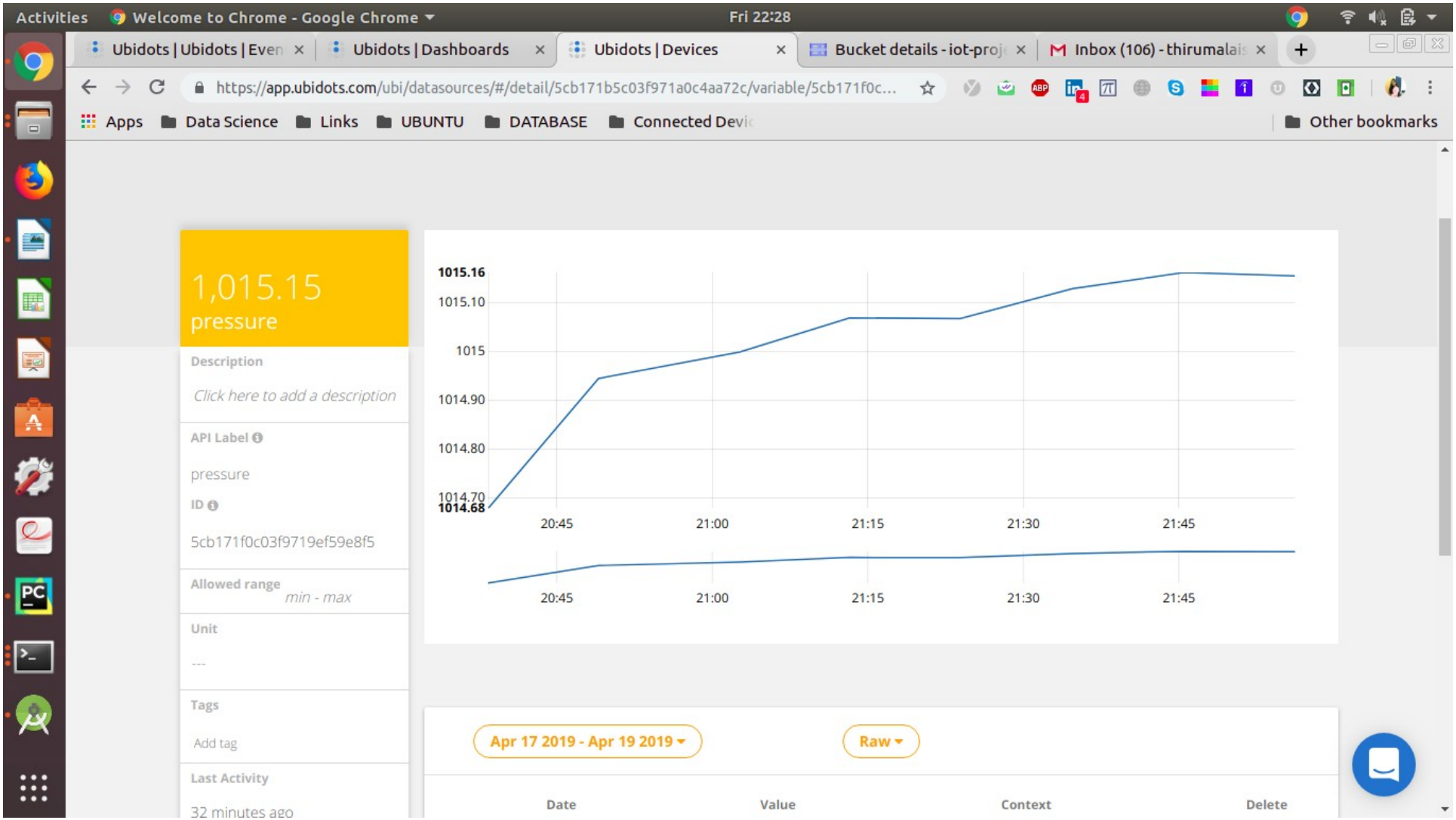




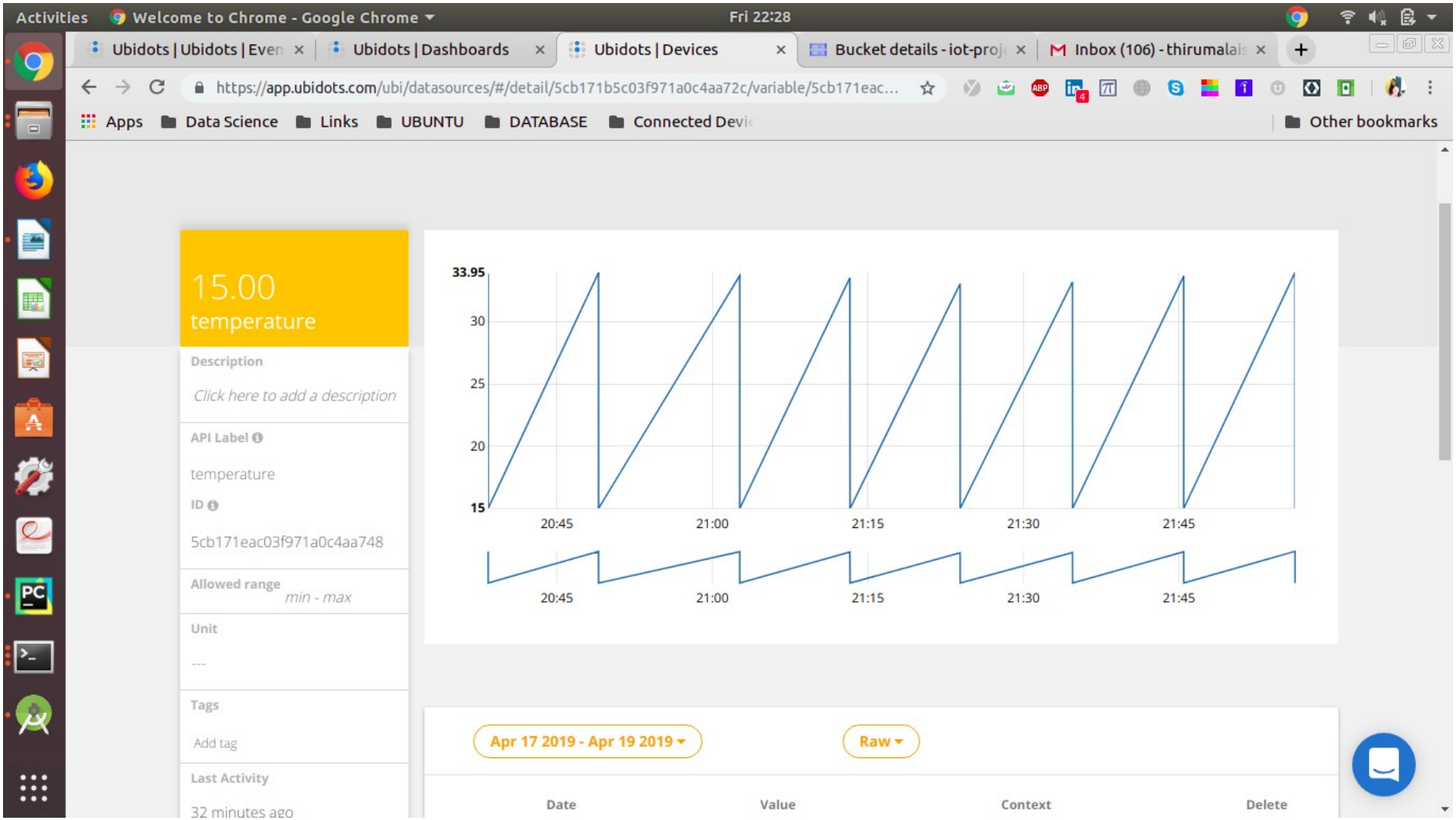

1 %
21:55
pi@raspberrypi: ~/FaceRecognition
File Edit Tabs Help
Modified Temperature 15
Original Temperature: 15.0
Modified Temperature 15.0
Original Temperature: 33.93307113647461
Modified Temperature 15
Original Temperature: 15.0
Modified Temperature 15.0
Current Pressure: 1015.16162109375
Current Humidity: 41.608497619628906
Current Pressure: 1015.12841796875
Current Humidity: 41.98527526855469
Current Pressure: 1015.0673828125
Current Humidity: 41.748931884765625
Current Pressure: 1015.06884765625
Current Humidity: 40.721351623535156
Current Pressure: 1014.99853515625
Current Humidity: 41.019351959228516
Current Pressure: 1014.944580078125
Current Humidity: 41.27967071533203
Image Uploaded


Activities
Welcome to Chrome - Google Chrome
Fri 22:26
Ubidots | Ubidots | Even
Ubidots | Dashboards
Ubidots | Devices
Bucket details - iot-proj
Inbox (106) - thirumalais
https://app.ubidots.com/ubi/datasources/#/detail/5cb171b5c03f971a0c4aa72c/variable/5cb171f8c...
Apps
Data Science
Links
UBUNTU
DATABASE
Connected Devi
Other bookmarks
40.61
humidity
Description
Click here to add a description
API Label
humidity
ID
5cb171f8c03f971a0c4aa749
Allowed range
min - max
Unit

Tags
Add tag
Last Activity
41.99
41.80
41.60
41.40
41.20
41.00
40.80
40.61
20:45
21:00
21:15
21:30
21:45
Apr 17 2019 - Apr 19 2019
Raw
Date
Value
Context
Delete

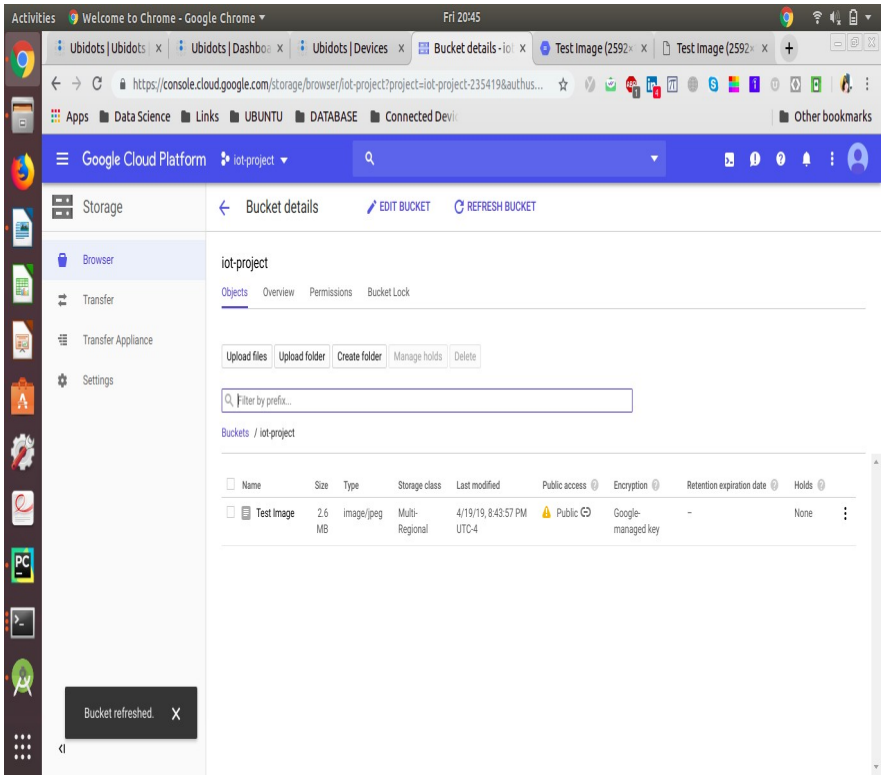

Activities
Welcome to Chrome - Google Chrome
Fri 22:28
Ubidots | Ubidots | Even
Ubidots | Dashboards
Ubidots | Devices
Bucket details - iot-proj
Inbox (106) - thirumalais
https://app.ubidots.com/ubi/datasources/#/detail/5cb171b5c03f971a0c4aa72c/variable/5cb171f0c...
Apps
Data Science
Links
UBUNTU
DATABASE
Connected Devi
Other bookmarks
1,015.15
pressure
Description
Click here to add a description
API Label
pressure
ID
5cb171f0c03f9719ef59e8f5
Allowed range
min - max
Unit

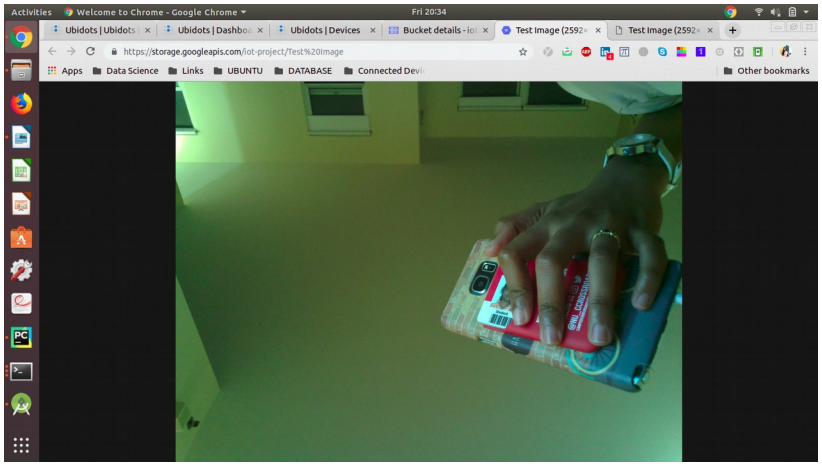
Tags
Add tag
Last Activity
32 minutes ago
1015.16
1015.10
1015
1014.90
1014.80
1014.70
1014.68
20:45
21:00
21:15
21:30
21:45
Apr 17 2019 - Apr 19 2019
Raw
Date
Value
Context
Delete

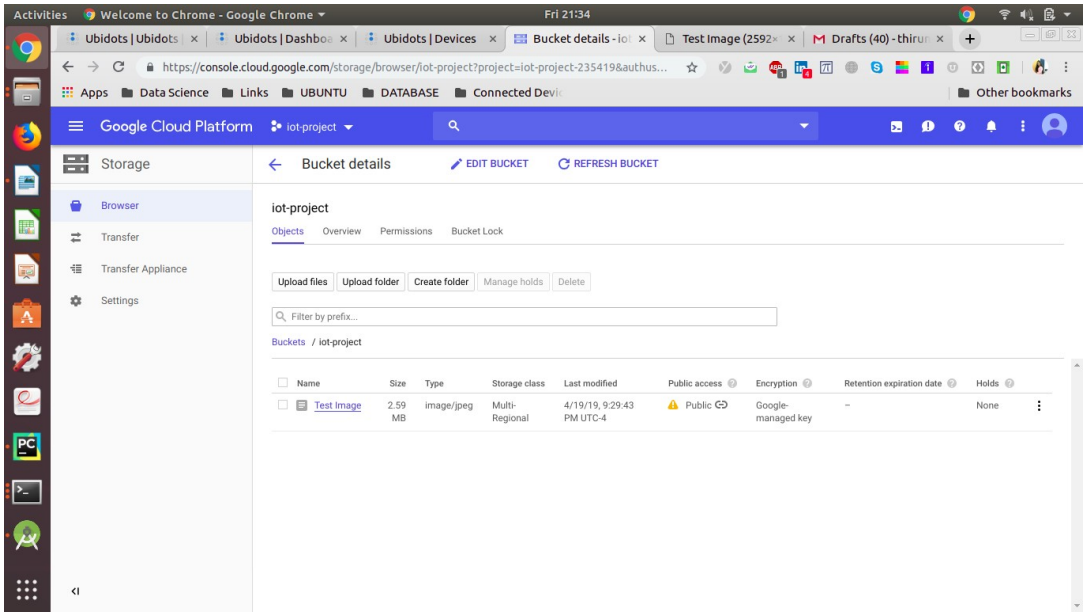

Activities
Welcome to Chrome - Google Chrome
Fri 22:28
Ubidots | Ubidots | Even
Ubidots | Dashboards
Ubidots | Devices
Bucket details - iot-proj
Inbox (106) - thirumalais
https://app.ubidots.com/ubi/datasources/#/detail/5cb171b5c03f971a0c4aa72c/variable/5cb171eac...
Apps
Data Science
Links
UBUNTU
DATABASE
Connected Devi
Other bookmarks
15.00
temperature
Description
Click here to add a description
API Label
temperature
ID
5cb171eac03f971a0c4aa748
Allowed range
min - max
Unit

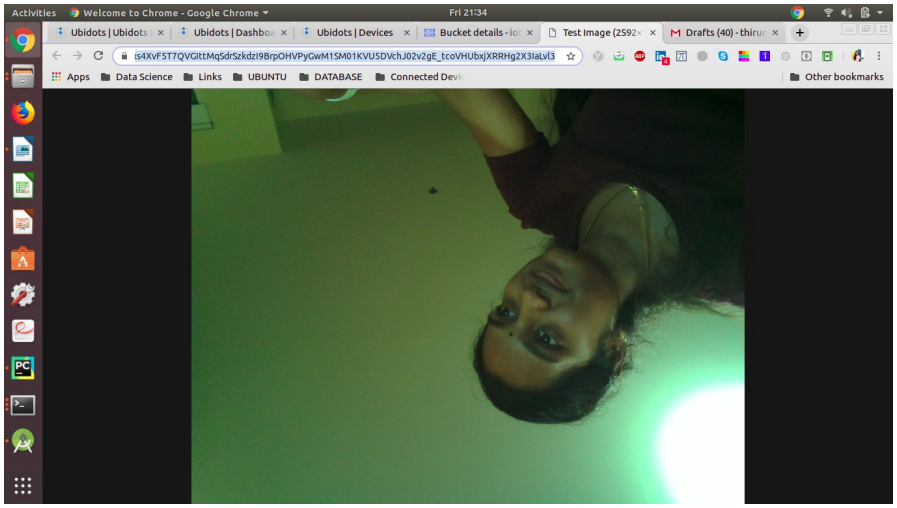
Tags
Add tag
Last Activity
32 minutes ago
33.95
30
25
20
15
20:45
21:00
21:15
21:30
21:45
Apr 17 2019 - Apr 19 2019
Raw
Date
Value
Context
Delete

4. Sending image to Google Cloud Storage*[f]* :

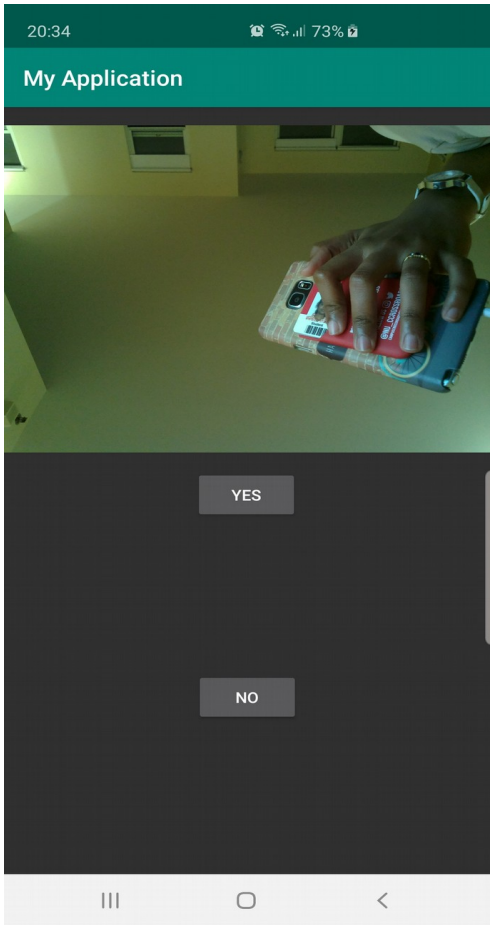


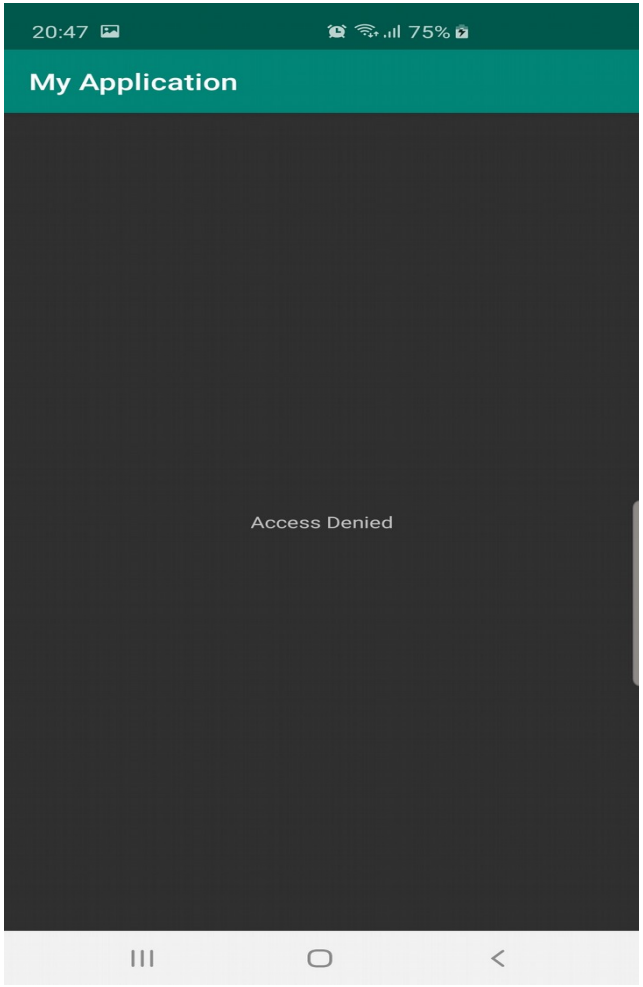


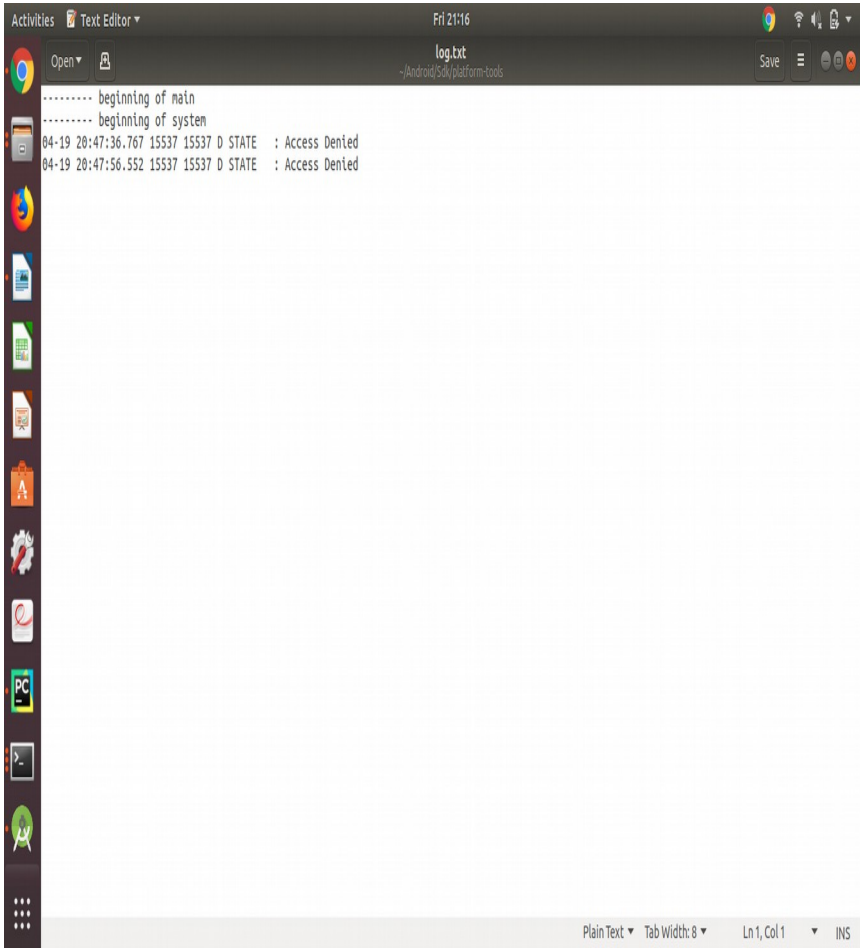

Activities
Welcome to Chrome - Google Chrome
Fri 21:34
Ubidots | Ubidots
Ubidots | Dashboa
Ubidots | Devices
Bucket details - io
Test Image (2592
Drafts (40) - thirur
https://console.cloud.google.com/storage/browser/iot-project?project=iot-project-235419&authus...
Apps
Data Science
Links
UBUNTU
DATABASE
Connected Devi
Other bookmarks
Google Cloud Platform
iot-project
Storage
Bucket details
EDIT BUCKET
REFRESH BUCKET
Browser
Transfer
Transfer Appliance
Settings
iot-project
Objects
Overview
Permissions
Bucket Lock
Upload files
Upload folder
Create folder
Manage holds
Delete
Filter by prefix...
Buckets / iot-project
Name
Size
Type
Storage class
Last modified
Public access
Encryption
Retention expiration date
Holds
Test Image
2.59 MB
image/jpeg
Multi-Regional
4/19/19, 9:29:43 PM UTC-4
Public
Google-managed key
–
None

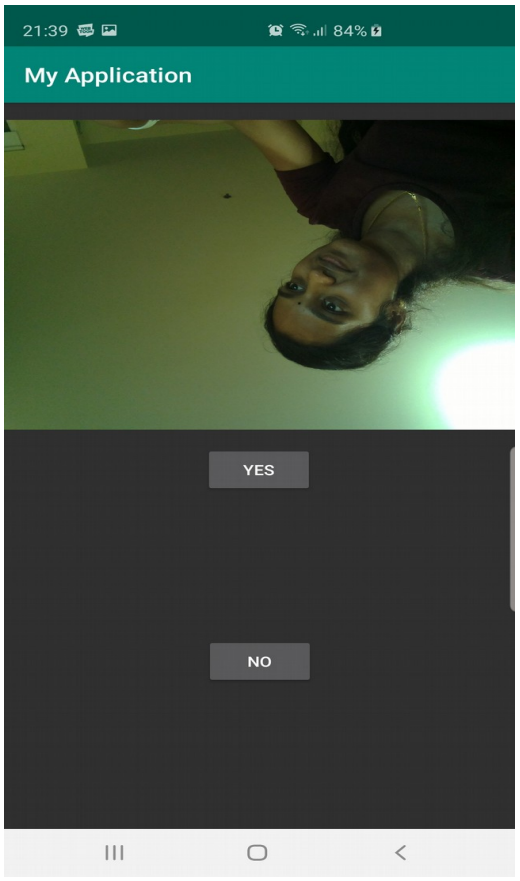

Activities
Welcome to Chrome - Google Chrome
Fri 21:34
Ubidots | Ubidots
Ubidots | Dashboa
Ubidots | Devices
Bucket details - io
Test Image (2592
Drafts (40) - thirur
Apps
Data Science
Links
UBUNTU
DATABASE
Connected Devi
Other bookmarks

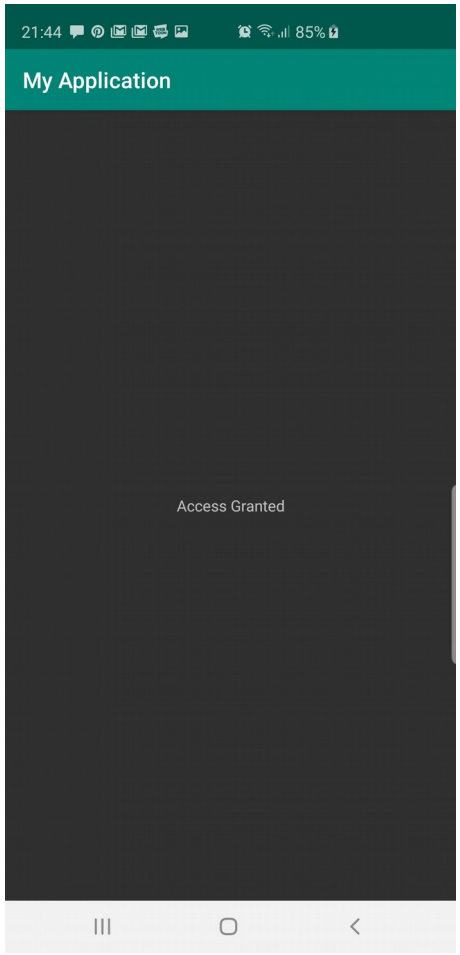
5. Android App accessing the data *[b]*:

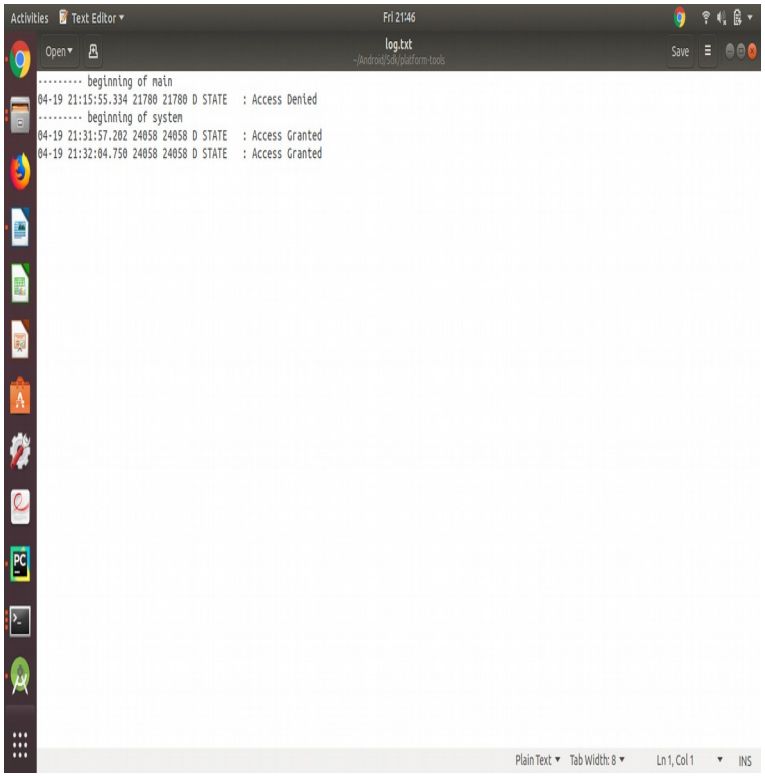


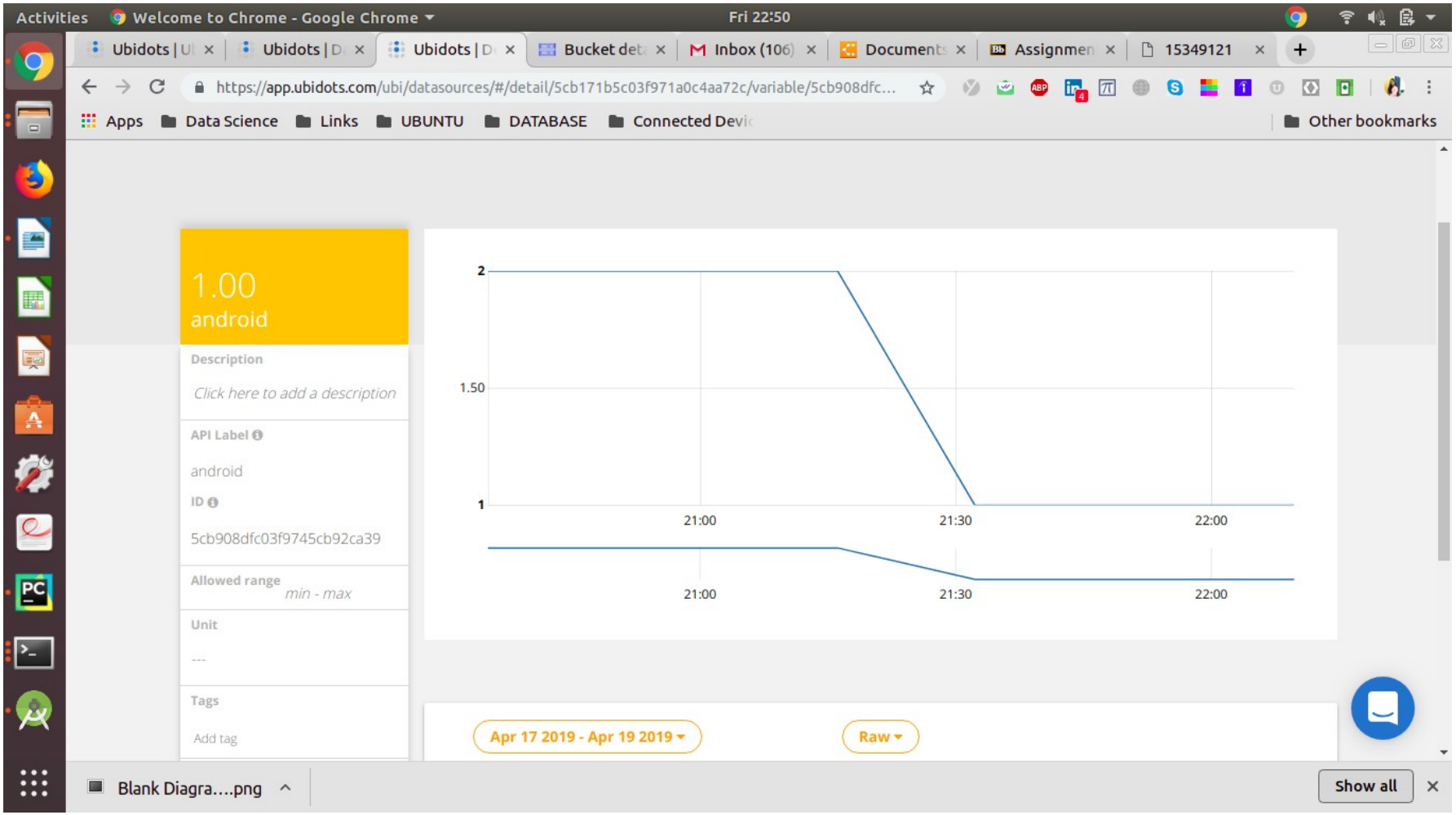





21:39
84%
My Application
YES
NO


21:44
85%
My Application
Access Granted


Activities
Text Editor
Fri 21:46
Open
log.txt
~/Android/Sdk/platform-tools
Save
--------- beginning of main
04-19 21:15:55.334 21780 21780 D STATE : Access Denied
--------- beginning of system
04-19 21:31:57.202 24058 24058 D STATE : Access Granted
04-19 21:32:04.750 24058 24058 D STATE : Access Granted
Plain Text
Tab Width: 8
Ln 1, Col 1
INS



6. Sense Hat matrix Displaying images *[a]***:**

https://youtu.be/xa_9HWD0yGU

REFERENCES :

[a] ***projects.raspberrypi.org***

[b] developer.android.com

[c] sites.google.com

[d] wildanmsyah.wordpress.com

[e] projects.raspberrypi.org

[f] console.cloud.google.com