

DAY1

LINUX OS

-OS is required to run programs. Programs are required to interact with OS.

OS purpose is for using our program(usecase)

Multiple programs make up an OS

-OS used -RHEL(RedHat Enterprise Linux) (We are using 7.5v)

Do we need harddisk for running a program?

No, We need only RAM and CPU(RAM+CPU =Compute Unit)to run a program.

HDD-> Storage Unit where data is stored permanently(persistent)

Memory->RAM

*HDD IS NOT MEMORY.

To boost OS ,we need compute unit.

Baremetal setup:-

Installing OS on hardware.



Virtualisation:-

If windows is base OS and we want to store another OS.This another OS is called GUEST OS/Virtual Machine.

*There is no difference in OS whether it runs in baremetal or virtualisation.

HOW TO USE REDHAT LINUX

*We will always work on ROOT. (because we will have unlimited privileges)

Click on not listed while logging in. OR su command.

There are two ways to interact with the OS

-GUI,Graphical user interface (Interacting with OS by using mouse)

-CLI ,Command line interface(Interacting with OS by using interface)

Example cli commands : Type cal for calendar

Type date for date

firefox to open firefox

which firefox to find location or path of firefox

gedit is text editor in linux

gedit /usr/bin/firefox will open source code of firefox

cheese to open the camera app in linux

history shows all the commands you've run till now.

rpm -q -f /user/bin/date to get name and info

rpm -q -f /user/bin/firefox

rpm -e firefox

rpm -q vlc

q->query , f->file ,e->uninstall/erase, q -> query if the file is installed or not

yum whatprovides firefox to know how to get it

yum install firefox

man date (to see various other commands related to it)

man rpm to get the manual for rpm

q to get out of manual

LEFT CTRL KEY +C to get next prompt(to get out of current prompt and terminate the program)

LEFT CTRL +Z (program stops and goes in the background)

ping google.com

jobs (Shows the programs running in background) (Can be used after first ctrl +z)

fg 3 (brings the program from background to foreground, here 3 is the index of firefox got from jobs command)

firefox & (To keep it running in the background)

echo hello(to print hello)

echo hello | festival --tts (To pass the text to speaker)(hello goes to festival)

free -m(to see memory)

*Best way to software to install a software in redhat is YUM.

*GUI doesn't work when you are connected to other person's laptop.

*Cookies(Saved data/token) can be used to login directly just by finding out the location where the token is saved.

To set up external device in the new OS.

Go to virtualbox -> devices and select device.

(Device will be removed from windows and loaded to current OS)

To access any device we need a driver.

User can interact with file or folder in the OS. Folder is also called a directory.

Software is a package of many files/folder. Software making methodology in redhatlinux is called RPM(RedHat packet manager)

In windows .exe

In redhat linux .rpm

PYTHON

We shall use python 3.6(python36)

Live interpreter is available in python.

Python prompt is like >>> which is called as REPL(Read Evaluate Print Loop)

To start prompt:-

Enter python36

To exit prompt:-

exit()

How to read memory (Data) from RAM in linux

COMMANDS

@Type(x) (To find the data type)

@x=[“abhi” , “vimal” , “pop”] (list)

x[0] (to get first element)

x[1:4] (To get elements 0,1,2,3)

x[:3] (To get elements 0,1,2)

x[1:] (to get all elements starting from 1)

@x=[["vimal",11111],["tom",22222],["harry",33333]] (for nested list or 2d array)

Vimal	11111
Tom	22222
Harry	33333

x[0] (to get vimal and 11111)

x[0][1] (to get only 11111)

x[0][0] (to get only vimal)

*Use list for row-wise operations.Use numpy for column-wise operations.

IMPORTING OS MODULE for enabling linux commands using python

Module has a set of functions and to use it we have to import it.

```
>>>import os
```

```
>>>os.system("date")
```

```
>>>os.system("cal")
```

IMPORTING NUMPY module for column wise operations.

1)First get pip command through yum

```
yum whatprovides pip3.6 (to see what to write infront of install)
```

```
yum install python36-pip
```

2) install numpy before importing

```
pip3.6 install numpy-1.16.2-cp36-cp3... (press tab)
```

3)importing numpy

Python36

```
>>>import numpy
```

```
>>>x=[[a,11,1],[
```

```
>>>x=numpy.array([[
```

```
>>>type(x)
```

```
>>>a=numpy.array(x)
```

```
>>>a
```

COMPUTER VISION

1)first install cvpython

```
pip3.6 install opencv_python(presstab)
```

2) open python

python36

```
>>>import cv2
```

```
>>>x=cv2.VideoCapture(0)
```

```
>>>x.read()
```

```

>>>ret,photo=x.read()

>>>ret

>>>Cv2.imwrite("ameerul.png",photo)

ret,photo=x.read()

cv2.imwrite("ameerul1.png",photo)

a>>>x.release()

```

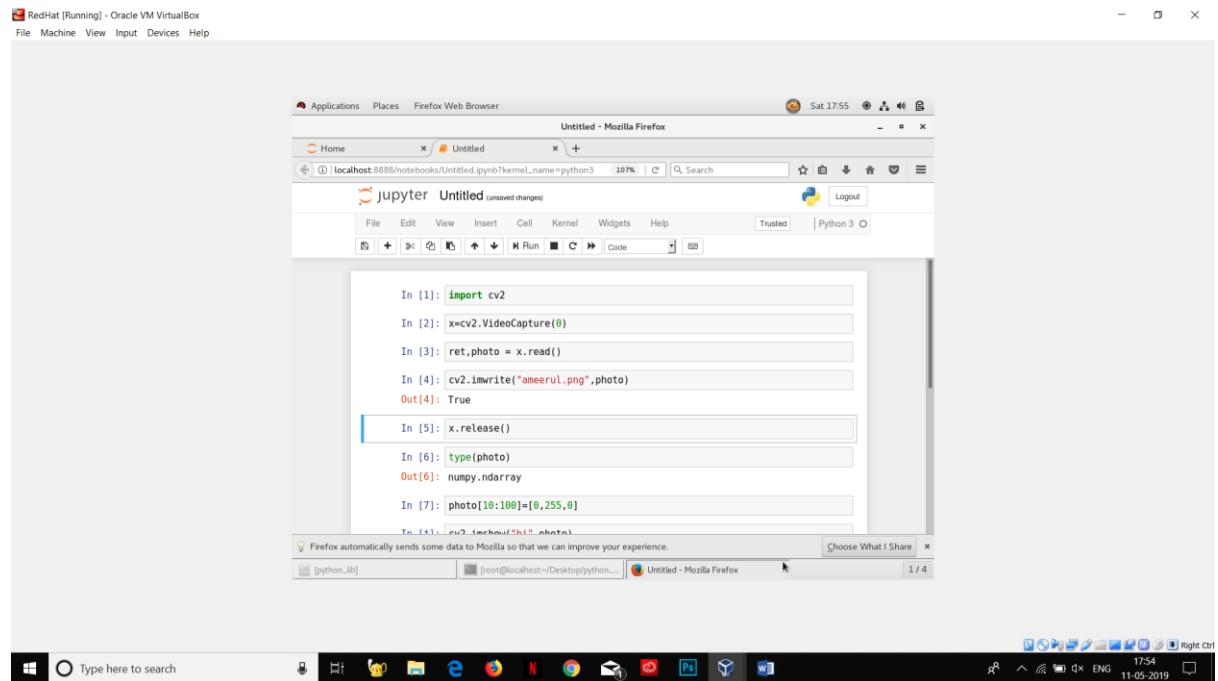
JUPYTER IDE

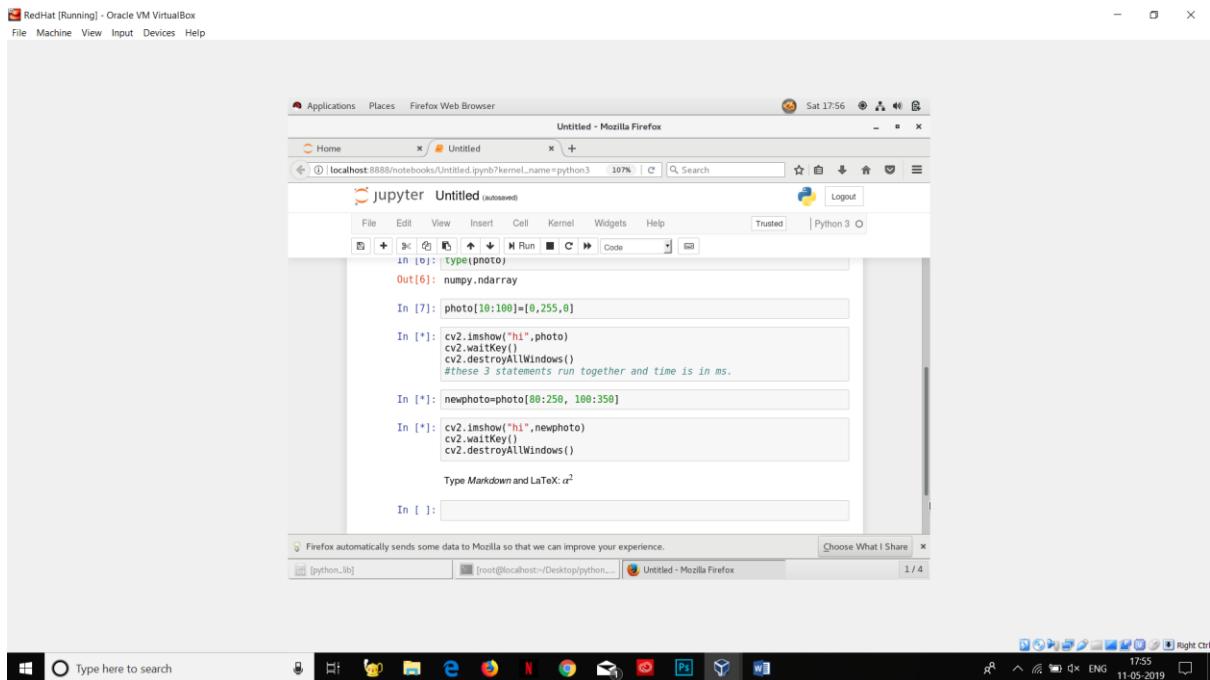
>>>pip3.6 install jupyter(tab) AND AT THE END ADD “ -no-index -f. (so that it doesn't download other dependencies from online)

>>>jupyter notebook --allow-root

Right Shift+Enter ->Run

Right Shift+Tab ->Autofill





```
In [1]: type(photo)
Out[1]: numpy.ndarray

In [2]: photo[10:100]=[0,255,0]
In [*]: cv2.imshow("hi",photo)
cv2.waitKey()
cv2.destroyAllWindows()
#these 3 statements run together and time is in ms.

In [*]: newphoto=photo[80:250, 100:350]

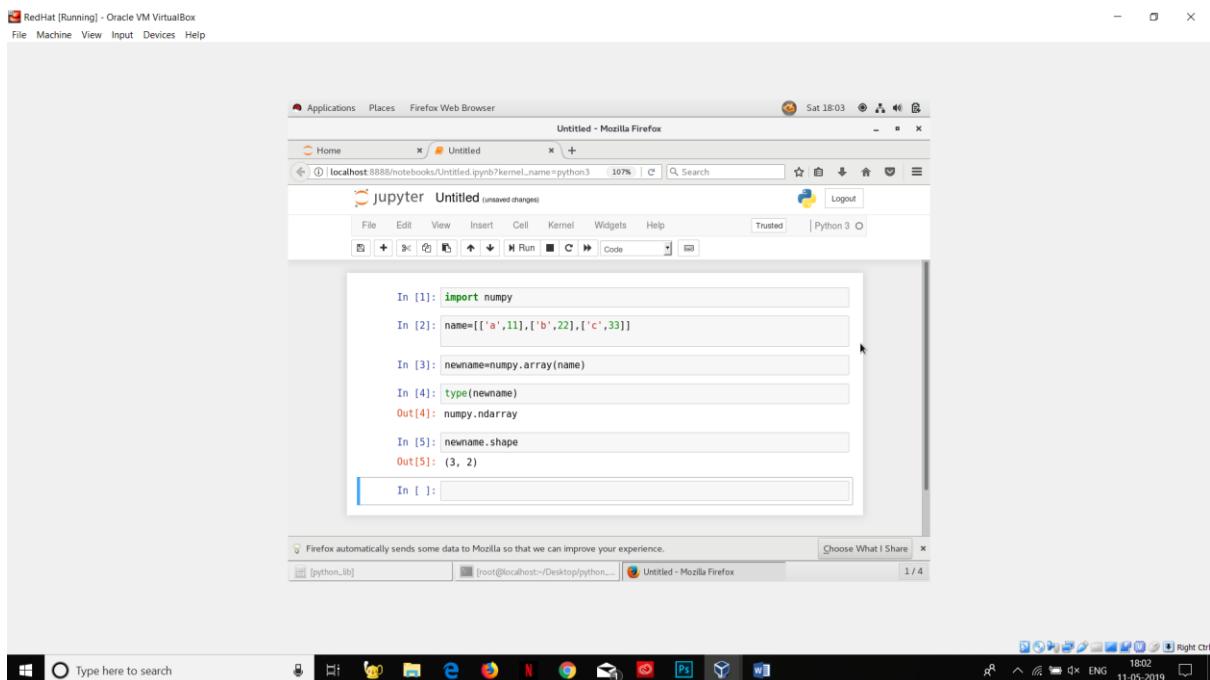
In [*]: cv2.imshow("hi",newphoto)
cv2.waitKey()
cv2.destroyAllWindows()

Type Markdown and LaTeX: a2

In [ ]:
```

Line 7 :- Row 10 -100 0,255,0 signifies R G B (green color from row 10 -100)

All array operations can be performed in image too



```
In [1]: import numpy
In [2]: name=[['a',11],['b',22],['c',33]]
In [3]: newname=numpy.array(name)
In [4]: type(newname)
Out[4]: numpy.ndarray
In [5]: newname.shape
Out[5]: (3, 2)

In [ ]:
```

Newname.shape gives the rows,columns

DAY-2

NETWORKING

We need a network to connect two devices and enable communication between them.

Requirements:

- 1)All devices connected through a network,2)Network card,3)IP address.

Networking in Phone

Both the phones should be connected through a network and have a unique number provided by simcard.

Networking in PC

Each computer has lan/nic/network/ETHERNET card.This card provides an unique IP address.

Connecting through switch

All laptops will be connected to a single switch.

Connecting through WLAN

All laptops will be connected through a wlan switch.

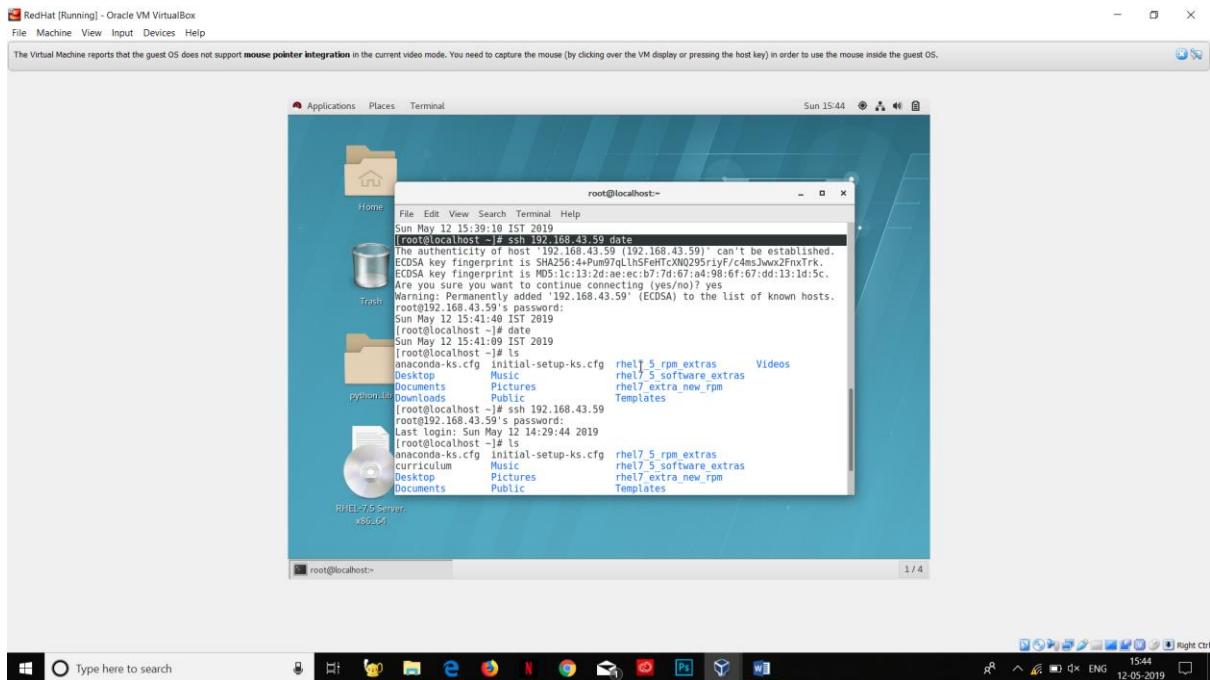
*Instead of wlan we can use mobile hotspot .

(Connecting in virtualbox)

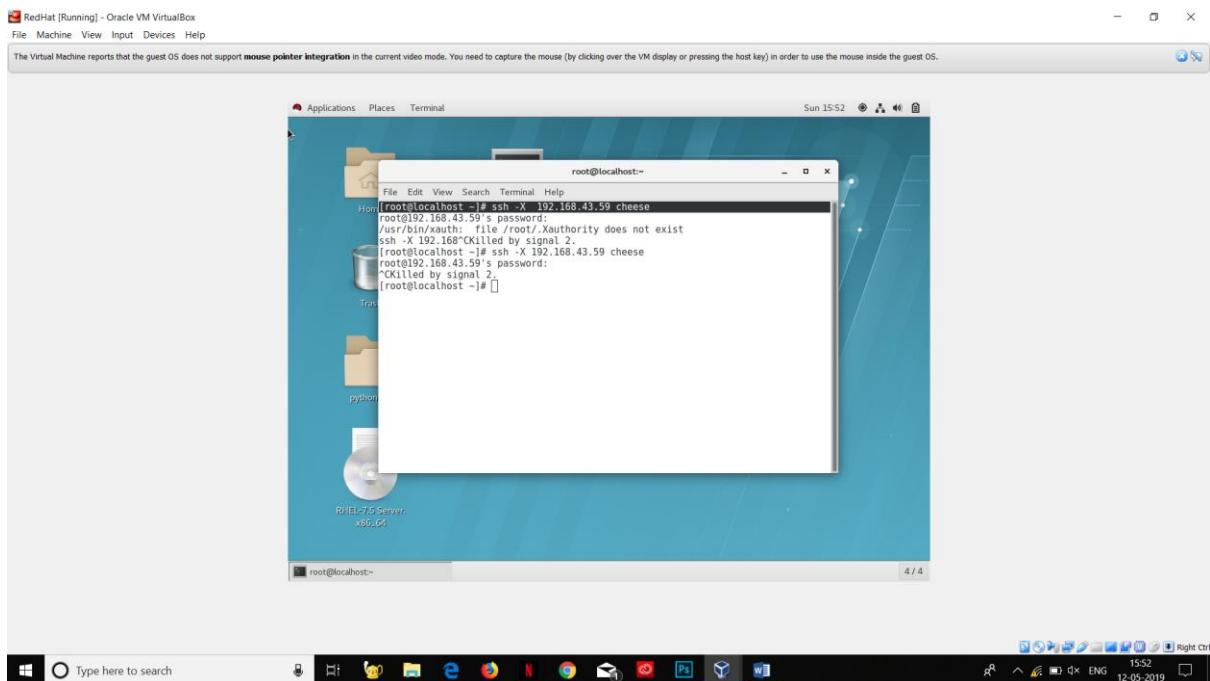
Connect windows network card with redhat network card.This concept is called **bridging**.

LOCAL HOST->

REMOTE HOST-> CPU and RAM of the other system is used.



CHEESE



-X is used because cheese gives graphical output

IP Address

nslookup www.google.com is used to get IP address of google.com

*There is no dot in IP address. Dot is just for presentation purposes.

Proof:

Converting IP Address of google to decimal and directly putting in search bar.

316.256.54.12

$$= 316 \cdot 2^{24} + 256 \cdot 16 + 54 \cdot 8 + 12 \cdot 2^0$$

$$= 363838299$$

By entering the above address we can login <http://363838299>

Can be used to spoof some firewalls.

Python coding using text editor (networking)

1) Make program

[Open by typing :](#)

gedit ameerul.py

[Code:](#)

Import cv2

```
Cap=cv2.VideoCapture(0)
```

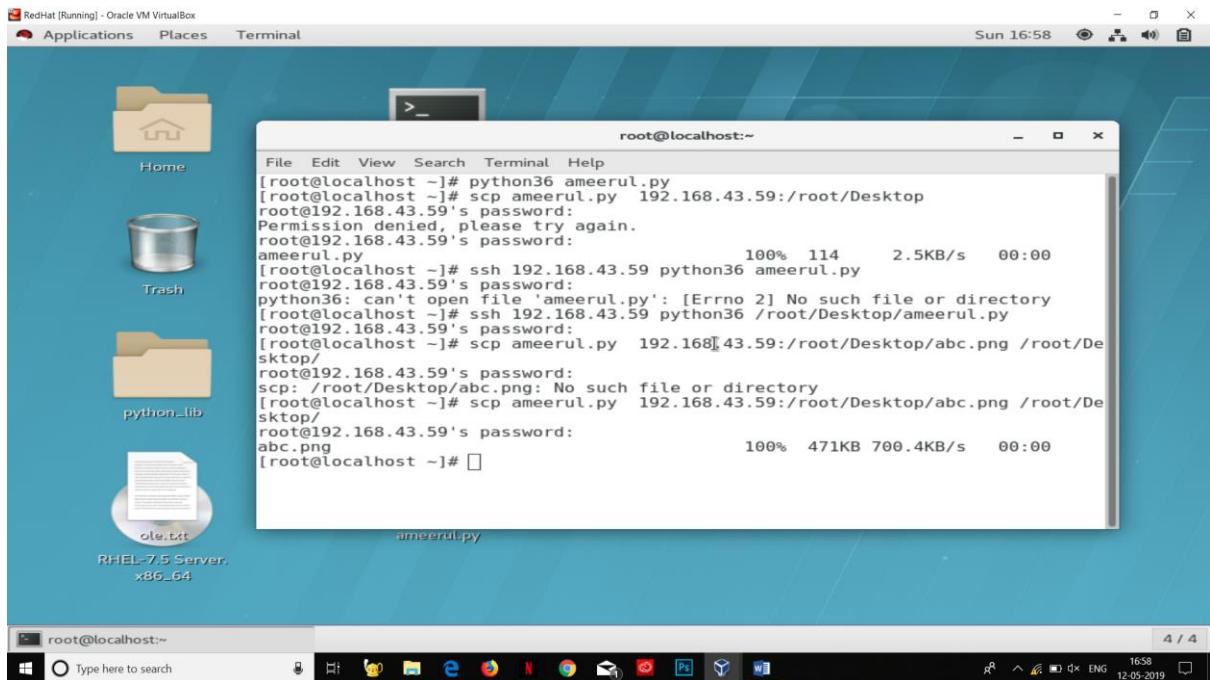
```
ret,photo=cap.read()
```

```
cv2.imwrite("/root/Desktop/abc.png",photo)
```

```
cap.release()
```

2) Run this program by

Python36 ameerul.py



3) Transfer coded file to other system by

scp Ameerul.py 192.168.43.59:/root/Desktop

4) Run this file in other system

ssh 192.168.43.59 python 36 /root/Desktop/ameerul.py

5) Get the image from the other system

scp ameerul.py 192.168.43.59:/root/Desktop/abc.png /root/Desktop/ (FROM ->
TO)

* *COMMANDS

touch hi.txt (to make file)

ls (to see the contents in the directory)

mkdir dir123 (makes new directory(in blue))

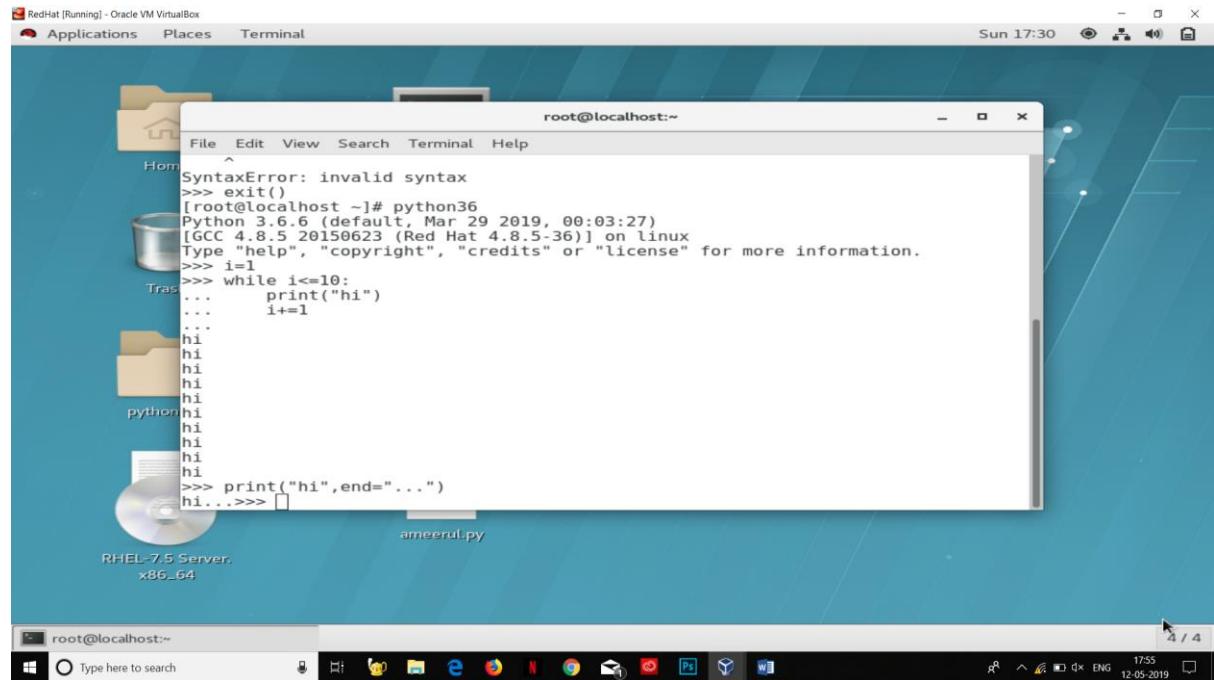
cd dir123 (goes to dir123)

cd.. (goes one directory back)

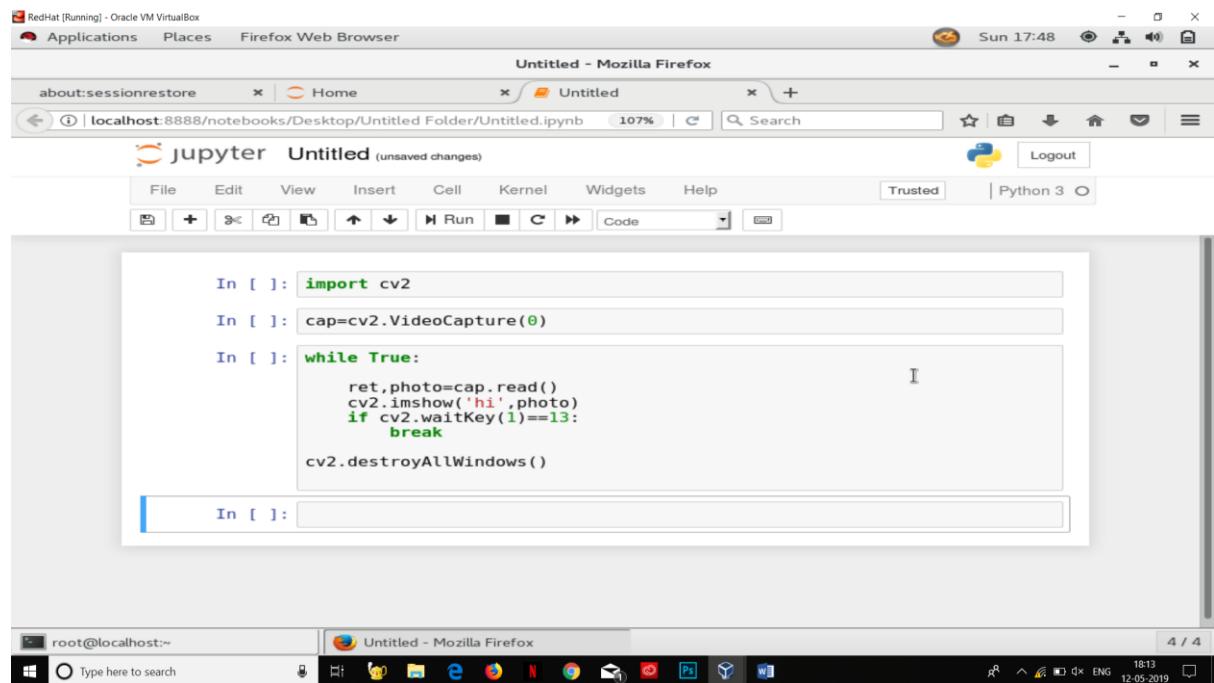
rmdir vimal (remove directory)

REAL TIME VIDEO CAPTURE

While loop and end function



VIDEO



13 is the code for ENTER key.

Next, DOWNLOAD py file by going into file on top left of Jupyter.

And then transfer this file and run in the other system as shown:

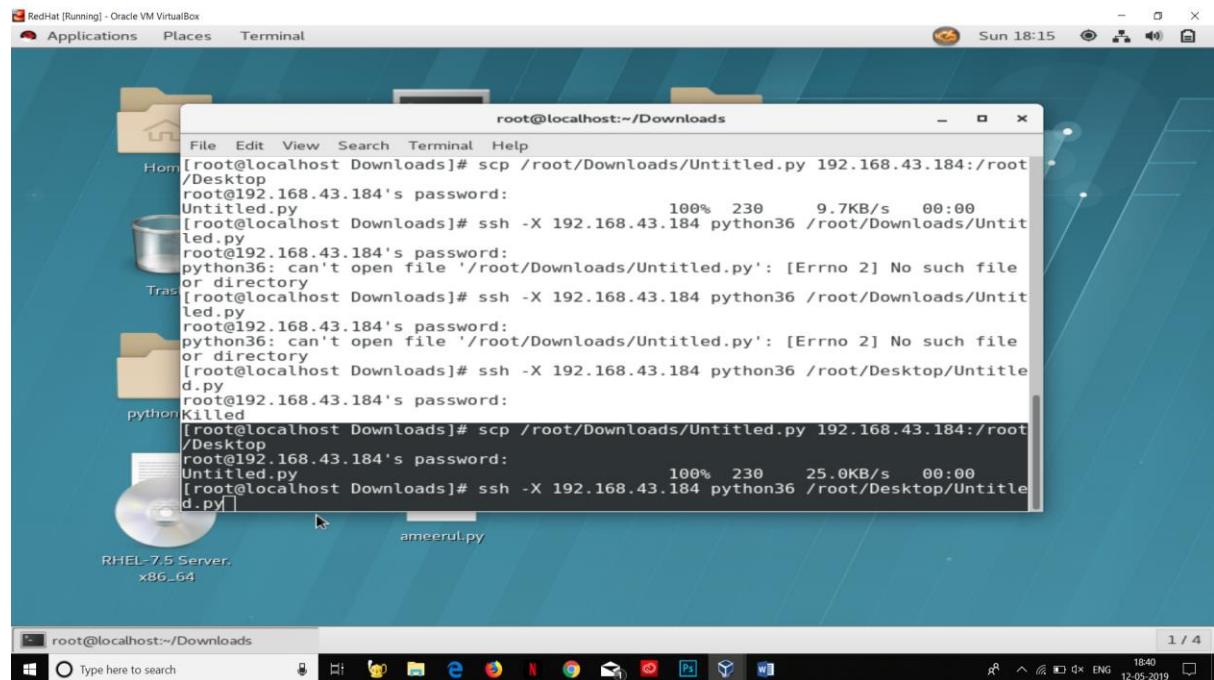


IMAGE PROCESSING

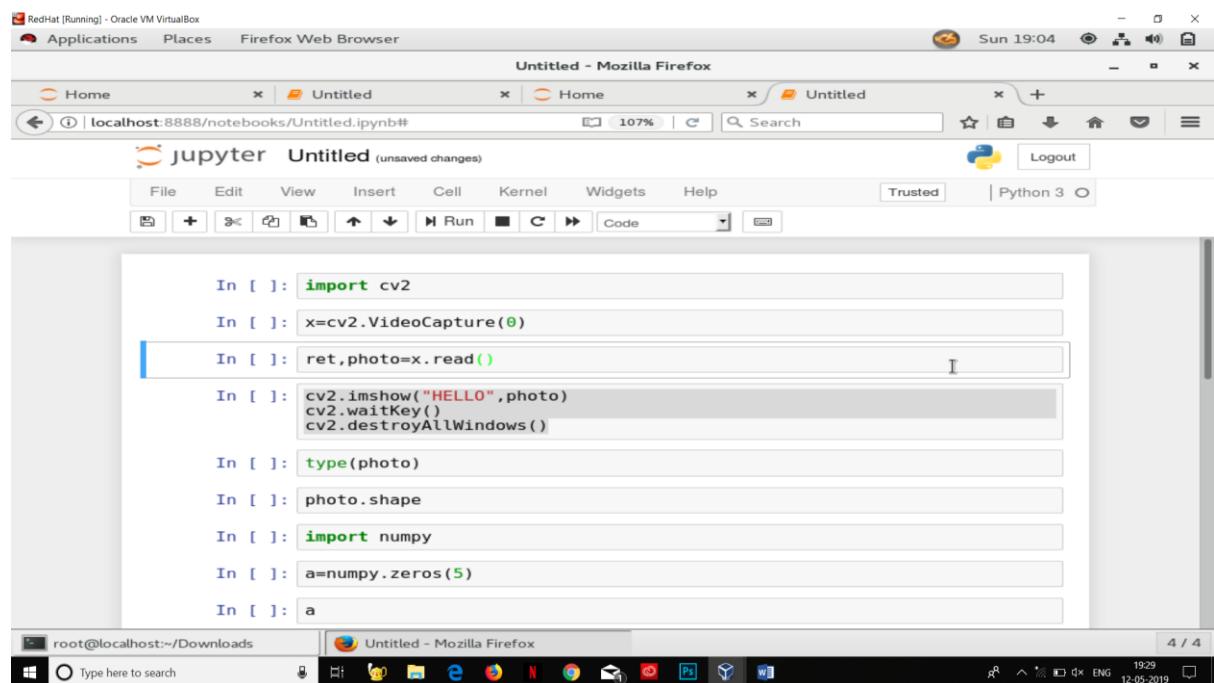


Photo.shape gives 480,640 which means there are 480 rows and 640 columns in the picture

```
In [ ]: a=numpy.zeros(5)
In [ ]: a
In [ ]: a1=numpy.zeros([480,640],dtype="uint8")
In [ ]: a2=numpy.zeros([480,640],dtype="uint8")
In [ ]: a3=numpy.zeros([480,640],dtype="uint8")
In [ ]: cv2.merge([a1,a2,a3]) #making 3d array
In [ ]: B,G,R=cv2.split(photo)
In [ ]: R.shape
In [ ]: R_image=cv2.merge([B+100,G,R])
In [ ]: cv2.imshow("HELLO",R_image)
```

**CAN ALSO TRY R_image=cv2.merge([a1,G,R])

```
In [ ]: cv2.merge([a1,a2,a3]) #making 3d array
In [ ]: B,G,R=cv2.split(photo)
In [ ]: R.shape
In [ ]: R_image=cv2.merge([B+100,G,R])
In [ ]: cv2.imshow("HELLO",R_image)
cv2.waitKey()
cv2.destroyAllWindows()
In [ ]: grey=cv2.cvtColor(photo,cv2.COLOR_BGR2GRAY)
In [ ]: cv2.imshow("HELLO",grey)
cv2.waitKey()
cv2.destroyAllWindows()
```

TO RUN VIDEO IN GRayscale

The screenshot shows a Red Hat Linux desktop environment. At the top, there is a menu bar with 'Applications', 'Places', and 'Firefox Web Browser'. Below the menu bar, a Firefox window is open with two tabs: 'localhost:8888/edit/video.py' and '*video.py - Mozilla Firefox'. The main content area of the Firefox window displays a Jupyter notebook cell containing Python code for video capture using OpenCV. The code imports cv2, initializes a VideoCapture object, and enters a loop to read frames, convert them to grayscale, and display them. It includes a break condition for the key 'q'. The terminal window at the bottom shows the command 'root@localhost:~/Downloads' and the output of the code execution.

```
1
2
3
4 import cv2
5
6 cap=cv2.VideoCapture(0)
7
8
9
10 while True:
11     ret,photo=cap.read()
12     photo=cv2.cvtColor(photo, cv2.COLOR_BGR2GRAY)
13     cv2.imshow('hi',photo)
14     if cv2.waitKey(1)==13:
15         break
16
17 cv2.destroyAllWindows()
```

DAY-3

BASIC LINUX OS

Useradd vimal (Add a user)

pswd vimal

whoami(shows which account you are logged in)

Linux is a multi user OS.

left ctrl+alt+f2 (for 2nd console)

left ctrl+alt+f6(for 6th console)

f2-f6(cli)

f1(gui)

to make your own gnome

startx (CLI TO GUI)

Directory

mkdir helldir

cd helldir/

touch hi

ls

`mkdir pop`

`ls` (will show pop directory inside helldir and hi file)

`mkdir .linux` (. Files are hidden)

`ls -a` (to see hidden file)

To know whether file or directory

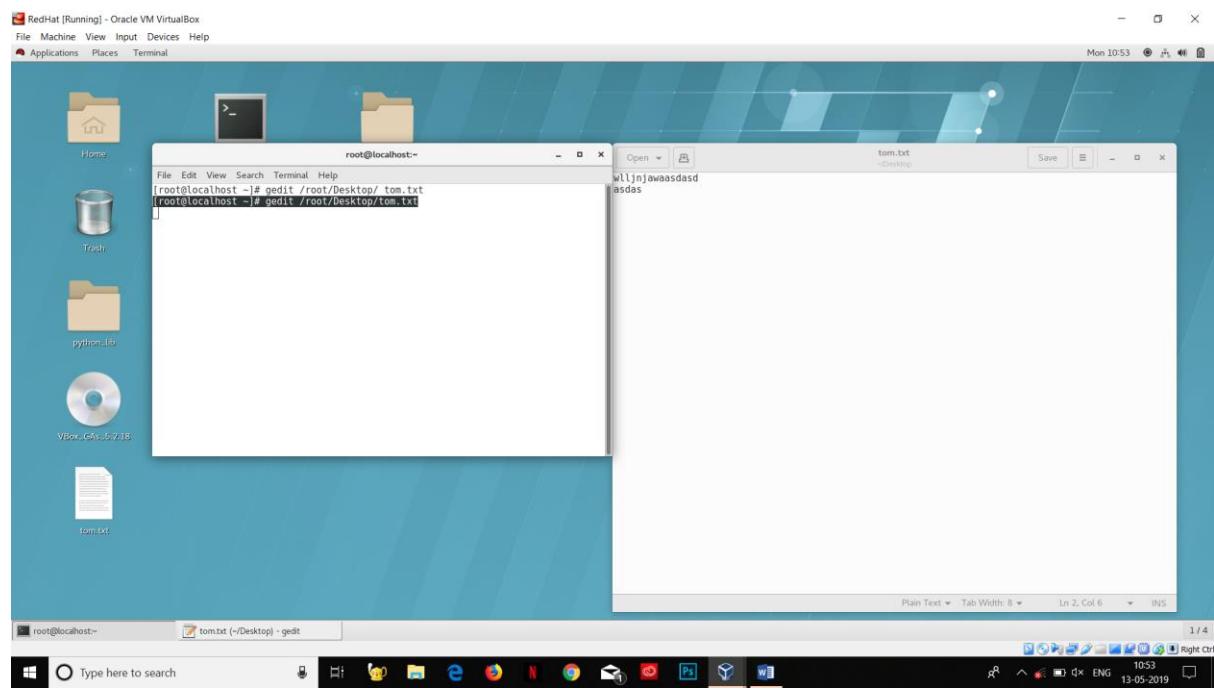
`ls -a -l`

infront of directory **d** is there and infront of file **-** is there

a->shows hidden files

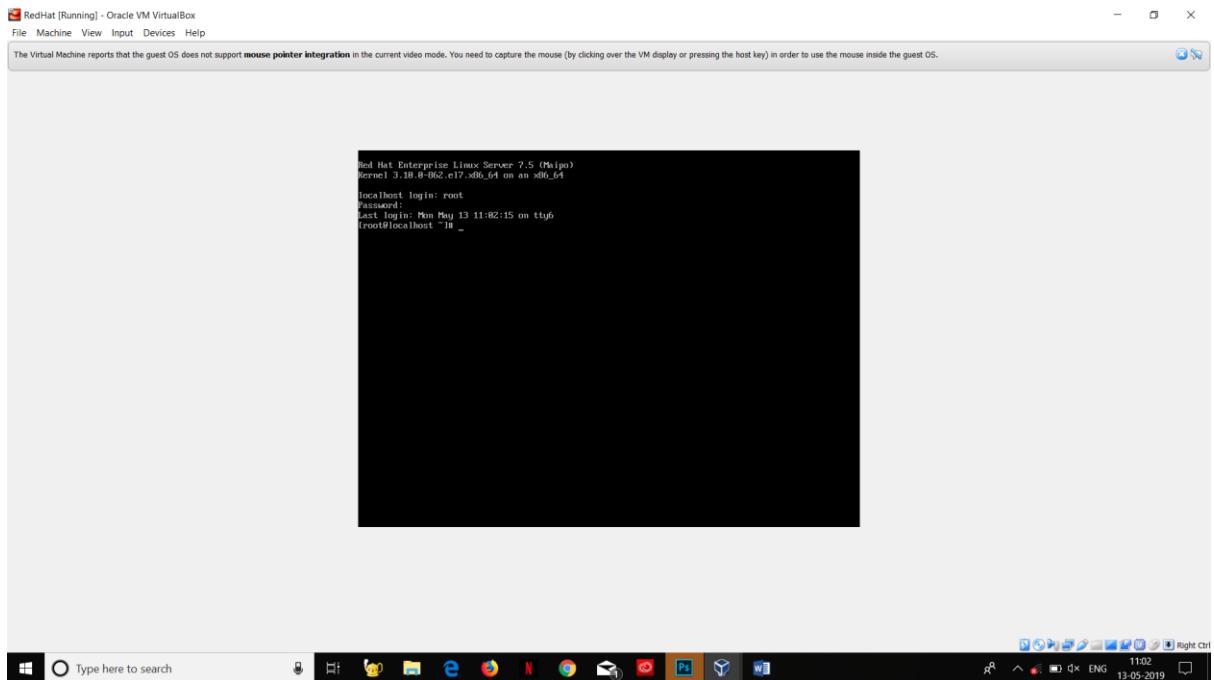
l->shows permissions too

Text Editor



*Not possible to use graphical stuff like gedit in CLI

So , use



Vim harry.txt

I -> insert mode

Esc->command mode

:wq-> (w to write and save ,q for quit)

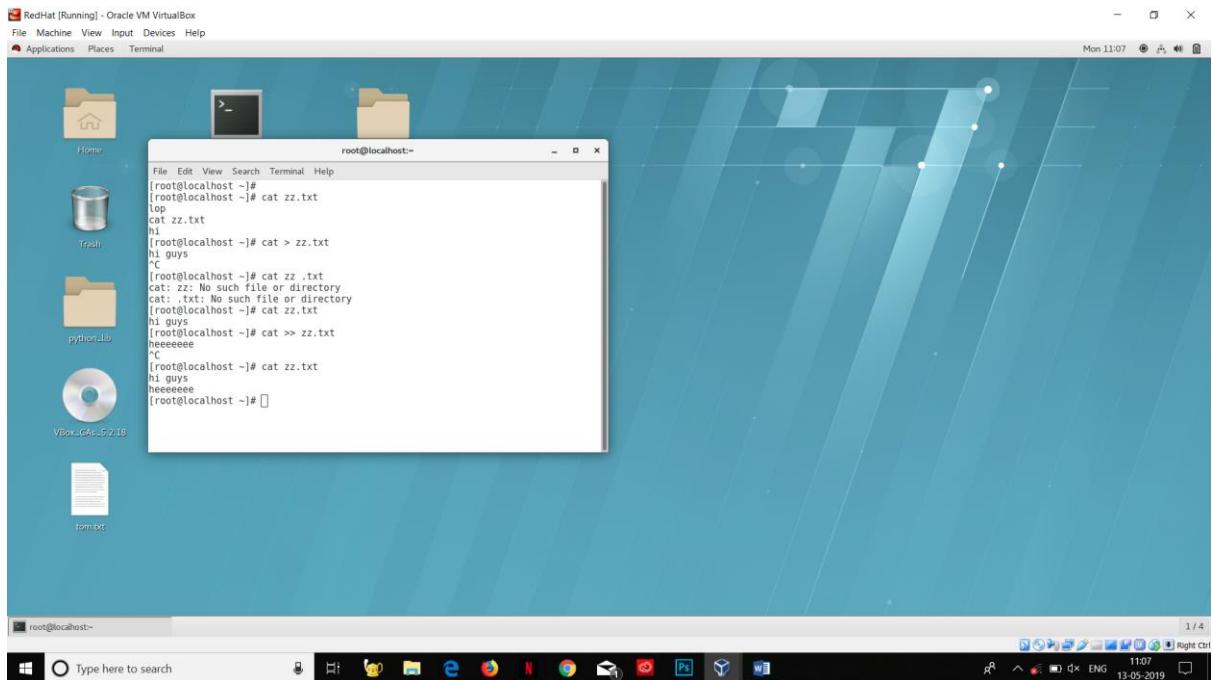
yy->copy line (do in command mode)

dd-> cut line

p->paste (10p paste ten times)

u-> undo

CAT



cat zz.txt (print content in zz)

cat > zz.txt (replace content in zz)

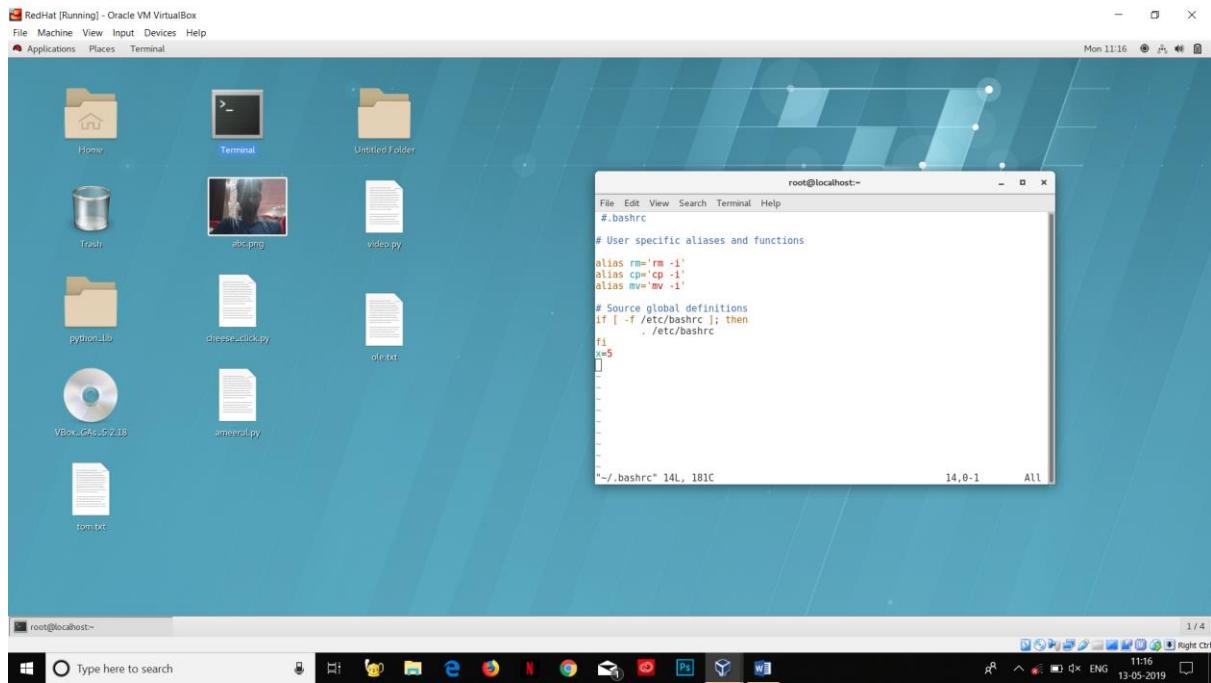
cat >> zz.txt (append content without replacing in zz)

SAVING VARIABLES USING BASH COMMAND

TYPE vim /root/.bashrc

Then save x=5

And esc and :wq to save and quit

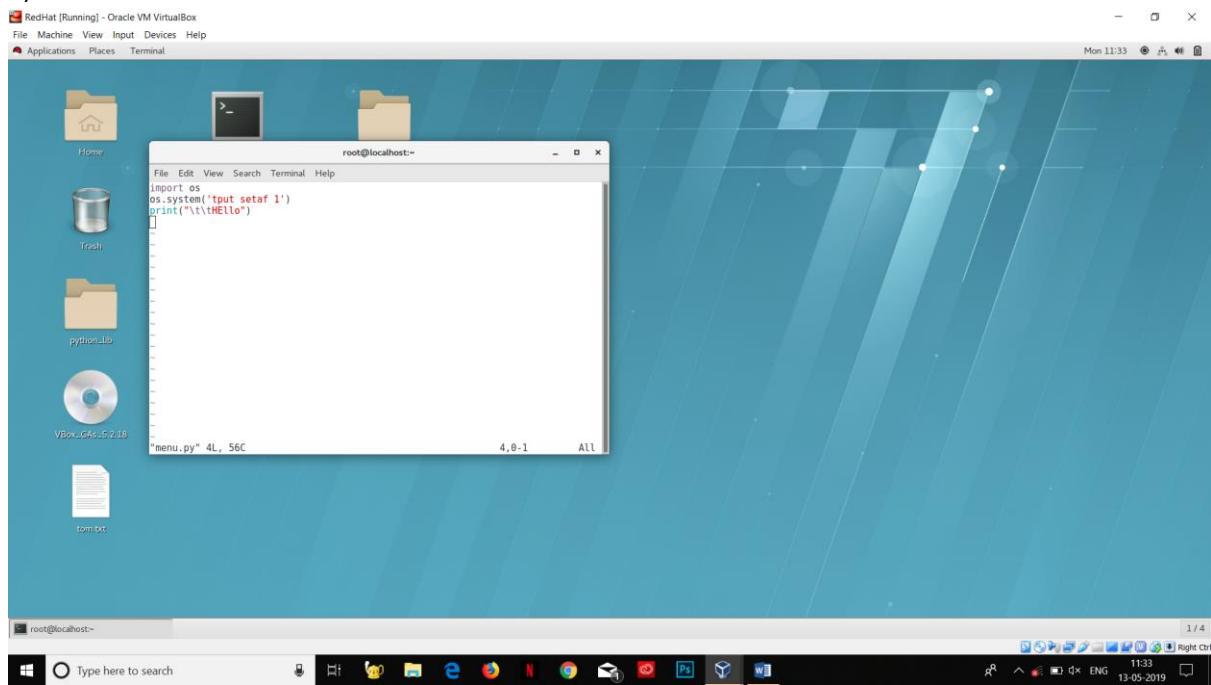


Print echo \$x to see that x is saved with value 5.

Running python using vim

1)vim menu.py

2)



```

RedHat [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
root@localhost:~>

File Edit View Search Terminal Help
import os
import subprocess as sp
os.system("tput setf 1")
print("1:to check date")
os.system("tput setaf 0")
print("-----")
print("2:to create user")
print("3:to create file")
print("4:to exit")
print("5:exit")
"""

print("Enter choice : ", end=' ')
ch=input()
print(ch)
if int(ch)==1:
    x=sp.getoutput("date")
    print(x)

elif int(ch)==2:
    print("cal")
elif int(ch)==3:
    print("user")
elif int(ch)==4:
    print("Enter filename",end=' ')
    file_name=input()
    sp.getoutput("touch {}".format(file_name))
elif int(ch)==5:
    print("exit")

"""
menu.py" [readonly] 32L, 568C
root@localhost:~>

Windows Taskbar: Type here to search, Start button, File Explorer, Edge, Google Chrome, Mail, Photos, Paint, File Manager, Task View, Taskbar icons, Language: ENG, Date: 13-05-2019, Time: 12:04, Battery: 4/4

```

3)run by python36 menu.py

TTS using python

1)install pyttsx3 using pip

```

RedHat [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
root@localhost:~/

Mozilla Firefox
localhost:8888/?token=01a18e619da4275490cb340a88b92a498f482d0e178ae71 107% | X | Q Search
File Edit View Search Terminal Help
[root@localhost python lib]# pip3.6 install pyttsx3-2.7-py3-none-any.whl
Processing ./pyttsx3-2.7-py3-none-any.whl
Installing collected packages: pyttsx3
Successfully installed pyttsx3-2.7.2
You are using pip 10.0.1; however version 19.1.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
[root@localhost python lib]# jupyter notebook --allow-root
bash: jupyter: command not found...
[root@localhost python lib]# jupyter notebook --allow-root
[12:06:23.758 NotebookApp] Writing notebook server cookie secret to /run/user/0/jupyter/notebook/cookie_secret
[12:06:23.757 NotebookApp] Serving notebooks from local directory: /root/Desktop/python lib
[12:06:23.758 NotebookApp] 0 active kernels
[12:06:23.758 NotebookApp] The Jupyter Notebook is running at:
[12:06:23.758 NotebookApp] http://localhost:8888/?token=2938278f535a8ad12bb88566f
de05e532ad12bb88566f5a46b
[12:06:23.758 NotebookApp] Use Control-C to stop this server and shut down all
kernels (twice to skip confirmation).
[C 12:06:23.764 NotebookApp]

Copy/paste this URL into your browser when you connect for the first time,
to login with a token:
http://localhost:8888/?token=2938278f535a8ad12bb88566f

Waiting for localhost...
root@localhost:~/
python lib
root@localhost:~/Desktop/python lib
Home - Mozilla Firefox
File Edit View Search Terminal Help
Windows Taskbar: Type here to search, Start button, File Explorer, Edge, Google Chrome, Mail, Photos, Paint, File Manager, Task View, Taskbar icons, Language: ENG, Date: 13-05-2019, Time: 12:06, Battery: 1/4

```

2)

```

RedHat [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
root@localhost:~ root@localhost:~ Mon 12:12 12:12 ENG 13-05-2019 1 / 4

File Edit View Search Terminal Help
import os
import subprocess as sp
import pytsx
os.system("tput setaf 1")
print("Welcome to my tools")
os.system("tput setaf 0")
print("-----")
print("1:to check date")
print(2:cal)
print 3:create user
print 4:to create file
print 5:exit
"""
speaker=pytsx3.init()
speaker.say("Enter your choice")
speaker.runAndWait()

print("Enter choice :",end='')
ch=input()
print(ch)
if int(ch)==1:
    x=sp.getoutput("date")
    print(x)

elif int(ch)==2:
    print("cal")
elif int(ch)==3:
    print("user")
elif int(ch)==4:
    print("Enter filename",end='')
    file_name=input()
    sp.getoutput("touch {}".format(file_name))
elif int(ch)==5:
    print("exit")
"""

37.0-1 All

```

3)run using python36 menu.py

Some more basics in Python

List can be edited and changes can be made to data

In tuple you can't change.

```

RedHat [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
root@localhost:~ root@localhost:~ Mon 12:54 12:13 ENG 13-05-2019 1 / 4

File Edit View Search Terminal Help
[root@localhost ~]# python36
Python 3.6.9 (default, Mar 29 2019, 00:03:27)
[GCC 4.8.5 20150623 (Red Hat 4.8.5-36)] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> x=[1,2,3,4]
>>> y=(1,2,3,4)
>>> type(x)
<class 'list'>
>>> type(y)
<class 'tuple'>
>>> []

```

String

```
RedHat [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
root@localhost:~#
File Edit View Search Terminal Help
bash: ppython36: command not found...
Similar commands are 'python36'
Simpler command is 'python36'
Python 3.6.6 (default, Mar 29 2019, 00:03:27)
[GCC 4.8.5 20150623 (Red Hat 4.8.5-36)] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> x="this is linuxworld"
>>> type(x)
<class 'str'>
>>> x[3]
's'
>>> s[3:7]
's'
>>> traceback (most recent call last):
  File "<stdin>", line 1, in <module>
NameError: name 's' is not defined
>>> x[3:7]
's is'
>>> x[-1]
'd'
>>> x.append("hello")
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
AttributeError: 'str' object has no attribute 'append'
>>> []
VBox-GA-5.2.18
```

List and dictionary

Both are same and do row wise operation. Only difference is dictionary has its own id like a,b,c,mob instead of 0,1,2

```
RedHat [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
root@localhost:~#
File Edit View Search Terminal Help
[root@localhost ~]# python36
Python 3.6.6 (default, Mar 29 2019, 00:03:27)
[GCC 4.8.5 20150623 (Red Hat 4.8.5-36)] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> x=vimal;1234
>>> x.append('ok')
>>> x
[1, 'vimal', 1234, 'ok']
>>> type(x)
<class 'list'>
>>> y={"id":1,"name":vimal,"mob":1234}
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
NameError: name 'vimal' is not defined
>>> y={"id":1,"name":'vimal','mob':1234}
>>> type(y)
<class 'dict'>
>>> y["mob"]
1234
>>> []
VBox-GA-5.2.18
```

```
[root@localhost ~]# python36
Python 3.6.6 (default, Mar 29 2019, 00:03:27)
[GCC 4.8.5 20150623 (Red Hat 4.8.5-36)] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> x=[{"a":["vimal",111],"b":["krish",222],"c":["pop",333]}
... x[0]
... x[0][0]
... x[0][0][0]
...
SyntaxError: invalid syntax
>>> x=[{"a":["vimal",111],"b":["krish",222],"c":["pop",333]}]
... type(x)
<class 'dict'>
>>> x["b"]
['krish', 222]
>>> 
```



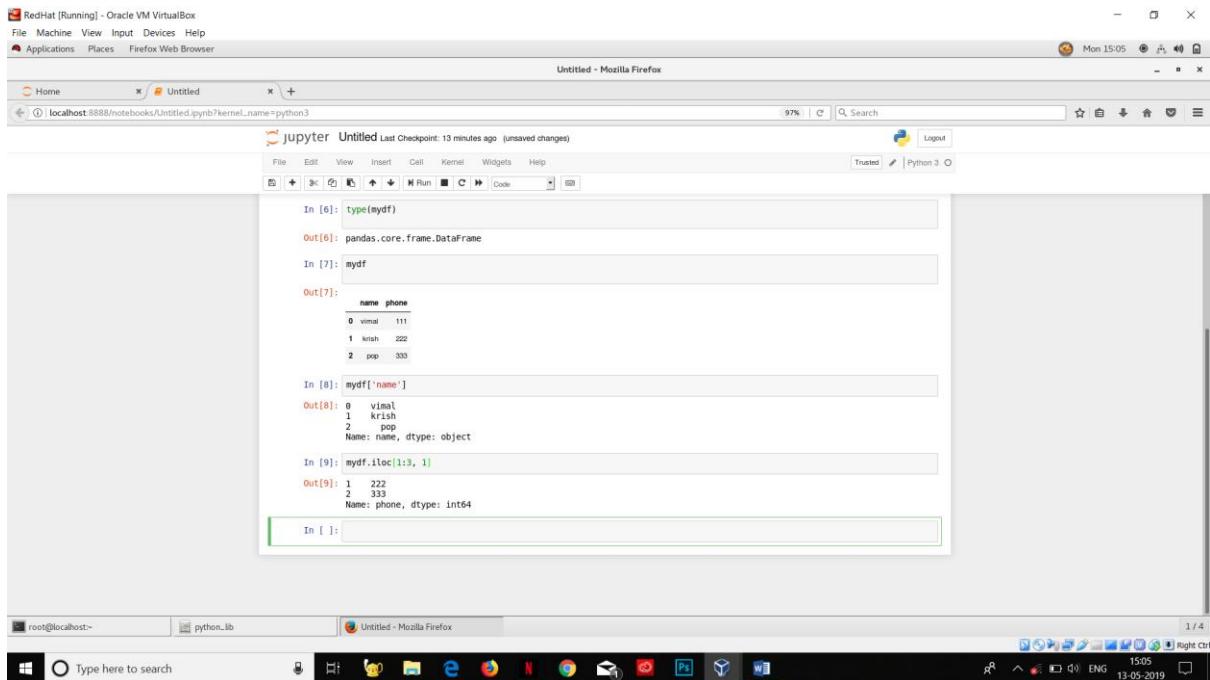
DATAFRAME

1)Install pandas

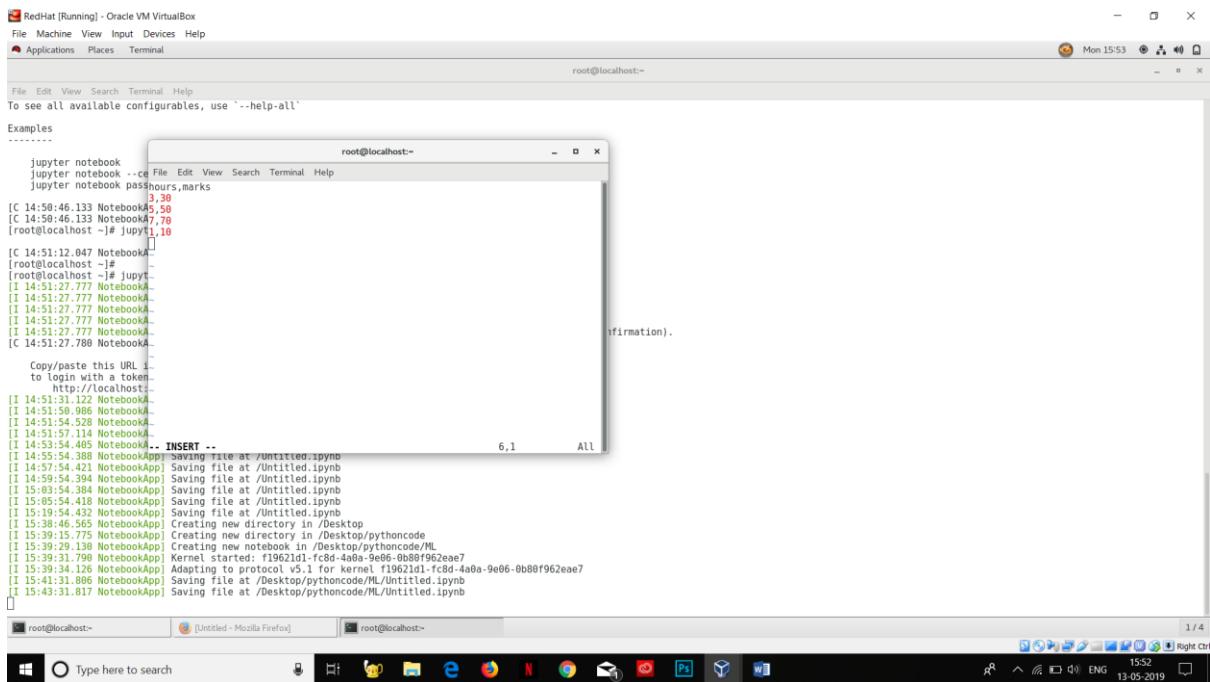
pip3.6 install pandas(tab)

```
In [1]: import pandas as pd
In [2]: x=[{"a":["vimal",111],"b":["krish",222],"c":["pop",333]}]
In [3]: x[0]
In [4]: type(x)
Out[4]: list
In [5]: mydf=pd.DataFrame(data=x,columns=["name","phone"])
In [6]: type(mydf)
Out[6]: pandas.core.frame.DataFrame
In [7]: mydf
Out[7]:
   name  phone
0  vimal    111
1  krish    222
2    pop    333
In [8]: mydf['name']
Out[8]: 0    vimal
1    krish
2     pop
Name: name, dtype: object
```





MACHINE LEARNING



Machine learns from data.Based on models,formula,experience.

The collected data is called **dataset**.

Here marks is the **dependent variable** ($\text{marks} = 10 * \text{hours}$)

Hours is called **Predictor/Independent Variable**

$Y = 10x \rightarrow \text{Model}$

Here 10 is coefficient

Plot a graph for model. This line is called prediction line.

Linear Regression Model

Model or linear algebra formula

FLOW for ML

1) Dataset is given to machine

2) Machine is trained(fit)

3) This model is now used to predict

The screenshot shows a Jupyter Notebook interface within a Mozilla Firefox window. The notebook has two tabs: 'Untitled' and 'Untitled'. The code in the notebook is as follows:

```
In [1]: import pandas as pd
In [7]: dataset=pd.read_csv('marks.csv')
In [8]: type(dataset)
Out[8]: pandas.core.frame.DataFrame
In [53]: hours=dataset.iloc[:, 0:1]
marks=dataset.iloc[:, 1]
In [54]: from sklearn.linear_model import LinearRegression
In [55]: model=LinearRegression()
In [56]: hours.shape
Out[56]: (4, 1)
In [57]: model.fit(hours,marks)
Out[57]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
In [58]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
Out[58]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
In [59]: model.predict([[6]])
Out[59]: array([60.])
In [ ]:
```

Just see hours and marks in below one

The screenshot shows a Jupyter Notebook interface within a Mozilla Firefox window. The notebook has two tabs: 'Untitled' and 'Untitled'. The code in the notebook is as follows:

```
In [1]: import pandas as pd
In [7]: dataset=pd.read_csv('marks.csv')
In [8]: type(dataset)
Out[8]: pandas.core.frame.DataFrame
In [53]: hours=dataset.iloc[:, 0:1]
marks=dataset.iloc[:, 1]
In [60]: hours
Out[60]:
   hours
0      3
1      5
2      7
3      1
In [62]: marks
Out[62]:
   0    30
   1    50
   2    70
   3    10
Name: marks, dtype: int64
In [54]: from sklearn.linear_model import LinearRegression
In [55]: model=LinearRegression()
In [56]: hours.shape
Out[56]: (4, 1)
```

```

In [54]: from sklearn.linear_model import LinearRegression
In [55]: model=LinearRegression()
In [56]: hours.shape
Out[56]: (4, 1)
In [57]: model.fit(hours,marks)
Out[57]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
In [58]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
Out[58]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
In [59]: model.predict([[6]])
Out[59]: array([60.])
In [60]: model.coef_
Out[60]: array([10.])
In [61]: import matplotlib.pyplot as plt
In [62]: plt.scatter(hours,marks)

```

`[:, 0:1]` -> First one column with all data rows

`[:, 1]` -> same as above

```

In [63]: model.coef_
Out[63]: array([10.])
In [64]: import matplotlib.pyplot as plt
In [65]: plt.scatter(hours,marks)
Out[65]: <matplotlib.collections.PathCollection at 0x7f89cc2f2da0>

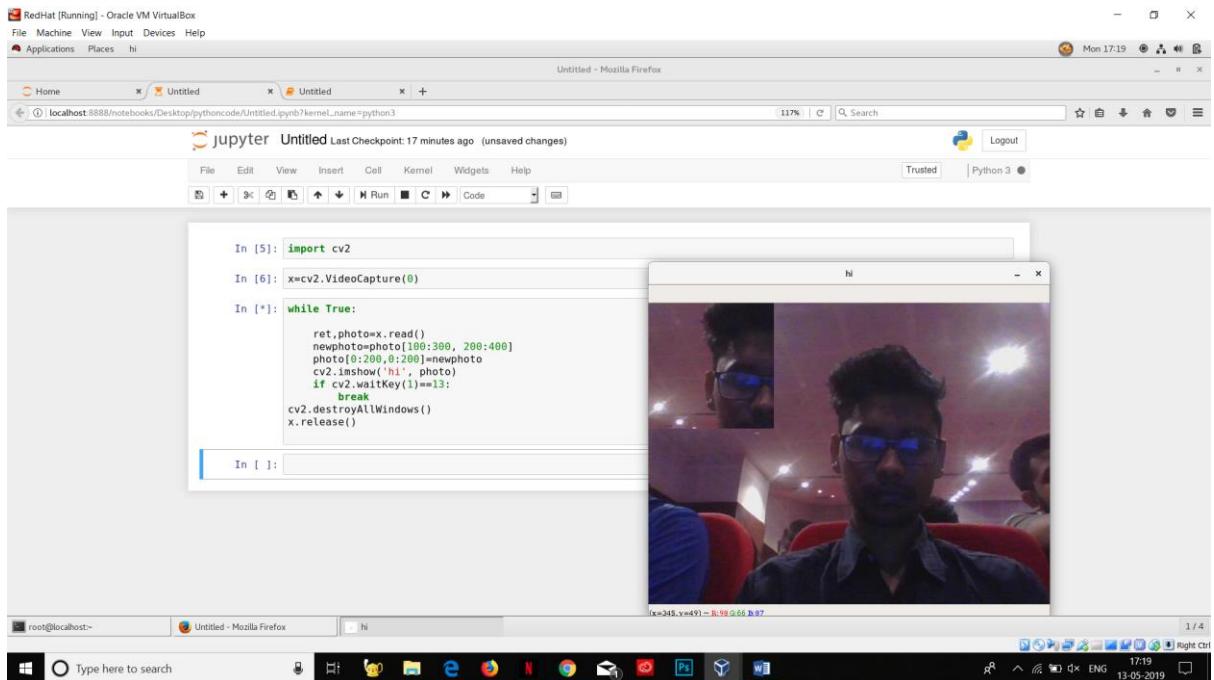
```

```

In [66]: plt.plot(hours,marks)
Out[66]: [<matplotlib.lines.Line2D at 0x7f89cc291438>]

```

CROPPED REAL TIME VIDEO



IOT

Copper wire has many particles. Speed of the movement of these particles is directly proportional to the energy produced. This movement is called as current.

Longer end of led is +ve

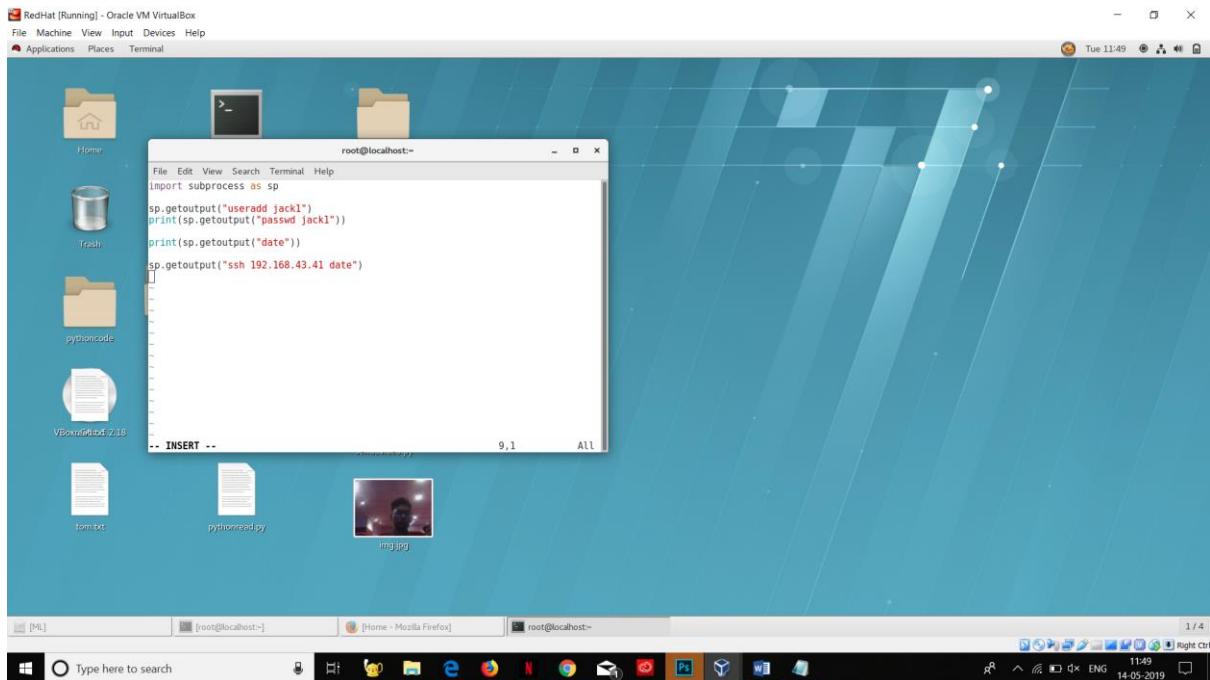
The more resistance , lesser the led will glow.

Photoresistor will provide lesser resistance with more light.

DAY-4

Linux

Interactive commands-> passwd jack, ssh



We use print because **sp.getoutput** only returns the value but doesn't print it

We **print passwd jack1** because it is an interactive command (otherwise when we run it it will be show blank output)

RUN using python36 interactive.py

REMOTE ACCESS MENU

Go to vim menu.py

CLOUD COMPUTING

Companies purchase resources and datacentres and rent it as sp(Service providers) to other companies.

Ex:-GoogleCloudPlatform(GCP),Microsoft Azure

You can rent 1TB ram,hard disk etc instead of buying.

There are two types of cloud :Public and Private

AWS(Public)

Amazon Web Service(AWS) is the biggest cloud.Its datacentre is called AZ(Availability Zones)

To see availability zones:-

<https://aws.amazon.com/about-aws/global-infrastructure/>

There's always two data centres(two availability zones) in case of disaster.

CONTAINER

With the use of container we boot up OS using 20-30MB RAM in a single click and in one second.

Agile form-Docker

In containerization we use **docker**(like Oracle VM in virtualization).The launched OS is called a **container**.

The layer which separates container and linux os is **docker engine**(like layer which separates is called virtualization layer)

DOCKER

Docker

1)Install docker using yum command

```
yum install docker-ce
```

```
systemctl restart docker
```

We always need an **image** for installing(booting up) the OS.(like the iso disk file we)

To check for docker images,Type in terminal **docker images**

docker pull Ubuntu:14.04 (Get version from online by searching download docker images but for us it already downloaded)

Transfer files

We can transfer files from windows to redhat using WinSCP(because its like Windows and Redhat linux are on two different systems)

Open WinSCP and enter ip address (by ifconfig) ,enter username(root),enter password(redhat)

NEXT drag and drop folders.

Load image

Type in terminal

Docker load –i centos-latest.tar

Check by typing,**docker images**

Launching OS

Check if any os is installed by , **docker ps** (shows currently launched os)

Docker ps –a (shows all the launched os till now)

Docker run –t –i ubuntu:14.04

Docker run –it -d Ubuntu:14.04 (Running in detached mode)

NEW OS(UBUNTU) IS LAUNCHED!

You can setup multiple OS in different terminals

Exit -> to exit

Leftctrl+p+q -> use instead of exit if you want to just come out of prompt

Opening old OS that we launched

Docker start f1d6e58675dc (this unique id can be got from **docker ps -a**)

Docker attach f1d6e58675dc(to get the terminal of it)

Then press enter!

Stop

Exit (OR) docker stop unique id

Docker rm unqiue id

Note:-task manager in linux is **ps -aux**

kill processno -> to kill a program

Opening multiple OS at once using loop in python

The screenshot shows a Red Hat [Running] - Oracle VM VirtualBox desktop environment. In the top-left window, a root shell is running a Python script to pull multiple Docker images. In the bottom-right window, another root shell is running a script to list Docker containers. A task manager in the bottom center shows several open tabs, including a Firefox browser window.

```
[root@localhost rhel7_5_software_extras]# docker pull ubuntu:14.04
Error response from daemon: Get https://registry-1.docker.io/v2/: net/http: request canceled while waiting for connection (Client.Timeout exceeded while awaiting headers)
[root@localhost rhel7_5_software_extras]# docker pull ubuntu:14.04
Error response from daemon: Get https://registry-1.docker.io/v2/: net/http: request canceled while waiting for connection (Client.Timeout exceeded while awaiting headers)
[root@localhost rhel7_5_software_extras]# ping 8.8.8.8
connect: No route to host
[root@localhost ~]
```

```
root@localhost:~/Desktop/pythoncode/loopdocker.py
File Edit View Search Terminal Help
File "root/Desktop/pythoncode/loopdocker.py", line 3
    while i<=10:
      ^

SyntaxError: invalid syntax
[root@localhost rhel7_5_software_extras]# python36 /root/Desktop/pythoncode/loop
docker.py
File "root/Desktop/pythoncode/loopdocker.py", line 5
    ^
SyntaxError: invalid syntax
[root@localhost rhel7_5_software_extras]# python36 /root/Desktop/pythoncode/loop
docker.py
File Edit View Search Terminal Help
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
495e77806f6c        ubuntu:14.04       "/bin/bash"         21 seconds ago   Up 21 seconds      0.0.0.0:22->22/tcp
cranky_wiles        ubuntu:14.04       "/bin/bash"         22 seconds ago   Up 21 seconds      0.0.0.0:22->22/tcp
clever_leavitt      ubuntu:14.04       "/bin/bash"         22 seconds ago   Up 21 seconds      0.0.0.0:22->22/tcp
keen_kowalevski     ubuntu:14.04       "/bin/bash"         23 seconds ago   Up 22 seconds      0.0.0.0:22->22/tcp
```

Left side python code

Right side running it

MACHINE LEARNING

In $y=10x$

The computer's main objective is to find out the coefficient "10". x and y will be given. Here 10 is called as the **weight**.

ML gives approximate predictions.

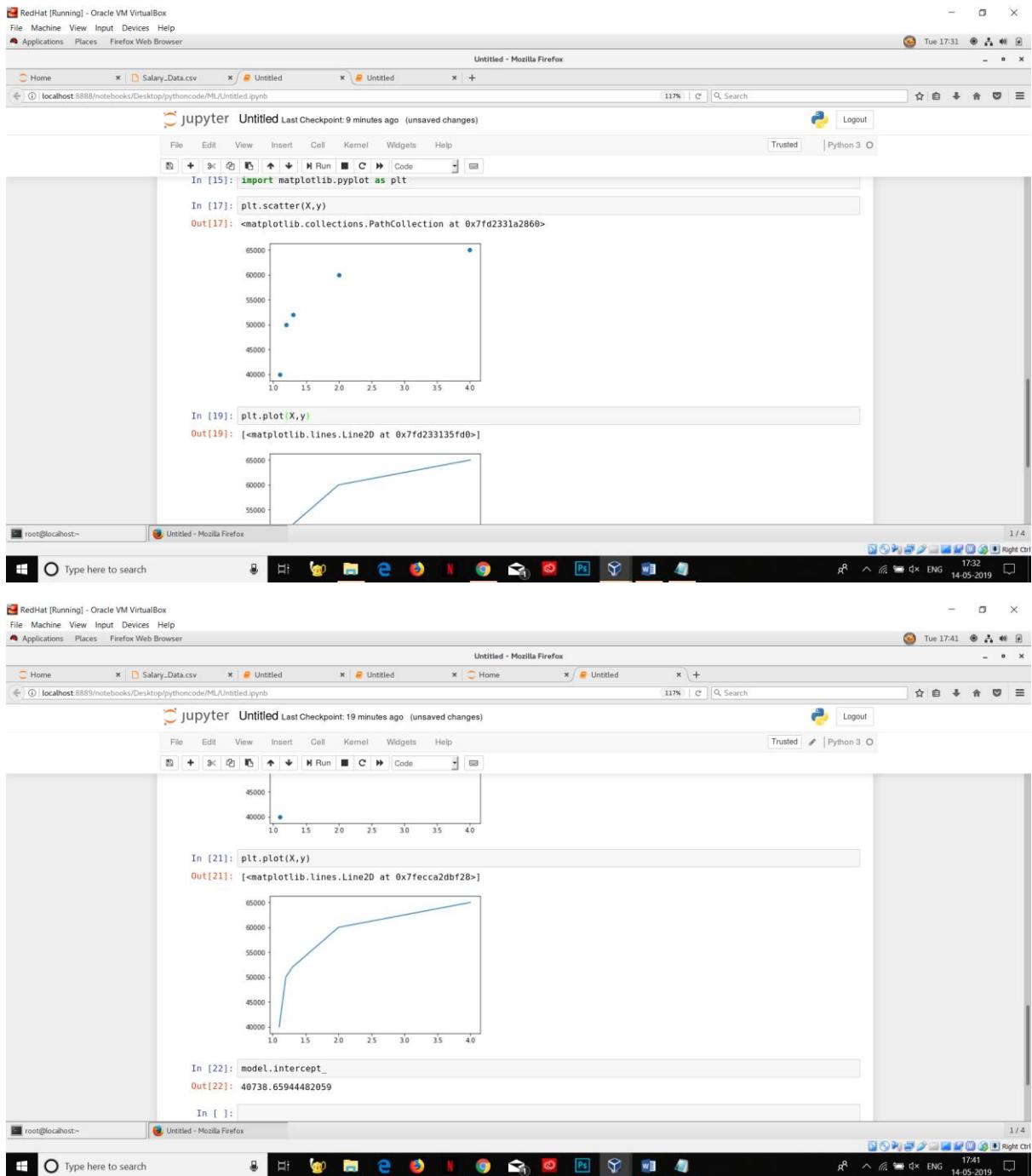
Salary_data ML program

RedHat [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Firefox Web Browser
Untitled - Mozilla Firefox
Home Salary_Data.csv Untitled
localhost:8888/notebooks/Desktop/pythoncode/ML/Untitled.ipynb
jupyter Untitled Last Checkpoint: 9 minutes ago (unsaved changes)
File Edit View Insert Cell Kernel Widgets Help
In [1]: import pandas as pd
In [2]: dataset=pd.read_csv('Salary_Data.csv')
In [3]: type(dataset)
Out[3]: pandas.core.frame.DataFrame
In [4]: dataset.head() #.head just gets first 5 dataset values
Out[4]:
Experience Salary
0 1.1 40000
1 1.2 50000
2 1.3 52000
3 2.0 60000
4 4.0 65000
In [5]: y=dataset.iloc[:, 1] #dependent variable
In [6]: X=dataset.iloc[:, 0:1]
In [7]: y.shape
Out[7]: (5,)
root@localhost~| Untitled - Mozilla Firefox
Windows Start Type here to search Taskbar Icons 17:31 ENG 14-05-2019

In this screenshot, the Jupyter Notebook is running in Mozilla Firefox. The code cell In [1] imports the pandas library. The code cell In [2] reads the 'Salary_Data.csv' file into a DataFrame named 'dataset'. The code cell In [3] prints the type of 'dataset', which is a DataFrame. The code cell In [4] prints the first five rows of the dataset using the head() method. The output shows the 'Experience' and 'Salary' columns with some sample data points. The code cell In [5] selects the dependent variable 'y' from the dataset. The code cell In [6] selects the independent variable 'X' from the dataset. The code cell In [7] prints the shape of the 'y' variable, which is (5,).

RedHat [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Firefox Web Browser
Untitled - Mozilla Firefox
Home Salary_Data.csv Untitled
localhost:8888/notebooks/Desktop/pythoncode/ML/Untitled.ipynb
jupyter Untitled Last Checkpoint: 9 minutes ago (unsaved changes)
File Edit View Insert Cell Kernel Widgets Help
Out[7]: (5,)
In [8]: X.shape
Out[8]: (5, 1)
In [9]: from sklearn.linear_model import LinearRegression
In [10]: model=LinearRegression()
In [11]: model.fit(X,y)
Out[11]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
In [12]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
Out[12]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
In [13]: model.predict([[5]])
Out[13]: array([73710.90047393])
In [14]: model.coef_
Out[14]: array([6594.44820582])
In [15]: import matplotlib.pyplot as plt
root@localhost~| Untitled - Mozilla Firefox
Windows Start Type here to search Taskbar Icons 17:31 ENG 14-05-2019

In this screenshot, the Jupyter Notebook continues. The code cell In [9] imports the LinearRegression class from the sklearn.linear_model module. The code cell In [10] creates an instance of the LinearRegression class named 'model'. The code cell In [11] fits the model to the data using the fit() method. The code cell In [13] makes a prediction for an input value of 5 using the predict() method. The output is an array containing the predicted salary value. The code cell In [14] prints the coefficient of the model using the coef_ attribute. The code cell In [15] imports the matplotlib.pyplot module as 'plt'.



Practically, it will be of the form $y = b + wx$

a->constant/bias/y-intercept

w->coefficient/weight

x->IV

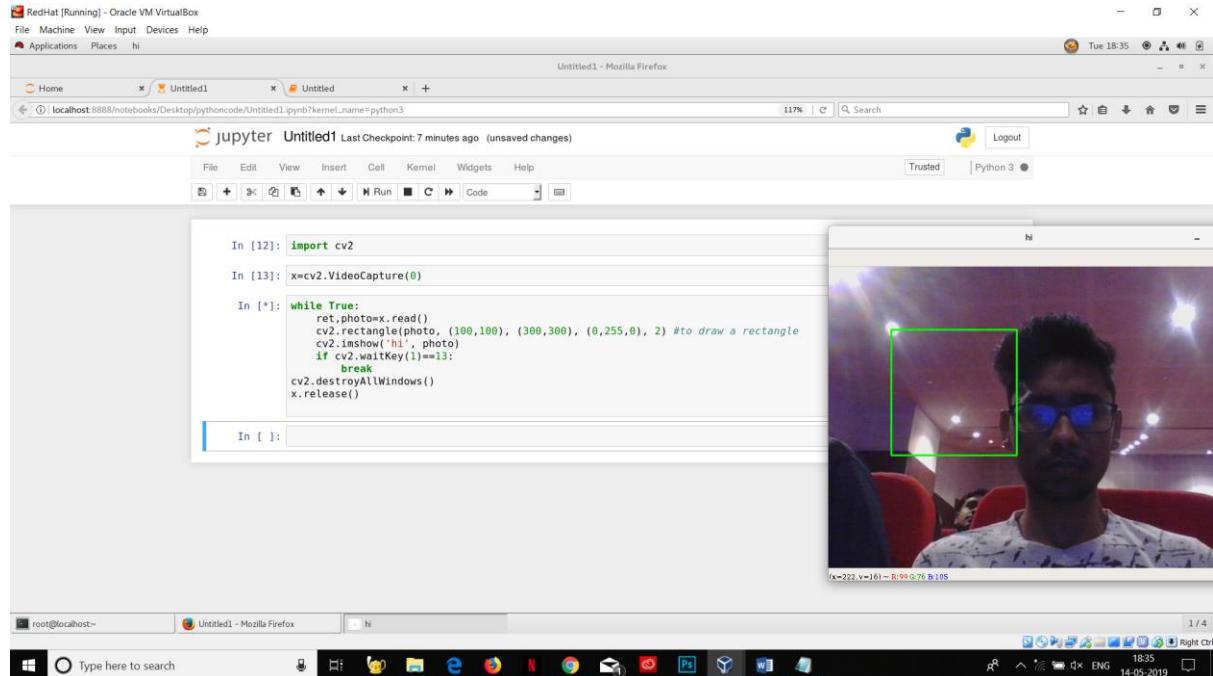
y->DV

Machine doesn't know what **a** and **w** is. It finds out using the dataset.

***TILL NOW WE HAVE ONLY USED LINEAR REGRESSION AND IT ISN'T THIS SIMPLE PRACTICALLY.A LOT OF FACTORS ARE CONSIDERED.**

IMAGE PROCESSING

Drawing a rectangle



(100,100) -> (300,300) (box from this to that)

0,255,0 -> BGR

2 -> pixels

FACE DETECTION

Frontalface

Feature extraction

Using black and white pixels we recognise face features

We compress photo like we use 1 pixel instead of 5 by giving it median value.

Top left coordinate,height and width is returned

We shall use haar cascade for face detection

Haarcascade has features like eye detection,face detection

We import the xml

VideoCapture(0) ->_ turn on the laptop camera

We r using frontal face detection

Ret,photo = cap.read()

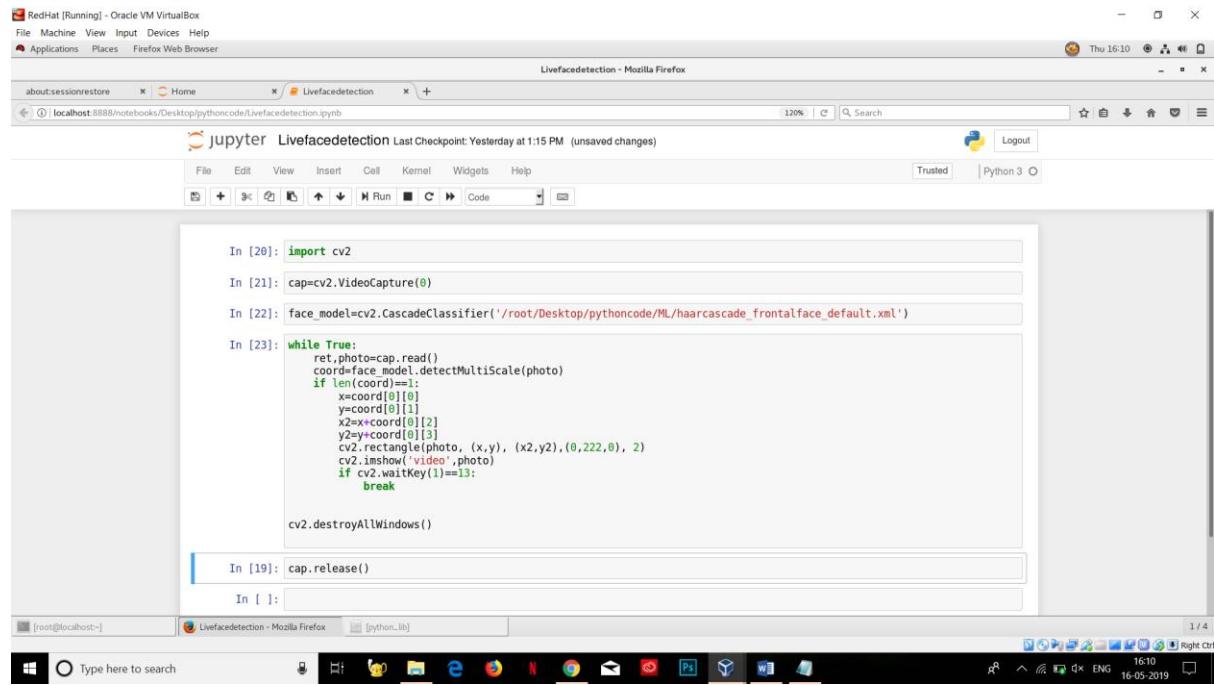
detectMultiScale(photo) returns the tuple(x-coordinate,y coordinate,height and width)

X1 ,Y1 is leftmost coordinate

Axis start from reverse value

Convert to grayscale (0 white ,1 black)

Rectangle -> coordinate1 ,coordinate2 ,bgr color of rect frame,pixel thickness of rect



```
In [20]: import cv2
In [21]: cap=cv2.VideoCapture(0)
In [22]: face_model=cv2.CascadeClassifier('/root/Desktop/pythoncode/ML/haarcascade_frontalface_default.xml')
In [23]: while True:
    ret,photo=cap.read()
    coord=face_model.detectMultiScale(photo)
    if len(coord)==1:
        x=coord[0][0]
        y=coord[0][1]
        x2=x+coord[0][2]
        y2=y+coord[0][3]
        cv2.rectangle(photo, (x,y), (x2,y2),(0,222,0), 2)
        cv2.imshow('video',photo)
        if cv2.waitKey(1)==13:
            break
    cv2.destroyAllWindows()

In [19]: cap.release()
In [ ]:
```

#PRACTICE

Classes

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

class - Mozilla Firefox

Home class Untitled Untitled +

localhost:8888/notebooks/Desktop/Group/class.ipynb 117% Search Logout

jupyter class Last Checkpoint: 18 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [13]: `class vimaldagafc:`
 `def __init__(self):`
 `self.p=10 #write self.p everywhere you see p`
 `def show(self):`
 `print(self.p)`
 `def change(self,arg):`
 `print('{} is the new number'.format(arg))`

In [14]: `s=vimaldagafc()`

In [15]: `s.show()`

10

In [16]: `s.change(15)`

15 is the new number

In []:

[root@localhost ~] class - Mozilla Firefox [root@localhost ~] [Home] 1 / 4

Type here to search   23:13 14-05-2019

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

RHEL - Mozilla Firefox

Home RHEL Untitled Untitled +

localhost:8888/notebooks/Desktop/Group/RHEL.ipynb 110% Search Logout

jupyter RHEL Last Checkpoint: 14 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [32]: `import subprocess as sp`

In [33]: `class RHEL:`
 `def date(self):`
 `print(sp.getoutput("date"))`
 `def cal(self):`
 `print(sp.getoutput("cal"))`
 `def statusdate(self):`
 `print(sp.getstatusoutput("date")) #statusoutput gives 0-> true ,1->false`

In [34]: `s=RHEL()`

In [35]: `s.date()`

Tue May 14 23:29:25 IST 2019

In [36]: `s.cal()`

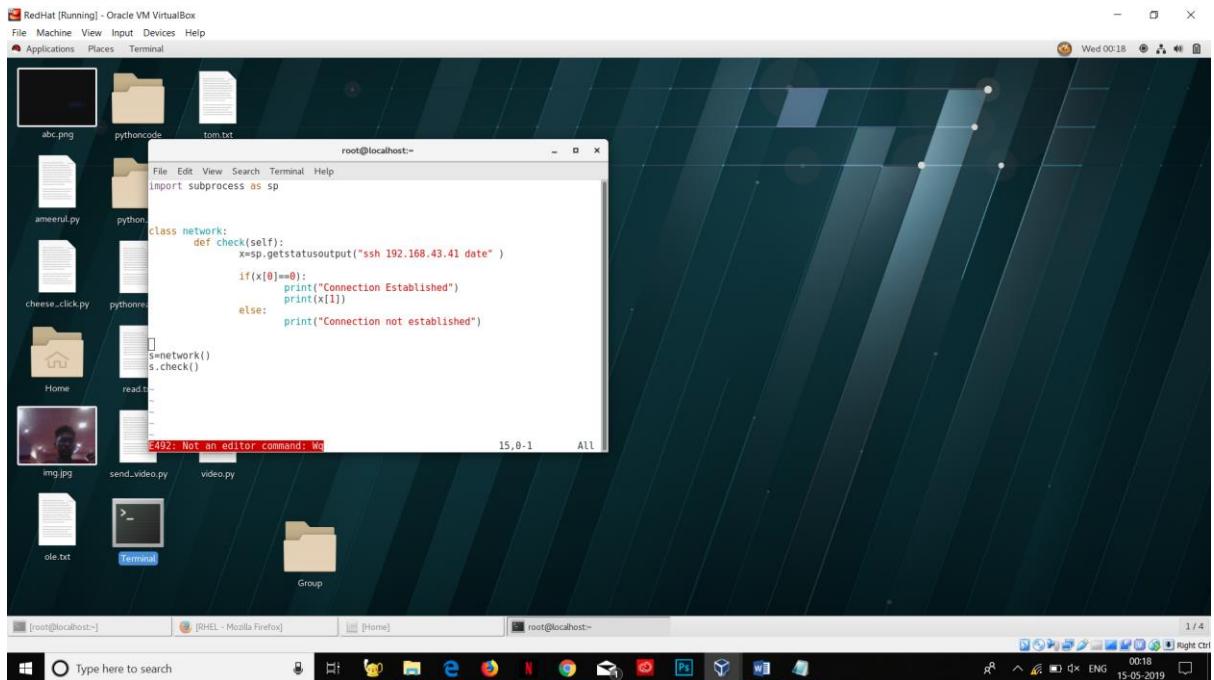
May 2019
Su Mo Tu We Th Fr Sa
 1 2 3 4
 5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

In [37]: `s.statusdate()`

(0, 'Tue May 14 23:29:25 IST 2019')

[root@localhost ~] RHEL - Mozilla Firefox [root@localhost ~] [Home] 1 / 4

Type here to search   23:32 14-05-2019



GITHUB

yum install git

open in terminal group folder and git add file -> to add specific file

git add . -> to add all file

DAY 5

Linux commands

Actual use of **touch** command -> gives timestamp of the file

Touch zz.txt -t 1201131415 (change timestamp)

Ls -l (to check if time has changed)

Change **date** by **date 0312133014**

SSH remote login

ssh 192.168.143.41

and then write commands like date,cal

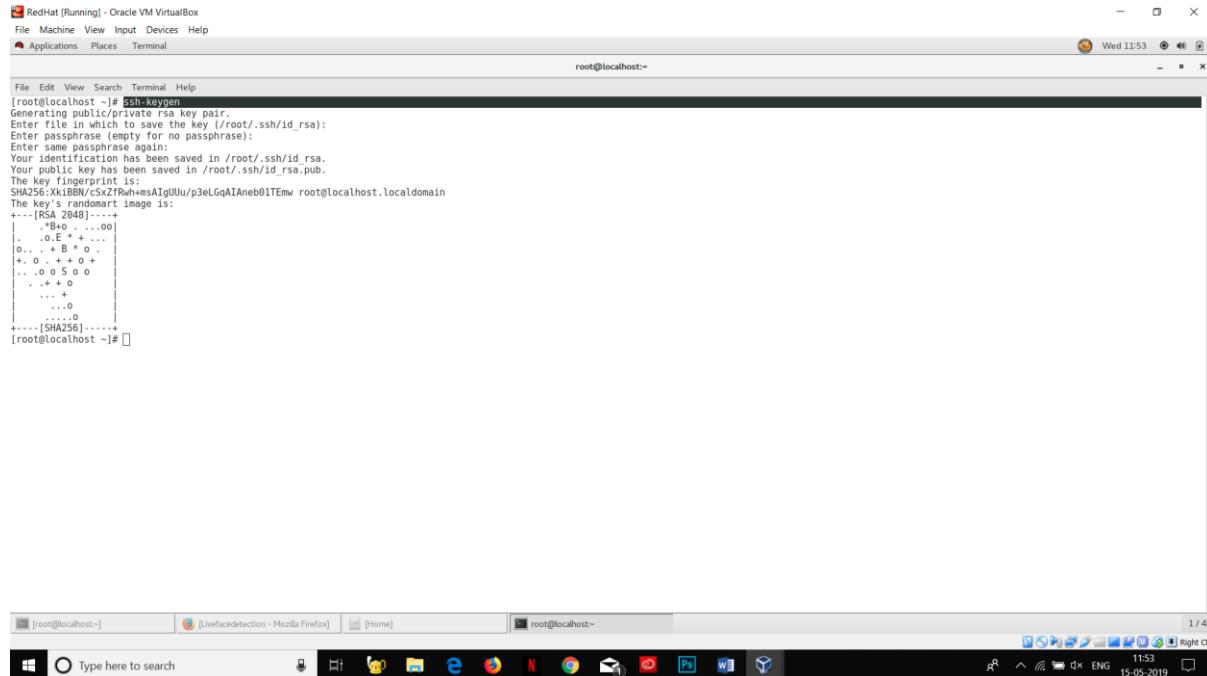
you can check that you are still in the other system through ifconfig

*There are two ways to authenticate ssh login 1) Password based 2) Key based authentication

Key-based authentication

1)Here the system logging in generates the key.

*public and private key is generated.By default the public key is sent to other system

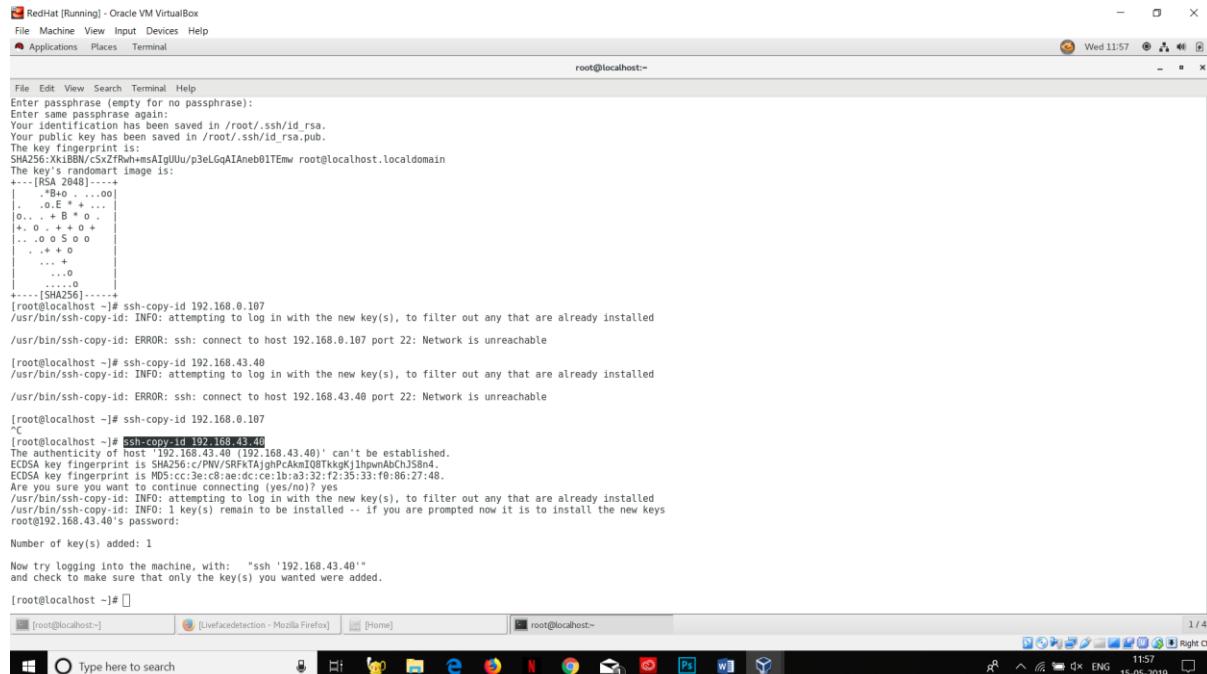


```
[root@localhost ~]# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:XkLBBN/cSzXfRhWmsA1gUUu/p3eLGoAIAnebB1TEmw root@localhost.localdomain
The key's randomart image is:
+---[RSA 2048]----+
| *B+o . ...oo|
| ..o.E + + ... |
| .o.. + B o o .|
| +. o . + + o + |
| ..o o S o o . |
| .+ + o . . . . |
| . . . . . . . . |
| . . . . . . . . |
+---[SHA256]-----+
[root@localhost ~]#
```



2)Send the generated key to the other system

C



```
[root@localhost ~]# ssh-copy-id 192.168.43.40
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: ERROR: ssh: connect to host 192.168.43.40 port 22: Network is unreachable
[root@localhost ~]# ssh-copy-id 192.168.43.40
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: ERROR: ssh: connect to host 192.168.43.40 port 22: Network is unreachable
[root@localhost ~]# ssh-copy-id 192.168.43.40
^C
[root@localhost ~]# ssh-copy-id 192.168.43.40
The authenticity of host '192.168.43.40' ('192.168.43.40') can't be established.
ED25519 key fingerprint is SHA256:/PmHqfAfghAcmRzTkgkj1hpvnBChJ58n4.
ED25519 key fingerprint is MD5:4c:ae:de:c3:32:f2:35:33:f0:86:27:48.
Are you sure you want to continue connecting (yes/no)? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
root@192.168.43.40's password:
Number of key(s) added: 1
Now try logging into the machine, with: "ssh '192.168.43.40'" and check to make sure that only the key(s) you wanted were added.
[root@localhost ~]#
```



3)Try ssh 192.168.43.40 date and you will get date without password

Keybased authentication is much more secure (CHECK BY USING COMMAND cat /root/.ssh/id_rsa)

LINUX SERVER

Server client model

Server->provides service

Client->takes service

Sir is a training server. We are the clients getting trained.

Types of server:

Website	Mail	Download/Upload	Client Program
(Web server)	(Mail server)	(File transfer)	RAM/CPU ,Remote Execution
http	smtp	ftp	ssh

Web Server

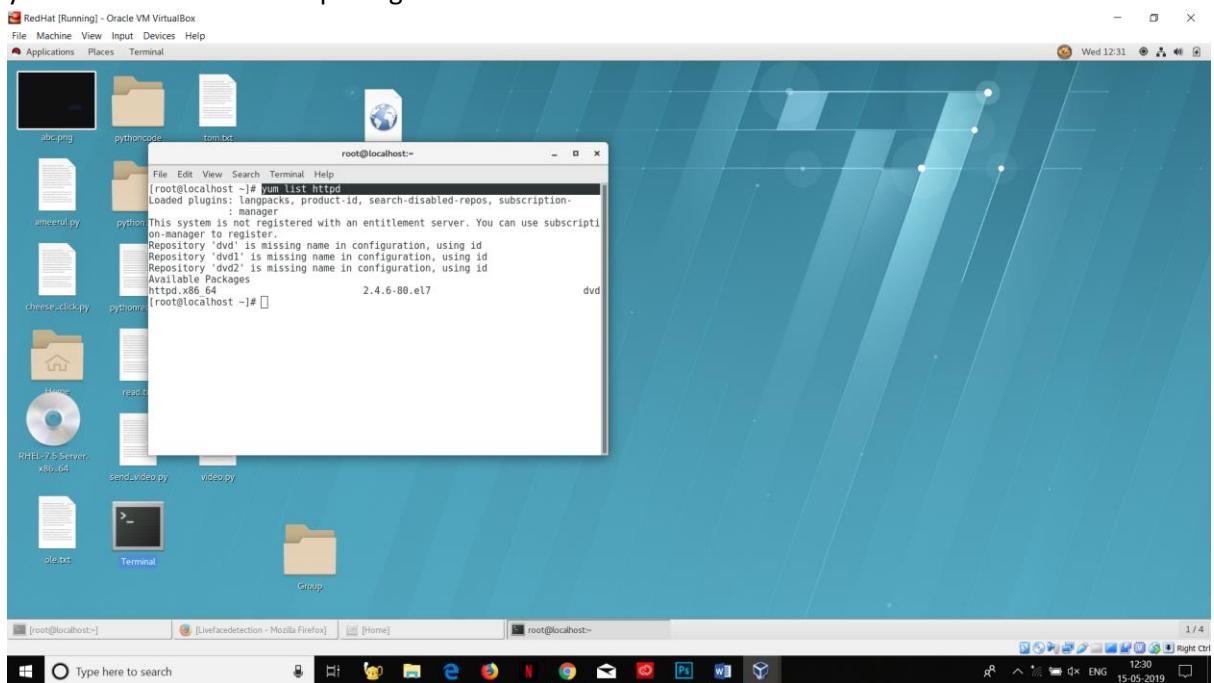
Apache is an open source community and HTTPD(rpm in Linux) is a product from Apache company. We make products using HTTPD.

Apache also created nginx. But we shall use HTTPD.

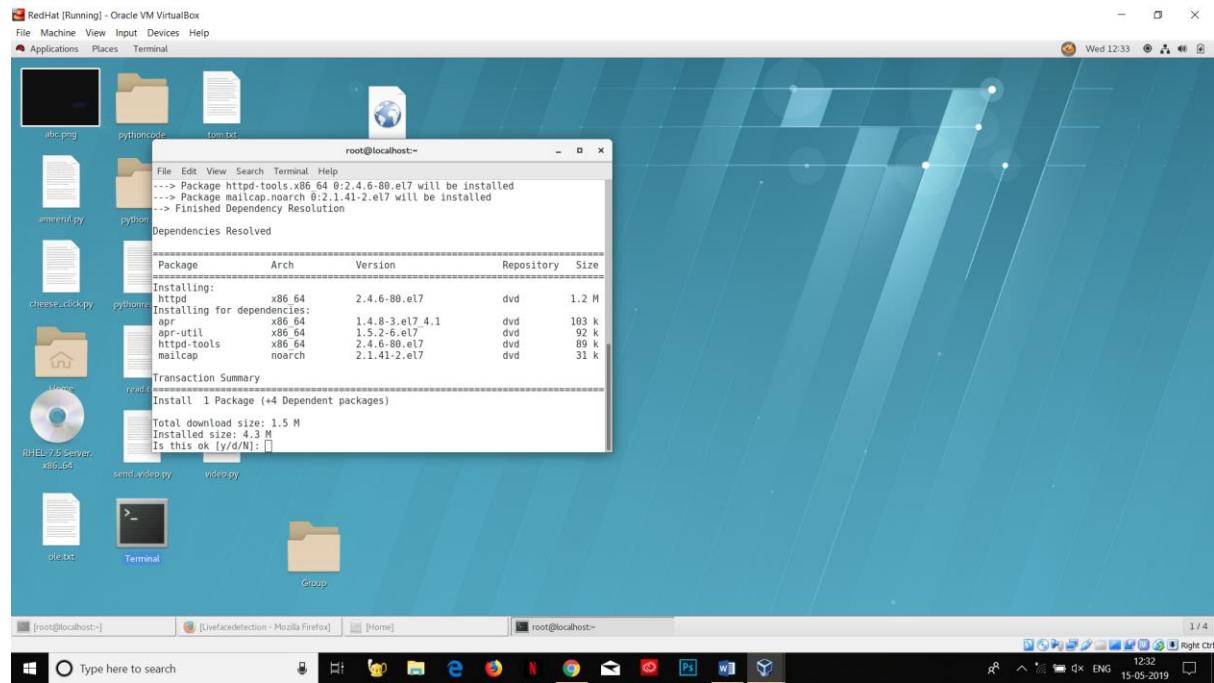
To configure a webserver:

- 1) Software (package) installation through rpm(or)yum
- 2) Configure
- 3) Execute(Service run)

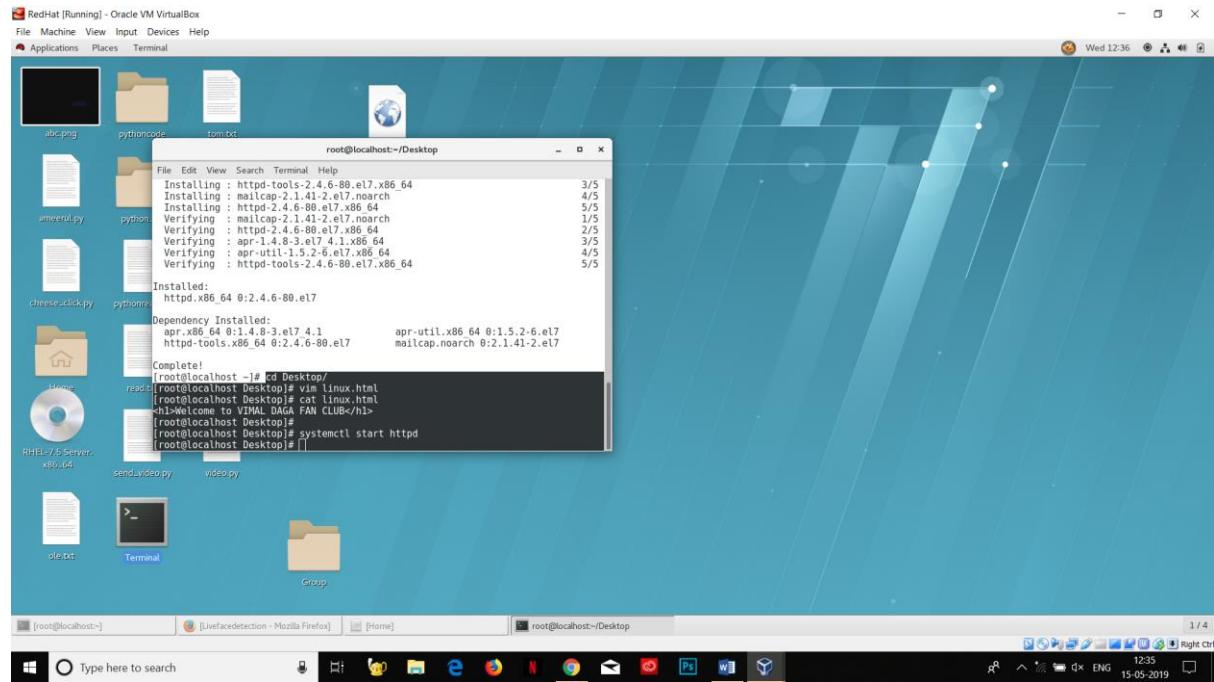
- 1) yum shows that there is a package that's not installed



Installing httpd



2)Configure server



Systemctl to start the server

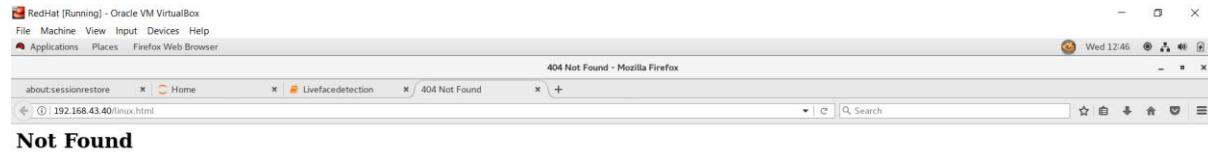
Systemctl status httpd to check the status of server

*Firefox is a web client program

<http://192.168.43.40> /linux.html is called URL (IP address is Ria's and linux.html is the file we created)

Firefox doesn't allow the URL because of firewall. Turn off the firewall using [iptables](#)-F

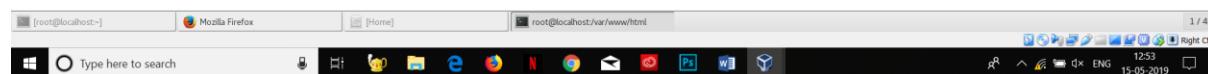
Still it shows server not found because page not found



3) make a new linux.html file there

```
root@localhost:~] 404 Not Found - Mozilla Firefox [Home] root@localhost:~/Desktop]
[Windows] Type here to search [File] [Edit] [View] [Search] [Terminal] Mozilla Firefox
about:sessionrestore x Home x Livefacedetection x / 404 Not Found x + | C Search
192.168.43.40/linux.html x / 1 / 4

welcome to lw
root@localhost:/var/www/html
File Edit View Search Terminal Help
64 bytes from 192.168.43.40: icmp_seq=69 ttl=64 time=153 ms
64 bytes from 192.168.43.40 ping statistics ...
69 packets transmitted, 8 received, +51 errors, 88% packet loss, time 68049ms
rtt min/avg/max/mdev = 25.620/206.038/386.457/180.419 ms
[root@localhost Desktop]# iptables -F
[root@localhost Desktop]# cd var/www/html
[root@localhost html]# cd var/www/html
bash: cd: var/www/html: No such file or directory
[root@localhost Desktop]# cd /var/www/html
[root@localhost html]# pwd
[root@localhost html]# ls
[root@localhost html]# vim linux.html
[root@localhost html]#
```



INSTALLATION OF linux OS

First go to settings, system and drag hard disk to top

Kdump disable

```

root@localhost:/etc/yum.repos.d# repolist
repo id          repo name      status
h1               h1            5,099
h2               h2            99
h3               h3             0
repo list: 5,198
[root@localhost yum.repos.d]# history
1 cd /etc/yum.repos.d/
2 vi h1.repo
3 yum repolist
4 vi h2.repo
5 vi h2.repo
6 yum repolist
7 yum repolist
8 vi h2.repo
9 yum repolist
10 vi h2.repo
11 yum repolist
12 vi h3.repo
13 yum repolist
14 vi h3.repo
15 vi h2.repo
16 vi h3.repo
17 yum repolist
18 vi h3.repo
19 yum repolist
20 vi h3.repo
21 ls
22 yum repolist
23 vi h2.repo
24 vi h3.repo
25 yum repolist
26 history
[root@localhost yum.repos.d]#

```

The terminal window is titled "root@localhost:/etc/yum.repos.d". The status bar at the bottom right shows "Thu 11:13" and "1 / 4". The taskbar at the bottom includes icons for File Explorer, Task View, Start, Taskbar settings, and system status.

CENTOS

Softwares and commands working on redhat will also work on Centos.RHEL is paid and Centos is free.

Systemctl start docker

Systemctl enable docker

Docker images

Docker run –it centos

There are very few softwares in centos so you need to install anything you require.

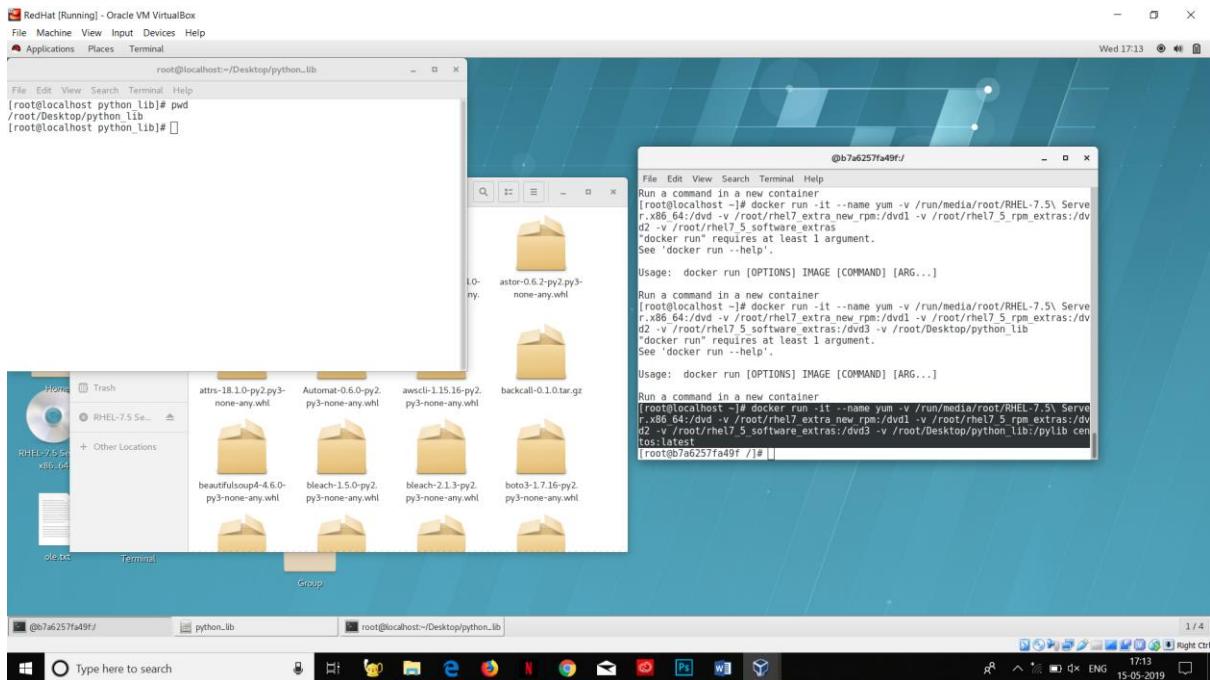
Yum repolist (checking if yum is already configured)

Yes it is configured.

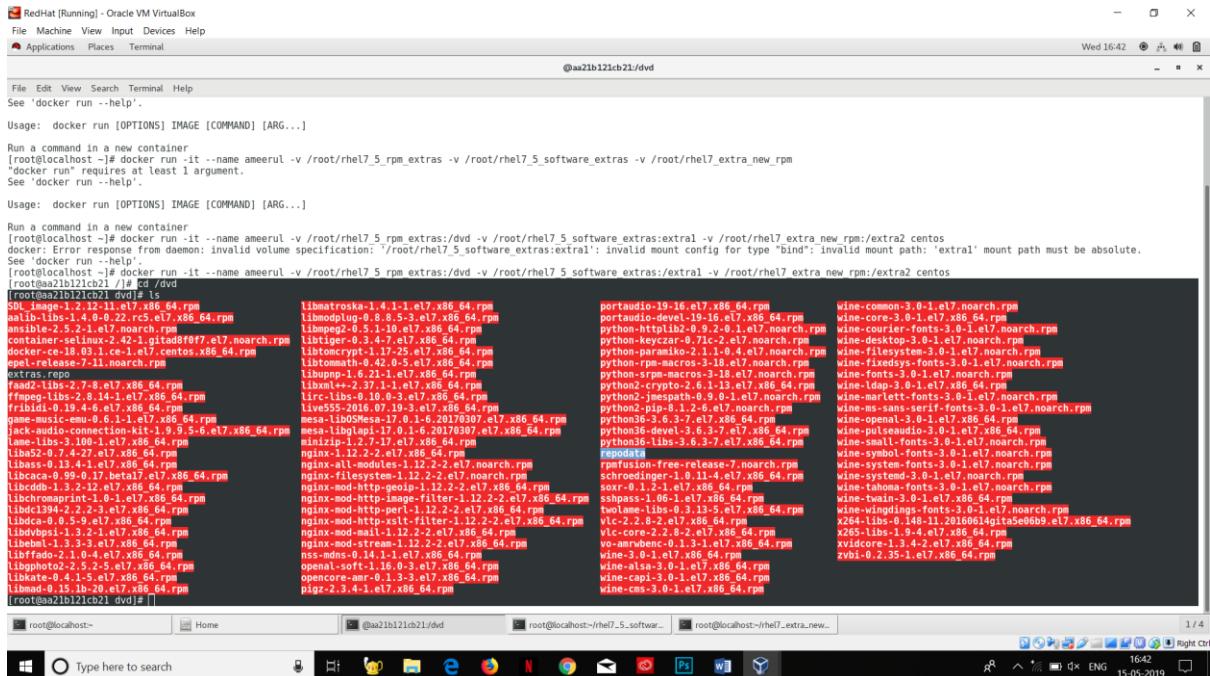
Sharing files to docker

(see 15/05 notes)

Take path by opening in terminal



Now, checking if the files are loaded



RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Terminal

©aa21b121cb21/extral

```

File Edit View Search Terminal Help
dockerc: Error response from daemon: invalid volume specification: '/root/rhel7_5_software_extras:extral': invalid mount config for type "bind": invalid mount path: 'extral' mount path must be absolute.
See 'dockerc run --help'.
[root@aa21b121cb21 ~]# docker run -it --name ameerul -v /root/rhel7_5_rpm_extras:/dvd -v /root/rhel7_5_software_extras:/extral -v /root/rhel7_extra_new.rpm:/extral2 centos
[root@aa21b121cb21 ~]# ls -l /dvd
total 12
SDL-image-2.1.2-11.el7.x86_64.rpm      libmatroska-1.4.1-1.el7.x86_64.rpm
aa1ib-libs-1.4.0-0.22.c5.el7.x86_64.rpm libmodplug-0.8.8.5-3.el7.x86_64.rpm
ansible-2.5.2-1.el7.noarch.rpm          libmpeg2-0.5-1-10.el7.x86_64.rpm
centos-release-7-0.1.10.el7.centos.x86_64.rpm librtiper-0-1.el7.noarch.rpm
dockerc-ce-18.03.1.ce-1.el7.centos.x86_64.rpm libtomcat-1.17-25.el7.x86_64.rpm
epel-release-7-11.noarch.rpm             libtommath-0.42-0.5.el7.x86_64.rpm
extras.repo                            libunp-1.6-21-1.el7.x86_64.rpm
faad2-libs-2.7-8.el7.x86_64.rpm         libxml++-2.37-1-1.el7.x86_64.rpm
fmpc-libs-1.0.14-1.el7.x86_64.rpm       libirc-0.95-1.1.el7.x86_64.rpm
frida-gdb-19.0.1-1.el7.x86_64.rpm       libjpeg-turbo-2.0.1-10.el7.x86_64.rpm
game-music-emu-0.6-1.1.el7.x86_64.rpm   mesa-libOSMesa-17.0.1-6.20178307.el7.x86_64.rpm
jack-audio-connection-kit-1.9.9.5-6.el7.x86_64.rpm  mesa-libGLapi-17.0.1-6.20178307.el7.x86_64.rpm
lame-libs-3.100-1.el7.x86_64.rpm        minizip-1.2.7-17.el7.x86_64.rpm
libaio-0.3.104-1.el7.x86_64.rpm        nginx-1.12.2-2.el7.x86_64.rpm
libbase-0.1.3-4.el7.x86_64.rpm          nginx-all-modules-1.12.2-2.el7.noarch.rpm
libcaca-0.99-0.17.beta17.el7.x86_64.rpm nginx-softwares-1.12.2-2.el7.noarch.rpm
libcdbd-1.3.2-12.el7.x86_64.rpm        nginx-mod-http-geopip-1.12.2-2.el7.x86_64.rpm
libchromaprint-2.1-0.1.el7.x86_64.rpm   nginx-mod-http-image-filter-1.12.2-2.el7.x86_64.rpm
libdc1394-2.2.2-3.el7.x86_64.rpm       nginx-mod-http-perl-1.12.2-2.el7.x86_64.rpm
libdvdnav-4.1.5-1.el7.x86_64.rpm       nginx-mod-http-ssleay-1.12.2-2.el7.x86_64.rpm
libdvdread-4.1.5-1.el7.x86_64.rpm      nginx-mod-mail-1.12.2-2.el7.x86_64.rpm
libdyndns-1.2.1-1.el7.x86_64.rpm       nginx-mod-stream-1.12.2-2.el7.x86_64.rpm
libeasel-1.3.3-3.el7.x86_64.rpm        nss-mdns-0.14.1-1.el7.x86_64.rpm
libffado-2.1.0-4.el7.x86_64.rpm        openal-soft-1.16.3-3.el7.x86_64.rpm
libfontconfig-2.12.4-1.el7.x86_64.rpm   opencore-amr-0.1.3-3.el7.x86_64.rpm
libfreeimage-3.15.0-15.el7.x86_64.rpm  pigz-2.3-4-1.el7.x86_64.rpm
libmad-0.15.1b-20.el7.x86_64.rpm      python36-3.6.6-5.el7.x86_64.rpm
python36-devel-3.6.6-5.el7.x86_64.rpm  python36-libs-3.6.6-5.el7.x86_64.rpm
python36-setuptools-39.2.0-3.el7.noarch.rpm
python36-pip-8.1.2-8.el7.noarch.rpm    python36-pygments-2.3.1-1.el7.noarch.rpm
repodata
[root@aa21b121cb21 ~]# cd /root/extral
bash: cd: /root/extral: No such file or directory
[root@aa21b121cb21 ~]# cd /root/extral
bash: cd: /root/extral: No such file or directory
[root@aa21b121cb21 ~]# cd /root/extral
[root@aa21b121cb21 ~]# ls
centos-latest.tar  get_ip.py  linux.jpg  ubuntu-14.04.tar  ubuntu-latest.tar
[root@aa21b121cb21 ~]# cd /root/extral
[root@aa21b121cb21 ~]# ls
[root@aa21b121cb21 ~]# ls
atomp.x86_64.rpm  kube  newrpm.repo  python36-3.6.6-5.el7.x86_64.rpm  python36-libs-3.6.6-5.el7.x86_64.rpm  python36-setuptools-39.2.0-3.el7.noarch.rpm
epel-release-7-11.noarch.rpm  newrpm.repo  python36-devel-3.6.6-5.el7.x86_64.rpm  python36-pip-8.1.2-8.el7.noarch.rpm  repodata
[root@aa21b121cb21 ~]#

```

root@aa21b121cb21 dvd# cd /root/extral

root@aa21b121cb21 dvd# ls

root@aa21b121cb21 dvd# cd /root/extral

root@aa21b121cb21 extral# ls

centos-latest.tar get_ip.py linux.jpg ubuntu-14.04.tar ubuntu-latest.tar

root@aa21b121cb21 extral# cd /root/extral

root@aa21b121cb21 extral# ls

atomp.x86_64.rpm kube newrpm.repo python36-3.6.6-5.el7.x86_64.rpm python36-libs-3.6.6-5.el7.x86_64.rpm python36-setuptools-39.2.0-3.el7.noarch.rpm

epel-release-7-11.noarch.rpm newrpm.repo python36-devel-3.6.6-5.el7.x86_64.rpm python36-pip-8.1.2-8.el7.noarch.rpm repodata

[root@aa21b121cb21 extral]# ls

NOW ,Create a repo

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Terminal

©root@localhost-~

abc.png pythoncode tom.txt

File Edit View Search Terminal Help

[root@localhost ~]# ssh 13.233.150.39

ssh: connect to host 13.233.150.39 port 22: No route to host

[root@localhost ~]# ssh -

ameerul.py python.

cheese.click.py pythones

Home ready

RHEL-7.6 Server. x86_64

sendVideo.py video.py

ols.txt

Terminal

Group

File Edit View Search Terminal Help

Could not load host key: /etc/ssh/ssh_host_ed25519_key

ssh: no hostskeys available -- exiting.

[root@b7a6257fa49f ~]# history

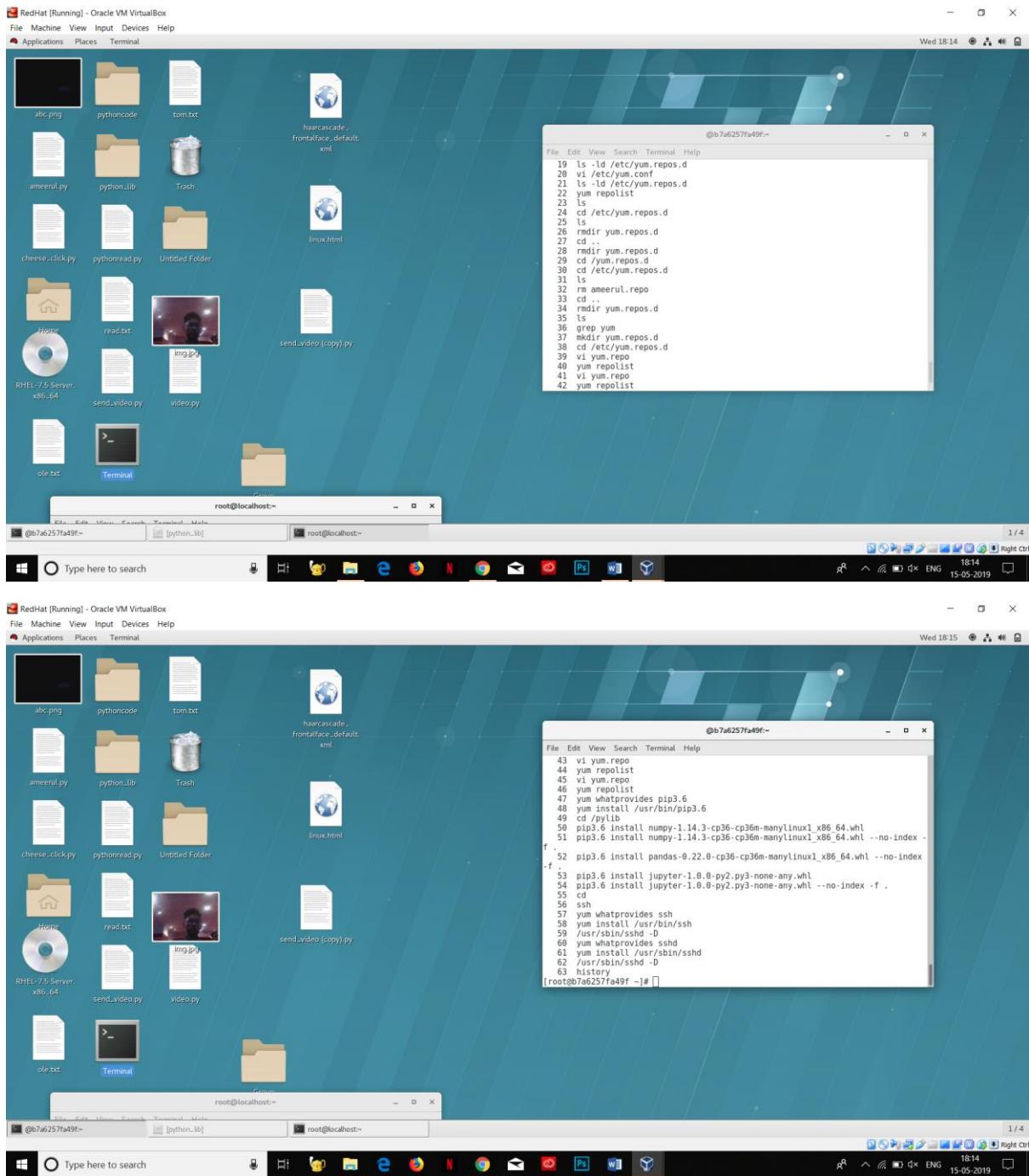
- 1 cd /etc/yum.repos.d
- 2 ls
- 3 rm -f *
- 4 ls
- 5 vi ameerul.repo
- 6 yum repolist
- 7 vi ameerul.repo
- 8 yum repolist
- 9 cd
- 10 yum repolist
- 11 cd /etc/yum.repos.d
- 12 ls
- 13 rm -la ameerul.repo
- 14 yum repolist
- 15 exit
- 16 yum repolist
- 17 vi /etc/yum.conf
- 18 yum repolist
- 19 ls -ld /etc/yum.repos.d
- 20 vi /etc/yum.conf
- 21 ls -ld /etc/yum.repos.d

[@b7a6257fa49f-~] [python.lib]

Type here to search

1/4

1645 15-05-2019



CLOUD COMPUTING

Take mumbai server because it is closer and low latency

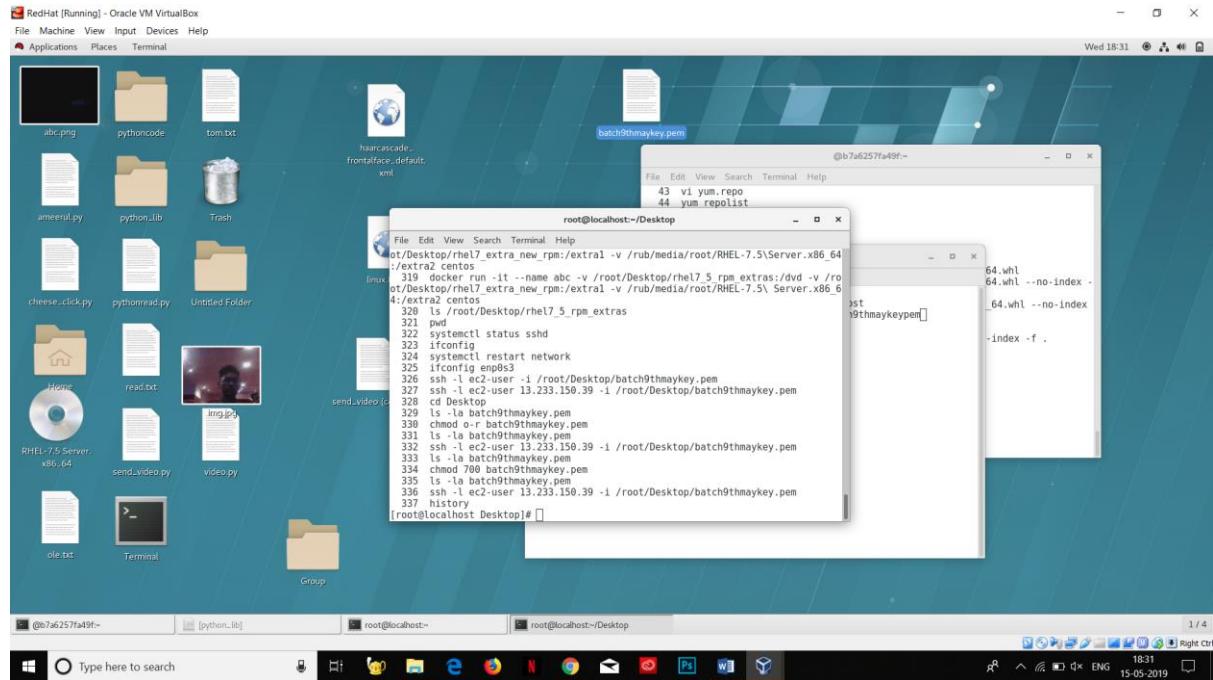
IAS(Infrastructure as a service) Service

Using ec2 you can launch an OS.

AWS

(from 326)

Giving permissions



DAY-6

1GiB= 2^{10} KiB

1MiB=1024kB

To delete a file :- it is IMPOSSIBLE to delete data

There are holes generated when we write data. New data may be overwritten on the holes. So you cannot always recover data.

Hard disk stores data in sectors. The filename is just the address of the data.

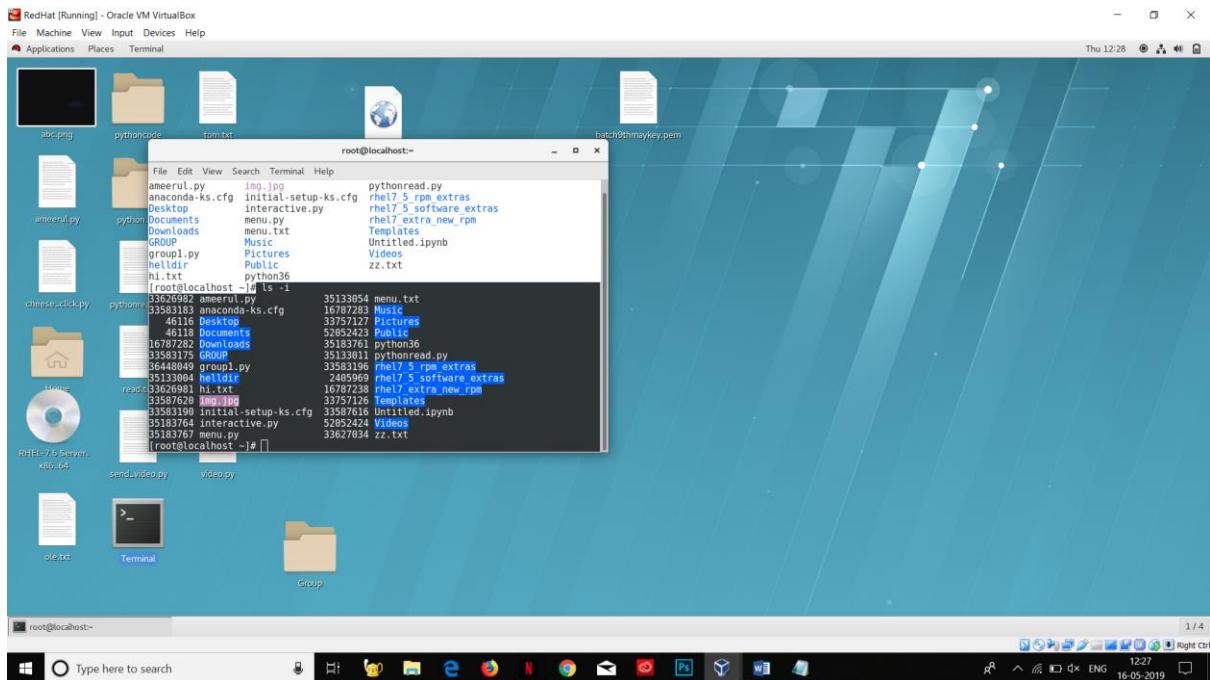
Inode table(Index node table) has filename and address and size.

When a file is removed ,only the entry from table is removed. Hence it can be recovered.

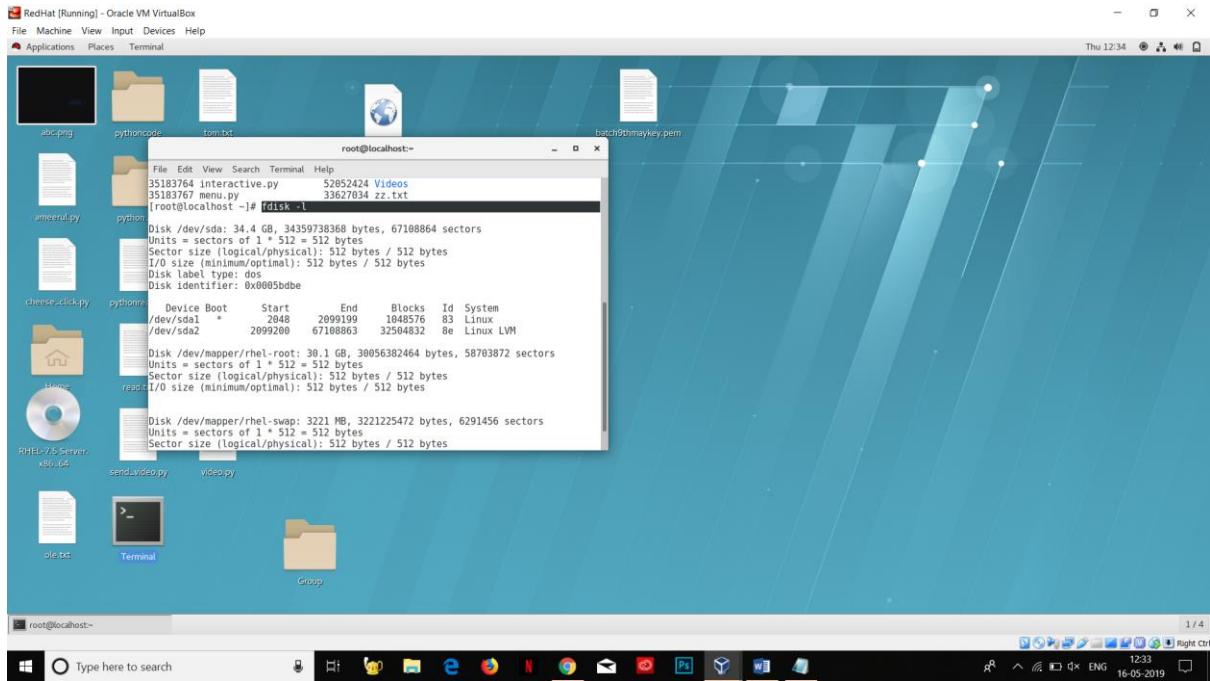
Format==filesystem.

When we partition ,old table is deleted and new table is created. This data can be 100% recovered.

To know the inode number of file



To see partition table



Steps to use any storage:-

- 1) Make partition in the harddisk(100 gb hardisk->50 gb c drive)
- 2) Format (so as to make the table)
- 3) Use the physical device(mount)

TO ATTACH A NEW HARDISK

Shut down the OS

Right click and go to settings

Go to storage->

SATA->Create new hardisk

Power ON

Now run on terminal fdisk -l

You'll see two hardisks. (Sda1 and sda2)

1)Creating a partition

fdisk /dev/sdb (going inside hardisk)

p -> print

Sector 0-2047 is reserved for boot loading (2047 sectors =1MB).Make a partition from sector 2048-10000 named

n->to create a partition

p (select partititon type primary)

enter first and second sector(Either write sector number or just write in terms of gb like **+2G** or **+2M** (MB))

p (check if the parition is made)

finally save by **w**

*You can make only 4 partitions (because we can make only 4 partition tables(16*4))

To make more than 4 partitions

We can make extended partition now (not primary partition)

First make one more partition table.

In terminal:

Fdisk /dev/sdb

n

E(extended)

P(select default)

Enter first and last sector

P(print)

2)Formatting the partition

Format – ntfs,fat,ex16,ex4

`mkfs.ext4 /dev/sdb6` (sdb6-> partition)

`mkfs` (to check all supported formats)

***IF YOU DON'T KNOW ANY COMMAND STARTING FROM "A" IN LINUX, WRITE **a** and press TAB TAB TO get all the commands

3)Mount(To go in the partition)

First link dev/sdb6 to a folder(This is called mounting)

`mkdir /my`

`mount /dev/sdb6 /my`

Reading file from our partition:

`cd /my`

`pwd`

`cat > linux.txt`

`ls`

`pwd`

`cd`

You cant read file after unmounting:

`umount /dev/sdb6`

`cd /my`

`ls` (nothing is listed)

`df -h` (to see all mounted)

Real time streaming in mobile phone

Download IP Webcam

Start server Inside app

Connect PC through hotspot

Enter IP Address(got from phone) in browser

Video renderer-> browser

To click pic-> add in URL/[shot.jpg](#)

<http://ip/shot.jpg>

y=string

y.encode()

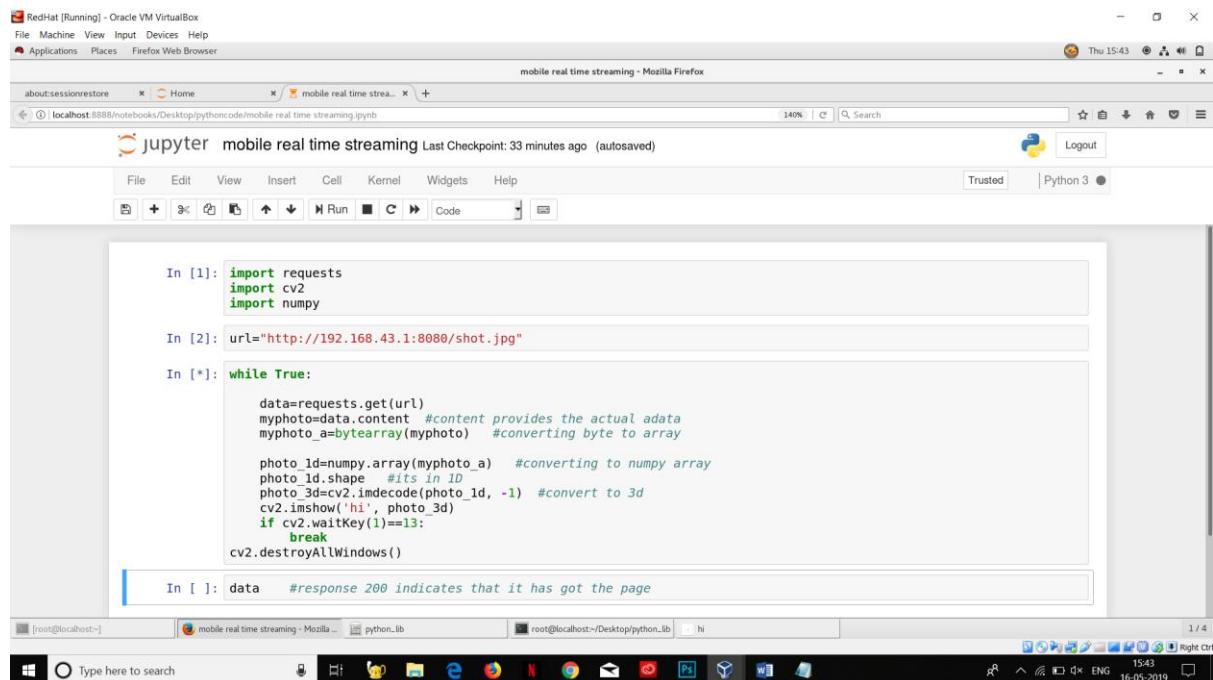
y.decode()

byte to string ->decode

string to byte ->decode

Webclient is the one accessing webserver through URL. It goes into the other IP using http protocol.

Using python code to execute the same:



The screenshot shows a Linux desktop environment with several windows open. In the foreground, a Jupyter Notebook window is displayed, showing Python code for real-time video streaming. The code uses the requests library to get a URL (localhost:8888/notebooks/Desktop/pythoncode/mobile real time streaming.ipynb), decodes the response, and then uses OpenCV to convert the byte array to a numpy array, reshape it, and display it. A break statement is used to exit the loop. The code also destroys all windows at the end. Below the Jupyter window, a terminal window shows the command 'root@localhost~\$'. In the background, a Firefox browser window titled 'mobile real time streaming' is open, showing the URL 'http://192.168.43.1:8080/shot.jpg'. The status bar at the bottom of the screen shows the date and time as '16-05-2019 15:43'.

```
In [1]: import requests
import cv2
import numpy

In [2]: url="http://192.168.43.1:8080/shot.jpg"

In [*]: while True:
    data=requests.get(url)
    myphoto=data.content #content provides the actual adata
    myphoto_a=bytarray(myphoto) #converting byte to array

    photo_1d=numpy.array(myphoto_a) #converting to numpy array
    photo_1d.shape #its in 1D
    photo_3d=cv2.imdecode(photo_1d, -1) #convert to 3d
    cv2.imshow('hi', photo_3d)
    if cv2.waitKey(1)==13:
        break
cv2.destroyAllWindows()

In [ ]: data #response 200 indicates that it has got the page
```

TRIGGERING PROGRAMS USING PENDRIVE

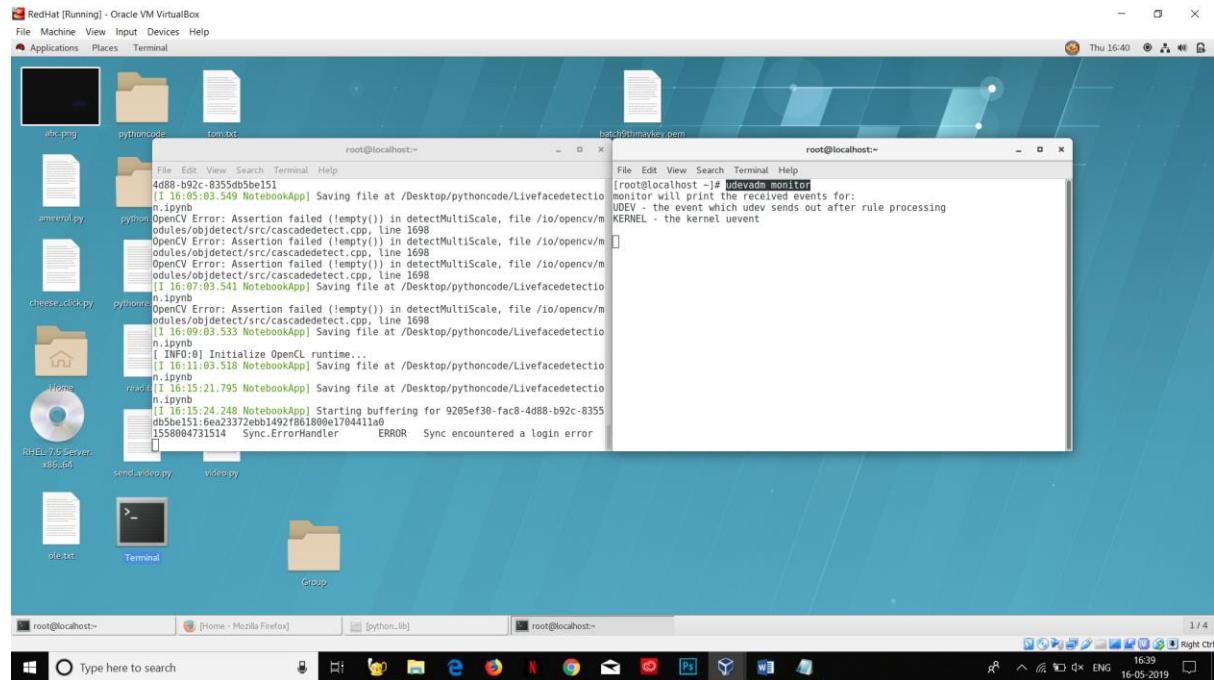
Go to devices ->USB ->

fdisk /dev/sdb

p(print)

d(delete partition)

If a pendrive is detected(by udev),program is run



(See drive notes)

AWS CLOUD

Adding extra hard disk from amazon

DAY-7

Why do we need partitions?

1)To create filesystem

2)If we want to format the partition to store data

LVM-Combining two pendrives as a single pendrive(or hardisk)

See 17/05 notes

If we have two pendrives of 4gb and 8gb each. Can we combine it into a single pendrive of 12GB? Yes.

1) Make partition

2) Format

3) Mount

The real pendrives of 4gb and 8gb are called **PVs**(Physical volume)

The single hardisk made from these two is called a **VG** (volume group)

Further partitioning this hardisk gives us logical volume (**LV**) (logical volume)

1) Make partition in 4gb and 8gb pendrive

2) Convert the two partition of the 4gb pendrive and 8gb pendrive that we made into physical volume.

3) make volume group using physical volume of the two partitions and we get a single hardisk

4) Finally make LV of 10GB using this new hardisk

5) Format , here vimalvg is VG's name and lv1 is LV's name

6) Mount

MACHINE LEARNING

Training of the model is done through testing. Testing passes if accuracy is around 80%. (Good model)`

Do not give entire data to machine. Domain expert decides what to give.

Cat Salary_data.csv | wc -l for counting the lines

The first line in the csv file is treated as the header in pandas.

Dataset is split into training and testing data. Test data is used to compare with the predicted results.

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Untitled1 - Mozilla Firefox

Home Salary_Data.csv Untitled1

localhost:8888/notebooks/Desktop/pythoncode/ML/Untitled1.ipynb?kernel_name=python3

110% Search Logout

Jupyter Untitled1 Last Checkpoint: 39 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [1]: `import pandas as pd`

In [2]: `dataset=pd.read_csv('Salary_Data.csv') #to remove the header #sep tells symbol which separates data`

In [3]: `type(dataset)`

Out[3]: `pandas.core.frame.DataFrame`

In [4]: `dataset.head()`

Out[4]:

	Experience	Salary
0	1.1	40000
1	1.2	50000
2	1.3	52000
3	2.0	60000
4	4.0	65000

In [5]: `X=dataset.iloc[:, 0:1] #**{all rows,columns 0:1}`

In [6]: `X`

Out[6]:

	Experience
0	1.1
1	1.2

root@localhost~] root@localhost~] root@localhost~] root@localhost~] Untitled1 - Mozilla Firefox 1 / 4

Type here to search

Windows Start button

Firefox icon

Chrome icon

Mail icon

Photoshop icon

PowerPoint icon

Word icon

Excel icon

Calculator icon

System tray icons: battery, signal, volume, clock (16:05), language (ENG), date (17-05-2019), right-click menu

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Untitled1 - Mozilla Firefox

Home Salary_Data.csv Untitled1

localhost:8888/notebooks/Desktop/pythoncode/ML/Untitled1.ipynb?kernel_name=python3

110% Search Logout

Jupyter Untitled1 Last Checkpoint: 39 minutes ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [6]: `X`

Out[6]:

	Experience
0	1.1
1	1.2
2	1.3
3	2.0
4	4.0
5	3.0
6	5.0
7	11.0
8	8.0
9	7.0
10	2.5
11	4.4

In [7]:

In [8]: `y=dataset.iloc[:, 1] #all rows and 1st column`

Out[7]: `(12, 1)`

root@localhost~] root@localhost~] root@localhost~] root@localhost~] Untitled1 - Mozilla Firefox 1 / 4

Type here to search

Windows Start button

Firefox icon

Chrome icon

Mail icon

Photoshop icon

PowerPoint icon

Word icon

Excel icon

Calculator icon

System tray icons: battery, signal, volume, clock (16:05), language (ENG), date (17-05-2019), right-click menu

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Untitled1 - Mozilla Firefox

Home Salary_Data.csv Untitled1 Untitled

localhost:8888/notebooks/Desktop/pythoncode/ML/Untitled1.ipynb?kernel_name=python3

jupyter Untitled1 Last Checkpoint: 40 minutes ago (unsaved changes)

In [8]: `ydataset.iloc[:, 1]` #all rows and 1st column

In [9]: `from sklearn.model_selection import train_test_split` #to split data

In [10]: `X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.30,random_state=42)`

In [11]: `#test_size=30% of total data #randomstate value is the basis of selection of lines randomly`

In [12]: `len(X_train)`

Out[12]: 8

In [13]: `len(X_test)`

Out[13]: 4

In [14]: `from sklearn.linear_model import LinearRegression`

In [15]: `model=LinearRegression()`

In [16]: `model.fit(X_train,y_train)`

Out[16]: `LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)`

In [17]: `X_test`

Out[17]:

Experience	Salary
10	2.3
9	7.0
0	1.1
8	8.0

root@localhost:~] root@localhost:~/Desktop/python... root@localhost:~] root@localhost:~] Untitled1 - Mozilla Firefox 1 / 4

Type here to search

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Untitled1 - Mozilla Firefox

Home Salary_Data.csv Untitled1 Untitled

localhost:8888/notebooks/Desktop/pythoncode/ML/Untitled1.ipynb?kernel_name=python3

jupyter Untitled1 Last Checkpoint: 41 minutes ago (unsaved changes)

In [16]: `LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)`

In [17]: `X_test`

Out[17]:

Experience	Salary
10	2.3
9	7.0
0	1.1
8	8.0

In [18]: `y_pred=model.predict(X_test)`

In [19]: `y_pred`

Out[19]: `array([55758.51043019, 125677.77026907, 37906.78451388, 140554.20853266])`

In [20]: `y_test`

Out[20]: `10 63000
9 82000
0 40000
8 90000
Name: Salary, dtype: int64`

In [21]: `import matplotlib.pyplot as plt`

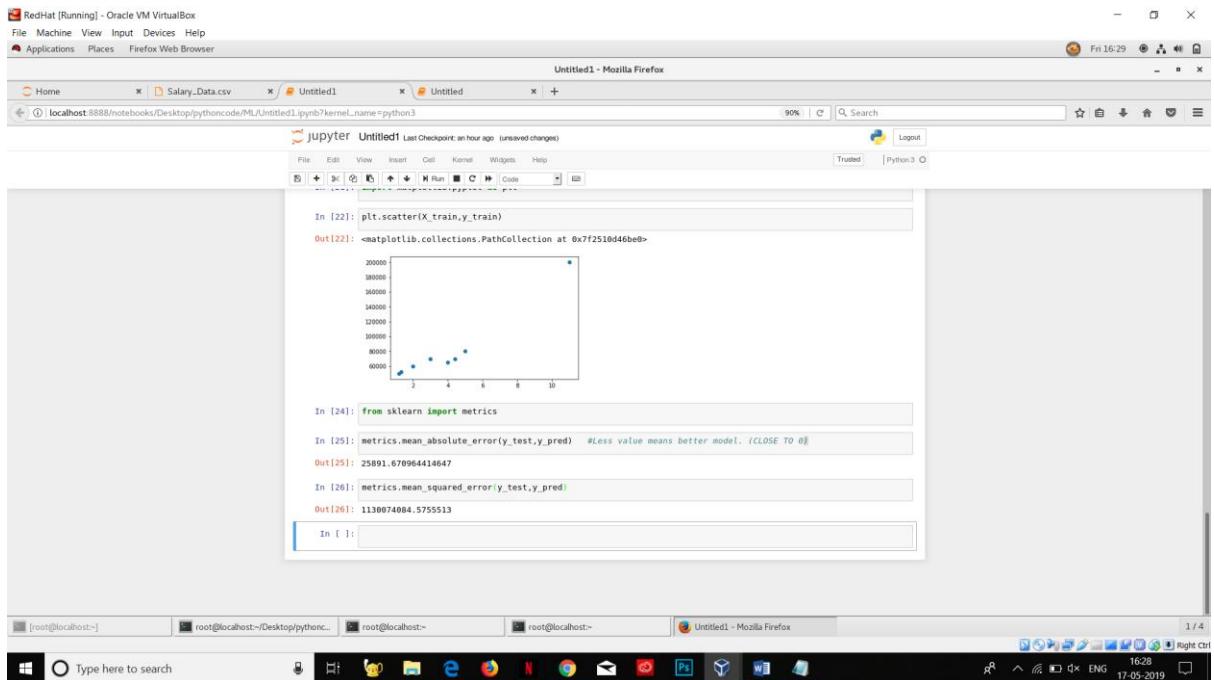
In [22]: `plt.scatter(X_train,y_train)`

Out[22]: <matplotlib.collections.PathCollection at 0x7f2510d46be0>

root@localhost:~] root@localhost:~/Desktop/python... root@localhost:~] root@localhost:~] Untitled1 - Mozilla Firefox 1 / 4

Type here to search

$\hat{Y} - Y = 0$ (a good model is close to 0)



When multiple parameters are there

$$W_1x_1 + W_2x_2 + W_3x_3 + W_4x_4 = y$$

Here w are the weights and they should give the value Y. X is the feature.

Machine finds w1,w2,w3 and w4.

DAY 7

Machine Learning

Stages: Training, Model, Prediction and Testing

Training data should be accurate.

Dataset with strings

Label Encoding:- numerical values like 0,1,2 are given to the strings

One Hot Encoding:- new columns are added for the strings.

1darray->vector

2darray->matrix

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Untitled2 - Mozilla Firefox

Share CSV files online ... Home Untitled2

localhost 8888/notebooks/Desktop/pythoncode/ML/Untitled2.ipynb?kernel_name=python3

jupyter Untitled2 Last Checkpoint: 18 minutes ago (unsaved changes)

In [1]: `import pandas as pd`

In [2]: `dataset=pd.read_csv("50_Startups.csv")`

In [3]: `dataset.head(10)`

Out[3]:

	R&D Spend	Administration	Marketing Spend	State	Profit
0	163340.20	136897.80	471784.10	New York	182261.83
1	162597.70	151377.59	443998.53	California	191726.06
2	153441.51	101147.55	407934.54	Florida	191050.39
3	144372.41	118671.85	383199.62	New York	182011.99
4	142071.34	91391.77	366168.42	Florida	181871.94
5	131875.90	99814.71	362861.00	New York	156991.12
6	134615.46	147198.87	127716.00	California	159122.51
7	130296.13	145501.06	323876.68	Florida	157750.80
8	120542.52	148714.85	311613.29	New York	152211.77
9	123334.88	108679.17	304981.62	California	149759.96

In [4]: `y=dataset.iloc[:, -1]` # -1 is the 3rd column

In [5]: `X=dataset.iloc[:, 0:4]`

In [6]: `X.shape` # X is normally 2d array and y is 1d array

Out[6]: (50, 4)

In [7]: `y.shape`

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Untitled2 - Mozilla Firefox

Share CSV files online ... Home Untitled2

localhost 8888/notebooks/Desktop/pythoncode/ML/Untitled2.ipynb?kernel_name=python3

jupyter Untitled2 Last Checkpoint: 19 minutes ago (unsaved changes)

In [6]: `X.shape` # X is normally 2d array and y is 1d array

Out[6]: (50, 4)

In [7]: `y.shape`

Out[7]: (50,)

In [8]: #The dataset has strings(CALIFORNIA,FLORIDA,...) so it should be pre-processed.
#Give a number to each string(label encoding). 0=Newyork, 1=California

In [9]: `from sklearn.preprocessing import LabelEncoder
encoder = LabelEncoder()
x4=X.iloc[:,1]
x4_new=encoder.fit_transform(x4)
LabelEncoder().transform(x4_new)`

In [10]: `X.head(5)` #The values given in the states will affect the ranking. So use one hot encoding

Out[10]:

	R&D Spend	Administration	Marketing Spend	State
0	163340.20	136897.80	471784.10	2
1	162597.70	151377.59	443998.53	0
2	153441.51	101147.55	407934.54	1
3	144372.41	118671.85	383199.62	2
4	142071.34	91391.77	366168.42	1

In [11]: `from sklearn.preprocessing import OneHotEncoder
oh=OneHotEncoder(categorical_features=[-1])
X_oh=oh.fit_transform(X).toarray()`

/usr/local/lib64/python3.6/site-packages/sklearn/preprocessing/_encoders.py:414: FutureWarning: The handling of integer values will change in version 0.22. Currently, the categories are determined based on the range 10, max(values), while in the future they will be determined based on the unique values.
If you want the future behavior now, you can specify "categories='auto'".
In case you used a LabelEncoder before this OneHotEncoder to convert the categories to integers, then you can

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Untitled2 - Mozilla Firefox

Share CSV files online ... Home Untitled2

localhost 8888/notebooks/Desktop/pythoncode/ML/Untitled2.ipynb?kernel_name=python3

jupyter Untitled2 Last Checkpoint: 18 minutes ago (unsaved changes)

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Untitled2 - Mozilla Firefox

Share CSV files online - ... Home Untitled2

localhost:8888/notebooks/Desktop/pythoncode/ML/Untitled2.ipynb?kernel_name=python3

jupyter Untitled2 Last Checkpoint: 20 minutes ago (autosaved)

In [12]: `x`

```
Out[12]: array([[0.000000e+00, 0.000000e+00, 1.000000e+00, 1.653492e+05,
   1.368978e+05, 4.717841e+05],
   [1.000000e+00, 0.000000e+00, 0.000000e+00, 1.625977e+05,
   1.513775e+05, 4.186718e+05],
   [0.000000e+00, 1.000000e+00, 0.000000e+00, 1.534415e+05,
   1.611455e+05, 4.079345e+05],
   [0.000000e+00, 0.000000e+00, 1.000000e+00, 1.443724e+05,
   1.386718e+05, 3.811996e+05],
   [0.000000e+00, 1.000000e+00, 0.000000e+00, 1.421073e+05,
   1.321971e+05, 3.088941e+05],
   [0.000000e+00, 0.000000e+00, 1.000000e+00, 1.318769e+05,
   9.881471e+04, 3.628613e+05],
   [0.000000e+00, 0.000000e+00, 0.000000e+00, 1.346154e+05,
   1.471988e+05, 1.277168e+05],
   [0.000000e+00, 1.000000e+00, 0.000000e+00, 1.302981e+05,
   1.152099e+05, 3.088941e+05],
   [0.000000e+00, 0.000000e+00, 1.000000e+00, 1.205425e+05,
   1.487189e+05, 3.116132e+05],
   [1.000000e+00, 0.000000e+00, 0.000000e+00, 1.233348e+05,
   1.886791e+05, 3.849815e+05],
   [0.000000e+00, 1.000000e+00, 0.000000e+00, 1.191938e+05,
   1.185941e+05, 2.911699e+05],
   [1.000000e+00, 0.000000e+00, 0.000000e+00, 1.006719e+05,
   9.179061e+04, 2.493396e+05],
   [0.000000e+00, 0.000000e+00, 0.000000e+00, 9.386375e+04,
   1.273308e+05, 2.493396e+05],
   [1.000000e+00, 0.000000e+00, 0.000000e+00, 9.199239e+04,
   1.354959e+05, 2.5266493e+05],
   [0.000000e+00, 0.000000e+00, 0.000000e+00, 1.1994324e+05,
   1.565474e+05, 2.5651292e+05],
   [0.000000e+00, 0.000000e+00, 1.000000e+00, 1.145236e+05,
   1.212911e+05, 2.615441e+05],
   [1.000000e+00, 0.000000e+00, 0.000000e+00, 7.801311e+04,
   1.215975e+05, 2.643466e+05],
   [0.000000e+00, 0.000000e+00, 1.000000e+00, 9.465716e+04,
   1.459775e+05, 2.825743e+05],
   [0.000000e+00, 1.000000e+00, 0.000000e+00, 9.179191e+04,
   1.112994e+05, 2.493396e+05],
   [0.000000e+00, 0.000000e+00, 1.000000e+00, 8.641979e+04,
   1.353141e+05, 0.000000e+00],
   [1.000000e+00, 0.000000e+00, 0.000000e+00, 8.471330e+04,


root@localhost:~| Untitled2 - Mozilla Firefox | root@localhost:~| Library | Downloads | ML | 1 / 4



Type here to search



13:25 18-05-2019



RedHat [Running] - Oracle VM VirtualBox



File Machine View Input Devices Help



Applications Places Firefox Web Browser



Untitled2 - Mozilla Firefox



Share CSV files online - ... Home Untitled2



localhost:8888/notebooks/Desktop/pythoncode/ML/Untitled2.ipynb?kernel_name=python3



jupyter Untitled2 Last Checkpoint: 20 minutes ago (autosaved)



In [13]: x=X[:, :1]



```
In [14]: type(X)
Out[14]: numpy.ndarray
```



In [15]: X



```
Out[15]: array([[0.000000e+00, 1.000000e+00, 1.653492e+05, 1.368978e+05,
 4.717841e+05],
 [1.000000e+00, 0.000000e+00, 1.625977e+05, 1.513775e+05,
 4.186718e+05],
 [0.000000e+00, 0.000000e+00, 1.534415e+05, 1.611455e+05,
 4.079345e+05],
 [0.000000e+00, 1.000000e+00, 1.443724e+05, 1.386718e+05,
 3.811996e+05],
 [0.000000e+00, 1.000000e+00, 1.421073e+05, 1.321971e+05,
 3.088941e+05],
 [0.000000e+00, 0.000000e+00, 1.318769e+05, 9.881471e+04,
 3.628613e+05],
 [0.000000e+00, 0.000000e+00, 1.346154e+05, 1.471988e+05,
 1.277168e+05],
 [0.000000e+00, 1.000000e+00, 1.302981e+05, 1.345308e+05,
 3.088941e+05],
 [0.000000e+00, 0.000000e+00, 1.205425e+05, 1.487189e+05,
 3.116132e+05],
 [1.000000e+00, 0.000000e+00, 1.233348e+05, 1.886791e+05,
 3.849815e+05],
 [0.000000e+00, 1.000000e+00, 1.191938e+05, 1.185941e+05,
 2.911699e+05],
 [1.000000e+00, 0.000000e+00, 1.006719e+05, 9.179061e+04,
 2.493396e+05],
 [0.000000e+00, 0.000000e+00, 9.386375e+04, 1.273308e+05,
 2.493396e+05],
 [0.000000e+00, 0.000000e+00, 9.199239e+04, 1.354959e+05,
 2.5266493e+05],
 [1.000000e+00, 0.000000e+00, 1.1994324e+05, 1.565474e+05,
 2.5651292e+05],
 [0.000000e+00, 0.000000e+00, 1.145236e+05, 1.212911e+05,
 2.615441e+05],
 [1.000000e+00, 0.000000e+00, 7.801311e+04, 1.215975e+05,
 2.643466e+05],
 [0.000000e+00, 0.000000e+00, 9.465716e+04, 1.459775e+05,
 2.825743e+05],
 [0.000000e+00, 1.000000e+00, 9.179191e+04, 1.112994e+05,
 2.493396e+05],
 [0.000000e+00, 0.000000e+00, 8.641979e+04, 1.353141e+05,
 0.000000e+00],
 [1.000000e+00, 0.000000e+00, 8.471330e+04, 1.354959e+05,

root@localhost:~| Untitled2 - Mozilla Firefox | root@localhost:~| Library | Downloads | ML | 1 / 4

Type here to search

13:25 18-05-2019


```


```

```

[1]: 1.000000e+00, 0.000000e+00, 1.3154600e+03, 1.1581621e+05,
2.9711446e+05),
[0.000000e+00, 0.000000e+00, 0.000000e+00, 1.3542692e+05,
0.000000e+00),
[0.000000e+00, 1.000000e+00, 5.4205000e+02, 5.1743150e+04,
0.000000e+00),
[0.000000e+00, 0.000000e+00, 0.000000e+00, 1.1698380e+05,
4.3173600e+04]]))

In [16]: from sklearn.model_selection import train_test_split

In [17]: X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.2,random_state=42)

In [18]: X_train.shape

Out[18]: (40, 5)

In [19]: X_test.shape

Out[19]: (10, 5)

In [20]: from sklearn.linear_model import LinearRegression

In [21]: model=LinearRegression()

In [22]: model.fit(X_train,y_train)

Out[22]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)

In [23]: model.coef_

Out[23]: array([ 9.38793006e+02, 6.98775997e+00, 8.05630064e-01, -6.8787823e-02,
2.98554429e-02])

In [24]: model.intercept_

Out[24]: 54028.03959405894

In [25]: y_test

Out[25]: 13    134307.35
39    81095.76
30    99937.59
45    43955.98
17    125370.37
48    35673.41
26    102454.54
25    107464.34
32    97427.84
19    125000.0
Name: Profit, dtype: float64

In [26]: y_pred=model.predict(X_test)

In [27]: from sklearn import metrics
metrics.mean_absolute_error(y_test,y_pred)

Out[27]: 6961.477813275567

```

JOB SCHEDULING in Linux (RHCA)

crontab –e

min hours(24hourformat) dateofmonth month dayofweek job/program > TERMINAL NAME

Ex:-

15 * * * * echo hello >/dev/pts/0 (it will print hello every 15 minutes)

- * * * * echo hello (Every minute hello will be printed)

(Terminal should be open for this to work)

Leftctrl+alt+f4 -> open CLI (can do in terminal also)

And type tty(to know the device)

To type in one terminal and get output in other terminal

Use > symbol

Date > dev/tty5

Crontab -l (to see the list of jobs)

Crontab -e (for deleting crontab and starting new one)

DOCKER

Install firefox in centos

1)First Link redhat dvd first in the container

2)Then make yum

3)Then install software

DAY 8

UID:- unique user id

UID of root is 0

Open vim /etc/shadow using root account

DAY 9

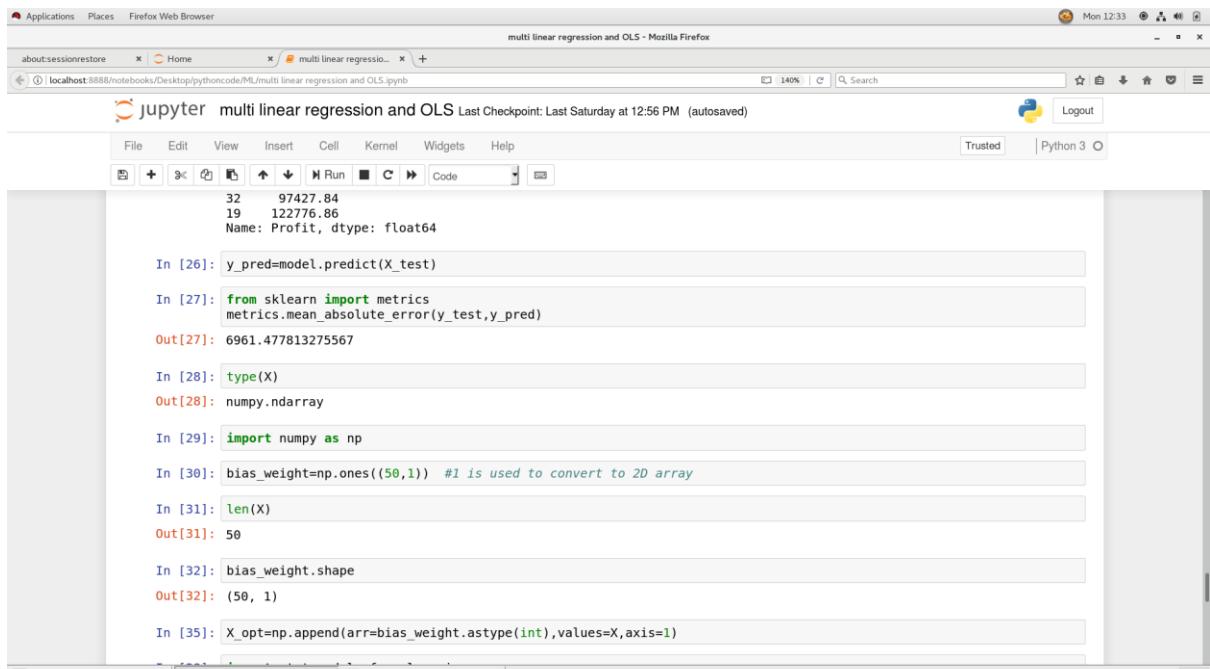
Backward elimination is done by OLS(Ordinary least square) model.

OLS is used to optimize our model.

Significance value is 5%

Check $P > |t|$, if it is less than 5% remove progressively

See if Adj.R Squared is increasing (getting optimized if it increases)



The screenshot shows a Jupyter Notebook interface running in a Firefox browser window. The notebook displays several code cells and their corresponding outputs. The code involves importing libraries like numpy and sklearn, calculating predictions, and testing the mean absolute error. The output includes numerical values and array types.

```

In [26]: y_pred=model.predict(X_test)

In [27]: from sklearn import metrics
metrics.mean_absolute_error(y_test,y_pred)

Out[27]: 6961.477813275567

In [28]: type(X)
Out[28]: numpy.ndarray

In [29]: import numpy as np

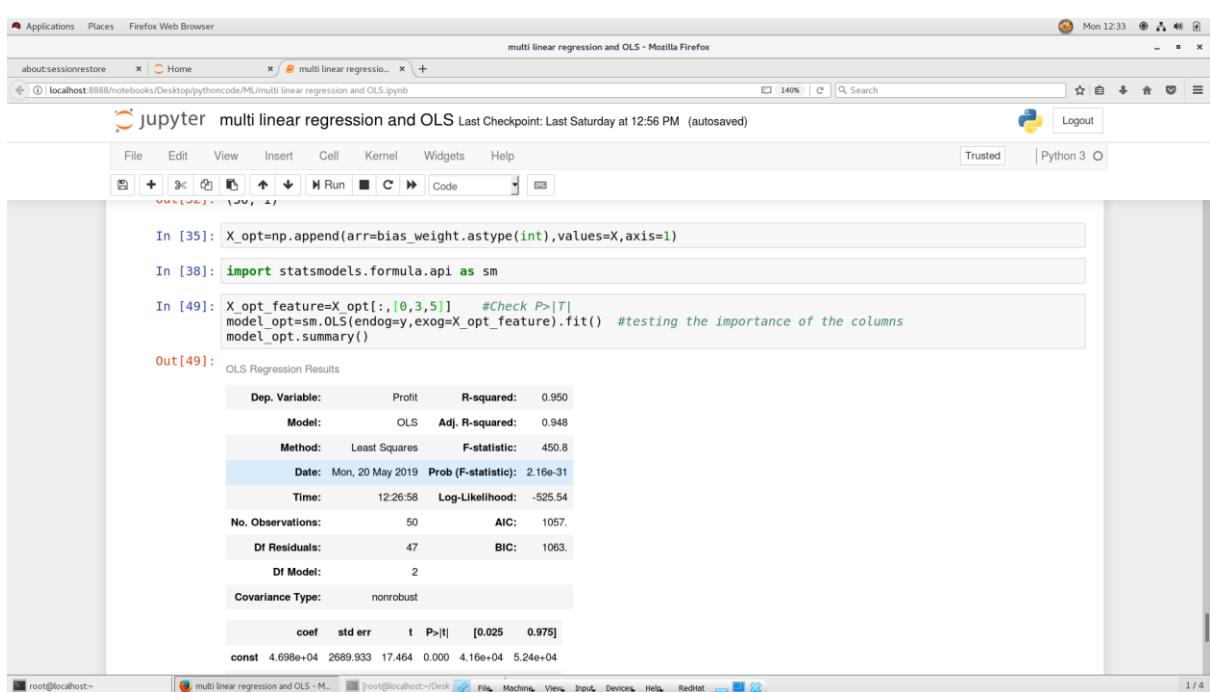
In [30]: bias_weight=np.ones((50,1)) #1 is used to convert to 2D array

In [31]: len(X)
Out[31]: 50

In [32]: bias_weight.shape
Out[32]: (50, 1)

In [35]: X_opt=np.append(arr=bias_weight.astype(int),values=X,axis=1)

```

The screenshot shows a continuation of the Jupyter Notebook session. A new code cell imports statsmodels and performs an OLS regression analysis. The output displays the regression results, including the model summary table and the coefficient table.

```

In [35]: X_opt=np.append(arr=bias_weight.astype(int),values=X,axis=1)

In [38]: import statsmodels.formula.api as sm

In [49]: X_opt_feature=X_opt[:,[0,3,5]] #Check P>|T|
model_opt=sm.OLS(endog=y,exog=X_opt_feature).fit() #testing the importance of the columns
model_opt.summary()

Out[49]:
OLS Regression Results

```

Dep. Variable:	Profit	R-squared:	0.950
Model:	OLS	Adj. R-squared:	0.948
Method:	Least Squares	F-statistic:	450.8
Date:	Mon, 20 May 2019	Prob (F-statistic):	2.16e-31
Time:	12:26:58	Log-Likelihood:	-525.54
No. Observations:	50	AIC:	1057.
Df Residuals:	47	BIC:	1063.
Df Model:	2		
Covariance Type:	nonrobust		

coef	std err	t	P> t	[0.025	0.975]	
const	4.698e+04	2689.933	17.464	0.000	4.16e+04	5.24e+04

RHCA

Rhel8:

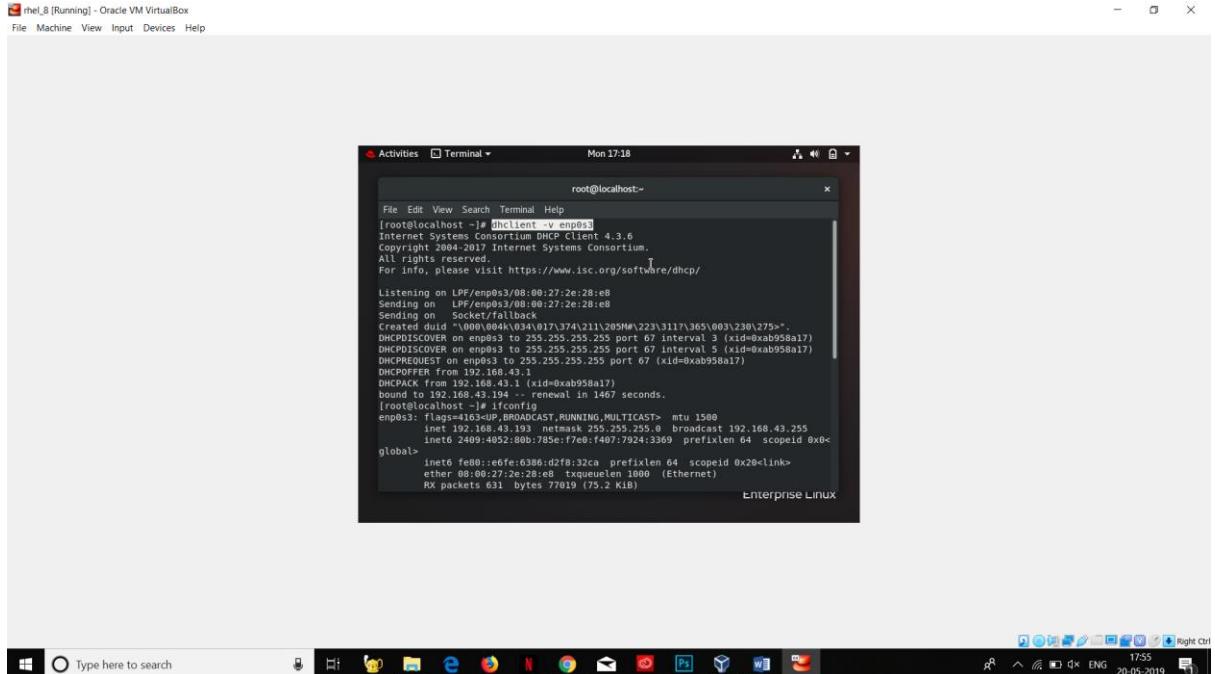
- 1.dvd attach:then configure yum
- 2.to configure ip address via dhcp
- 3.create username eric with uid 2001 and password redhat
- 4.configure web server and create web page with name index.html
- 5.create partition of size 512MiB and format it with ext4 and mount under /mnt/data

6.create lvm with size of 400MiB name lvshare and volume name vgshare and format with vfat and mount under/mnt/my1vm

7.create user named jack,create some random file in some random location(path),you have to search the location of files created by user jack

8.inside the file ,you have to search content with pattern bacu inside file named /usr/share/dict/words and save all lines in file /root/lines.txt

2)



3)

A screenshot of a Linux desktop environment (Enterprise Linux) showing a terminal window. The terminal window title is "root@localhost:/etc". The terminal content shows a series of commands being run:

```
root@localhost:/etc
File Edit View Search Terminal Help
59 cd /root/Desktop/
60 ls
61 cd /
62 wpsit
63 dhcp
64 yum whatprovides dhcp
65 ifconfig
66 dhclient -v enp0s3
67 useradd eric
68 passwd eric
69 cd /etc
70 ls
71 vim passwd
72 vim /etc/passwd
73 dhclient -v enp0s3
74 ifconfig
75 useradd eric1
76 passwd eric1
77 passwd /etc/passwd
78 cd /etc
79 ls
80 vim passwd
81 history
[root@localhost etc]#
```

The terminal window has a dark background and light-colored text. The status bar at the bottom right of the terminal window says "Enterprise Linux". The desktop interface includes a taskbar with various icons and a system tray.

Don't do cd/etc/passwd

OR

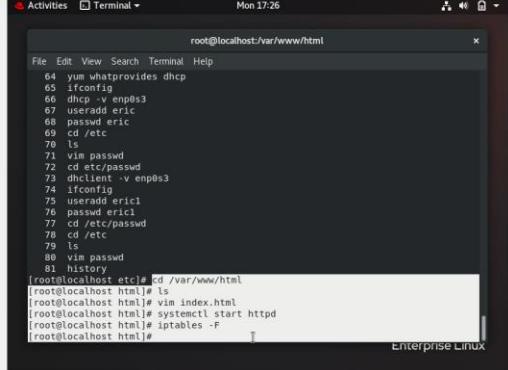
Useradd eric1 –u 2001

A screenshot of a Linux desktop environment (Enterprise Linux) showing a terminal window. The terminal window title is "root@localhost:/etc". The terminal content shows a series of commands being run:

```
root@localhost:/etc
File Edit View Search Terminal Help
extrausers:x:993:993:/var/lib/setroubleshoot:/sbin/nologin
extrausers:x:998:76:sslauthd:users:/run/sslauthd:/bin/nologin
dnsmasq:x:984:984:dnsmasq:DHCP and DNS server:/var/lib/dnsmasq:/bin/nologin
radvd:x:75:75:radvd:users:/sbin/nologin
clevix:x:983:982:clevix:Decryption Framework unprivileged user:/var/cache/clevix
/usr/sbin/nologin
cockpit:x:986:986:User for cockpit-ws:/sbin/nologin
sssd:x:1001:1079:User for sssd:/sbin/nologin
colorl:x:980:978:User for colorl:/var/lib/colorl:/sbin/nologin
gdm:x:42:42:/var/lib/gdm:/bin/nologin
rpcuser:x:29:29:RPC Service User:/var/lib/nfs:/sbin/nologin
process-control:x:978:978:Process Control group:initial-setup:/sbin/nologin
sshd:x:74:74:Privilege-separated SSH:/var/empty/sshd:/sbin/nologin
insights:x:978:978:Red Hat Insights:/var/lib/insights:/sbin/nologin
pesign:x:977:973:Group for the pesign signing daemons:/var/run/pesign:/sbin/nologin
avahi:x:70:70:avahi:mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
tcpdump:x:72:72::/sbin/nologin
ameerul:x:1000:1000:ameerul:/home/ameerul:/bin/bash
apache:x:48:48:Apache:/usr/share/httpd:/sbin/nologin
user1:x:1001:1001:/home/user1:/bin/bash
eric:x:2001:2001:/home/eric:/bin/bash
eric1:x:2001:2001:/home/eric1:/bin/bash
-- INSERT --
```

The terminal window has a dark background and light-colored text. The status bar at the bottom right of the terminal window says "Enterprise Linux". The desktop interface includes a taskbar with various icons and a system tray.

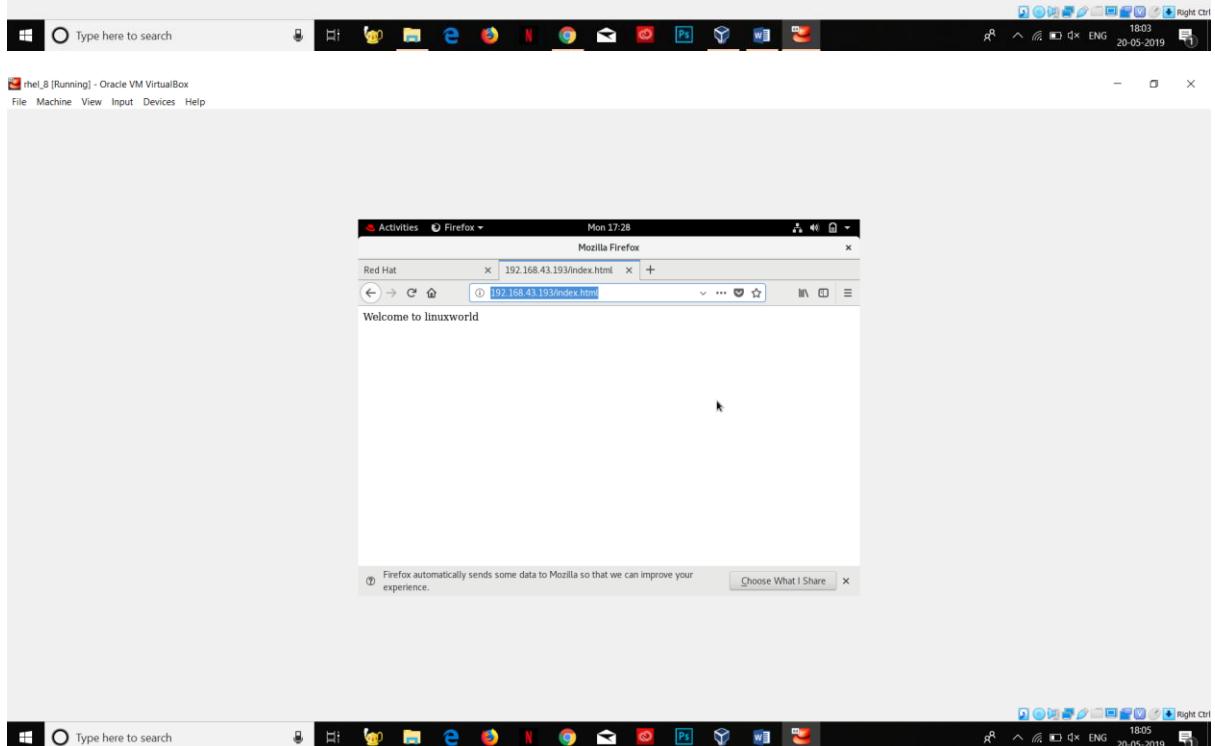
4)



The screenshot shows a terminal window titled "Activities Terminal". The title bar indicates it's running on "root@localhost:/var/www/html" at "Mon 17:26". The terminal window displays a series of command-line entries:

```
File Edit View Search Terminal Help
64 yum whatprovides dhcp
65 ifconfig
66 dhclient -v enp0s3
67 useradd eric
68 passwd eric
69 cd /etc
70 ls
71 vim passwd
72 cd etc/passwd
73 dhclient -v enp0s3
74 ifconfig
75 useradd eric1
76 passwd eric1
77 cd /etc/passwd
78 cd /etc
79 ls
80 vim passwd
81 history
[root@localhost etc]# Ed /var/www/html
[root@localhost html]# ls
[root@localhost html]# vim index.html
[root@localhost html]# systemctl start httpd
[root@localhost html]# iptables -F
[root@localhost html]#
```

The bottom right corner of the terminal window says "Enterprise Linux".



5)First attach a harddisk in SATA

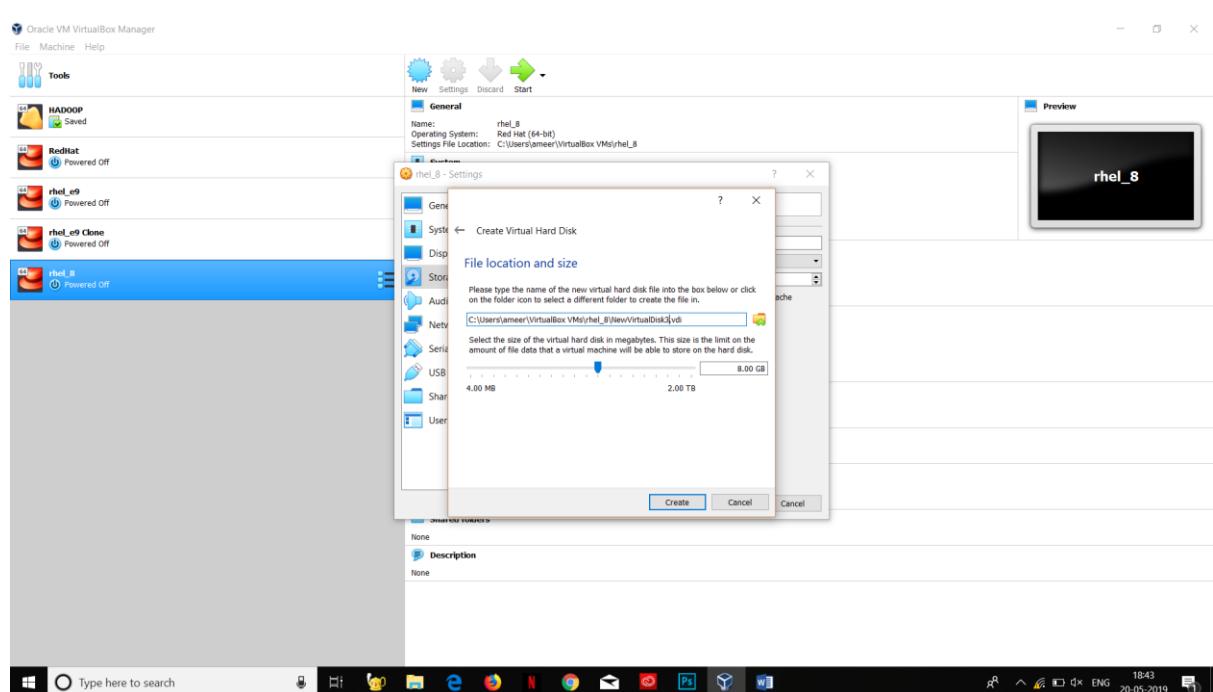
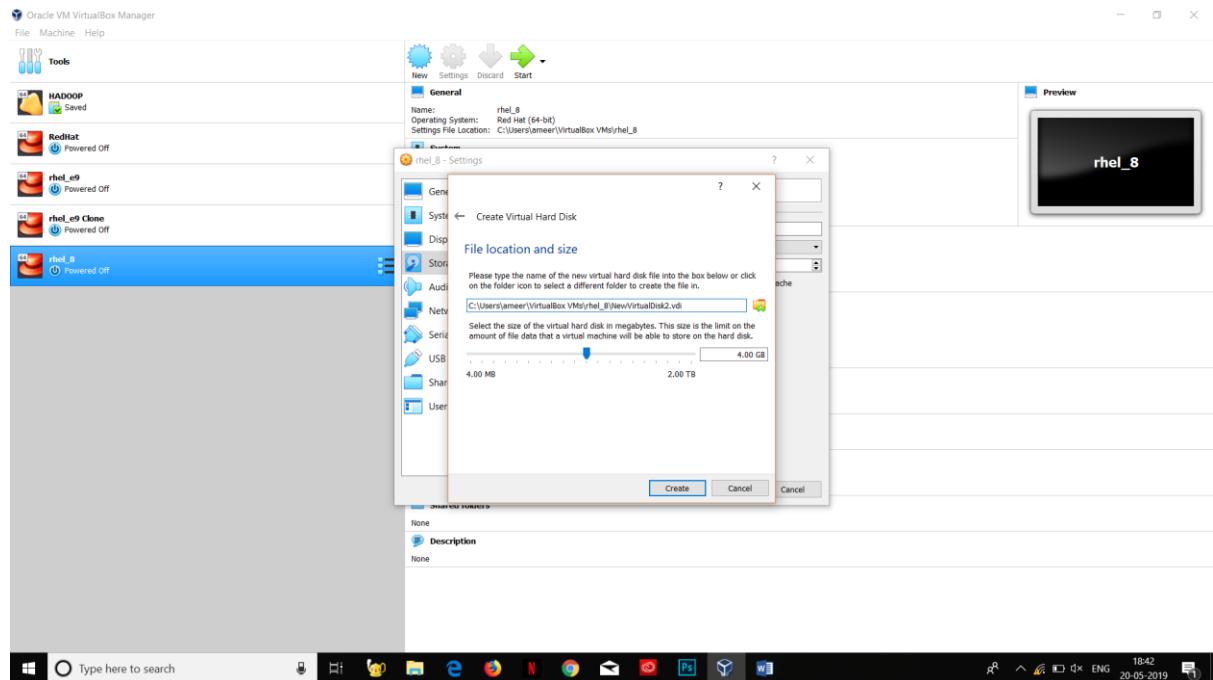
Then

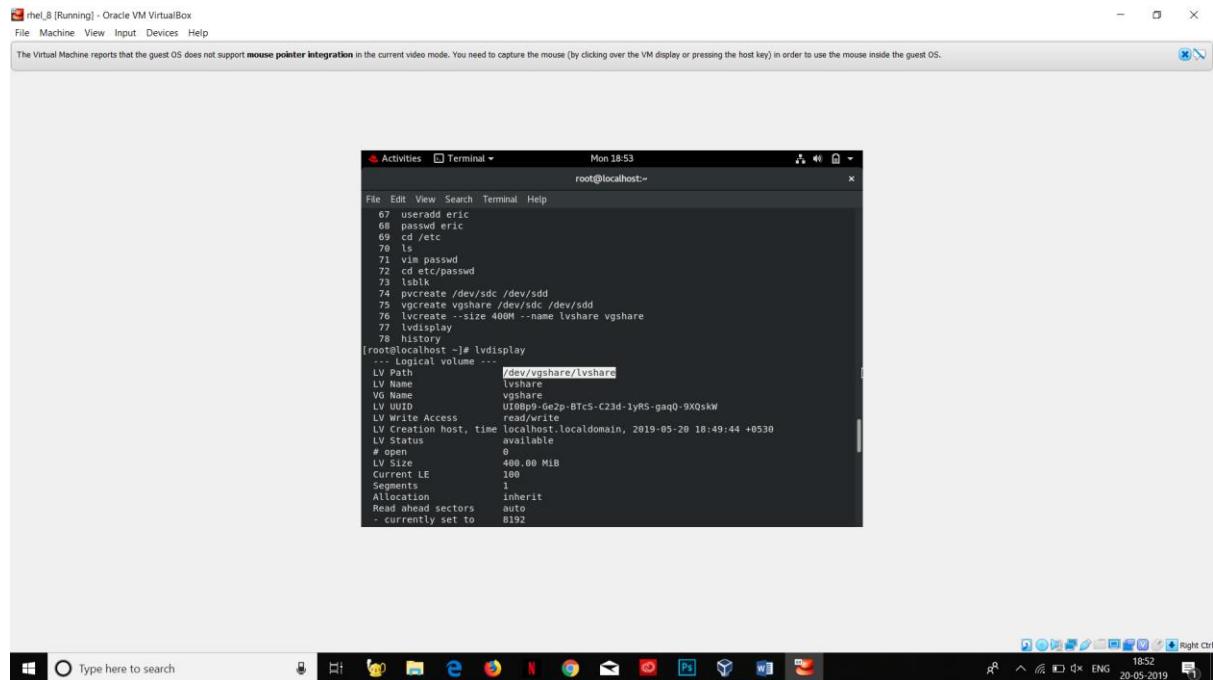
P(print) N(new partition) P(primary) W(save)

Format and mount

6) Before doing lvm unmount it by

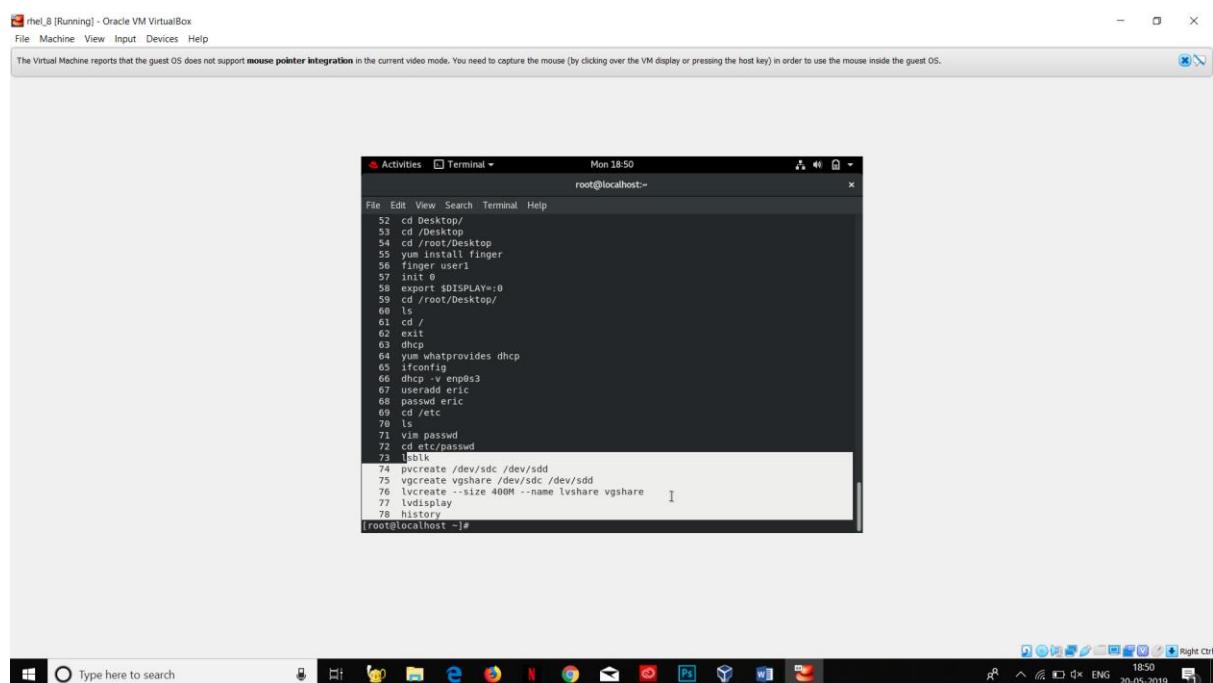
`umount /dev/sdb1`





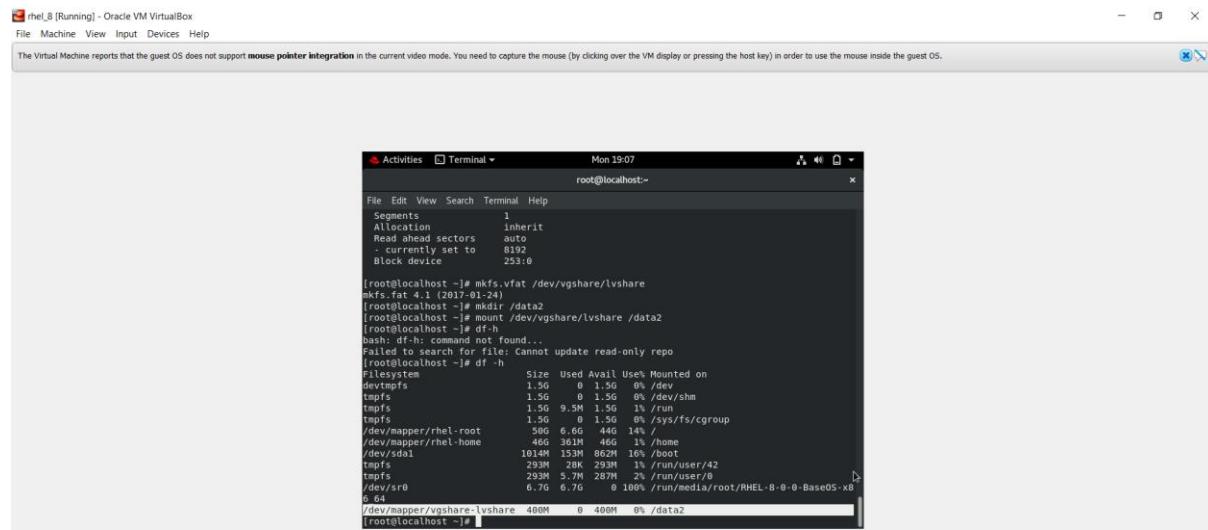
```
Activities Terminal Mon 18:53
root@localhost:~# lvdisplay
  Logical volume ...
  LV Path          /dev/vgshare/lvshare
  LV Name          lvshare
  VG Name          vgshare
  LV UUID          UU0B99-0c09-8Tc5-C23d-1yR5-gaq0-9XQskW
  LV Write Access  read/write
  LV Creation host, time localhost.localdomain, 2019-05-20 18:49:44 +0530
  LV Status        available
  # open           0
  LV Size          400.00 MIB
  Current LE      100
  Segments         1
  Allocation       inherit
  Read ahead sectors  auto
  - currently set to     8192
```

Use the above lv path (through lvdisplay and mount)



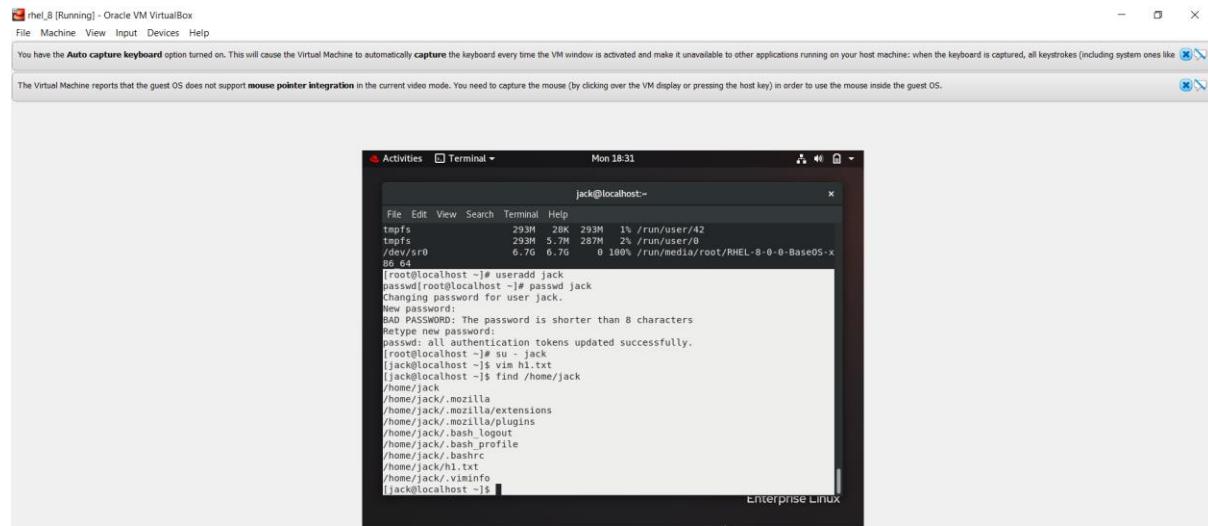
```
Activities Terminal Mon 18:50
root@localhost:~# lvdisplay
  Logical volume ...
  LV Path          /dev/vgshare/lvshare
  LV Name          lvshare
  VG Name          vgshare
  LV UUID          UU0B99-0c09-8Tc5-C23d-1yR5-gaq0-9XQskW
  LV Write Access  read/write
  LV Creation host, time localhost.localdomain, 2019-05-20 18:49:44 +0530
  LV Status        available
  # open           0
  LV Size          400.00 MIB
  Current LE      100
  Segments         1
  Allocation       inherit
  Read ahead sectors  auto
  - currently set to     8192
```

Df -h



```
root@localhost ~# mkfs.vfat /dev/vgshare/lvshare
mkfs.fat 4.1 (2017-01-24)
root@localhost ~# mkdir /data2
root@localhost ~# mount /dev/vgshare/lvshare /data2
root@localhost ~# df -h
bash: df-h: command not found...
Failed to search for file: Cannot update read-only repo
root@localhost ~# df -h
Filesystem      Size   Used  Avail   Use%  Mounted on
/dev/vgshare/lvshare 1.5G    0  1.5G   0%  /data2
tmpfs          1.5G    0  1.5G   0%  /dev/shm
tmpfs          1.5G  9.5M  1.5G   1%  /run
tmpfs          1.5G    0  1.5G   0%  /sys/fs/cgroup
/dev/mapper/rhel-root 50G   6.7G  43G   13%  /
/dev/mapper/rhel-home 46G  361M  46G   1%  /home
/dev/sr0        1014M 153M  862M  16%  /boot
tmpfs          293M  28K  293M   1%  /run/user/42
tmpfs          293M  5.7M  287M   2%  /run/user/0
tmpfs          6.7G  6.7G  0  100%  /run/media/root/RHEL-8-0-0-BaseOS-x86_64
/dev/mapper/vgshare-lvshare 400M    0  400M   0%  /data2
[root@localhost ~]#
```

7)



```
root@localhost ~# useradd jack
passwd: all authentication tokens updated successfully.
[root@localhost ~]# su - jack
[jack@localhost ~]$ vim hello.txt
[jack@localhost ~]$ find /home/jack
/home/jack/.mozilla
/home/jack/.mozilla/extensions
/home/jack/.mozilla/plugins
/home/jack/.background
/home/jack/.background.profile
/home/jack/.backgrounds
/home/jack/h1.txt
/home/jack/.viminfo
[jack@localhost ~]$
```

Useradd jack

Passwd jack

Su – jack

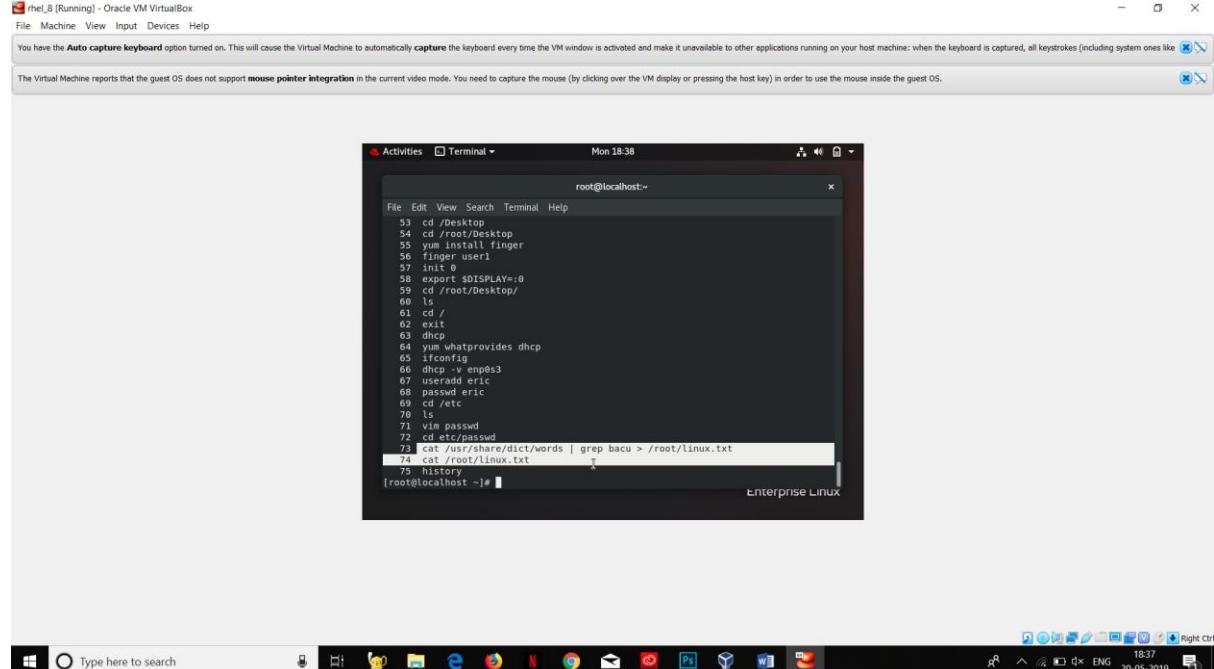
Vim hello.txt

Cd

Find /home/jack –name “hello.txt”

Find /home/jack – name “*.*” (for all files)

8) cd



```
root@localhost:~# 
root@localhost:~# cd /Desktop
root@localhost:~/Desktop# yum install finger
root@localhost:~/Desktop# finger user1
root@localhost:~/Desktop# init 0
root@localhost:~/Desktop# export $DISPLAY=:0
root@localhost:~/Desktop# ls
root@localhost:~/Desktop# cd /
root@localhost:~# exit
root@localhost:~# 
root@localhost:~# yum whatprovides dhcp
root@localhost:~# ifconfig
root@localhost:~# dhcpc -v enp0s3
root@localhost:~# useradd eric
root@localhost:~# passwd eric
root@localhost:~# ls
root@localhost:~# vim bacu
root@localhost:~# cd etc/passwd
root@localhost:~/etc/passwd# cat /usr/share/dict/words | grep bacu > /root/linux.txt
root@localhost:~/etc/passwd# cat /root/linux.txt
root@localhost:~/etc/passwd# history
[root@localhost ~]#
```

**Grep bacu /usr/share/dict/words > /root/lines.txt

WEBSERVER IN REDHAT8 (TURNING FIREWALL OFF)

System status firewalld

System stop firewalld(Temporarily turn off firewall)

System disable firewalld(Permanently shut down firewall)

Curl <http://192.168.0.4/vimal.html> to get the contents in that page

Eog -> same as double click in GUI

DAY -10 (21/05)

ML - > 1)Traditional ML 2)Deep Learning

Feature selection can be done by domain expert also. We [optimize manually in Traditional ML](#)

Deep learning is exactly equal to [automated feature engineering](#)

DEEP Learning = ML + Feature engineering

Neural Network

Neurons are interconnected and are trained through senses(eyes,ear,touch).This is called supervised learning.

Input Layer -> Neuron(Hidden Layer) -> Output Layer

Neuron which has more weight will be activated.Input is eliminated through backward propagation.There are lots of hidden layers.

Sklearn abstracts numpy

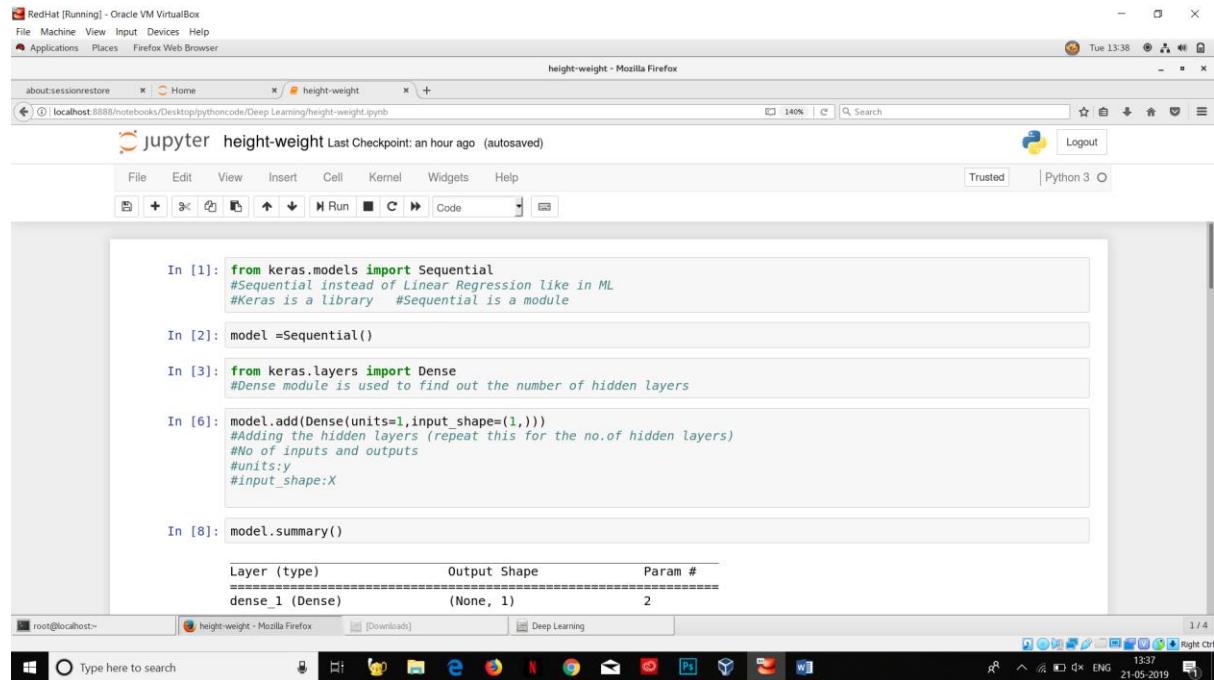
Sklearn is made from numpy code

ANN -> Artificial Neural Networks

Tensorflow -> Background mathematical calculation carried out by tensorflow

Keras abstracts tensorflow(Keras works over tensorflow)

HEIGHT-WEIGHT



```
In [1]: from keras.models import Sequential  
#Sequential instead of Linear Regression like in ML  
#Keras is a library #Sequential is a module  
  
In [2]: model =Sequential()  
  
In [3]: from keras.layers import Dense  
#Dense module is used to find out the number of hidden layers  
  
In [6]: model.add(Dense(units=1,input_shape=(1,)))  
#Adding the hidden layers (repeat this for the no.of hidden layers)  
#No of inputs and outputs  
#units:y  
#input_shape:X  
  
In [8]: model.summary()  
  
Layer (type) Output Shape Param #  
===== (Dense) (None, 1) 2  
  
1 / 4
```

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Tue 13:38

height-weight - Mozilla Firefox

about:sessionrestore Home height-weight

localhost:8888/notebooks/Desktop/pythoncode/Deep Learning/height-weight.ipynb

140% Search Logout

Jupyter height-weight Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [8]: `model.summary()`

Layer (type)	Output Shape	Param #
dense_1 (Dense)	(None, 1)	2

Total params: 2
Trainable params: 2
Non-trainable params: 0

In [10]: `from keras.optimizers import Adam,SGD`

In [12]: `model.compile(optimizer=Adam(),loss='mean_squared_error')`
#used to optimize .Technique used is SGD(Sarcastic gradient descent)

In [13]: `import pandas as pd`

In [14]: `dataset=pd.read_csv('weight-height.csv')`

In [16]: `dataset.head(2)`

root@localhost~| height-weight - Mozilla Firefox | Downloads | Deep Learning | 1 / 4

Type here to search

Windows Start button

Tue 13:38 21-05-2019

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

Tue 13:39

height-weight - Mozilla Firefox

about:sessionrestore Home height-weight

localhost:8888/notebooks/Desktop/pythoncode/Deep Learning/height-weight.ipynb

140% Search Logout

Jupyter height-weight Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [16]: `dataset.head(2)`

Out[16]:

	Gender	Height	Weight
0	Male	73.847017	241.893563
1	Male	68.781904	162.310473

In [17]: `y=dataset.iloc[:, -1]`

In [18]: `X=dataset.iloc[:, 1]`

In [20]: `dataset.plot(kind='scatter',x='Height',y='Weight')`

Out[20]: <matplotlib.axes._subplots.AxesSubplot at 0x7fa2e8fd5208>

root@localhost~| height-weight - Mozilla Firefox | Downloads | Deep Learning | 1 / 4

Type here to search

Windows Start button

Tue 13:38 21-05-2019

The screenshot shows a Jupyter Notebook interface running on a Red Hat Linux system within a VirtualBox environment. The notebook displays a scatter plot of height versus weight, training logs for a model fit, and a prediction plot.

In [22]:

```
model.fit(X,y,epochs=10)
#with each epoch the loss is reduced
```

Epoch 1/10
10000/10000 [=====] - 2s 159us/step - loss: 563.7620
Epoch 2/10
10000/10000 [=====] - 2s 163us/step - loss: 563.6195
Epoch 3/10
10000/10000 [=====] - 2s 161us/step - loss: 563.4429
Epoch 4/10
10000/10000 [=====] - 2s 155us/step - loss: 563.2387
Epoch 5/10
10000/10000 [=====] - 2s 167us/step - loss: 563.0075
Epoch 6/10
10000/10000 [=====] - 2s 157us/step - loss: 562.7294
Epoch 7/10
10000/10000 [=====] - 2s 175us/step - loss: 562.5274

Out[22]:

```
<keras.callbacks.History at 0x7fa2e8f96c88>
```

In [24]:

```
y_pred=model.predict(X)
```

In [25]:

```
import matplotlib.pyplot as plt
```

In [26]:

```
plt.plot(X,y_pred)
```

Out[26]:

```
[<matplotlib.lines.Line2D at 0x7fa2e6d4e780>]
```

A scatter plot showing a positive linear relationship between Height and Weight. The x-axis is labeled 'Height' and ranges from 55 to 80. The y-axis is labeled 'Weight' and ranges from 100 to 150. The data points form a dense cloud along a diagonal line.

RHCSA –

MOUNTING PERMANENTLY

Use lsblk instead of fdisk -l (more user friendly)

Parted /dev/sdb print (same command to check hard disk)

Mkfs.xfs /dev/sdb2

Mkdir /d

Mount /dev/sdb2/d

Cd /d

Touch hi (this file is created inside mounted device folder)

df -h -T (To know format type of mounted device)

PERM:-

Edit in:-

vim /etc/fstab (to create permanenly and mount)

devicename	mountpoint	formattype	options	diskchecking field	disk_sync
/dev/sdb1	/d	xfs	default(ro,rw)	0	0

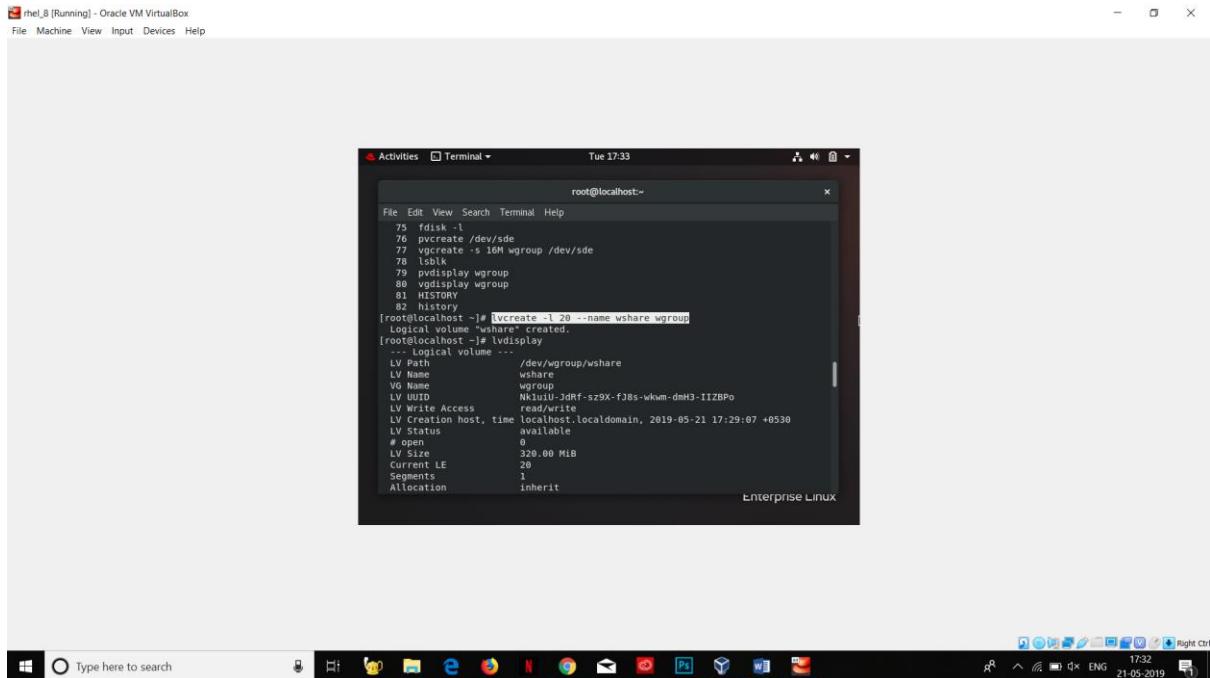
Mount -a (Check if no error is made)

Storage is always available in multiples (like 4MiB)

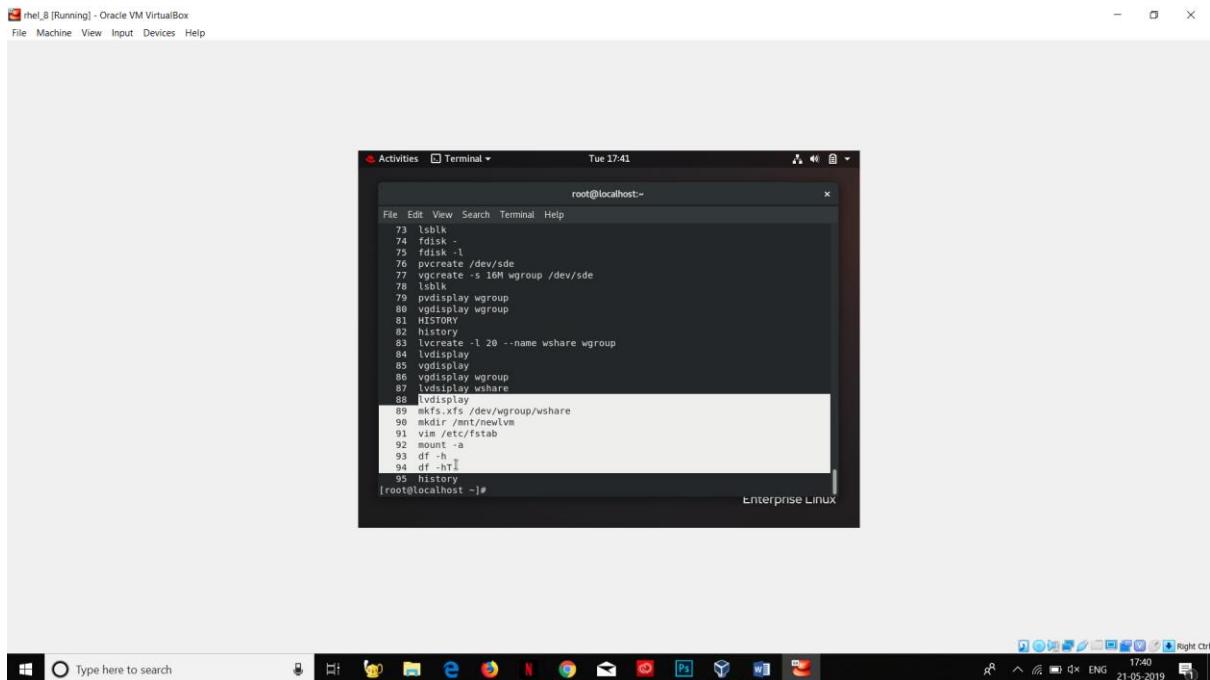
Q.)create lvm named wshare having total extents 20,where extends size is 16MiB and vg name is wgroup.Finally format with xfs and mount under /mnt/newlvm permanently or persistently.

```
[root@localhost ~]# Disk /dev/mapper/vgshare-lvshare: 400 MiB, 419430400 bytes, 819200 sectors
[...]
[root@localhost ~]# pvcreate /dev/sde
Physical volume "/dev/sde" successfully created.
[root@localhost ~]# vgcreate -s 16M wgroup /dev/sde
Volume group "wgroup" successfully created.
[root@localhost ~]# lvcreate -n wshare -L 20 -s 16M wgroup
Logical volume "wshare" created.
[root@localhost ~]# lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda      8:0    0 1080  0 disk 
└─sda1   8:1    0   16  0 part /boot
sda2   8:2    0  996  0 part 
  ├─rhel-root 253:1  0  596  0 lvm  /
  └─rhel-swap 253:2  0  466  0 lvm  [SWAP]
  ├─rhel-home 253:3  0  400  0 lvm  /home
sdb      8:16   0 1080  0 disk 
└─sdb1   8:17   0  512M 0 part 
sdc      8:32   0   40  0 disk
```

Vgdisplay wgroup (to check if PE size is 16M)



Current LE =20




```

[ 2.313981] [drm/vmm_host_log (mmap)] *ERROR* Failed to send log
[ 2.314255] [drm/vmm_host_log (mmap)] *ERROR* Failed to send log
Generating '/var/initramfs/rdsosreport.txt'

Entering emergency mode. Exit the shell to continue.
Type "journalctl" to view system logs.
You might want to save '/var/initramfs/rdsosreport.txt' to a USB stick or /boot
of for mounting them and attach it to a bug report.

switch_root:# mount -o remount,rw /sysroot
switch_root:# chroot /sysroot
sh-4.4# passwd root
Enter new password:
Re-type new password:
passwd: All authentication tokens updated successfully.
sh-4.4# exit
switch_root:# exit
logout
[FAILED] Failed to start User Manager for UID 42.
See 'systemctl status user@42.service' for details.
Stopping /run/user/42/mount.wrapper...

```

```

Activities Terminal Tue 18:38
root@localhost:~#
File Edit View Search Terminal Help
[root@localhost ~]# ls -l -Z /etc/shadow
-----. 1 root root system_u:object_r:unlabeled_t:s0 2181 May 21 18:32 /etc/
shadow
[root@localhost ~]# restorecon /etc/shadow
[root@localhost ~]# ls -l -Z /etc/shadow
-----. 1 root root system_u:object_r:shadow_t:s0 2181 May 21 18:32 /etc/sha
dow
[root@localhost ~]#

```

Extending size of LV (21/5)

After extending size using lvextend you can format the newly extended storage using lvresize.

Lvextend --size +1G /dev/vg2/lv2

Lvdisplay /dev/vg2/lv2

Df -hT

Resize2fs /dev/vg2/lg2

Lvdisplay/dev/vg2/lv2

Df-hT

Xfs_growfs /dev/vg2/lv3 (IN RHEL8 do df-H and put in mountpoint) (for xfs)

DAY-11

MACHINE LEARNING

Face Recognition, Pass/fail are all examples of classification.

Continuous problem statement->REGRESSION

Problem statement pass/fail , vimal's face/not vimal's face -> CLASSIFICATION

There are two types of classification :Binary and Multi

Binary Classification

Model -> Logistic Regression

Function -> Sigmoid ($1/(1+e^{-z})$ here $z=b+wx$)

$Y(0)$ -> fail

$Y(1)$ -> pass

50% above-yes , 50% below -no

RHCSA

Attaching or sharing a file from one system to my system. (not the same as copy through scp or access through ssh)

Can be done through nfs(network file system) protocol

Uses:- song is in other system(107). But using my system(104) to play the song in my system using VLC.

- Make fileserver or nfs server to implement NFS.

PROCEDURE:-

mkdir /mydir in system107(File which you wanna share)

1) rpm -q nfs-utils (TO check if nfs is installed)

Systemctl stop firewalld

2) vim /etc/exports

3) Write inside the file /mydir 192.168.0.104 (IP address of other system)

4) cat /etc/exports

5) systemctl restart nfs(**nfs-server** in RHEL8) (temporary)

System enable nfs(permanent)

6) Mkdir /newdata (make in system 104)

7) Mount 192.168.0.107(server's IP):/mydir /newdata

8) Check for the file using ls (but first go to /newdata)

9) df -hT

***FOR MULTIPLE**

/mydir 192.168.0.104(ro)	ro->read only ,rw-> re-writable
/etc *(rw)	* -> anyone can access it

Also add **chmod o+w /mydir** (to get re writable permissions) in server

Note:-Do BOTH chmod and (rw) in vim file to get writable permissions

System 107 acts as centralized storage.

NFS shares **READ ONLY** data

Exportfs -v (in system107 ,to see the permissions and details)

Note *** For root it is saved in home

For / it is saved in computer (go to places and click on computer)

Make user in client.user is saved in home/jane.content is saved In 104's hard disk.

But we want the content to be stored in 107.

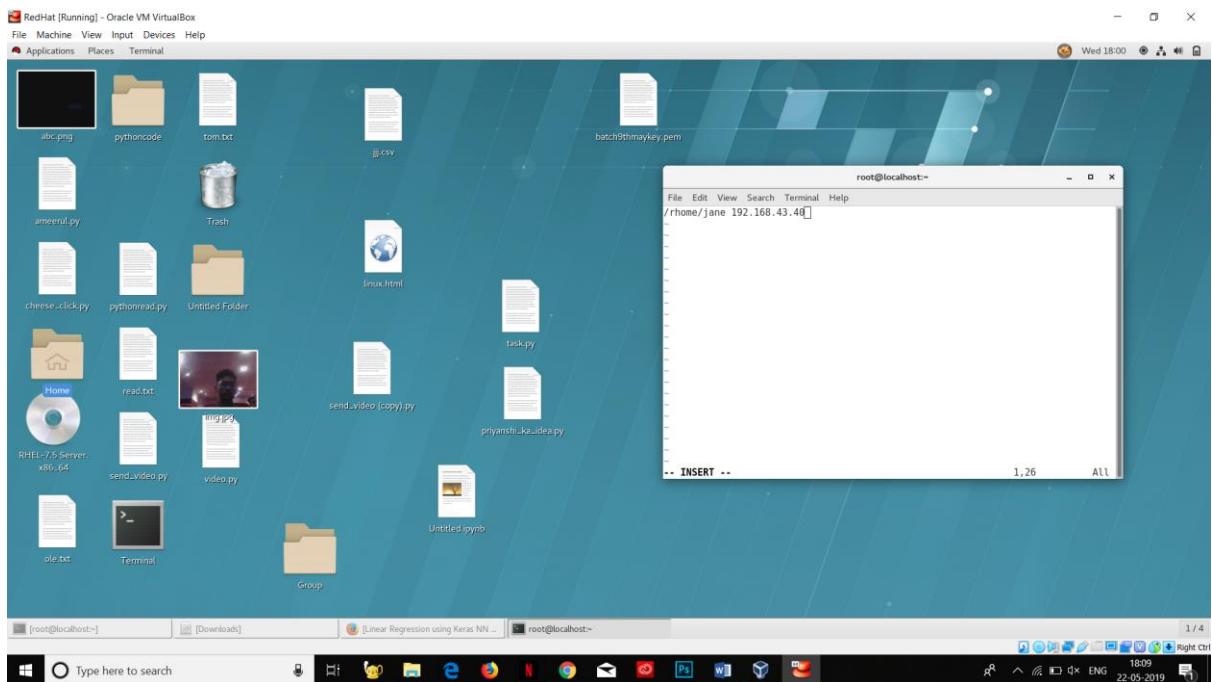
DO THIS IN SERVER:

Mkdir /rhome

Mkdir /rhome/jane

Chmod o+w /rhome/jane

Vim /etc/exports



/mydir 192.168.0.104(rw)

/rhome/jane 192.168.0.104(rw)

CLIENT:-

Useradd jane

Passwd jane

Finger jane (copy directory ,ie /home /jane)

Getenforce (to check if se linux is ON enforcing-ON permissive-OFF)

Setenforce 0(disable se linux)

Setenforce 1(enable se linux)

Getsebool –a | grep nfs (getsebool is to see which all Boolean are on and off)

Note *** search command in linux is grep

Setsebool –P use_nfs_home_dirs=1 (allow)

Leftctrl+alt+f3

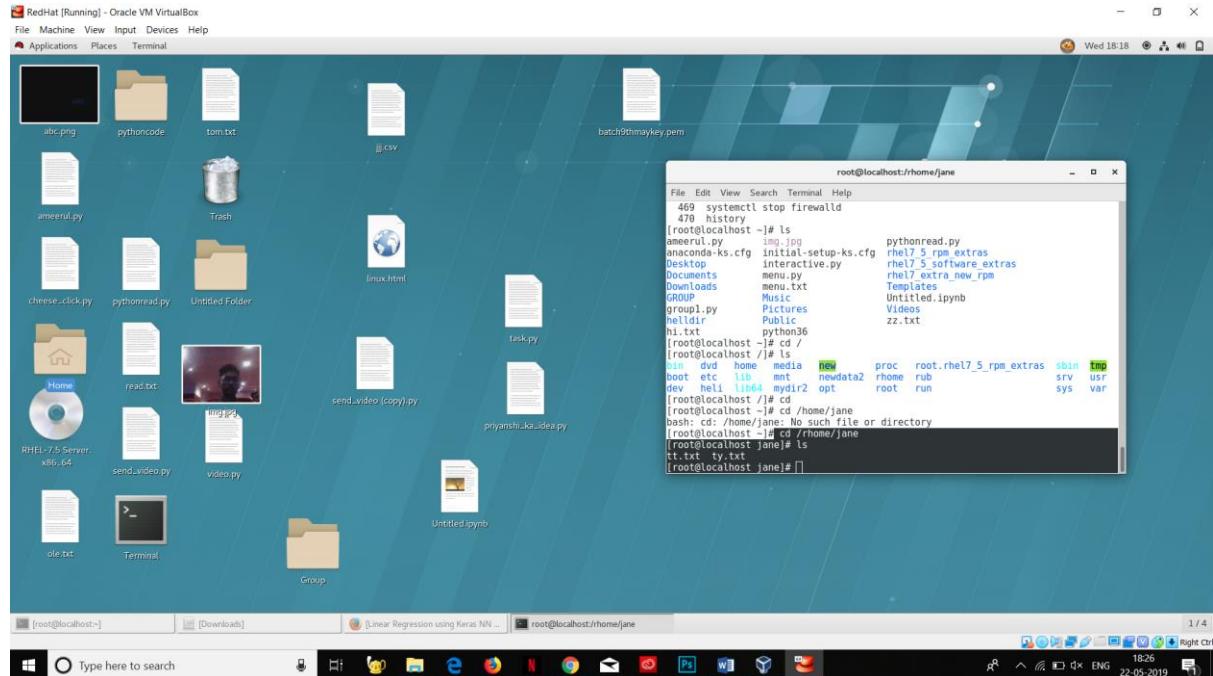
Login jane user

Touch hi.txt

Vim ty.txt

NOW IN SERVER:-

Checking for files



AUTOFS (in client)

Instead of Mount 192.168.0.107:/rhome/jane

according to who logged in.

home/jane ,automate the mounting

Yum install autofs

Vim /etc/auto.misc

Add at last -> krish

192/168.43.40:/rhome/krish

(for any user automation) *

192/168.43.40:/rhome/&

Vim /etc/auto.master

home misc /etc/auto.misc

REPLACE misc with home

Systemctl restart autofs

Systemctl enable autofs

DAY -12

RHCSA

NEW command to check for ip address

Ip addr

Nmcli connection show (to show all the connection profiles. Green color indicates activated connection)

Nmcli connection up enp0s3

Nmcli connection show (to check if the connection is activated)

(Dhclient command is temporary)

DHCP provides IP

Changing document root

(Changing /var/www/html in webserver)

Vim /etc/httpd/conf/httpd.conf

Change In line no.122

Ps -aux -> checking all processes

Ps -aux | grep httpd -> checking only httpd processes

To stop a service/daemon

Systemctl stop httpd

Every process(server) is given a unique port number

Standard(Default ports) :-

Web server: port no. 80

Ssh server 22

Mail server 25

Netstat -tnlp (tells what is running on which port number. But only if the program is running)

To change the port number of server

vim etc/httpd/conf/httpd.conf

At line 45 apx

Listen 80 (change this port to 82)

Systemctl restart httpd

Semanage port -l (which port numbers are allowed for which service)

Semanage port -l | grep http

Semanage port -a -t http_port -p tcp 82 ((adding the port number 82 to the list of ports in shown in semanage port -l)

Semanage port -l |grep http

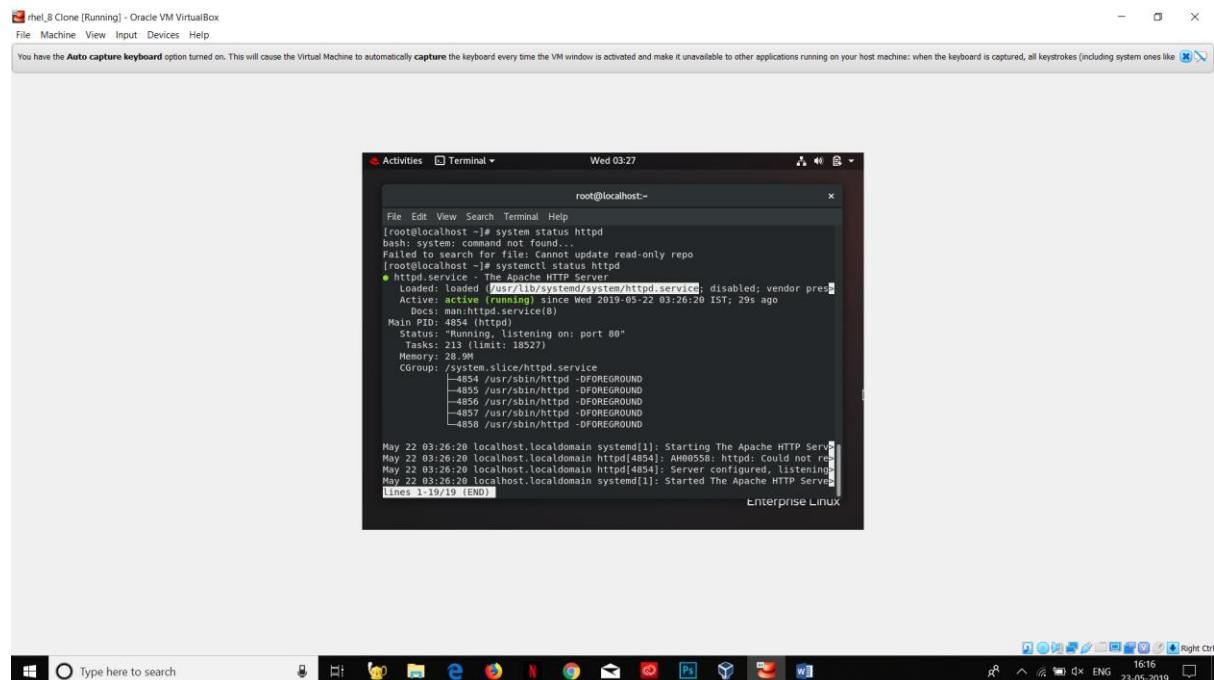
Systemctl re start httpd

Systemctl status httpd

Systemctl stop firewalld

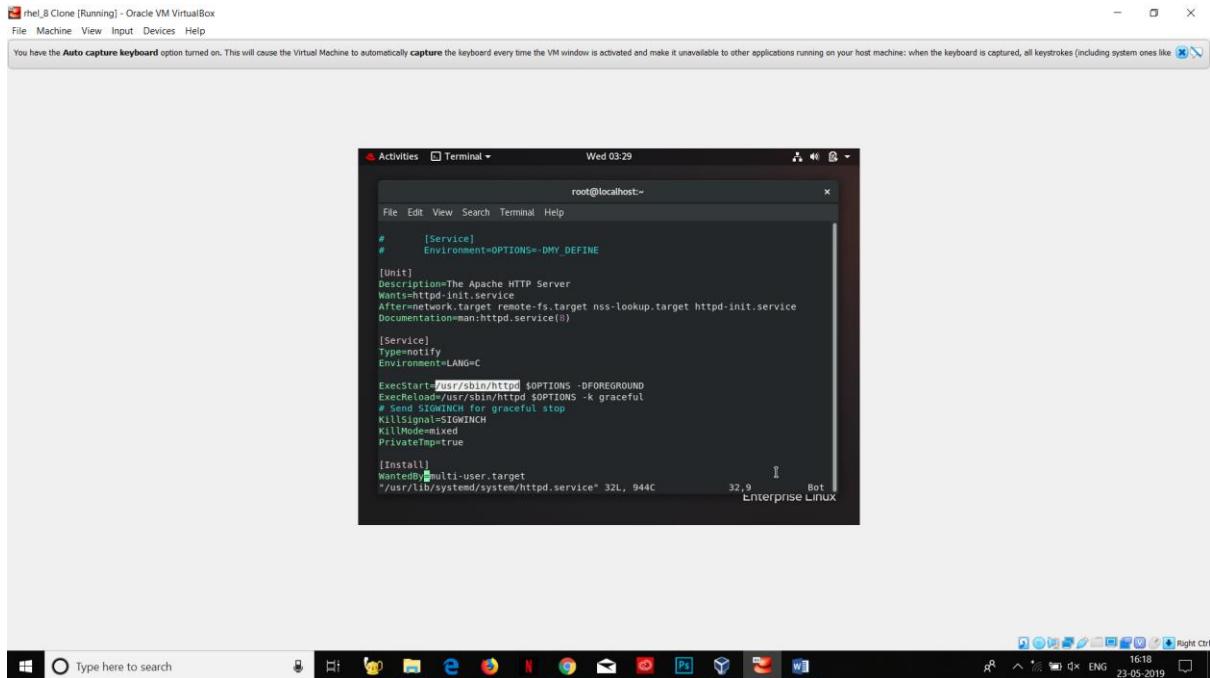
Systemctl disable firewalld

Copy the command from it loaded: (usr/)



```
[root@localhost ~]# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor pre
   Active: active (running) since Wed 2019-05-22 03:26:20 IST; 29s ago
     Docs: man:httpd.service(8)
Main PID: 4854 (httpd)
   Status: "Running, listening on: port 80"
      Tasks: 213 (limit: 18527)
     Memory: 28.1M
        CPU: 0.000 CPU(s) since start
       CGroup: /system.slice/httpd.service
           ├─4854 /usr/sbin/httpd -DFOREGROUND
           ├─4855 /usr/sbin/httpd -DFOREGROUND
           ├─4856 /usr/sbin/httpd -DFOREGROUND
           ├─4857 /usr/sbin/httpd -DFOREGROUND
           └─4858 /usr/sbin/httpd -DFOREGROUND
May 22 03:26:20 localhost.localdomain systemd[1]: Starting The Apache HTTP Server
May 22 03:26:20 localhost.localdomain httpd[4854]: AH00558: httpd: Could not read configuration file: /etc/httpd/conf.d/welcome.conf: No such file or directory
May 22 03:26:20 localhost.localdomain httpd[4854]: Server configured, listening on port 80
May 22 03:26:20 localhost.localdomain systemd[1]: Started The Apache HTTP Server
[root@localhost ~]
```

Vim /usr/lib/system/system/httpd.service (to open the file)



/usr/sbin/httpd -> THIS CAN BE USED TO RUN in docker.

***CTRL + ALT +DEL -> REBOOT

Summary :

1)YUM install httpd

2)vim /etc/httpd/conf/httpd.conf

3)line 45 approx :

Change keyword from 80 to 82

4)systemctl restart httpd

5)semanage port -l | grep http (To check if 82 is there or not in database)

6)**semanage port -a -t http_port_t -p tcp 82** (adding 82_

7)Systemctl restart httpd

8)Systemctl enable httpd

Systemctl stop firewalld

Systemctl disable firewalld

9)client :firefox

<http://serverip:82/index.html>

****If File doesn't exist**

yum whatprovides /usr/share/dict/words

yum install words

whoami -> current user

TUNED

RH442 (Redhat performance tuning)

Redhat 's target market is server and not a desktop.(Window's target market is desktop)

Rules for tuning are called [tune profile](#).

Tuned-adm list (To see the list of profiles)

Tuned-adm recommend (it recommends the best profile...ie virtual guest)

*Tuned-adm profile virtual-guest

You can improve system performance using tune -d

Changing home directory of user

Mkdir /newhome

Useradd -d /newhome/user2 user 2

Su - user2

Pwd

⇒ Newhome/user2

Q.)RHCSA

Nfs and autofs question

At SERVER:-

Mkdir -p /netdev/user1

Chmod o+w /netdev/user1

Vim /etc/exports

/netdev/user *(rw)

Systemctl restart nfs

Systemctl enable nfs

Systemctl stop firewalld

Systemctl disable firewalld

At CLIENT:-

Useradd -d /newhome/user1 user1

Passwd user1

Yum install autofs -y

Vim /etc/auto.misc

⇒ **User1 192.168.0.104:/netdev/user1 (write in last line)**
⇒ **(for any user automation) * 192.168.43.40:/rhome/&**
⇒

Vim /etc/auto.master

⇒ **Replace “/misc” with “/newhome” (* Exclude username
from home directory newhome/user1)**

Systemctl restart autofs

Systemctl enable autofs

To add files:-

Useradd jane

Passwd jane

Finger jane (copy directory ,ie /home /jane)

Getenforce (to check if se linux is ON enforcing-ON permissive-OFF)

Setenforce 0(disable se linux)

Setenforce 1(enable se linux)

Getsebool -a | grep nfs (getsebool is to see which all Boolean are on and off)

Note *** search command in linux is grep

Setsebool -P use_nfs_home_dirs=1 (allow)

Leftctrl+alt+f3

Su - jane

Touch hi.txt

Vim ty.txt

SWAP PARTITION

To extend RAM we use a concept called swap. CPU reads data from RAM and not directly from hardisk.

If our file is 3GB and our RAM is just 2GB.

Solution:-2GB of file is loaded in the RAM and 1GB(**SWAP partition**) is loaded in the harddisk.

(IN EXAM WE WILL HAVE 3HARDISKS VDA,VDB,VDC. Don't use VDA! Its main hardisk) Use VDB for Swap VDC for VDO

Free -m (Checking the current RAM usage)

Fdisk -l (check disks)

Make partition pnpw in vdb

*****Udevadm settle** (to make changes in partition table permanent after w) DO THIS IN LVM ALSO!!!!!!

Fdisk -l /dev/sdb

Mkswap /dev/sd1

Swapon /dev/sd1

(Can check using free -m)

Permanent by :

Vim /etc/fstab

/dev/sd1	swap	swap	defaults	0	0
----------	------	------	----------	---	---

Mount -a

DAY -13 (24/5)

MACHINE LEARNING (DATA PREPROCESSING)

For continuous --> **regression**

True/false, yes/no -->**binary classification**

Many choices -- > multi classification

Kaggle.com can be used to download datasets

Ex:-TITANIC DATASET

To predict survived(0,1) use binary classification

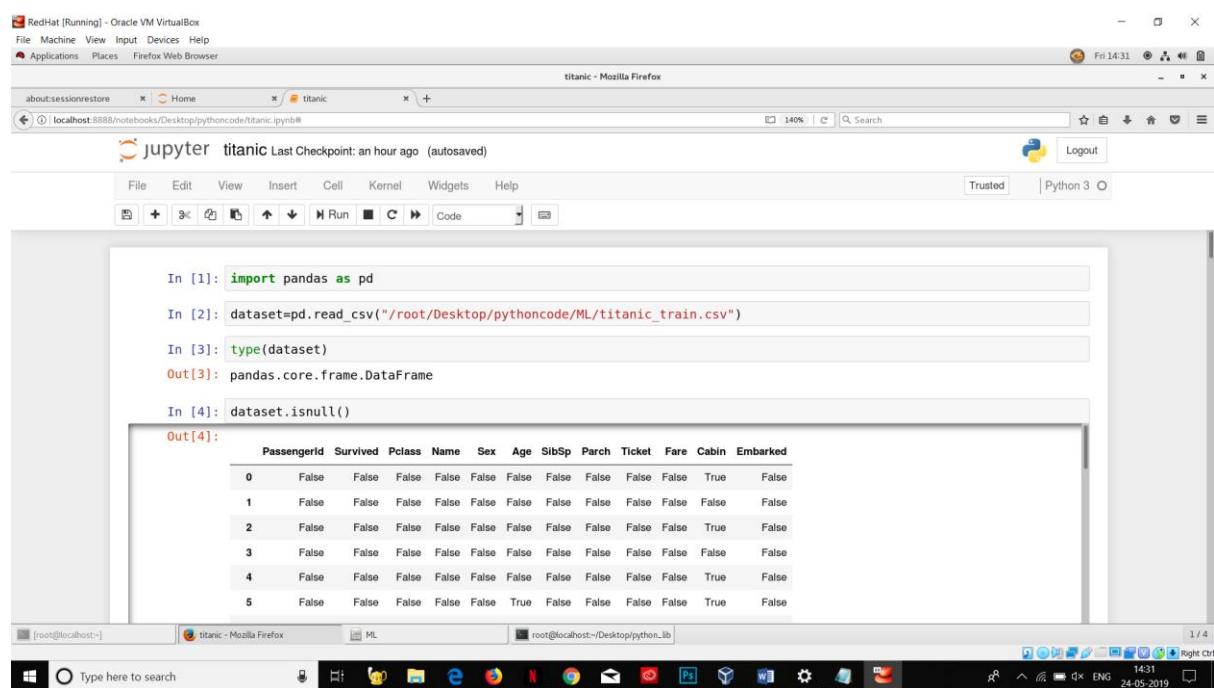
To predict fare use regression

First do data pre-processing

Data cleaning -> noisy data is removed ,data is added accordingly

In data analytics removing or altering few data entries wont affect the approximate predictions.

But data cant be altered or removed in databases.



```
In [1]: import pandas as pd
In [2]: dataset=pd.read_csv("/root/Desktop/pythoncode/ML/titanic_train.csv")
In [3]: type(dataset)
Out[3]: pandas.core.frame.DataFrame
In [4]: dataset.isnull()
Out[4]:
   PassengerId  Survived  Pclass  Name     Sex   Age  SibSp  Parch  Ticket  Fare Cabin Embarked
0            1      False    3.0  Mr.  B.    male  22.0      1     0   A/5 21171   7.25   S
1            2      False    1.0  Mr.  F.    male  38.0      1     0   113803  71.2833   S
2            3      False    3.0  Mr.  J.    male  26.0      0     0   349902  2.33  S
3            4      False    1.0  Mr.  F.    male  35.0      1     0   113832  71.2833   S
4            5      False    3.0  Mr.  J.    male  35.0      0     0   113843  71.2833   S
5            6      False    3.0  Mr.  F.    male  35.0      1     0   113852  71.2833   S
```

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

titanic - Mozilla Firefox

about:sessionrestore Home titanic

localhost:8888/notebooks/Desktop/pythoncode/titanic.ipynb#

140% Search Logout

Jupyter titanic Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [5]: `import matplotlib as plt`

In [6]: `import seaborn as sns`

In [7]: `sns.heatmap(dataset.isnull())`
#gives a report of inconsistent data

Out[7]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff3dc73d710>

1 / 4

[root@localhost~] titanic - Mozilla Firefox ML root@localhost~/Desktop/python_code

Type here to search 1432 ENG 24-05-2019 Right Ctrl

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

titanic - Mozilla Firefox

about:sessionrestore Home titanic

localhost:8888/notebooks/Desktop/pythoncode/titanic.ipynb#

140% Search Logout

Jupyter titanic Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [8]: `sns.countplot(x='Survived', data=dataset, hue='Sex')`
#0->died
#1->alive
#hue-> group by according to sex

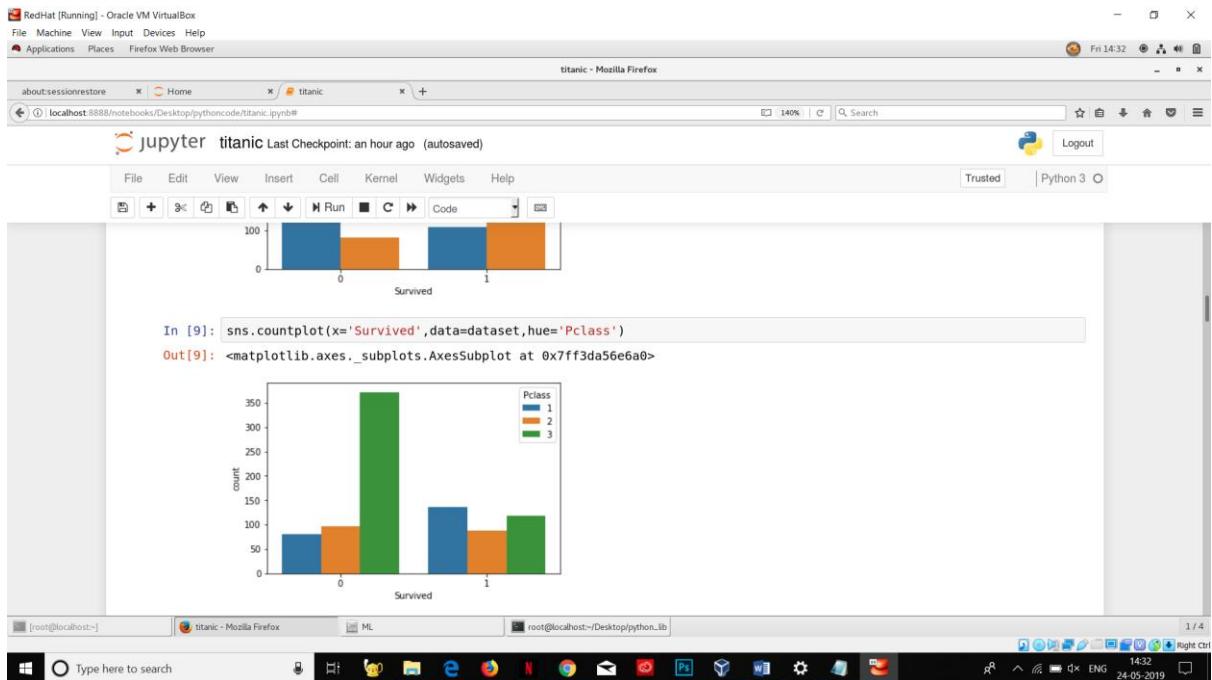
Out[8]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff3da626320>

In [9]: `sns.countplot(x='Survived', data=dataset, hue='Pclass')`

1 / 4

[root@localhost~] titanic - Mozilla Firefox ML root@localhost~/Desktop/python_code

Type here to search 1432 ENG 24-05-2019 Right Ctrl



RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

titanic - Mozilla Firefox

about:sessionrestore Home titanic

localhost:8888/notebooks/Desktop/pythoncode/titanic.ipynb#

140% Search Logout

Jupyter titanic Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3



```
In [10]: dataset.info() #cabin has less entries
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
PassengerId    891 non-null int64
Survived        891 non-null int64
Pclass          891 non-null int64
Name            891 non-null object
Sex             891 non-null object
Age             714 non-null float64
SibSp           891 non-null int64
Parch           891 non-null int64
Ticket          891 non-null object
Fare            891 non-null float64
Cabin           204 non-null object
Embarked        889 non-null object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.6+ KB
```

```
In [11]: dataset.drop('Cabin',axis =1,inplace=True)
#axis =0 -> x-axis(ROW)
#axis=1 -> y-axis(COLUMN)
```

root@localhost~] titanic - Mozilla Firefox ML root@localhost~Desktop/pythoncode.lib 1 / 4

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RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

titanic - Mozilla Firefox

about:sessionrestore Home titanic

localhost:8888/notebooks/Desktop/pythoncode/titanic.ipynb#

140% Search Logout

Jupyter titanic Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 O

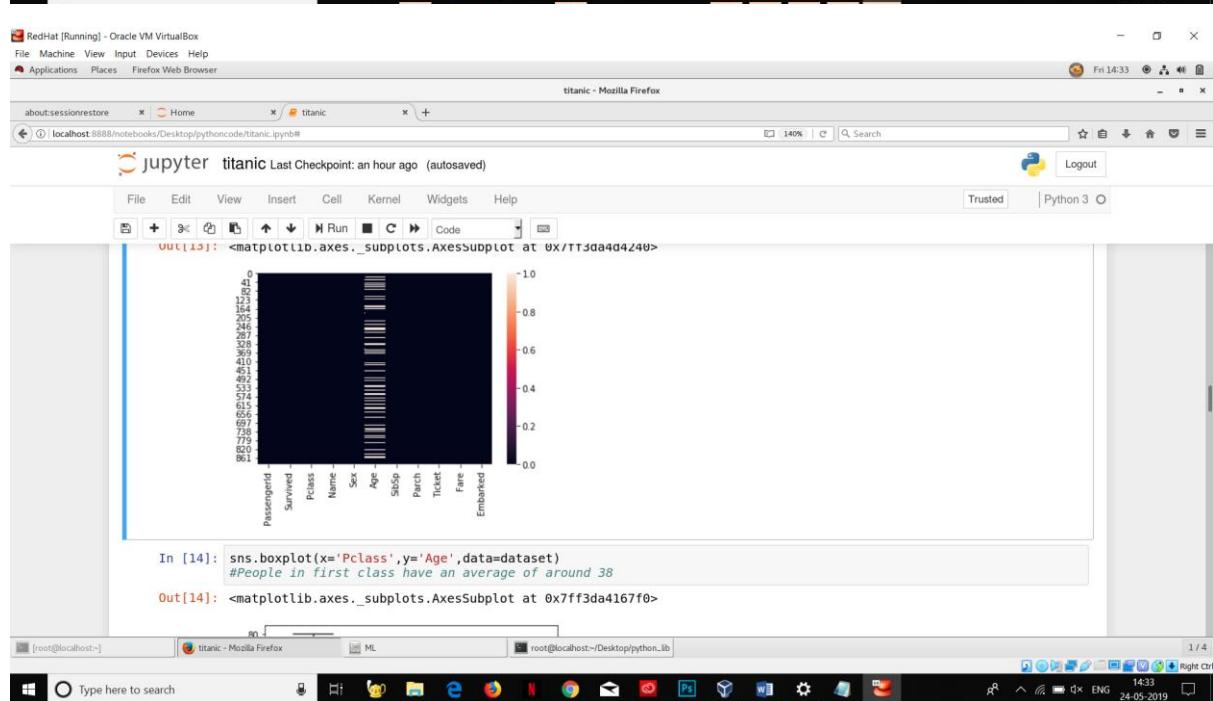
In [12]: dataset

Out[12]:

PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked
0	1	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	S
1	2	1	Cumings, Mrs. John Bradley (Florence Briggs Th... female	38.0	1	0	PC 17599	71.2833	C	
2	3	1	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	S
3	4	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	S
4	5	0	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	S
5	6	0	Moran, Mr. James	male	NaN	0	0	330877	8.4583	Q
6	7	0	McCarthy, Mr. Timothy J	male	54.0	0	0	17463	51.8625	S
7	8	0	Palsson, Master. Gosta Leonard	male	2.0	3	1	349909	21.0750	S
8	9	1	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742	11.1333	S
9	10	1	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736	30.0708	C

In [13]: sns.heatmap(dataset.isnull()) #white patches reduced

Out[13]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff3da4d4240>



RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

titanic - Mozilla Firefox

about:sessionrestore Home titanic

localhost:8888/notebooks/Desktop/pythoncode/titanic.ipynb#

140% Search Logout

Jupyter titanic Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [14]: sns.boxplot(x='Pclass',y='Age',data=dataset)
#People in first class have an average of around 38

Out[14]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff3da4167f0>

In [15]: def change_cols(cols):
 Age=cols[0]
 Pclass=cols[1]

In [16]: dataset['Age']=dataset[['Age','Pclass']].apply(change_cols, axis=1)

In [17]: sns.heatmap(dataset.isnull())
#all white patches gone..so mostly all null values rectified

Out[17]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff3da396470>

root@localhost~] titanic - Mozilla Firefox ML root@localhost~Desktop/python_code [1 / 4]

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RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

titanic - Mozilla Firefox

about:sessionrestore Home titanic

localhost:8888/notebooks/Desktop/pythoncode/titanic.ipynb#

140% Search Logout

Jupyter titanic Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [15]: def change_cols(cols):
 Age=cols[0]
 Pclass=cols[1]

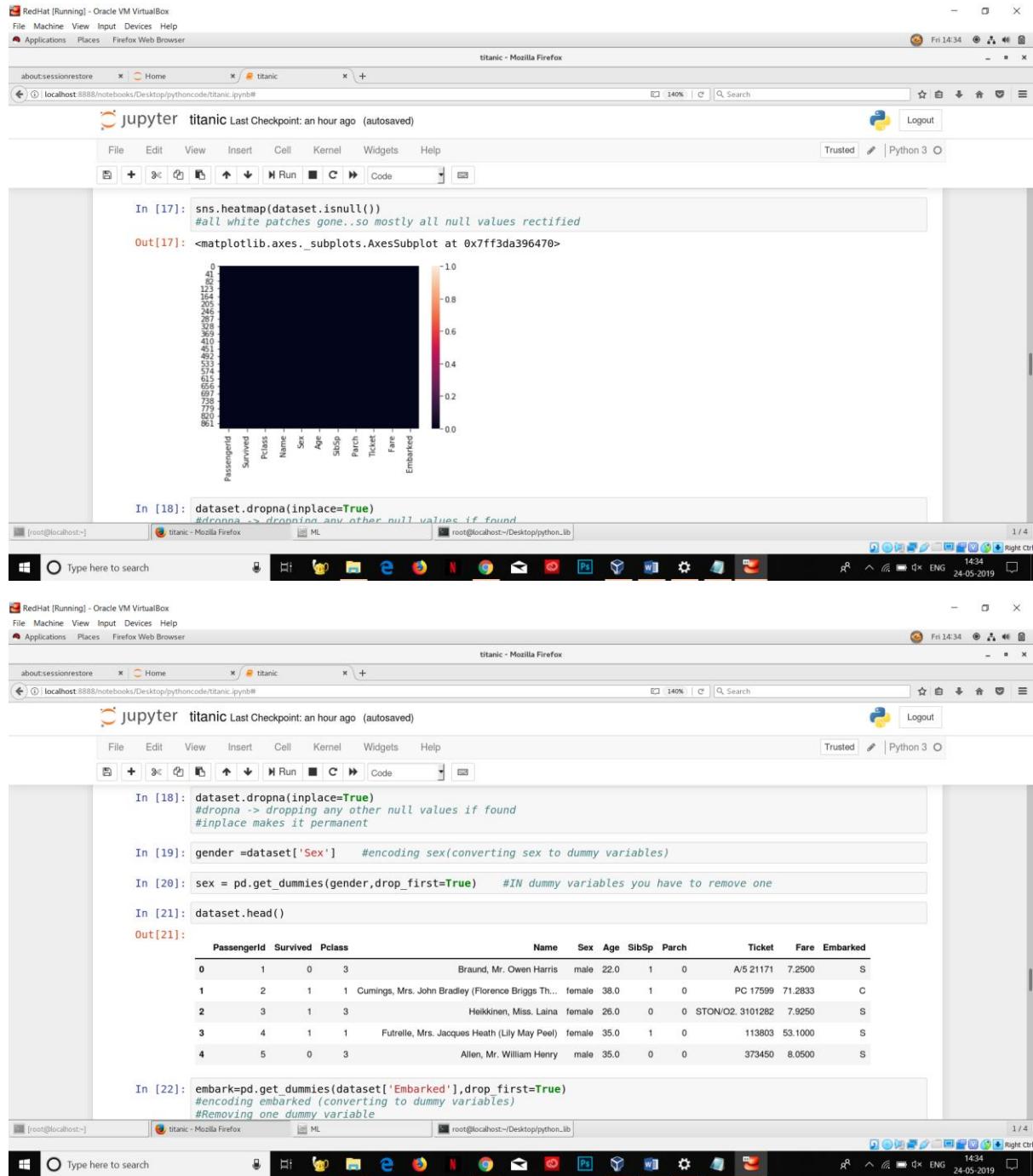
In [16]: dataset['Age']=dataset[['Age','Pclass']].apply(change_cols, axis=1)

In [17]: sns.heatmap(dataset.isnull())
#all white patches gone..so mostly all null values rectified

Out[17]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff3da396470>

root@localhost~] titanic - Mozilla Firefox ML root@localhost~Desktop/python_code [1 / 4]

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RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

titanic - Mozilla Firefox

about:sessionrestore Home titanic

localhost:8888/notebooks/Desktop/pythoncode/titanic.ipynb#

140% Search Logout

Jupyter titanic Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [22]: `embark=pd.get_dummies(dataset['Embarked'],drop first=True)`
#encoding embarked (converting to dummy variables)
#Removing one dummy variable

In [23]: `pclass=pd.get_dummies(dataset['Pclass'],drop first=True)`
#CATEGORICAL VALUE IS CONVERTED TO DUMMY VARIABLE
#Converting Pclass to dummy variable

In [24]: `dataset=dataset.concat([dataset,sex,embark,pclass],axis=1)` #Finally joining everything to make final dataset

In [25]: `dataset.drop(['PassengerId','Name','Pclass','Sex','Ticket','Fare','Embarked'],axis=1,inplace=True)`

In [26]: `len(dataset)`

Out[26]: 889

In [27]: `dataset`

Out[27]:

	Survived	Age	SibSp	Parch	male	Q	S	2	3
0	0	22.0	1	0	1	0	1	0	1

[root@localhost~] titanic - Mozilla Firefox ML root@localhost~/Desktop/python_code [1/4]

Type here to search 14:35 24-05-2019

RedHat [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Firefox Web Browser

titanic - Mozilla Firefox

about:sessionrestore Home titanic

localhost:8888/notebooks/Desktop/pythoncode/titanic.ipynb#

140% Search Logout

Jupyter titanic Last Checkpoint: an hour ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [28]: `y=dataset.iloc[:, 0]`

In [29]: `y.shape`

Out[29]: (889,)

In [30]: `X=dataset.iloc[:, 1:]`

In [31]: `X.shape`

Out[31]: (889, 8)

In [32]: `from sklearn.model_selection import train_test_split`

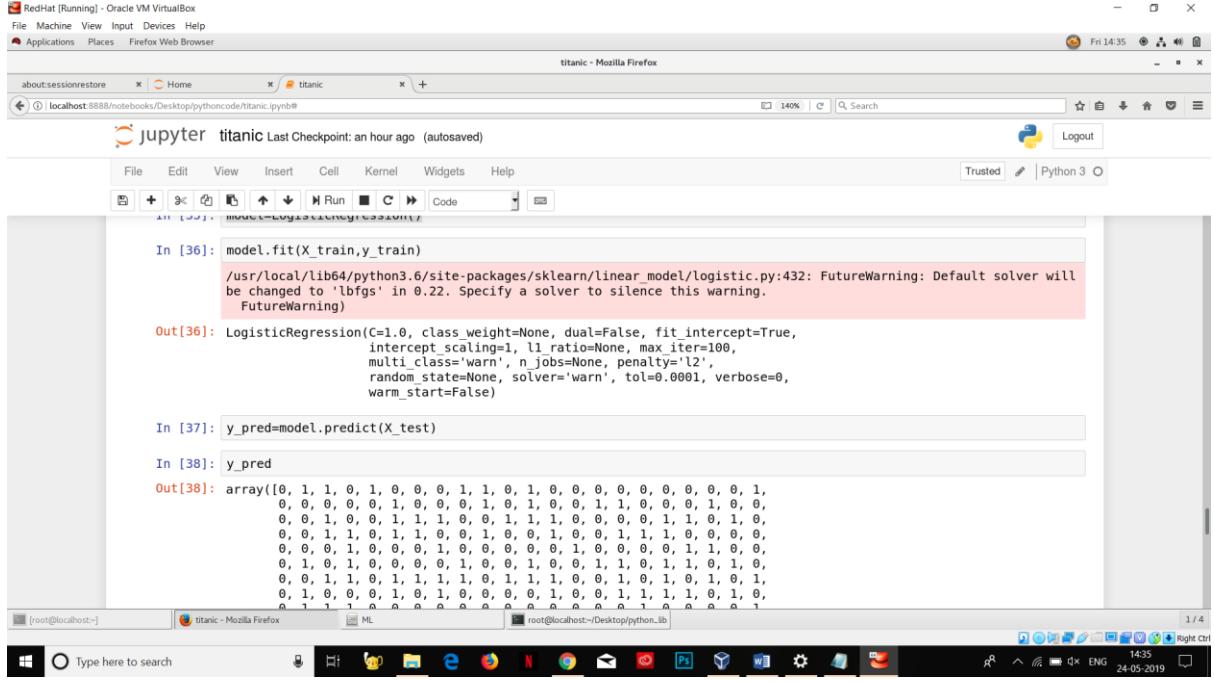
In [33]: `X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.33, random_state=42)`

In [34]: `from sklearn.linear_model import LogisticRegression`
#Using logistic regression because of classification

In [35]: `model=LogisticRegression()`

[root@localhost~] titanic - Mozilla Firefox ML root@localhost~/Desktop/python_code [1/4]

Type here to search 14:35 24-05-2019

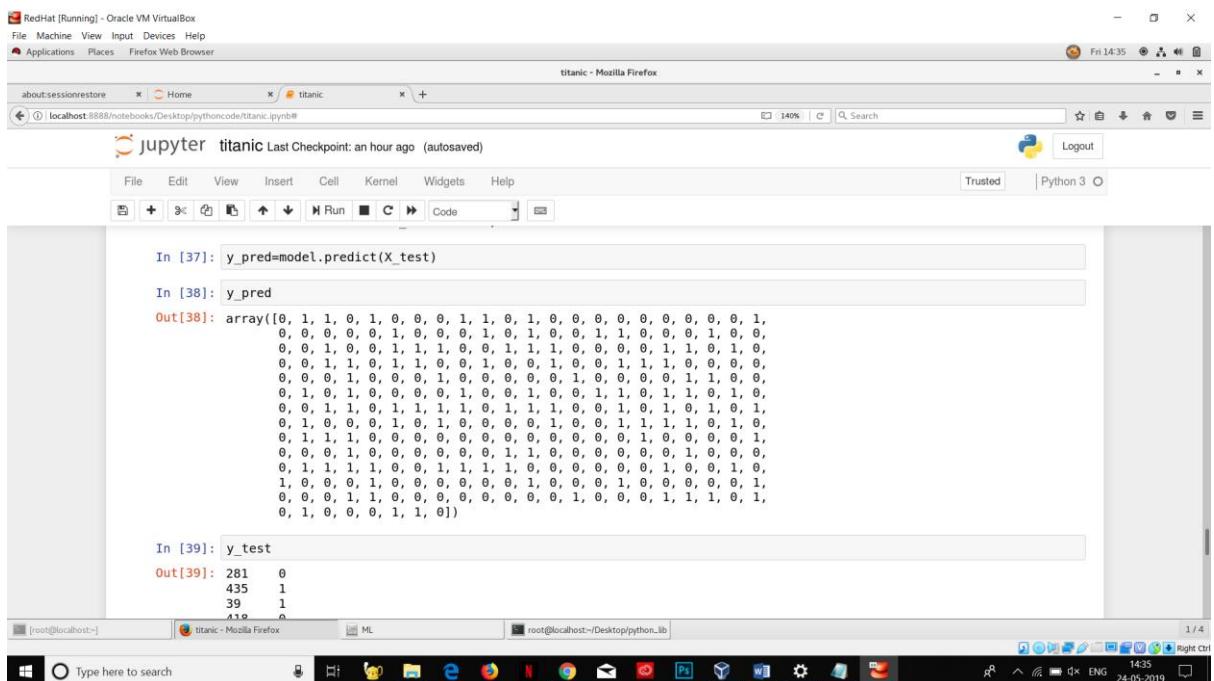


```
In [36]: model.fit(X_train,y_train)
/usr/local/lib64/python3.6/site-packages/sklearn/linear_model/logistic.py:432: FutureWarning: Default solver will be changed to 'lbfgs' in 0.22. Specify a solver to silence this warning.
FutureWarning)

Out[36]: LogisticRegression(C=1.0, class_weight=None, dual=False, fit_intercept=True,
intercept_scaling=1, l1_ratio=None, max_iter=100,
multi_class='warn', n_jobs=None, penalty='l2',
random_state=None, solver='warn', tol=0.0001, verbose=0,
warm_start=False)

In [37]: y_pred=model.predict(X_test)

In [38]: y_pred
Out[38]: array([0, 1, 1, 0, 1, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1,
0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 0, 1, 1, 0, 0, 1,
0, 0, 1, 0, 0, 1, 1, 1, 0, 0, 1, 1, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, 1, 0,
0, 0, 1, 1, 0, 1, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0,
```



```
In [37]: y_pred=model.predict(X_test)

In [38]: y_pred
Out[38]: array([0, 1, 1, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1,
0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0,
0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0,
```

```
In [39]: y_test
Out[39]: 281 0
          435 1
          39 1
          419 0
```

DEVOPS

Intelligent automation agile approach.

(Deliver operations through automation for any language instead of learning different commands for every OS)

Deliver Operations =Devops

Docker is a part of DevOps.

We will be studying about the tool Ansible in devops.

Cmd code(How to do) -> [Imperative language](#)

What to do -> [Declarative language](#)

RHCSA

VDO

Another way to make partition.

If you have a hardisk of 10GB you can make PV,GV and LV of 10GB.But **using VDO you can make a partition of 50GB ,100 GB in 10GB hardisk.**

This is called a **virtual partition**.

Thin provisioning -> Dynamic allocation

Thick provisioning -> Fixed allocation

yum install vdo

Use man vdo

```
Vdo create --name=vdo0 --device=/dev/sdb1 --vdoLogicalSize=10T
```

Copy syntax from examples at the end

Format and mount permanently

In vim/etc/fstab file write

```
/dev/mapper/mydisk      /mny/mydata      xfs      defaults,_netdev,x-
systemd.requires=vdo.service  0  0
```

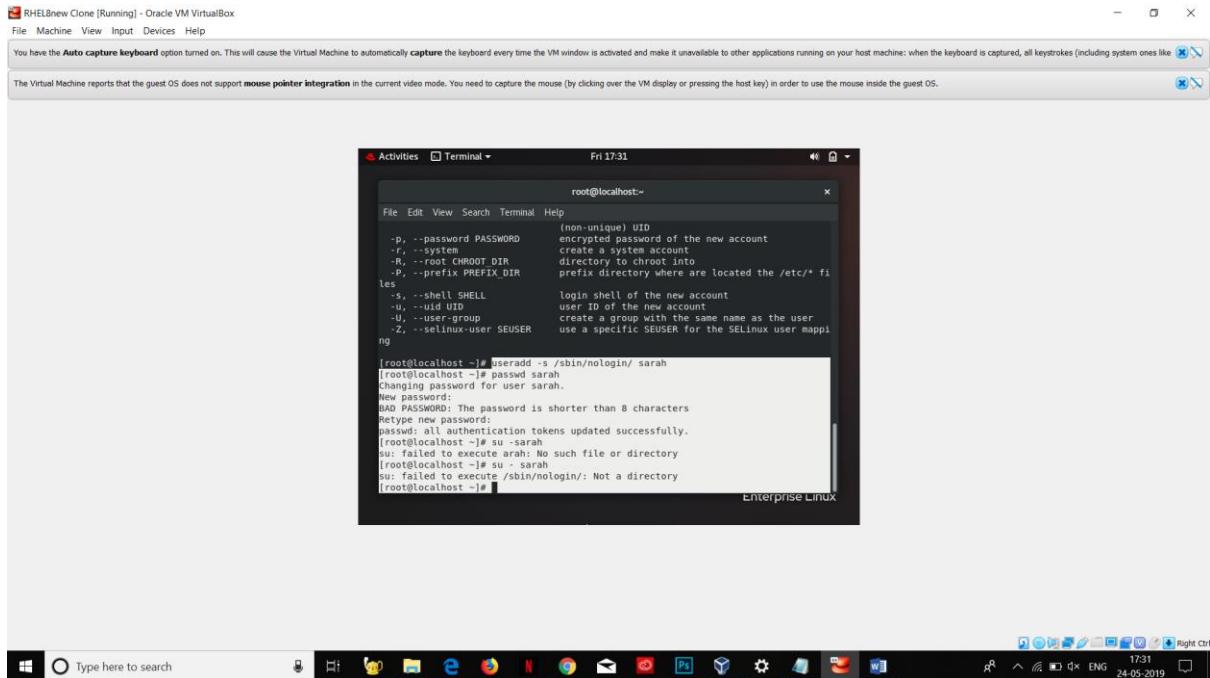
If it goes to maintenance mode :

Give root password

Go to vim /etc/fstab and remove or comment the last entry

Non interactive shell

User doesn't get access to terminal



NTP SERVER will be given make ntp server to sync time.

Yum install chrony

1)vim /etc/chrony.conf

(below iburst)

2)Server 192.168.0.254 iburst (IF THERE IS ANY OTHER SERVER THEN COMMENT IT)

3)timedatectl set-ntp yes (syncing time with ntp server instead of hardware clock)

4)systemctl restart chronyd

5)systemctl enable chronyd

To check chronyc sources -v

Uploading/sharing lots of files

Tar -c -f my.tar /d (-c for combining ,Archives all the files present in /d . Name of archive is my.tar)

Tar -x -f my.tar (-x for extracting)

Tar -c -z -f my1.tar.gz /e (-z compresses the file .There are two types of compression gzip(70%) and bzip(90%)

Tar -cjf my1.tar.bz /e (for bzip)

*-f should always be atleast followed by filename

MOUNTING DVD-YUM

Mkdir /dvd

mount /dev/cdrom /dvd

(Checking)cd /dvd

ls

SETUP FOR REDHAT EXAM

Base system is RedHat8

Two VMs are already installed (will be given which question to do in which VM)

BaseOS will be in GUI

CLI will be in VM

From terminal in BaseOS ,ssh

(Bring two cli and one gui. Do ssh from gui)

Systemctl restart nfs-server

Systemctl restart nfs-mountd

NOTE:-

****** MOUNTING PERMANENTLY ON START**

Manually mount in below

Vi /etc/rc.d/rc.local

DAY-13 (25/5)

STATIC IP

To connect devices within same network -> switch

To connect devices in different network -> router

Q.) Can devices with the following ip connect with each other

172.24.10.7 -> ip1

255.255.0.0 -> netmask

172.24.11.7 -> ip2

255.255.0.0 -> netmask

Do AND operation of ip and netmask and then check.

172.24.10.7 172.24.11.7

Ip addr (to see IP address)

Route -n -> shows routing IP table (we can get **Gateway's IP**)

To connect to different network:

We need 1)IP, 2)netmask and 3)gateway(gives IP of router) and 4)DNS (gives the ip addresses of all the websites)

Vim/etc/resolv.conf (Tells where the **DNS server** is and what its IP is)

There are two types of network config: 1)Auto(Dynamic through dhcp) 2)Manual static

In manual we have to provide all the 4 requirements to connect to different network.

RHCSA

STATIC IP

***nmcli connection add con-name IFNAME –ELS,ETH

Nmcli connection modify Wir(Press TAB)

Yum install net-tools

*Nmcli connection **show** (shows all connections. GREEN color indicates its connected.)

Ip addr

Nmcli connection add con-name ameerul ifname enp0s3 type Ethernet ip4 192.168.0.4 netmask 255.255.255.0 gw4 192.168.0.1 (Create new profile and give the network card ip address 192.168.0.4, our card type is Ethernet, give gateway as 192.168.0.1)

Note:-You can write 255.255.255.0 as /24 as given below

1)Nmcli connection add con-name ameerul ifname **enp0s3** type Ethernet ip4
192.168.0.4/24 gw4 192.168.0.1

2)Nmcli connection modify **lw** ipv4.dns 8.8.4.4 (giving dns)

3)Nmcli connection up **lw** (To update that we have added new profile)

4)Nmcli connection modify **lw** autoconnect yes (Our profile **lw** will remain on after reboot also)

5)Nmcli connection modify **enp0s3** autoconnect no (This profile wont be turned on)

PERMISSIONS(chmod)

Actions that can be performed in a File:

Read, write, execute

Directory:

ls(read), rm/touch(write), Cd(execute),

su – harry

cd / or cd ..

ls –l (to see list of folders along with their permissions) (Look at LAST 3 Blanks)

First 2 blanks ->**user** Second 2 blanks -> **group** Third 3 blanks->**other**)

ls –l /etc/passwd (to see a specific file)

chmod o+r /root/

chmod o+w /root/

To remove permissions:-

Login root

Chmod o-rwx /root

*Only the owner can change the permissions of its own file

Chown harry /zz (To make harry the owner of /zz)

Groupadd lw (Creating a new group)

Usermod –G lw user1 (Adding already existing member to the group)

Usermod –G lw user2

Useradd -G lw user3 (Adding a new member to group)

Chgrp lw /share (Attach group with the folder share)

Chmod g+rwx /share/ (now edit permissions to share for group)

Q.) create group named tech. Add user1 and user2. Give rwx permission to group. make user vimal the owner

r->4

w->2

x->1

rw->6

chmod 570 /share1 (gives rx to user ,rwx to group ,--- to other)

or **chmod o+rwx /hello** (for others)

chmod g+rwx /hello (group)

setfacl -m u:jane:rwx /hello (for individual user)

chmod 7xx /hello (for user)

SPECIAL PERMISSION

.

Chmod _490

4(SUID) – normal user inherits owner's rights

2 (SGID) group inherits owner's rights

1-> Sticky bit Member of group cannot edit other's file but can only read

Vim /new.txt

Ls -l /new.txt

Setfacl -m u:harry:r /new.txt

Setfacl -m u:user1:rwx /new.txt

Getfacl /new.txt

Setfacl -m u:user1:7 /new.txt

Setfacl -m o::0 /new.txt (others get no permissions)

```
Setfacl -m o::r /new.txt
```

```
Getfacl /new.txt
```

RHCSA

Q.)Find all the files created by jane and copy them to /root/found

```
Useradd -M jane (-M user jane is created without home directories)
```

```
Passwd jane
```

```
Su - jane
```

```
*Touch /tmp/hi.txt
```

```
Touch /var/temp/hello
```

```
Exit
```

```
Find / -user jane
```

```
Find /home/jack -name "*.*"
```

```
Mkdir -p /root/found/
```

```
Cp /var/spool/mail/jane /root/found/
```

```
Cp /tmp/hi /root/found/
```

q.) change hostname

```
hostnamectl set-hostname vimal.lw.com
```

```
hostname(to check)
```

1.)Activities ->Exam view

2.) read the instructions for 10mins.Take a pen with you and note all the info(ip ,hostname and password) in paper

3)click on VMControl (two machines will be available).Click on one and you'll get options like start,stop,reboot and console.

4.)password break for one of them

5.)make yum in both systems

6.)configure network in one (static IP)

***Nmcli connection modify Wi(Press TAB)

Network card will mostly be ens03

System2 will have partition questions. It will have 3 hard disk . Dont touch vda . Vdb (will already have a partition in it) , Use vdb for swap and lvm. Vdc will only be used for vdo

Leftctrl+shift ++ -> to increase font

***Reboot system after lvm and every partition question.

Maintenance mode troubleshooting (VDO,LVextend,lvm,swap)

VM can be reset if it goes in maintenance mode in VM console.

7.)ssh -l root 192.168.0.4

Ssh -l root 192.168.0.9

RHCSA

Q.)PERMISSIONS

Create Natasha and harry user whose secondary group will be manager and their password should be marcopol0.

Create sarah user who should have not get interactive shell and password is as above

Create directory adm in /common

Also files created in this directory whose group is automatically set to manager

The file created in this directory will be altered by user of manager group but not by either user & other users cannot read, write, execute and delete files in this directory.

ANS:

1.)Groupadd manager

Useradd -G manager natasha

Useradd -G manager harry

2.)useradd -s /sbin/nologin/ sarah

3.) mkdir /common

Mkdir /common/adm

4.)chgrp manager /common/adm

5.)chmod 2770 /common/adm

```

Prctice [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
FILE HOME INSERT DESIGN PAGE LAYOUT REFERENCES MAILINGS REVIEW VIEW
AaBbCcDd AaBbCcDd AaBbCcCr AaBbCcCc AaBbCcA AaBbCcD AaBbCcDd AaBbCcDd AaBbCcDc AaBbCcDd
Normal No Spac... Heading 1 Heading 2 Title Subtitle Subtle Em... Emphasis Intense E... Strong Quote
Styles Find Replace Select
7. jsh -> root 192.168.0.9
Sah -> root 192.168.0.9
RHCSA
Q.)PERMISSIONS
Create Natasha and harry user whose secondary group will be manager and their password should be marcopolo.
Create sarah user who should have not get interactive shell and password is as above
Create directory adm in /common
Also files created in this directory whose group is automatically set to manager
The file created in this directory will be altered by user of manager group but not by either user & other users cannot read,write,execute and delete files in this directory.
ANS:
1.)groupadd manager
Useradd -G manager natasha
Useradd -G manager harry
2.)useradd -s /sbin/nologin sarah
3.)mkdir /common
Mkdir /common/adm
4.)chgrp manager /common/adm
5.)chmod 2770 /common/adm
WebsERVER
configure web page for your system and it should be browsable through port 82
document root will be default
download web page from http://training.ift.example.com/com/content/station.html
rename that page to index.html
page should be accessible through url http://servera.lab.example.com/index.html:82

```

Webserver

configure web page for your system and it should be browsable through port 82

document root will be default

download web page from <http://training.ift.example.com/com/content/station.html>

rename that page to index.html

page should be accessible through url `http://servera.lab.example.com/index.html:82`

ANS:

1)Vi /etc/httpd/conf/httpd.conf

Semanage port -a -t http_port_t -p tcp 82

Systemctl restart httpd

Systemctl enable httpd

Systemctl restart firewalld

Systemctl enable firewalld

Curl

2)(curl 192.168.43.146:**82**/hello.html > index.html

Rm -r hello.html)

Curl <http://training.ift.example.com/com/content/station.html> > index.html

Rename by moving

DAY 13 (26/5)

ANSIBLE

DevOps

There are many nodes. There is one controller node. One manager node which manages programs.

Yum install ansible -y

DAY-15

(28/5)

DEEP LEARNING

Residual = $Y(\text{real}) - Y(\text{pred})$ (Lesser the residual value, the better)

Np.linspace(0,50) -> (breaks the data into 50 parts)

Plt.legend -> shows info about plot on the right side.

MACHINE LEARNING (FOR FACE RECOGNIZATION)

You need data to work on. Give X and y.

LBPH is an algorithm/model used for recognising face.

Pip3.6 install

Convert to grayscale so it can be processed easily

Take 100 samples pics

Resize photo into 200x200

Predict

DAY -18

(31/5)

SaaS(Software as a service)

To run graphics we need to enable Xwindowforwarding.

Committing a docker:- yum installed,firefox installed and saving it for immediate use in future.

SaaS through docker:-

QUESTION :- (docker inside VM.Launch firefox inside docker.Different docker for every user)

STEP1:-

Docker images

Docker run -it -v /run/media/root/RHEL-7.5\ Server.x86_64:/dvd --name myfirefox centos

Cd /etc/yum.repos.d/

Rm - f *

Vi dvd.repo (baseurl=file:///dvd)

Yum install firefox -y

Yum install net-tools -y

Ifconfig

Rpm - q firefox (to check for firefox)

Yum install openssh-server -y (for ssh in docker)

Sshd-keygen

/usr/sbin/sshd (starting server)

Netstat -tnlp (to check if its running, port 22)

Vi /root/.bashrc (**TO MAKE A SERVICE PERMANENT IN DOCKER**)

(Go inside this and write /usr/sbin/sshd -f SPACE /etc/ssh/sshd_config in last line to make ssh permanent)

Passwd root (giving password to root so that other user can login)

Make a clone of this OS's copy (COMMIT) .A new customised docker image is created

Docker commit myfirefox firefox_image:v1

Docker run -it firefox_image:v1 (running saved image)

Cd /etc/ssh/

Ls (checking for ssh)

Note:- if name is not given to docker in docker run -it then we will have to use the container ID.

Ex:- docker run -t firefox_image:v1

Docker commit 39a12124124546 firefox_image:v2

Dbus-uuidgen > /etc/machine-id

Rpm -q xorg-x11-xauth

Yum install xorg-x11

Dbus-uuidegen > /etc/machine-id

Docker rm vimaluser (to remove user)

Docker run

STEP 2:-

Now open new terminal

Ssh -X -l root 172.17.0.2 firefox

(Rm /root/.ssh/known_hosts)

For different users to use firefox in different OS

Docker run -it vimal firefox_saas:v1

(After closing reopen by docker start vimal)

Docker run -it krish firefox_saas:v1

Docker ps-a

LAUNCHING A WEB SERVER THROUGH ANSIBLE

Ansible is a tool through which you can configure multiple systems. This can be done through commands or playbooks

Install httpd , Restart httpd, enable httpd , stop firewalld, disable firewalld

Ansible-playbook

Open playbook through yml extension

There is a list in playbook

DAY 20

2/6

docker -dit web_image:v1

docker inspect OS ID or NAME (To know info about the os)

cd /proc

cat partitions (shows the partitions in the system)

pgrep firefox (to get the process ID of firefox)

cd 6613

every process is linked(mounted) with the "/" folder

docker doesn't start a new OS , it starts a new bash shell. Docker is just a process

CLOSE DOCKER BY:-

ps -aux | grep bash

kill -9 7267 (process no)

OPEN DOCKER BY

Cd /proc/7899

Cd root/ (goes to "/" of docker) (You can check files created in docker here)

Root/.bashrc

If docker doesn't run in bash (that's why file isn't running and not becoming permanent using dit)

MAKING IT RUN

Docker history centos

Replace /bin/bash with webserver by creating a customised image

CREATING YOUR OWN CUSTOMISED IMAGE USING DOCKERFILE

Mkdir /mydocker_code

Cd /docker_code

Vim Dockerfile(FIXED NAME)

FROM centos

(because baseimage is centos)

CMD /usr/bin/date (by default instead of bash its date. OS will work in date command folder)

Docked build -t vimal_img:v1 . (. -> current folder because we are already in the folder)

Docker images | grep vimal (to check if vimal image is made)

Docker run -it vimal_image:v1

OS will be launched inside date command. OS will work as long as the process works.

Making webserver permanent in detached version of docker

FROM web_image:V1

CMD /usr/sbin/httpd

Docker build -t web_image1:v1

Docker run -t web_image1:v1

TO MAKE IT KEEP RUNNING till we close:-

Systemctl status httpd

Vim /usr/lib/system/system/http.service

Make changes (/usr/sbin/httpd -> /usr/sbin/httpd -DFOREGROUND

DAY21

3/6

Pinging from one docker to another

AWS

Root/admin can use any service

User can use only ec2

Make a new user :-

Go to services->security->iam

Dashboard->users->add user

Username

Select AWS acces(imp) :- 1) Login through website(aws web console) OR 2)through CLI (install commands first)

OR 3)Ansible Programming (through python by installing a separate module)

Select both

Username and password doesn't work in cli or programming. You have to use [access key](#) instead of username and [secret key](#) instead of password.

Set permissions:

After logging in what privileges are to be given is decide by auth

Click on [attach existing policies](#).

In it ,Search for power and give [power access user](#).

COPY and store the secret access key

Created user doesn't have permission for billing service.

DEEP LEARNING

Guess neurons number (3 layers ,5 neurons generally)

More neurons and hidden layers doesn't necessarily mean less loss

Sequential model uses feed forward

In epoch back propagation happens and we update w and b values.

After getting trained some neurons go dead

Optimisation removes these neurons

Ansible -29/5

DAY 22

4/6

SOCKET PROGRAMMING

(In ssh we run the command here and output is in our system only.HERE we can get output in the other system)

[Python distribution](#)- complete package of python with pip and almost all libraries

Ex:- Anaconda

Always client connects to server

CLIENT(WINDOWS)

Open cmd in windows and type “jupyter notebook”

Import socket

S=socket.socket()

s.connect("192.34.0.102", 1234)

cmd=input("enter your command:")

s.send("hello guys").encode() OR s.send(date).encode()

s.recv(50) (waiting for data from client) (20-< length of string you want to print)

If “date” in cmd:

s.send("date".encode())

print(s.recv(50))

while True:

cmd=input("enter your command:")

s.send("hello guys").encode() OR s.send(date).encode()

s.recv(50) (waiting for data from client) (20-< length of string you want to print)

SERVER(LINUX)

Vim in.py

Import socket

Import subprocess as sp

S=socket.socket()

PortNumberameerul=1234

Ipserverameerul=192.168.0.104

```
s.bind(ipserverAmeerul,Portnumberameerul)           (bind takes input in tuples)
s.listen(1234)

c1,addr=s.accept()      (accept keeps the program running till it doesn't connect and
server gets the IP of the client )

while True:

INDENTATION STARTS

in c-> client information    addr-> ip address

#clientip=addr[0]

#print("hey client I know you : {}.format(clientip))

c1.send(out.encode())


data=c1.recv(20)          (input takes input from keyboard,recv takes input from network
packet)

print(n)

out=sp.getoutput(data.decode())  (decode is for converting the byte to string)

#Print (out)

#print("Enter the data to be sent to client : " , end ='')

#se=input()

"""

c1.close()

s.close()

INDENT ENDS

#input() (to make the program keep running)
```

port number is equal to program name(in.py).one program can get only one port number.the port given to the program must be free.

IP and portnumber should be given for the data to go to some other system.IP and portnumber is called path.Technically combination of IP and portnumber is called **socket**.

IP:portnumber -> to connect to it

Help(s.recv) -> to get manual for recv

Netstat -tnlp | grep 1234 ->to check for the python program status

In s.recv(50) ,till the buffer length isn't filled the program wont proceed

Timeout issue in socket ->"Address already in use" (wait for 20 seconds)

Checking for a word in string in python :

X="Can you please run date command for me"

"time" in x

>>False

"date" in x

>>True

DAY 23

5/6

Instead of python36 /root/Desktop

Go to desktop and [./hello.py](#)

s.socopt(REUSADR1) -> use of this is to use to reuse the address in the socket

ipconfig -> to check ip address in cmd

data=input("chat :") -> shows chat message when asking for input

s.send("cal".encode()) -> cal is sent in byte format

pip install pyttsx3 -> type in cmd to install python library in windows

speaker.pyttsx.init() -> connects to speaker

speaker.say("enter your requirement")

speaker.runAndWait() ->

Python modules:

For eye ->cv2

speaker-pyttsx

mic –PyAudio , portaudio , speechrecognition

[conda install PyAudio](#)

[pip install speechrecognition](#)

At client :

```
import PyAudio  
CHUNK=1024 (size per sec)  
CHANNELS=1 (channel for microphone)  
FORMAT =pyaudio.paInt16 (we'll use this format)  
RATE =48000 (speed of sample per second)  
P = pyaudio.PyAudio() (connecting python to mic)  
p.open ( by default we tell one mic things given below)  
format=FORMAT  
channels=CHANNELS  
rate  
frames per buffer=CHUNK  
input=True  
output =True
```

```
import speech_recognition as sr  
mic=sr.Microphone() (listen to data through mic)  
rec=sr.Recognizer() (This takes the data from mic and takes to google)  
with mic as source:  
    print("say : ")  
    audio= rec.listen(source) (listen to voice through source)  
    rec.recognize_google(audio) ->converts the voice to text
```

AR

Unity builds the android SDK after we give it the path.

File ->Build settings -> Android platform ->Switch platform

Edit ->preferences ->external tools->browse path

File ->Build settings ->Player settings ->

DAY-24

6/6

LINUX

sudo -> can give extra privileges to any user.

Vim /etc/sudoers

Go to root ALL and write below

jack2 ALL=(ALL) /usr/sbin/useradd,yum,fdisk(power given to jack2 for adding users,yum and fdisk)

jack2 ALL=(ALL) ALL

/usr/sbin/useradd is got from “which useradd” command

su – jack2

sudo useradd tt (logged in as jack but in background root powers are used.Called as privileges escalation.system thinks root is running it)

ssh -t -l jack2 192.168.0.104 sudo /usr/sbin/useradd tt334

(-t is for pseudo terminal allocation)

Date; cal (; is used for multiple commands in a single line)

ssh 192.168.0.104 ‘date; touch /hhh1.txt’

ssh 192.168.0.104 date > /h.txt (to save date output in h.txt)

ssh 192.168.0.104 ‘date > /h1.txt’

NOTE:- ‘ ’ is used to store the output in the other system

Without ‘ ’,the output is stored in the same system.

ANSIBLE

Controller node -> where playbook is written

Managed node -> where the configuration is run

Writing the ip of managed node here:-

Vim /etc/ansible/hosts

Ansible all --list-hosts

OR

Ssh-keygen

Ssh-copy id <root@192.168.0.5>

Ansible all -m command -a date

Ansible all -m command -a "useradd hi123"

Vim /etc/ansible/ansible.cfg

Line 62 ,uncomment host key checking

Line 98 , remote_user = harry2

Ssh-copy-id <harry@192.168.0.5>

Vim /etc/sudoers

Harry2 ALL=(ALL) NOPASSWD: ALL

Ansible all -m command -a sudo "sudo /usr/sbin/useradd tom123"

Better way:-

Do keygen thing and copy

Vim /etc/ansible/ansible.cfg

Line 98 , remote_user = harry2

Line 323 privilege escalation

Uncomment become=True ,become_method=sudo and become_user=root

Ansible all -m command -a "usr/sbin/useradd tom1234"

Ansible all -m command -a date & Ansible all -a date is same (because **by default command module is only used**)

Variables made from before are called system or environmental variables like \$SHELL

Ping localhost(pings own system)

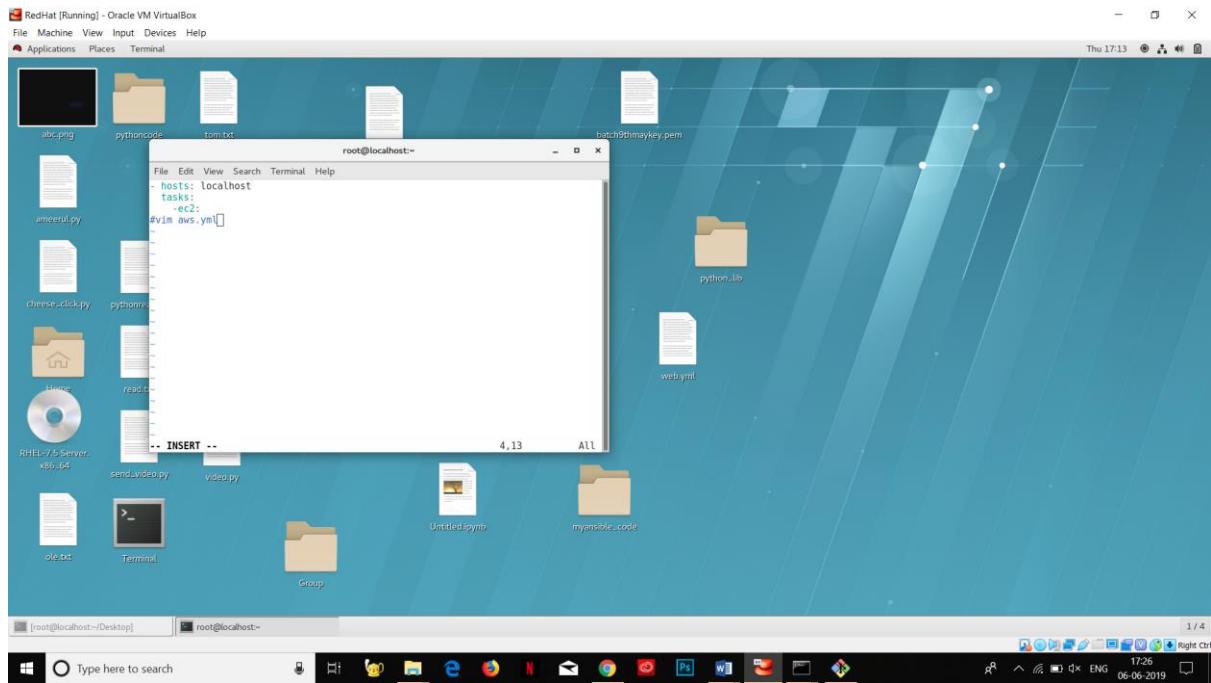
Ssh localhost(ssh own system)

In ansible inventory(Vim /etc/ansible/hosts) write "localhost"

Vim /etc/ansible/ansible.cfg

Ssh-copy-id root@localhost

Ansible all -m command -a date



Requirement:-Some tasks to be run on system1 and some on system2

Grouping in ansible

Find ipaddress of the systems

Vim /etc/ansible/hosts(Put ip in inventory file)

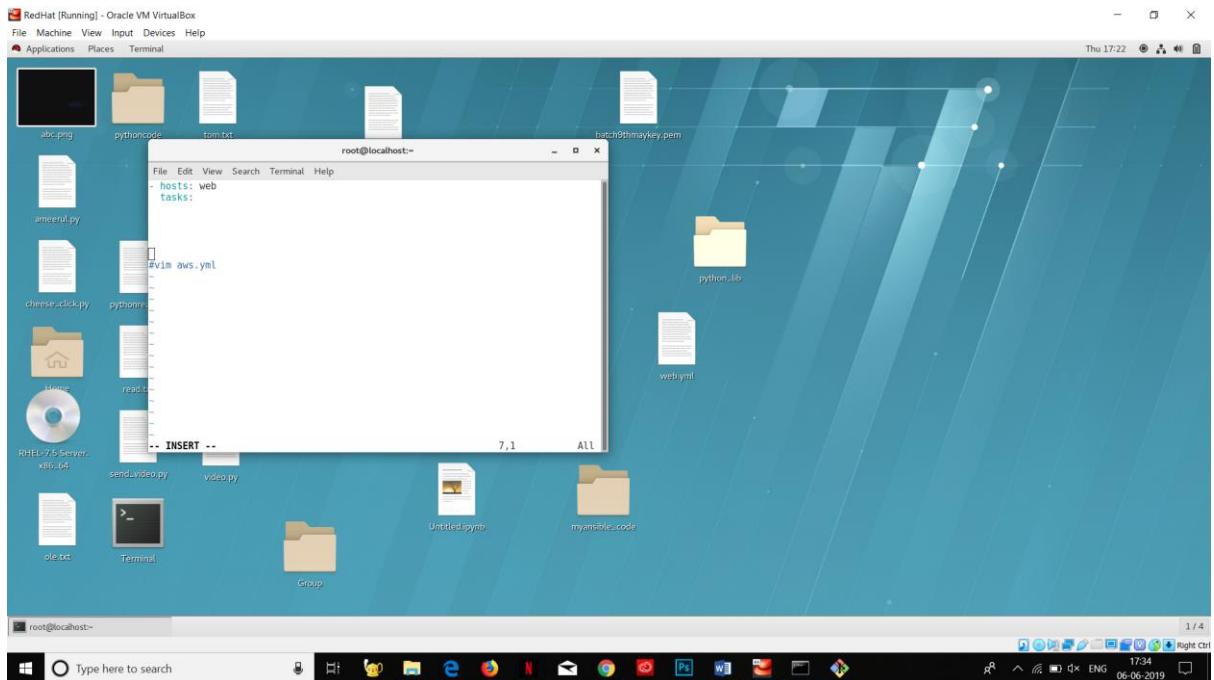
(** to create a group write [group1] above a bunch of IP ADDRESSES

Ansible group1 - -list-hosts -> to see all the ip address in the group1)

Ssh-copy-id <root@192.168.0.5>

ansible 192.168.0.8 -m command -a date (instead of all systems ,date command is run only in one system)

ansible group1 -m command -a date (date command is run in the group)



CLOUD COMPUTING

There are three types of storage :-

BLOCK

Partitioning must be done

FILE

Storage from google drive

OBJECT

NFS Protocol

http/https

AWS –Biggest public cloud -EBS PROTOCOL

Openstack – biggest and famous private cloud- CINDER

Using AWS S3

Sign in to console->Services->S3

S3 uses http .Folder is called a bucket

Create a new bucket

Name -> test (must be unique in the total region)

Region->Asia pacific Mumbai ->Next

Upload->add files

Share by clicking on the uploaded file and send object URL

BUT FIRST, Click on bucket and click Edit block public access settings , don't tick anything just save and confirm.

Click on file and click make public.

NATURAL LANGUAGE PROCESSING(ML MACHINE LEARNING)

Create a list x

S="hello world"

s.split() ->splits the string according to the space

=> hello , world

A= "this:is:you"

A.split(":") ->splits acc to :

Python library we will be using is spacy but first .Yum install gcc ,

DOWNLOAD python3-rpm-macros from GOOGLE(BINARY PACKAGE),

Rpm –ivh python3-rpm-macros(in terminal)

yum install python-devel ,pip3.6 install spacy(in python_lib)

DOCKER THROUGH ANSIBLE

Make playbook

Vim /etc/ansible/hosts (write IP address anywhere)

Ssh-keygen

Ssh-copy-id ipaddress

```
PRTHONPATH: "/usr/lib/python2.7/site-packages"
SHELL: /bin/bash
PORTS: 5000:5000
[...]
try: true
interactive: true
state: present
image: "centos"
name: "devk1shn1"
dockerr_container:
name: container
state: started
name: dockerd
service:
state: present
name: "dockerd"
package:
tasks:
hosts: all
[...]
```

DAY -25

7/6

Big Data

File is broken down into many parts and then stored.

Horizontal scaling is adding more storage by adding more computers.

Issues :-Volume(Where to store so much data) ,Velocity(Data keeps coming at fast rate)

Master-slave model:- One (**namenode**) computer takes the file from **client** and breaks it down to parts and tells the other 3 slave computers(**datanode**) to store.

These 4 computers form a cluster.Hadoop/glustefs/ceph /aws s3 is used to manage the cluster.

HDFS protocol is used.

Hadoop is built on top of Java.So we need to install **ORACLE'S JDK(Hotspot)**

Install **HADOOP version 1**

Copy hadoop1 and jdk8 from share-> software through WINSCP in desktop

Go to Desktop in terminal and type “**rpm -i -v -h jdk**(TAB)

i-> install ,v-> verbos(display) h->hashes (shows percentage)

export JAVA_HOME=/usr/java/jdk1.8.0_171-amd64/ (JAVA_HOME is an already existing variable.Give it new java's path)

export PATH=/usr/java/jdk1.8.0_171-amd64/bin:\$PATH

Open vim /root/.bashrc and write atlast **export JAVA_HOME=/usr/java/jdk1.8.0_171-amd64/** and in next line **export PATH=/usr/java/jdk1.8.0_171-amd64/bin:\$PATH**

(Making the variable permanent)

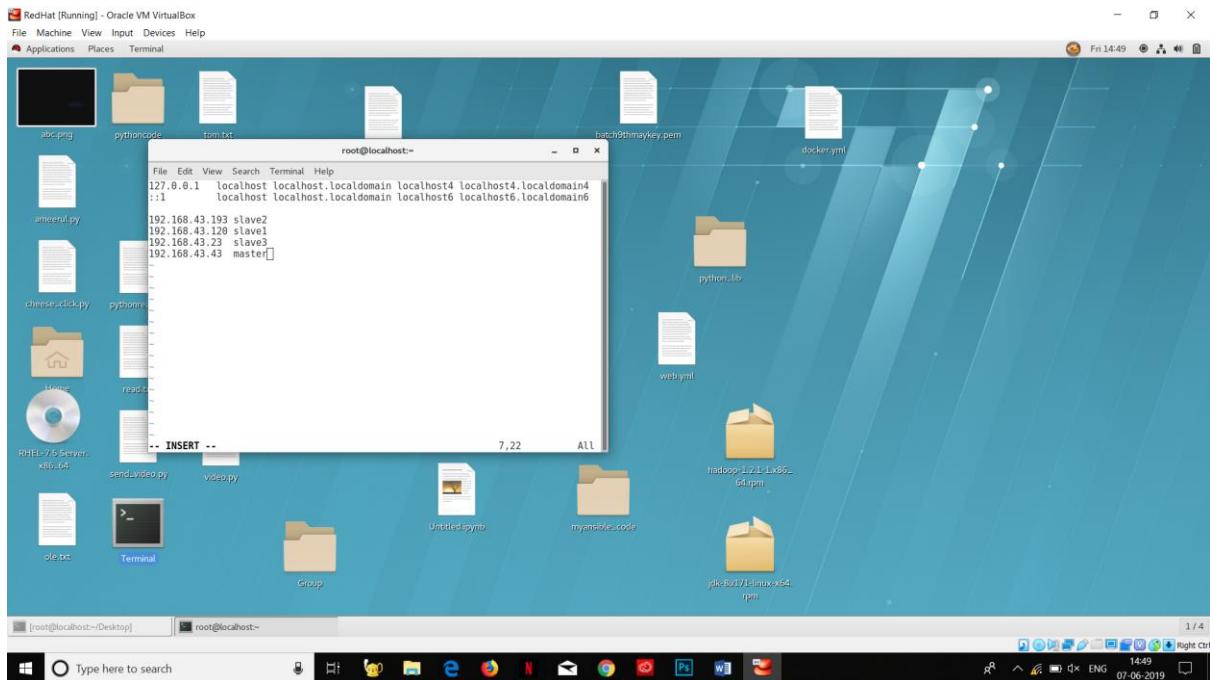
Now install hadoop from desktop

Rpm -ivh hadoop(TAB) --force

Hostnamectl set-hostname slave1

Exec bash (to show hostname without closing terminal)

Vim /etc/hosts



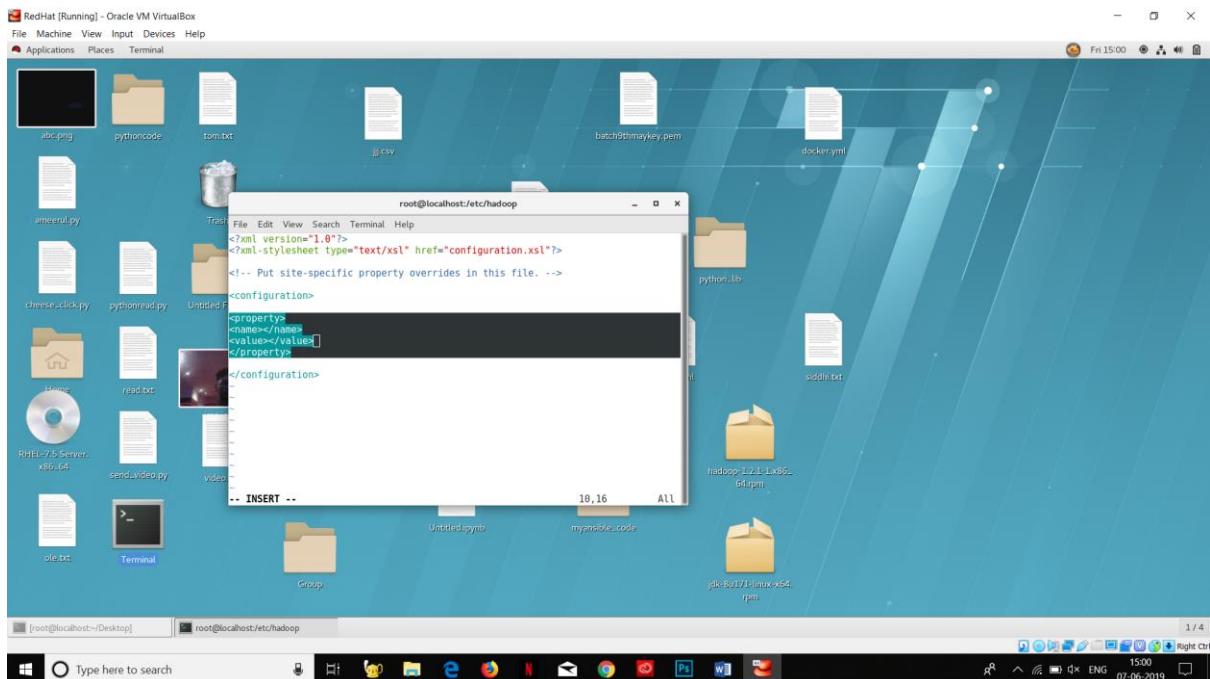
Now you can ping through just “**ping slave1**”

You can just make in one and do scp

All hadoop files are in **cd/etc/hadoop**

Vim hdfs-site.xml (Hadoop configuration file)

Write this in between <configuration> and </configuration>



SLAVE:

Write “**dfs.data.dir**” in between <name> and </name> if you are slave

Write “/**data**” in between <value> and </value> if you are slave

Values are stored in data folder .FIRST MAKE /data

Can do scp in slave 2 through “scp hdfs-site.xml 192.168.0.5:/etc/hadoop/hdfs-site.xml

BOTH IN MASTER AND SLAVE:

Vim **core-site.xml** (namenode entry is always in this)

Write “**fs.default.name**” in between <name> and </name>

Write “**hdfs://IP ADDRESS OF MASTER:9001**” in between <value> and </value>

MASTER:

mkdir /master if you are master

cd /etc/hadoop

Write “**dfs.name.dir**” in between <name> and </name>

Write “/**master**” in between <value> and </value>

Iptables -F

hadoop namenode –format (only in master)

hadoop-daemon.sh start namenode

jps (to check if above command is successful)

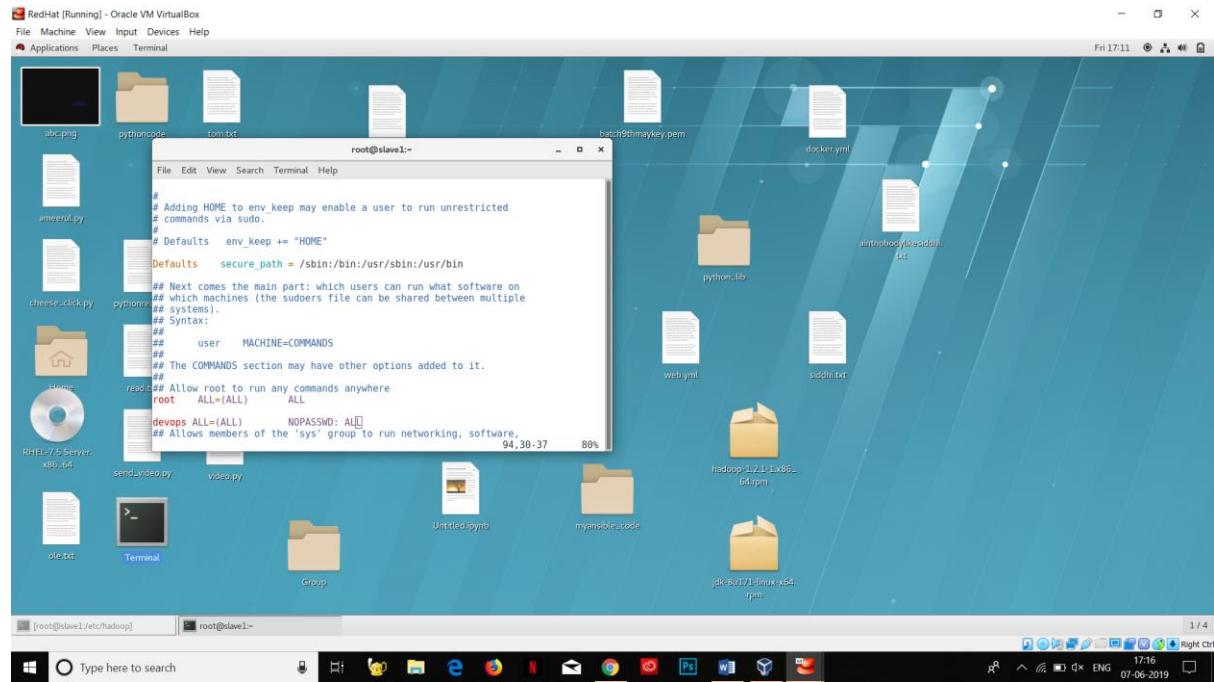
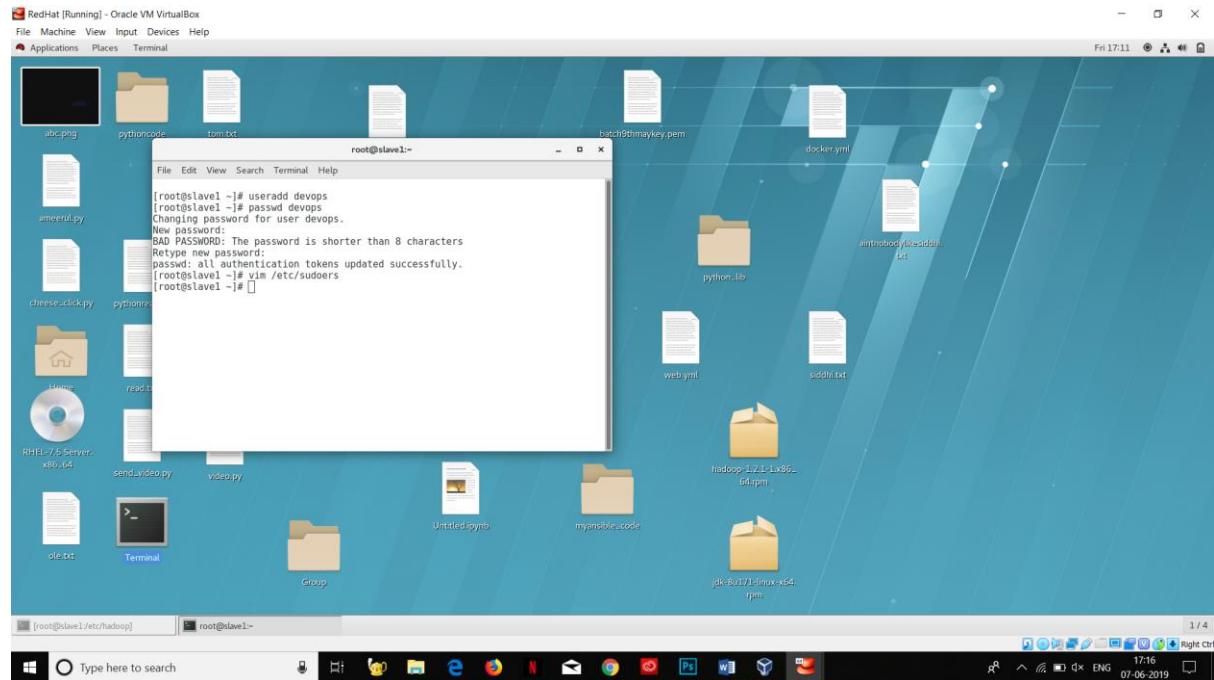
hadoop-daemon.sh start datanode (in slave)

jps

hadoop dfsadmin -report

ANSIBLE (7/6)

System(Where stuff will be executed)



In other system(where we make playbook)

Useradd myuser

Passwd myuser

Ansible-doc copy

We do cp so that myuser can get access to the config file

Vim hosts(new host file create In ws)

Playbook runs only where there is ansible.cfg

Vars for variable

Vars_prompt:

-name:y (to take input)

Private:no (input is visible)

Prompt:"enter your name"

- Is used because you can create multiple variables.- is used to show list.and below – are the features of it.

Debug is like print command

Name is for giving name to the task

NLP(7/6)

IOT ARDUINO (7/6)

Day-26

8/6

HADOOP

Problems in cluster:

Rm -rf /data

Mkdir /data

Hadoop-daemon.sh start datanode

To check cluster status:-

Go to http://master_IP:50070

How many pieces is the file broken down into?

Block size by default is 64MB.

No of blocks = filesize/blocksize

Client:-

Hadoop fs (to connect with hadoop filesystem)

Hadoop fs -mkdir /dir (directory is made in hadoop cluster)

Hadoop fs -ls / (to list the existing files in the filesystem)

Main root directory of hadoop is /

Hadoop fs -touchz /my.txt (to make empty file in hadoop)

Hadoop fs -put f.txt / (uploading f.txt)

HOW TO KNOW IF SOMEONE IS PINGING YOU(Read network packet)

tcpdump -l enp0s3 -n (to know how many packets are going and coming)

tcpdump -l enp0s3 tcp -n (only tcp)

tcpdump -l enp0s3 9001 -n (only namenode's)

tcpdump -l enp0s3 9001 -n -X (-X opens and shows the data being sent in the packet)

UDP

- speed.

-Calls use UDP

-UDP ignores in case of packet drop

-connection oriented

TCP

- reliability.

-Data is kept sending till it is sent.

- tcp is slow

-connection less

HADOOP

Files get saved parallel

Process:- Client only knows about master not about slave.

So client gets IP of slave from the master.

ANSIBLE (8/6) see docs

Ansible Vault

Only the person with password can open the yml file

`ansible-vault create mysecure.yml`

(new file called mysecure.yml is created and it is encrypted)

`ansible-vault edit mysecure.yml (to open the created file)`

`ansible-playbook --ask-vault-pass mail.yml` (so that password for the encrypted file containing the variable is asked)

`copy` is just for blindly copying(use only for static files)

use `template` to account for variables also

jinja template (.j2)

MOCK setup :-

5vm clone

Yum(2 folders and 1 dvd)

Make user devops and give sudo power

Make ip static in all 5 systems

Make keygen and copy Id from one system to other all systems

Question:-

- 1)Make workspace (ws) in users home directory
- 2)Make inventory (Groups and users)
- 3)make group and users using ansible
- 4)upload a file using ansible through copy command
- 5)dynamic content copy (facts)
- 6)vault
- 7)copy file using template
- 8)configure webserver using firewall

DAY 27

9/6

Linux

Subprocess.getstatusoutput("date")

Exitcode=x[0]

Output=x[1]

WHEREAS getoutput ONLY gives output.

Echo \$? -> gives the exit code of the last executed command . (0 indicates the command has been successfully carried out)

If x[0]==0 (then it means the command has been executed successfully)

If you don't want stuff to be echoed back (hidden letters):

Import getpass (in python)

Password=getpass.getpass (" Enter your password")

FUNCTIONS IN PYTHON

Def lw:

Print("hi")

X=5

Print(x)

*This block of code will run only when we call it.

Def lw(y,z,i):

X=y+z

Print(y)

Print(z)

Print(i)

x=Lw(10,30,50)

```
print(x)  
(instead of using many variables we can use a list). * is for dynamic list
```

```
Def lw(*y):
```

```
    Print(y)
```

```
Lw(10,30,50,60,70)
```

```
Def lw():
```

```
    x=6+7
```

```
    Return x
```

```
With return
```

```
Dir(getpass) -> to get all the options available in the module
```

```
Import signal
```

```
signal.signal()
```

```
signal ctrl through ctrl+c (see docs 9/6)
```

FILE HANDLING (9/6)

```
Mkdir /f
```

```
Vim lw.txt
```

```
Python36
```

```
>>>x=open("/f/lw.txt")
```

```
>>>x.read()
```

```
Welcome to linuxworld
```

```
>>>x.read()
```

```
"" (empty this time)
```

```
x.seek(30,0) -> goes to line 30 from starting
```

```
x.tell() -> tells the position
```

```
x=open("/f/lw2.txt,mode ='w')
```

```
x.write('h  
i')
```

DAY 28 (10/6)

HADOOP

To make it permanent :- GO to vim /etc/rc.d/rc.local

iptables -F

hadoop-daemon.sh start namenode

chmod +x /etc/rc.d/rc.local

Sometimes hadoop-daemon.sh stop namenode may not work

Then kill processid (from jps)

To makes changes:-

IN CLIENT:-

Vim hdfs-site

```
<property>  
<name>dfs.block.size</name>  
<value> 64 </value>  
</property>
```

Vim hdfs-site

```
<property>  
<name>dfs.replication</name>      -> to change replication factor  
<value> 2 </value>  
</property>
```

Hadoop fs -Ddfs.replication=1 -put z6
.txt / → Individually change replication

Save (SEE DOCS 10/6)

Tcpdump -X -r mypacket.txt > f1.txt (in readable format r)

14/06

Webtech(see docs)

17/06

CAAS-CONTAINER AS A SERVICE (How to make your own cloud)

Yum install shellinabox

Yum list - > to list the softwares that you have

We don't have shell in a box so download rpm manually

Search in google "shellinabox rpm download" OR

Install software

Yum install epel-release (this will update yum with the path of softwares found online)

Yum install shellinabox

Configure

Vim /etc/sysconfig/shellinaboxd

Uncomment line18 with OPTS and edit with your IP ADDRESS.

Comment line9

Start service

Systemctl restart shellinaboxd

Systemctl enable shellinabox

Iptables –F

TO open cli in windows webrowser

Ipaddress:4200

Go to cd /var/www/html

Create data.html

Access it using ipaddress/data.html

Use Iframe tag to create a webpage inside a webpage

USE IFRAME TO show many VM's in a single webpage

IN CGI-BIN

In browser: Ipaddresss/cgi-bin/docker.py

Vim hello.py

#!/usr/bin/python36 (because it is a python file)

Import subprocess

Import cgi

Content-Type/text is used to tell that the text below it is just normal text and not python code

Print()

form = cgi.FieldStorage

Docker_name=form.getvalue("n")

Docker_image=form.getvalue("img")

Docker_run= "sudo docker -dit --name {} {}".format(docker_name, docker_image)

(n and img are from docker.html file FORM)

x = subprocess.getoutput(docker_run)

Print(x)

Chmod +x docker.py

Give sudoers power to apache

Vim /etc/selinux/config and put selinux = permissive

Docker images

Docker run -dit --name web1 centos:latest

Docker attach web1

#!/usr/bin/python36

Print("content-type: text/html")

Print()

Print("<h1> Hello<h1>")

Paste images in cgi-bin

For i in range(10):

```
Print (“<a href> click here {} </a>” .format(i))
```

For i in range(3)

```
print(“<img src='i.png' />”)
```

X.SPLIT("\n") is a list of the docker images with improper spacing

```
for i in x.split("\n"):
```

```
j=i.split()
```

```
print(j[0] + ":" + j[1])
```

19/6

CLOUD

IAAS

(cloud on our own system)

On VNC SERVER:-

Vnc server is used to transfer the WHOLE GUI

Yum install tigervcn-server -y

Useradd clouduser

Passwd clouduser

Cp [/lib/systemd/system/vncserver@.service](#) /etc/systemd/system/vncserver@:5.service

lin line 43 (Execstart) remove <USER> and write your user name(clouduser)

In PID File also change to clouduser

Su – clouduser

Vncserver (set password and exit from clouduser)

Systemctl daemon-reload

Systemctl restart vncserver@:5

Systemctl enable vncserver@:5

Netstat - tnlp | grep vnc (to check port number,in this case 5905)

Iptables –F

On client:

Yum install tigervnc

Vncviewer ipaddressofvncserver:5905

On webserver

yum install epel-release

yum install novnc

novnc-server - -vnc Ipaddressofvncserver:5905 (telling our webserver about our vnc server and port no.)

➔ this will give an url .Type this url in chrome but just replace hostname with ip of vncserver.

iptables –F

cd /var/www/html

vim os.html

<iframe width='75%' height='75%' src= '
<http://ipaddressofvncserver:6080/vnc.html?host=ipaddressserver&port=6080>' >/iframe>

DIFFERENT PORTS FOR DIFFERENT USERS

Useradd tom

Passwd tom

Cp </lib/systemd/system/vncserver@.service> </etc/systemd/system/vncserver@:1.service>

HERE 1 specifies the port.We can give unique port number to each user.

Su – tom

Vncserver

Exit

Systemctl daemon-reload

Systemctl restart vncserver@:1

vim </etc/systemd/system/vncserver@:5.service>

In line 43 (Execstart) remove <USER> and write your user name TOM

In PID File also change to TOM

So if any user COMES TO 5901 he will login to TOM user.

20/6

Kubernetes

Kube

Consider we have 3(multiple) VMs

The VM in which we have docker installed is called the **dockerhost**

Assume all these VMs are considered as a single VM.

One master(**controller**) takes care of many slaves(**minion**).

These nodes form a cluster. One slave isn't connected to the other as they are isolated/

Container is called a **Pod**

* Set unique hostname in every system and ping each other systems.

* Don't use systemctl stop firewalld in docker kubernetes system. Use iptables -F

* Install docker in all systems (yum install docker-ce)

*systemctl restart docker

Systemctl enable docker

In master:

Yum install kubeadm

Kubeadm init

Systemctl restart kubelet

Systemctl enable kubelet

(min required cpu's is 2. And disable swap)

Go to vim /etc/fstab and delete swap . Increase the number of CPU's from virtualbox by exiting vm first.

Kubeadm init --apiserver-advertise-address=IPADDRESS --kubernetes-version=v1.13.3

```
Kubeadm join ipaddressfmaster 6443 –token nwflxl.x8edufbanej17hny –discovery-token-ca-cert-hash  
sha256:62232580c33bf1fe170624e51da7bbfd6e688542c77e156923af807b603ed002
```

In Slave:

Yum install kubelet

Yum install kubeadm kubelet

```
Kubeadm join ipaddressofmaster: 6443 –token nwflxl.x8edufbanej17hny –discovery-token-ca-cert-hash
```

```
sha256:62232580c33bf1fe170624e51da7bbfd6e688542c77e156923af807b603ed002
```

Vim /etc/fstab

Swapoff –a

Again in master,

Kubectl get nodes

(to see the joined nodes after setting up other nodes)

Mkdir –p \$HOME/.kube

Sudo cp -l /etc/kubernetes/admin.conf \$HOME/.kube/config

Sudo chown \$(id -u):\$(id -g) \$HOME/.kube/config

IOT

Heat index gives the actual temperature felt by human beings taking into account humidity.

DHT22 -> Humidity sensor

USB works as a COM port when you connect arduino to it

The screenshot shows the Arduino IDE interface. The code in the main window is:

```

void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600); //Port RATE
}

void loop() {
  // put your main code here, to run repeatedly:
  Serial.println("hello world");
  delay(1000);
}

```

The Serial Monitor window titled "COM3" shows the output:

```

hello world

```

At the bottom of the Serial Monitor window, there are checkboxes for "Autoscroll" and "Show timestamp", and dropdown menus for "Newline", "9600 baud", and "Clear output".

The screenshot shows a Windows taskbar with a progress bar indicating "Done uploading". Below it, a message box displays memory usage details:

Sketch uses 1642 bytes (5%) of program storage space. Maximum is 32256 bytes.
Global variables use 200 bytes (5%) of dynamic memory, leaving 1848 bytes for local variables. Maximum is 2048 bytes.

At the bottom right, the status bar shows "Arduino/Genuino Uno on COM3", the date "20-06-2019", and the time "17:28".

Right arrow key to upload

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Usermod –L krish1

Usermod –U krish1 (to unlock account)

CNN (Convolution neural networks)

See docs

Computer vision using DL

Kernel/feature filtering : we take a few imp features of the object

What should be the box size for filtering out the features?

Stride is the amount of space that you want to overlap boxes with

We are using 3x3 feature detector

In cnn relu activation function is used.

Advanced models in cnn do convolution+relu along with pooling n number of times

Only first layer is given input.The second layer automatically takes input from the first layer.

