

PRACTICAL NO. 1

Aim :- To learn Open Source operating System.

- a) learn any open source operating system of your choice linux, android, free BSD etc.

linux is a family of open source unix like operating system based on September 17, 1991, by Linus Torvalds. popular linux distributing included debian, fedora and ubuntu.

Here are Commercial distributing of linux to such as red hat enterprise linux and just linux enterprise server.

- b) we are going to install the widely know distributed of in linux (UBUNTU)

Step 1 :- Load the iso file in bootable cloning on the optical drive.

Step 2 :- Boot up the machine it will prompt with two option click on install ubuntu.

Step 3 :- It will ask to configure the keyword layout.

Step 4 :- It will ask to do Configure related to the updates.

Step 5 :- It will ask you entered the location
Step 6 :- wait for it is install and load
the required files.

- * Identify the unique feature of the OS your choice is (Ubuntu)
 - i) Easy to install
 - ii) Good support for hardware and easy to install points network
 - iii) Easy to launch memory used application from the taskbar
 - iv) Strong kernel architecture.

- (a) Install your choice of Linux distribution e.g. Ubuntu, fedora, Debian.
- b) Customize desktop environment by changing different default option like changing default ScreenSavers, background, themes.

Accessing Appearance Settings

- To access Appearance Settings click on user menu of the top right corner.

the top menu bar and select system settings

- A window will pop-up with all settings divided into personal, Hardware and System option icons. Let's first select the Appearance icon.
- * changing wallpaper picture.
 - on the left side of Background part, you can see your Current wallpaper.
 - on the right side is part where we can select one of Ubuntu wallpaper, clicking on any thumbnail our wallpaper will and be changed right away, with a fading effect
 - If you want to select wallpaper from your effect picture folder, click the drop down menu about thumbnails and Select them as your wallpaper.
 - To add wallpaper that is in another folder, just click the plus icon below the thumbnails and then icon in pop-up windows, selected the paths to our custom folder and choose the picture inside of it.

changing ubuntu theme

- Ubuntu also has an option to change the Desktop theme, which is one click will change the entire way your computer looks.
- To do that, click on the drop down menu below the wallpaper thumbnails, and choose between Ambiance, Radiance or High.
- Ambiance is a light theme that looks a bit more like while Radiance is the darkest brown theme used in Ubuntu by default.

c)

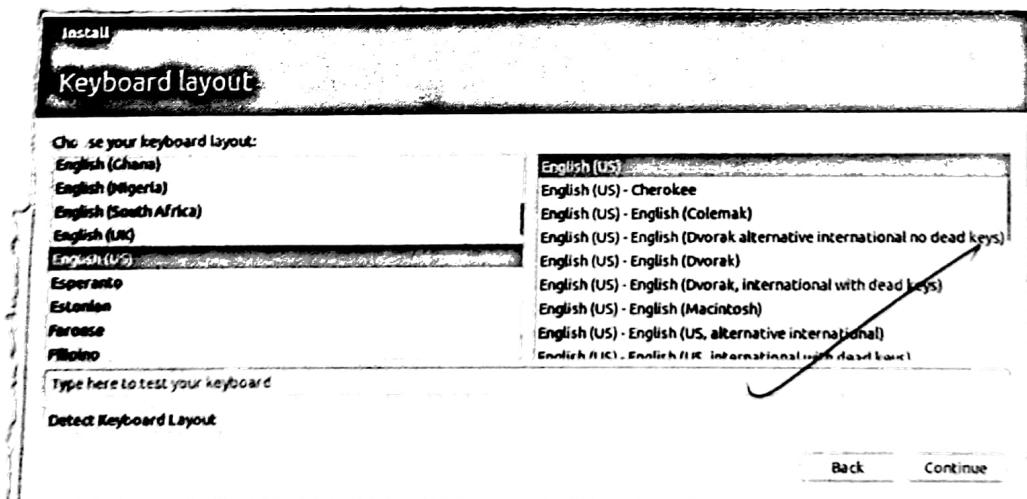
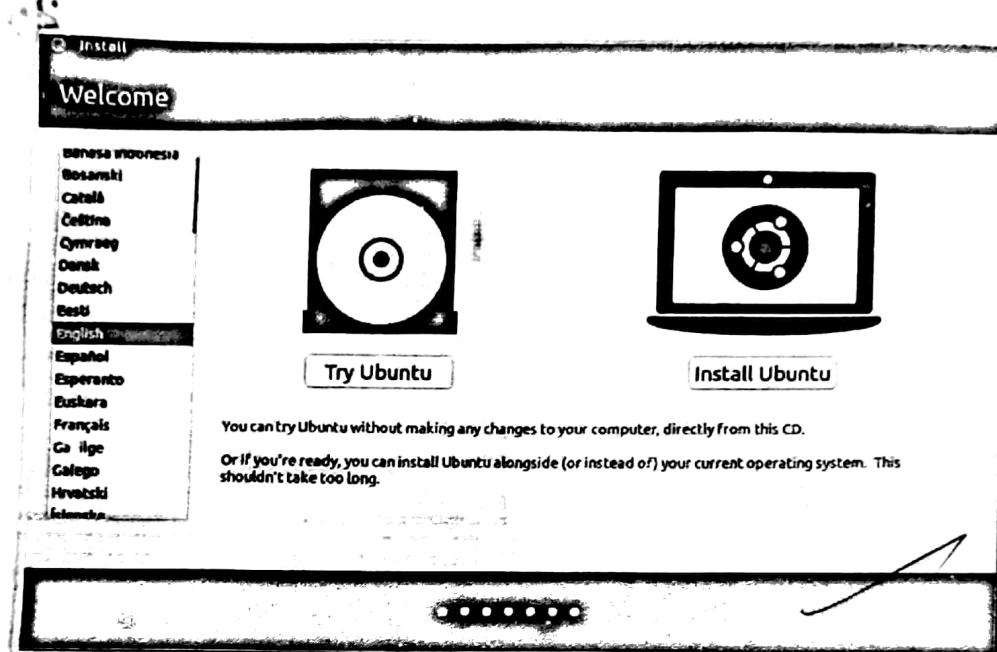
Screen Resolution: Ascertain the current screen resolution in your desktop. You can also change the size or rotation of the screen.

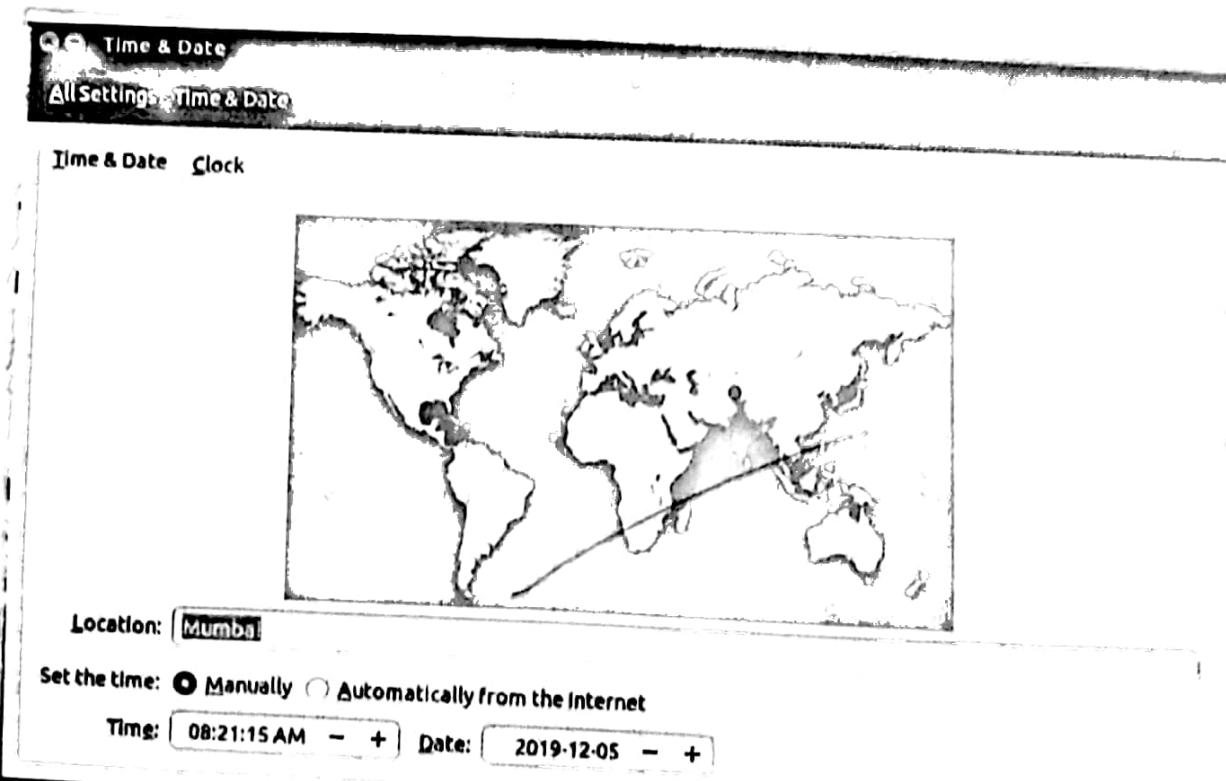
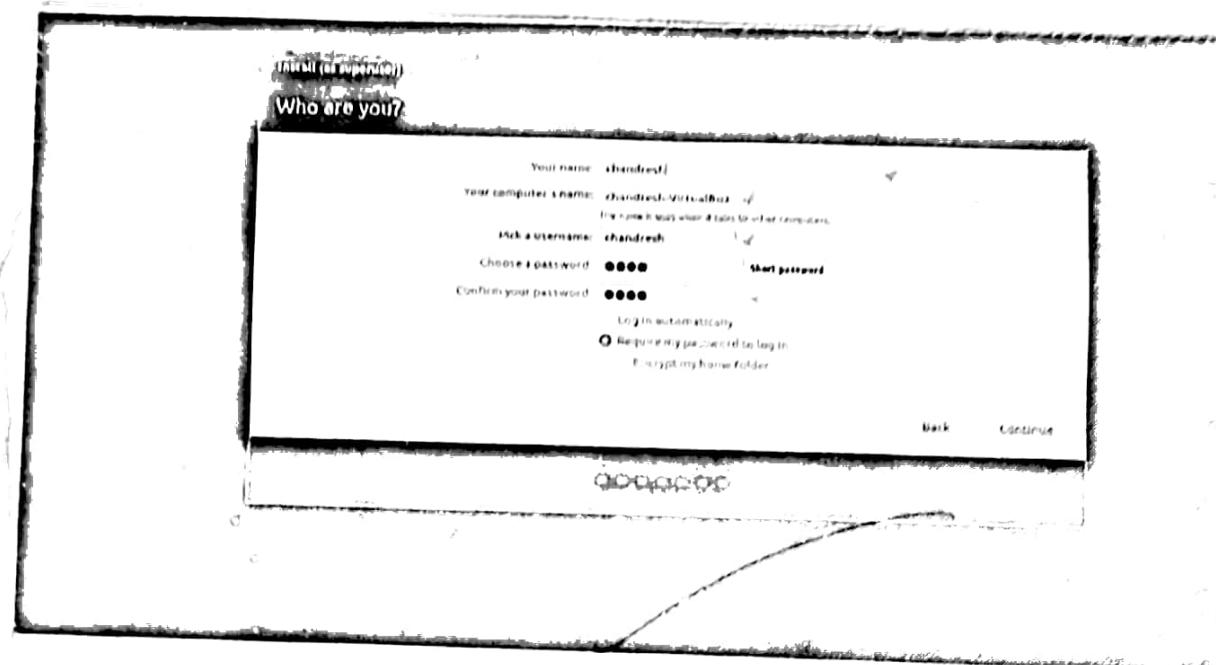
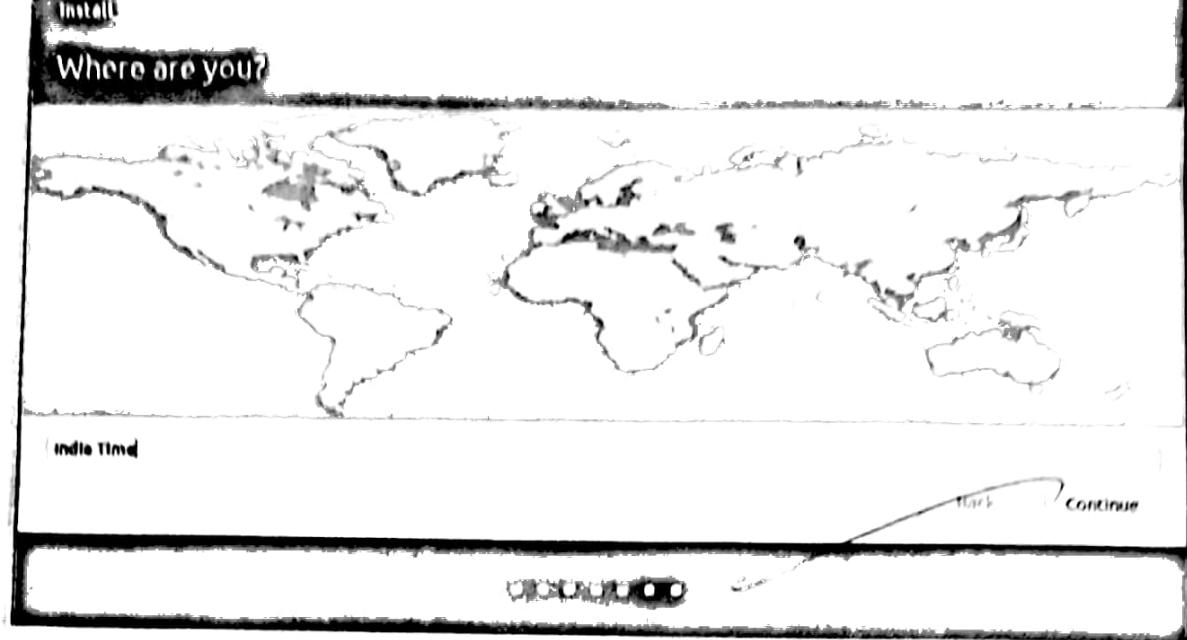
- You can change how big (or how detailed) things appear on the screen by changing the screen resolution.
 - You can change which way up things appear (for example if you have a rotating monitor).
- 1) click the icon on the entry of the menu bar and select system.
- 2) open screen Display.
 - 3) select you desired resolution and rotation.
 - 4) click Apply. The new settings will be applied for 30 seconds before reverting back.

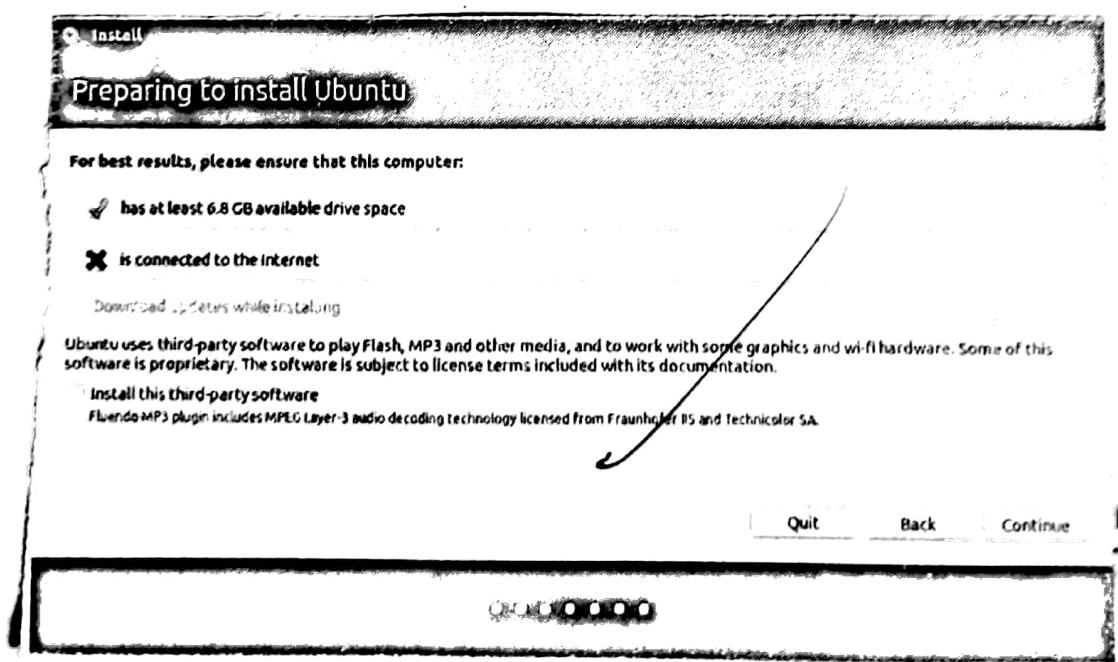
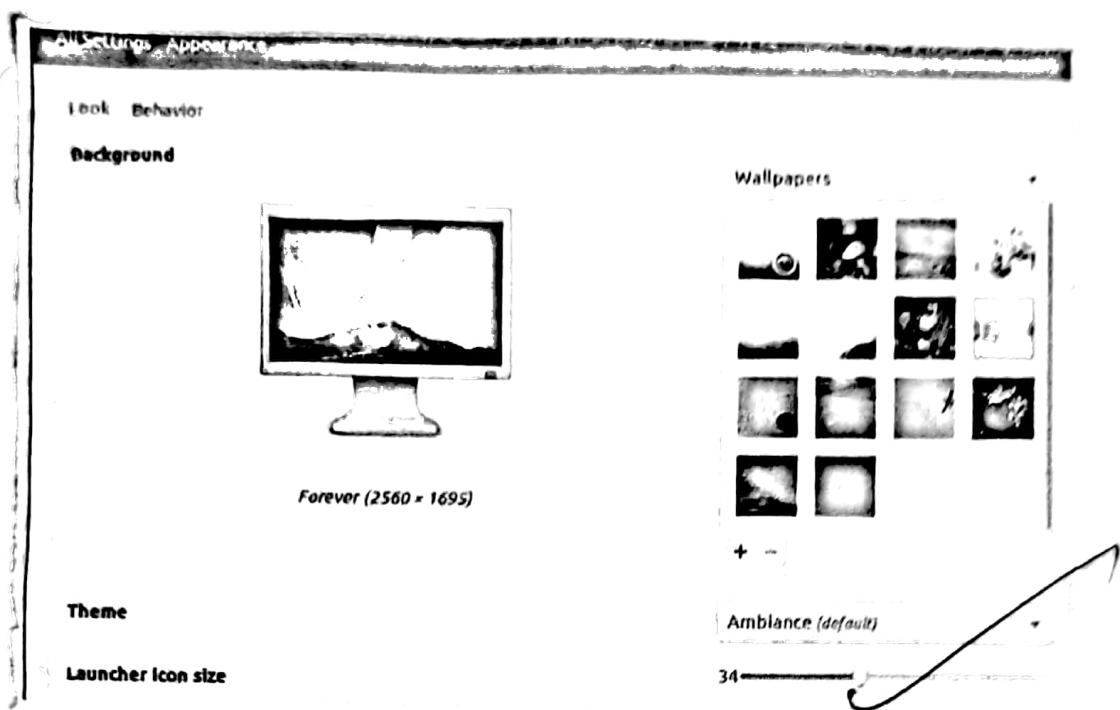
d) Time Settings change the time zone of your system to (or new York time)

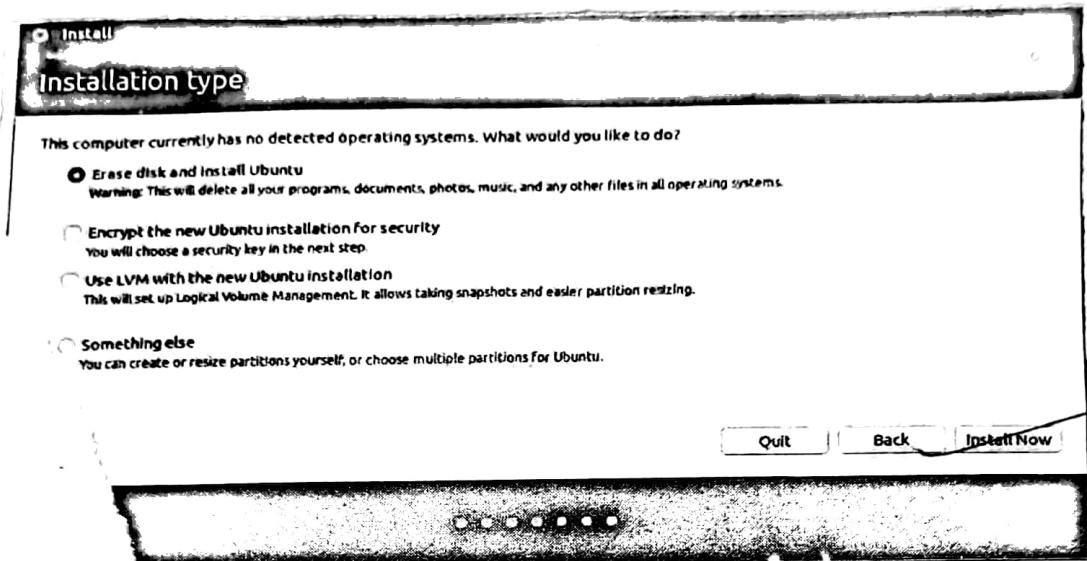
- if you are currently in india time : how does the display time change ?
- After noting the time change - change time zone back to your local time zone .
- just click on the clock on the top bar, and choose time and Date settings , once the time and date window opens, choose Manually , so you can change the time zone & date ; otherwise choose your time zone from the map , and choose Automatic .

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PRACTICAL NO. 2.

Aim :- Installing and removing Software

or Install gcc package , verify that it runs and then remove it

Step 1: First type `gcc -v` to know if you have already installing gcc compiler or not . if the output is blank then it means that you don't have gcc installed

Step 2: Type `Sudo apt-get install gcc`; After typing the following command installed will takes place .

Step 3 :- Type `Sudo apt-get install build-essential` This will install all the libraries required for C and C++ programming language .

Now To UNINSTALL Gcc COMPILER :

In Gcc 5.1.0 , although there is no top-level uninstalled target gcc , so you can do , sum directories do have it , in particular , gcc , so you can do :

Type : `. cd build/gcc`
`sudo make uninstall`

This does not remove everything that was installed but it removes many other executables like gcc , g++ , Cpp ... contained in that directory .

OR
 OR

PRACTICAL NO. 3

Aim:- Utilization of grep, man Commands Documentation

a) finding info documentation from the Commands like:
bring up the info page for the group Command
Bringing up the webpage section.

Ans:- To find info about any Command, info command is used. The Syntax Syntax of info Command is
info (Command name).

we are going to find the info about the group Command.

open the terminal (ctrl + Alt + T) and type:
info grep.

After typing this Command following output will be displayed on to your screen

(Space = Up) & (back space = down) pages.

Another summarized form of showing info is the 'man' Command. The Command is some info, but wired data.

b) Finding man page from the Cmd line :- Bring up the man page for the 'ls' Command scroll down the example section.

Ans :- To use the 'man' Command Simple type 'man (Command name)

Now we are going to find the manual for 'ls' Command

Simple : 'man ls'

Name -

ls ~ ls directory [Contents] [files]

Synopsis :- ls [operation] ... [files]

list information about files

-a - all

do not ignore entries starting with .

-b - escapes

print c-style escapes

~~finding man pages by topic : what man pages are available~~ that documents like tar compression.

Ans :- 'tar', 'zip' are some man pages which are available for document file compression simple type 'man zip' or 'man tar'

* 'man tar'

Name:

tar A - Content c - Create . The GNU version

Synopsis :

d - different -- compare deleted

Description

Tar stores and extracts files from a tarps

* 'man zip'

Name :

zip package and compress (archive) files

Synopsis

zip cl (See separate man page)

zip note (See separate man page)

Description

Zip is compression and file packaging utility
UNIX , VMS , MSDOS , OS/2

d) finding man pages by section from the Cmpline
bring up the man page for the given lib
function . which manual page section are library
function found .

Ans :- The number corresponds to what section of
the manual page is from , is used command
while and is sysadmin staff . The use command
for man itself explain it and list the output

These are certain term that have different page in different section (e.g. printf of a command appears in section 1. or 'Stklib' function appears in section 3) in cases like that you can pass the section no. to the man before the page name to change which of you want to use man -o to show every matching page in now.

You can tell which section a term falls in with 'man -k' (required to open command) It will do subs matches to so you to use 'term' do limit it.

e) Command line help list the available operation for Help command. How can you do this?

~~\$ findin -m a = swx directory name.~~

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PRACTICAL NO. 4

Command Line Operation

a) Install new package in your system
Such as apt-get install (package name)

b) Remove another package installed
Such as apt-get remove (package name)

c) Find the passwd file in / using find Command
find / - name passwd
• /usr/share/doc/nss-1dop-253/pamd/passwd
• /usr/bin/passwd
• /etc/pam.d/passwd
• /etc/passwd

Find the directory passwd file under root and one level down

find / - max depth 2 - name passwd
• /etc/passwd

Find the passwd file under root and 2 level down

find 1 - max depth 2 - name passwd

- /usr/pam.d/passwd
- /etc/passwd

find -P the passwd file between sub-directories level 2

find - maxdepth 3 - maxdepth -name passwd

- /usr/bin/passwd
- /etc/pam.d/passwd

d) Create a system symbolic link to the file you found in test step.

ln -s file1 file2

e) Create an empty file example.txt if move it to /tmp directory using relative path name

touch example.txt

mv example.txt /tmp

f) delete the file moved to /tmp in previous step by absolute method

rm /tmp/example.txt

Q)

Find the location of ls, ps, bash command
whereis ls

ls : /bin/ls /usr/share/man/man1/ls.1.gz

whereis ps

ps : /bin/ps /usr/share/man/man1/ps.1.gz

whereis bash

bash : /bin/bash /etc/bash.bashrc /usr/share/man/man1/bash.1.gz

or/else

PRACTICAL NO. 5

Topic :- File Operation

i) Explore mounted file Systems on your Computer

Ans :- df -k

```
jeba@jeba-VirtualBox:~$ df -k
Filesystem      1K-blocks   Used Available Use% Mounted on
udev             494436       0   494436  0% /dev
tmpfs            102416     3676    98740  4% /run
/dev/sda1        7092728  3383372   3326024  51% /
tmpfs            512076      216   511860  1% /dev/shm
tmpfs             5120       4     5116  1% /run/lock
tmpfs            512076       0   512076  0% /sys/fs/cgroup
tmpfs            102416      48   102368  1% /run/user/1000
jeba@jeba-VirtualBox:~$
```

2) what are the ways of exploring mounted file system on linux?

Ans :- mount

```
jeba@jeba-VirtualBox:~$ mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
udev on /dev type devtmpfs (rw,nosuid,relatime,size=494436k,nr_inodes=123609,mode=755)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,size=102416k,mode=755)
/dev/sda1 on / type ext4 (rw,relatime,errors=remount-ro,data=ordered)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,size=5120k)
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,mode=755)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release_agent=/lib/systemd/systemd-cgroups-agent,name=systemd,nsroot=/)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset,nsroot=/)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net_cls,net_prio,nsroot=/)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,nsroot=/)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsroot=/)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuacct,nsroot=/)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsroot=/)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsroot=/)
cgroup on /sys/fs/cgroup/bikio type cgroup (rw,nosuid,nodev,noexec,relatime,bikio,nsroot=/)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event,nsroot=/)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsroot=/)
systemd-1 on /proc/sys/fs/blinfmt_misc type autofs (rw,relatime,fd=32,pgrp=1,timeout=0,minproto=5,maxproto=5,direct)
hugetlbfss on /dev/hugepages type hugetlbfss (rw,relatime)
```

3) Copying text from files

Ans :- Cp Command , mv Command

```
jeba@jeba-VirtualBox:~$ ls
Desktop  Downloads  Music  Pictures  Public  Videos
Documents examples.desktop  jj  Pictures  Templates
jeba@jeba-VirtualBox:~$ cd jeb
jeba@jeba-VirtualBox:~/jeb$ cat .gg.txt
cat: .gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat >gg.txt
welcome :
Linux
^C
jeba@jeba-VirtualBox:~/jeb$ touch dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  gg.txt
jeba@jeba-VirtualBox:~/jeb$ cp gg.txt dd.txt
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
welcome :
Linux
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt
welcome :
Linux
jeba@jeba-VirtualBox:~/jeb$
```

```
jeba@jeba-VirtualBox:~/jeb$ touch ss.txt
jeba@jeba-VirtualBox:~/jeb$ mv gg.txt ss.txt
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt
welcome :
Linux
jeba@jeba-VirtualBox:~/jeb$
```

4) Archiving and backup the work directory Using tar, gzip and zip Commands

Ans :- gzip filename.txt
n.n n filename.txt

5) Use diff command to Create diff of two files

Ans :- diff filename1 filename2

```
jeba@jeba-VirtualBox:~/jeb$ ls  
dd.txt.gz ss.txt.bz2  
jeba@jeba-VirtualBox:~/jeb$ cat >aa.txt  
hello world  
^C  
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt  
this is linux^C  
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt  
1d0  
< hello world  
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt  
this is Linux  
^C  
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt  
1c1  
< hello world  
---  
> this is Linux  
jeba@jeba-VirtualBox:~/jeb$ gzip aa.txt  
jeba@jeba-VirtualBox:~/jeb$ gzip bb.txt  
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt.gz bb.txt.gz  
Binary files aa.txt.gz and bb.txt.gz differ
```

6) use patch Command to patch a file. And analyze the patch with patch Command again

```
jeba@jeba-VirtualBox:~/jeb$ cat >hi.txt  
hi  
hi  
hi  
^C  
jeba@jeba-VirtualBox:~/jeb$ cat >hil.txt  
hello  
hello  
hello  
^C  
jeba@jeba-VirtualBox:~/jeb$ diff -u hi.txt hil.txt >sam.patch  
jeba@jeba-VirtualBox:~/jeb$ patch <sam.patch  
^C  
jeba@jeba-VirtualBox:~/jeb$ patch <sam.patch  
patching file hi.txt  
jeba@jeba-VirtualBox:~/jeb$ cat sam.patch  
--- hi.txt 2020-01-08 22:14:55.463569834 +0530  
+++ hil.txt 2020-01-08 22:15:16.259898738 +0530  
@@ -1,3 +1,3 @@  
-hi  
-hi  
-hi  
+hello  
+hello  
+hello  
jeba@jeba-VirtualBox:~/jeb$
```

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PRACTICAL 6

Topic :- use Environment Variables and their uses.

- a) which account you are logged in? How do you find out?
- Ans : who Command & whoami

```
jeba@jeba-VirtualBox:~$ who
jeba    pts/0    2020-01-15 20:32 (:0)
jeba@jeba-VirtualBox:~$ whoami
jeba
jeba@jeba-VirtualBox:~$ who -l
LOGIN   pts/1    2020-01-15 20:30          780 id=tty1
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ w
20:35:04 up 4 min,  1 user,  load average: 0.70, 0.79, 0.38
USER  TTY      FROM              LOGIN@  IDLE   JCPU   PCPU WHAT
jeba  pts/7    :0                20:32   4:28   8.19s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -s
20:35:14 up 4 min,  1 user,  load average: 0.60, 0.77, 0.37
USER  TTY      FROM              LOGIN@  IDLE   JCPU   PCPU WHAT
jeba  pts/7    :0                4:38   8.67s  0.33s /sbin/upstart --user
jeba@jeba-VirtualBox:~$ w -h .
jeba  pts/7    :0                20:32   4:44   8.67s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -f
20:36:12 up 5 min,  1 user,  load average: 0.41, 0.69, 0.37
USER  TTY      LOGIN@  IDLE   JCPU   PCPU WHAT
jeba  pts/7    20:32   5:36   9.00s  0.33s /sbin/upstart --user
```

- b) Display /etc/shadow file using cat command and understand the importance of shadow file. How it's different than passwd file.

Ans : cat /etc/shadow

As with the passwd file, each field in the shadow is also separated with ":" colons character, and as follows:

- Username, up to 8 characters. Case-sensitive, usually all lowercase. A direct match to the username in the /etc/passwd file.
- password. 13 characters encrypted. A blank entry indicates a password is not required to log in, and a "*" entry indicates the account has been disabled.
- The number of days (since January 1, 1970) since the password was last changed.
- The number of days before password may be changed (indicates it may be changed at any time)
- The number of days (99999 indicates user can keep his password unchanged for many, many years) after which password must be changed.
- The number of days to password (+ for a full week) warn user of an expiring password.

- The number of days after password expires that account is disabled
- A reserved field for possible future use

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
[sudo] password for jeba:
root:!:18240:0:99999:7:::
daemon:*:16911:0:99999:7:::
bin:*:16911:0:99999:7:::
sys:*:16911:0:99999:7:::
sync:*:16911:0:99999:7:::
games:*:16911:0:99999:7:::
man:*:16911:0:99999:7:::
lp:*:16911:0:99999:7:::
mail:*:16911:0:99999:7:::
news:*:16911:0:99999:7:::
```

Each field in a passwd entry is separated with ":" colon character, and are as follows.

- username up to 8 characters - case-sensitive, usually all lowercase
- An "x" in the password field - passwords are stored in the "etc/shadow" files.
- Numeric group id - Red Hat use group id's in a fairly unique manner for enhanced file security - usually the group id will match the user id.
- full name of user - I'm not sure what that maximum length for this field is, but try to keep it reasonable
- user's name directory - usually /home/username - All user's personal files, web pages, mail download, etc.

- User "shell account". often set to "/bin/bash" to provide access to the bash shell (my personal favorite shell)

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
```

c) Get your current working directory

→ Ans :- pwd

```
jeba@jeba-VirtualBox:-
jeba@jeba-VirtualBox:~$ pwd
/home/jeba
jeba@jeba-VirtualBox:~$
```

d) Explor different ways of getting Command history, how to run previously executed command without typing it

Ans :- history + line number

```
jeba@jeba-VirtualBox:~$ history
1 who
2 whoami
3 who -l
4 clear
5 w
6 w -s
7 w -h
8 w -f
9 clear
10 cat /etc/shadow
11 sudo cat /etc/shadow
12 clear
13 sudo cat /etc/passwd
14 pwd
15 clear
16 history
jeba@jeba-VirtualBox:~$ !3
who -l
Logout . . . . . 2020-01-15 20:30
jeba@jeba-VirtualBox:~$ █
780 id=tty1
```

Create alias as most commonly used Commands
Alias Commands instructs the shell to replace one string
with another string while executing the Commands.

Ans :- alias label = "Command"

```
jeba@jeba-VirtualBox:~$ alias m="mkdir new"
jeba@jeba-VirtualBox:~$ .m
jeba@jeba-VirtualBox:~$ ls
Desktop Downloads Music Pictures Templates
Documents examples.desktop jj new Public Videos
jeba@jeba-VirtualBox:~$ █
```

J.D.

PRACTICAL 7

Topic : Linux Editors

a) Create, modify, Search and navigate a file in editor.

i) Create a file

To create file, on the terminal type vi followed by filename

ii) Modifying the file

To modify a file, on the vi editor, type 'o'

iii) Search in a file

To find word press / followed by the word to search

iv) Navigate :

Movement in four direction

| key | Action |
|-----|--------------------|
| k | Moves cursor up |
| j | Moves cursor down |
| h | Moves cursor left |
| l | Moves cursor right |

word Navigation

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| key | Action |
|----------|--|
| b | Moves back to the beginning of the word |
| e | Moves forward to the end of the word |
| w | Moves forward to the beginning of the word |
| 0 (zero) | Moves to first character of a line |
| \$ | Moves to the end of line |

Scrolling

| key | Action |
|----------|---------------------------|
| ctrl + f | Scroll forward |
| ctrl + b | Scroll backward |
| ctrl + d | Scroll half page |
| ctrl + u | Scroll half page backward |

Learn all essential Command like / replace , highlight , show line number

i) Replace

Syntax :- :g /word' to be replaced /s// new word/gc

jeba@jeba-VirtualBox: ~

```
Hello
This is my Linux example
Welcome
Welldone
This is VI Editor
Thank you
```

:g /my/s//our/gc

jeba@jeba-VirtualBox: ~

```
Hello
This is our Linux example
Welcome
Welldone
This is VI Editor
Thank you
```

Press Esc with our 'q' or 'q!' or 'qz' or 'qQ' or 'qY'

jeba@jeba-VirtualBox: ~

```
Hello
This is our Linux example
Welcome
Welldone
This is VI Editor
Thank you
```

ii) **Highlight**

use cat 11 - 1

```
jeba@jeba-VirtualBox: ~
Hello
This is our Linux example
Welcome
Welldone
This is Vi Editor
Thank you
:set hlsearch
```

(ii)

show the line numbers

use :set nu

```
jeba@jeba-VirtualBox: ~
1 Hello
2 This is our Linux example
3 Welcome
4 Welldone
5 This is Vi Editor
6 Thank you
:set nu
```

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PRACTICAL : 8

Linux Security

a) Use of sudo to change user privileges to root

```
jeba@jeba-VirtualBox:~$ sudo useradd user1  
[sudo] password for jeba:  
jeba@jeba-VirtualBox:~$ sudo passwd user1  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
jeba@jeba-VirtualBox:~$
```

To give some user root privileges edit /etc/sudoers
using visudo . Enter new line as highlighted below

```
# Please consider adding local content in /etc/sudoers.d/ instead of  
# directly modifying this file.  
# See the man page for details on how to write a sudoers file.  
  
Defaults env_reset  
Defaults mail_badpass  
Defaults secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/  
sbin:/bin"  
  
# Host alias specification  
  
# User alias specification  
  
# Cmnd alias specification  
  
# User privilege specification  
root    ALL=(ALL:ALL) ALL  
  
user1  ALL=(ALL:ALL) ALL
```

b) Identify operation that required sudo privileges

```
jeba@jeba-VirtualBox:~$ su user1
Password:
user1@jeba-VirtualBox:/home/jeba$ mkdir folder1
mkdir: cannot create directory 'folder1': Permission denied
user1@jeba-VirtualBox:/home/jeba$ sudo mkdir folder1
[sudo] password for user1:
user1 is not in the sudoers file. This incident will be reported.
```

c) Modify expiration date for new user using password ageing.

| | Jan. 20, 2020 |
|---|---------------|
| Last password change | never |
| Password expires | never |
| Password inactive | never |
| Account expires | never |
| Minimum number of days between password change | 0 |
| Maximum number of days between password change | 99999 |
| Number of days of warning before password expires | 7 |

```
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change : Jan. 20, 2020
Password expires      : never
Password inactive     : never
Account expires       : never
Minimum number of days between password change : 0
Maximum number of days between password change : 99999
Number of days of warning before password expires: 7
```

```
jeba@jeba-VirtualBox:~$ sudo chage user1
Changing the aging information for user1
Enter the new value, or press ENTER for the default
Minimum Password Age [0]: 100
Maximum Password Age [99999]: 200
Last Password Change (YYYY-MM-DD) [2020-01-20]: 2020-01-21
Password Expiration Warning [7]: 5
Password Inactive [-1]:
Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change : Jan 21, 2020
Password expires : Aug 08, 2020
Password inactive : never
Account expires : Jan 31, 2020
Minimum number of days between password change : 100
Maximum number of days between password change : 200
Number of days of warning before password expires : 5
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ sudo chage -E 25/01/2020 -m 10 -M 90 -I 30 -W 30 user1
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change : Jan 21, 2020
Password expires : Apr 20, 2020
Password inactive : May 20, 2020
Account expires : Jan 01, 2022
Minimum number of days between password change : 10
Maximum number of days between password change : 90
Number of days of warning before password expires : 30
jeba@jeba-VirtualBox:~$
```

- E : Expiration Date
- m : Minimum number of days before password change
- M : Number of days password is valid
- I : Account inactivates
- w : Number of days of warning before a password change is required

d) Delete newly added user

```
jeba@jeba-VirtualBox:~$ sudo userdel user1
[sudo] password for jeba:
jeba@jeba-VirtualBox:~$ sudo user1
No passwd entry for user 'user1'.
jeba@jeba-VirtualBox:~$
```

PRACTICAL 9

Network Management

a) Get IP address of your machine using ifconfig

```
jeba@jeba-VirtualBox:~$ ifconfig  
enp0s3 Link encap:Ethernet HWaddr 08:00:27:0e:6b:69  
inet addr:10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0  
inet6 addr: fe80::c0cd:53a0:d5a3:848e/64 Scope:Link  
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  
RX packets:2 errors:0 dropped:0 overruns:0 frame:0  
TX packets:73 errors:0 dropped:0 overruns:0 carrier:0  
collisions:0 txqueuelen:1000  
RX bytes:1180 (1.1 KB) TX bytes:8518 (8.5 KB)  
  
lo Link encap:Local Loopback  
inet addr:127.0.0.1 Mask:255.0.0.0  
inet6 addr: ::1/128 Scope:Host  
UP LOOPBACK RUNNING MTU:65536 Metric:1  
RX packets:53240 errors:0 dropped:0 overruns:0 frame:0  
TX packets:53240 errors:0 dropped:0 overruns:0 carrier:0  
collisions:0 txqueuelen:1  
RX bytes:4225072 (4.2 MB) TX bytes:4225072 (4.2 MB)
```

b) Get hostname of your machine

```
jeba@jeba-VirtualBox:~$  
jeba@jeba-VirtualBox:~$ hostname  
jeba-VirtualBox  
jeba@jeba-VirtualBox:~$
```

c) Use ping to check the network connectivity to remote machine

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=97.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=82.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=84.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=87.1 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=93.5 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=86.9 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=98.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=90.9 ms
^Z
[1]+ Stopped ping www.google.com
jeba@jeba-VirtualBox:~$
```

d) Use of dig Command

```
○○○ jeba@jeba-VirtualBox:~$ dig www.google.com
;; >>> DIG 9.18.3-P4-Ubuntu <>> www.google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52068
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
www.google.com.
;; ANSWER SECTION:
www.google.com. 91 IN A 172.217.166.100
;; Query time: 152 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Mon Jan 20 22:40:06 IST 2020
;; MSG SIZE rcvd: 59
jeba@jeba-VirtualBox:~$
```

e) Troubleshooting networking using traceroute, route
Command

```
jeba@jeba-VirtualBox:~$ traceroute www.google.com
traceroute to www.google.com (172.217.166.100), 30 hops max, 60 byte packets
1 10.0.2.2 (10.0.2.2) 0.190 ms 0.143 ms 0.151 ms
2 *
3 10.0.2.2 (10.0.2.2) 68.568 ms 68.486 ms 68.405 ms
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ route
Kernel IP routing table
Destination     Gateway      Genmask       Flags Metric Ref Use Iface
default         10.0.2.2   0.0.0.0     UG    100    0   0 enp0s3
10.0.2.0        *           255.255.255.0 U     100    0   0 enp0s3
link-local      *           255.255.0.0   U     1000   0   0 enp0s3
jeba@jeba-VirtualBox:~$
```

f) Use of arp Command

```
jeba@jeba-VirtualBox:~$ arp
Address          HWtype  HWaddress          Flags Mask Iface
10.0.2.2        ether   52:54:00:12:35:02  C      00:00:00:00:00:00  enp0s
```

g) Use of host Command

```
jeba@jeba-VirtualBox:~$ host -V
host 9.10.3-P4-Ubuntu
jeba@jeba-VirtualBox:~$
```

h) Use of netstat Command and Nmap Command

| Netstat -an | | | | Foreign Address | State |
|---|--------------------|------|-------|-----------------|-----------------------|
| Proto Recv-Q Send-Q Local Address | Proto Refcnt Flags | Type | State | I-Node | Path |
| Active Internet connections (w/o servers) | | | | 42149 | /run/user/1000/system |
| Active UNIX domain sockets (w/o servers) | | | | 9694 | /run/systemd/journal/ |
| | | | | 9695 | /run/systemd/journal/ |
| | | | | 9704 | /run/systemd/journal/ |
| | | | | 9684 | /run/systemd/notify/ |
| | | | | 44042 | @/tmp/dbus-CymTe17AQC |
| | | | | 43331 | @/tmp/dbus-CymTe17AQC |
| | | | | 42988 | @/tmp/dbus-CMGGGG7PS |
| | | | | 42690 | /run/systemd/journal/ |
| | | | | 13242 | /run/systemd/journal/ |
| | | | | 43113 | /run/systemd/journal/ |
| | | | | 43013 | /run/systemd/journal/ |
| | | | | 42935 | |

```
jeba@jeba-VirtualBox:~$ netstat -an
```

```
Starting Nmap 7.01 ( https://nmap.org ) at 2020-01-20 22:51 IST
Nmap scan report for www.google.com (216.58.196.68)
Host is up (0.044s latency).
Other addresses for www.google.com (not scanned): 2404:6800:4007:811::2004
rDNS record for 216.58.196.68: bom05s11-in-f4.1e100.net
Not shown: 998 filtered ports
PORT      STATE SERVICE
80/tcp    open  http
443/tcp   open  https
```

```
Nmap done: 1 IP address (1 host up) scanned in 20.32 seconds.
jeba@jeba-VirtualBox:~$
```

SO
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PRACTICAL - 10

Aim :- SHELL SCRIPTING

Basic of shell Scripting

- a) To get a shell, you need to start a terminal
- b) To see what shell you have, run : echo \$SHELL
- c) In linux, the dollar sign (\$) stands for shell variable
- d) The echo Command just return whatever you type in.
- e) #!/bin/bash - It is called shebang. It is written at the top of a shell script and it passes the instruction to the program /bin/bash

```
tcsc@tcsc-VirtualBox: ~
tcsc@tcsc-VirtualBox: ~$ echo $SHELL
/bin/bash
tcsc@tcsc-VirtualBox: ~$
```

• vi filename.sh
 #!/bin/bash
 echo "THIS IS LINUX"

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```
tcsc@tcsc-VirtualBox:~  
#!/bin/bash  
echo "THIS IS LINUX!"
```

chmod 777 filename.sh
./filename.sh

```
tcsc@tcsc-VirtualBox:~  
tcsc@tcsc-VirtualBox:~$ vi linux.sh  
tcsc@tcsc-VirtualBox:~$ chmod 777 linux.sh  
tcsc@tcsc-VirtualBox:~$ ./linux.sh  
THIS IS LINUX!  
tcsc@tcsc-VirtualBox:~$
```

step to write and execute a shell Script.

Shell Script is just a simple .txt file with .sh extension, having executable permission.

a) Open terminal

b) Navigate to the place where you want to create script using cd Command.

- c) Touch filename.sh
- d) vi filename.sh [You can use your favorite editor, to edit the Script]
- e) chmod 777 filename.sh (for making the script executable)
- f) sh filename.sh or ./filename.sh (for running the script)

program to display your name

```
#!/bin/bash
Echo "Enter your name:"
Read name
Echo "My name is: $name"
```

```
tcsc@tcsc-VirtualBox: ~
#!/bin/bash
echo "Enter your name:"
read name
echo "My name is: $name"
```

```
tcsc@tcsc-VirtualBox: ~
tcsc@tcsc-VirtualBox: ~ vi ubuntu.sh
tcsc@tcsc-VirtualBox: ~ chmod 777 ubuntu.sh
tcsc@tcsc-VirtualBox: ~ ./ubuntu.sh ...
'Enter your name:
TANVI
My name is: TANVI
tcsc@tcsc-VirtualBox: ~
```

program to find the sum of two variables

vi filename.sh

#!/bin/bash

a=100

b=25

Sum=\$((a+b))

Echo "Sum is : \$sum"

```
tcsc@tcsc-VirtualBox:~
```

```
#!/bin/bash
a=100
b=25
sum=$((a+b))
echo "Sum is:$sum"
```

```
tcsc@tcsc-VirtualBox:~$ vi linux2.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 linux2.sh
tcsc@tcsc-VirtualBox:~$ ./linux2.sh
Sum is:125
tcsc@tcsc-VirtualBox:~$
```

program to find the sum of two numbers (values passed during ex)

```
tcsc@tcsc-VirtualBox:~
```

```
#!/bin/bash
sum=$((S1+S2))
echo "sum is:$sum"
```

```
tcsc@tcsc-VirtualBox:~$ vi lin.sh  
tcsc@tcsc-VirtualBox:~$ chmod 777 lin.sh  
sum ls:120  
tcsc@tcsc-VirtualBox:~$
```

Sed

Sed Command on Stream Edition is very powerful utility offered by Linux Systems. It is mainly used for text Substitution , find & replace but it can perform other text manipulations like insertion , deletion , Search , etc . with Sed . we can edit Completed files without actually to open file .

Consider the following text file.

```
subjects offered in cs  
data structure  
database management  
linux  
python  
green tech  
softskill  
stats  
calculus  
computer basics
```

1) Displaying partial text of a file

With Sed, we can view only of a file rather than seeing whole file.

```
tcsc@tcsc-VirtualBox:~  
tcsc@tcsc-VirtualBox:~$ vi cs.txt  
tcsc@tcsc-VirtualBox:~$ sed -n 3,5p cs.txt  
database management  
linux  
python  
tcsc@tcsc-VirtualBox:~$
```

2) Display all except some lines

To display all content of a file except for some portion, use option 'd'

```
tcsc@tcsc-VirtualBox:~$ sed 3,5d cs.txt  
subjects offered in cs  
datastructure  
green tech  
softskill  
stats  
calculus  
computer basic  
tcsc@tcsc-VirtualBox:~$
```

3) Deleting a line

To deleting line, use line number followed by 'd'

```
tcsc@tcsc-VirtualBox:~  
tcsc@tcsc-VirtualBox:~$ vi linux.sh  
tcsc@tcsc-VirtualBox:~$ chmod 777 linux.sh  
tcsc@tcsc-VirtualBox:~$ ./linux.sh  
THIS IS LINUX!  
tcsc@tcsc-VirtualBox:~$
```

4) Search and Replacing a String.
 's' option is for searching a word.

```
tcsc@tcsc-VirtualBox:~$ sed 's/cs/computer/' cs.txt
subjects offered in computer
datastructure
database management
linux
python
green tech
softskill
stats
calclus
computer basic
```

Replaced a string on a particular line

To replace a string on a particular line, use line number with 's' option.

```
tcsc@tcsc-VirtualBox:~$ sed '6 s/cs/computer system /' cs.txt
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calclus
computer basic
```

Add a line before the matched string.

To adding a new line with some content after every pattern matched, use option 'a'

```
tcsc@tcsc-VirtualBox: $ sed '/cs/a "this is linux"' cs.txt  
subjects offered in cs :  
"this is linux"  
datastructure  
database management  
linux  
python  
green tech  
softskill  
stats  
calculus  
computer basic  
tcsc@tcsc-VirtualBox:~$
```

To add a new line with some content before every pattern match, use option "i"

```
tcsc@tcsc-VirtualBox:~$ sed '/cs/i "this is linux"' cs.txt  
"this is linux"  
subjects offered in cs :  
datastructure  
database management  
linux  
python  
green tech  
softskill  
stats  
calculus  
computer basic  
tcsc@tcsc-VirtualBox:~$
```

To change a whole line which matched pattern.
To change a whole line to a new line when a
Search pattern matched ,use option 'c'

```
tcsc@tcsc-VirtualBox:~$ sed '/linux/c "this is linux"' cs.txt
subjects offered in cs
datastructure
database management
>this is linux"
python
green tech
softskill
stats
calculus
computer basic
```

Appending lines.

To add Some Content before every line with sed,
use * cmd & os follows.

```
tcsc@tcsc-VirtualBox:~$ sed -e 's/.*/Thanks &/' cs.txt
Thanks subjects offered in cs
Thanks datastructure
Thanks database management
Thanks linux
Thanks python
Thanks green tech
Thanks softskill
Thanks stats
Thanks calculus
Thanks computer basic
```

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