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S11-05

UNIX Lab

Assignment No. 1 – To study General Purpose Commands.

1. Time

time command in Linux is used to execute a command and prints a summary of real-time, user CPU time and system CPU time spent by executing a command when it terminates.
‘real’ time is the time elapsed wall clock time taken by a command to get executed, while
‘user’ and ‘sys’ time are the number of CPU seconds that command uses in user and kernel mode respectively.

Syntax:

time [option] [COMMAND]

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ time
real    0m0.000s
user    0m0.000s
sys     0m0.000s
```

2. Uptime:

Uptime is used to find out how long the system is active (running). This command returns set of values that involve, the current time, and the amount of time system is in running state, number of users currently logged into, and the load time for the past 1, 5 and 15 minutes respectively.

Syntax:

uptime [-options]

Example:

Input

```
[mistersubha@server-1 ~]$uptime
```

08:24:37 up 207 days, 11:10, 0 users, load average: 0.00, 0.03, 0.05

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ uptime  
16:13:26 up 23 min, 1 user, load average: 0.11, 0.21, 0.23
```

3. Cat

The cat command in unix is more than just a simple tool; it's a versatile companion for various file-related operations, allowing users to view, concatenate, create, copy, merge, and manipulate file contents. Let's delve into the details of some frequently used cat commands, understanding each example along the way.

The basic syntax of the 'cat' command is as follows:

cat [OPTION] [FILE]

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat demo  
Hello world  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat demo -A  
Hello world $  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat demo -b  
1 Hello world  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat demo -e  
Hello world $
```

4. Man

In unix is used to display the user manual of any command that we can run on the terminal. It provides a detailed view of the command which includes NAME, SYNOPSIS, DESCRIPTION, OPTIONS, EXIT STATUS, RETURN VALUES, ERRORS, FILES, VERSIONS, EXAMPLES, AUTHORS and SEE ALSO.

Every manual is divided into the following sections: Executable programs or shell commands

System calls (functions provided by the kernel)

Library calls (functions within program libraries)

Games

Special files (usually found in /dev)

File formats and conventions eg /etc/passwd

Miscellaneous (including macro packages and conventions), e.g. groff(7)

System administration commands (usually only for root)

Kernel routines [Non standard]

Syntax :

\$man [OPTION]... [COMMAND NAME]...

Example:

\$ man -f ls

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ man
What manual page do you want?
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$
```

5. TTY:

There is a command called tty which displays information related to the terminal. The tty command of the terminal basically prints the file name of the terminal connected to standard input. tty is short for teletype, but popularly known as a terminal it allows you to interact with the system by passing on the data (your input) to the system and displaying the output produced by the system.

Syntax of `tty` Command

tty [OPTION]....

The most basic use of the tty command is to display the name of the current terminal. To

do this, simply type “tty” without any options

```
What manual page do you want?
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ tty
/dev/pts/0
```

6. Which:

Which command in unix is a command that is used to locate the executable file associated

with the given command by searching it in the path environment variable. It has 3 return

statuses as follows:

0 : If all specified commands are found and executable.

1 : If one or more specified commands is nonexistent or not executable.

2 : If an invalid option is specified.

Syntax of `Which` Command in unix

The basic syntax of which command is
which [filename1] [filename2] ...

For Example: To find the location of the “cd” command, we use the following command

which cd

7. echo

The echo command in unix is a built-in command that allows users to display lines of text or strings that are passed as arguments. It is commonly used in shellscripts and batch files to output status text to the screen or a file.

Syntax of `echo` command in Linux

echo [option] [string]

Here,

[options] = The various options available for modifying the behavior of the `echo` command

[string] = It is the string that we want to display.

Example:

If we want to display “aarya”. We use the following command.echo “aarya”.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ echo hello world
hello world
```

8. who

The ‘\$ who’ command displays all the users who have logged into the system currently. As shown above, on my system I am the only user currently logged in. The first line shows the terminal line the user is using and the next line gives the current date and time

\$ who

Output: harssh tty2 2017-07-18 09:32 (:0)

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ who
lab1003  :0              2024-01-29 09:40 (:0)

```

9. pwd

The ‘\$pwd’ command stands for ‘print working directory’ and as the namesays,it displays the directory in which we are currently (directory is same as folder for WindowsOS users).

In the output, we are harssh directory (folder for Windows OS that are moving to Linux),which is present inside the home directory.

```
$ pwd
```

Output: /home/harssh

```
Lab1003@Lab1003-HP-280-G4-MT-Business-PC:~$ pwd  
/home/lab1003
```

10. mkdir

The ‘\$ mkdir’ stands for ‘make directory’ and it creates a new directory.We have used ‘\$ cd’ (which is discussed below) to get into the newly created directory and again on giving ‘\$ pwd’ command,we are displayed with the new‘newfolder’ directory.

```
$ mkdir newfolder
```

```
$ cd newfolder
```

```
$ pwd
```

11. rmdir

The ‘\$ rmdir’ command deletes any directory we want to delete and you can remember it by its names ‘rmdir’ which stands for ‘remove directory’.

```
$ rmdir newfolder
```

12. cd

The ‘\$ cd’ command stands for ‘change directory’ and it changes your current directory to the ‘newfolder’ directory.You can understand this as double-clicking a folder and then you do some stuff in that folder.

```
$ cd newfolder (assuming that there is a directory named 'newfolder' on your system)
```

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cd Desktop  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/Desktop$ █
```

13. cal

The '\$ cal' means calendar and it simply display calendar on to your screen.

```
$ cal
```

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cal  
January 2024  
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
```

14. file

The '\$ file' command displays the type of file. As I mentioned earlier Linux treats everything as a file so on executing the command file on a directory (Downloads) it displays directory as the output

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ file  
Usage: file [-bchikllNnprsvzz] [--apple] [--extension] [--mime-encoding] [--mime-type]  
           [-e testname] [-f separator] [-f namefile] [-m magicfiles] file ...  
           file -C [-m magicfiles]  
           file [--help]
```

15. lpr

The '\$ lpr' command send a file to the printer for printing.

```
$ lpr new.txt
```

16. clear

The '\$ clear' command is used to clean up the terminal so that you can type with more accuracy

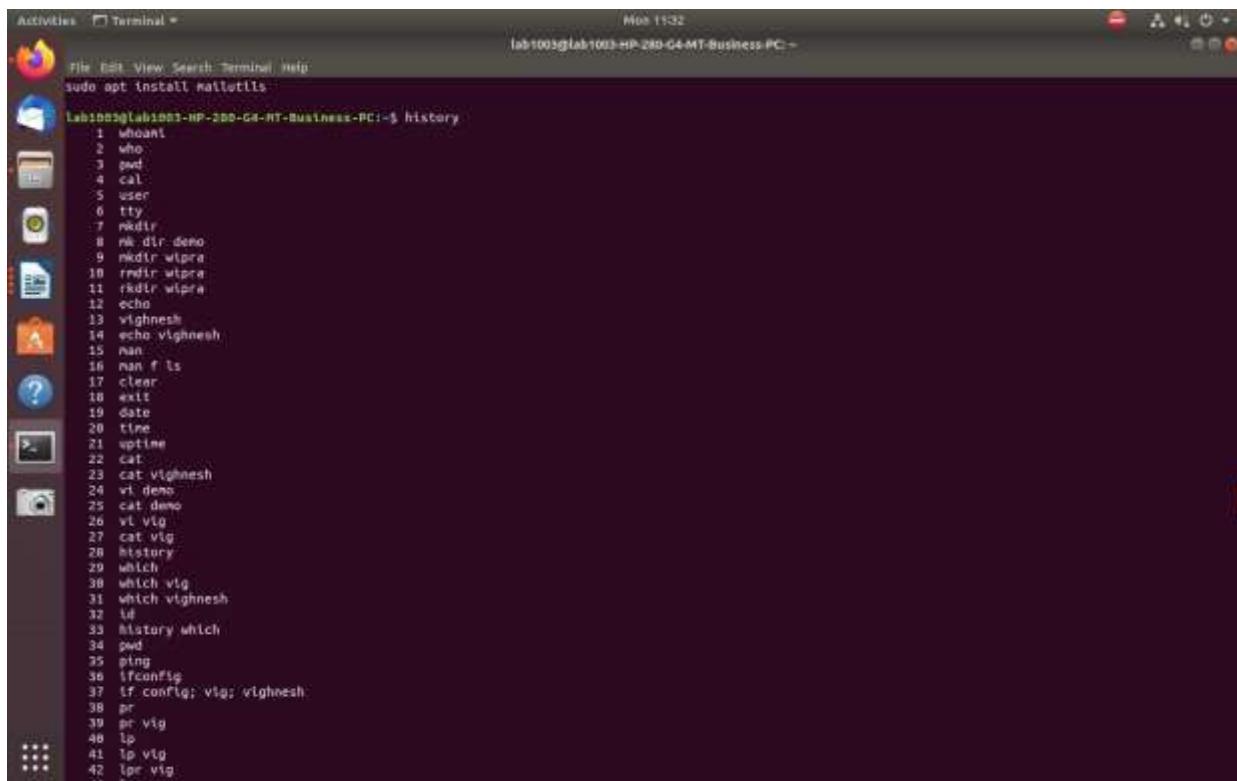
```
$ clear
```

17. history

The '\$ history' command is used to get list of previous commands may

be obtained by executing the following command. you can also use parameters like !n to re-execute the nth command, !! to executes the most recent command, and !cp this will execute the most recent command that starts with cp.

```
$ history
```



The screenshot shows a terminal window titled "Terminal" with the command "history" entered. The output lists approximately 50 command entries, each preceded by a number from 1 to 50. The commands include basic system utilities like who, whoami, pwd, cal, user, tty, mkdir, rm, rmdir, rmdir, rmdir, echo, vighnesh, echo, vighnesh, man, man, f, ls, clear, exit, date, time, uptime, cat, cat, vi, vi, cat, cat, which, ping, ifconfig, ifconfig, pr, pr, lp, lp, lpr, lpr, and yes.

```
Activities Terminal - lab1003@lab1003-HP-280-G4-MT-Business-PC: ~
File Edit View Search Terminal Help
sudo apt install mailutils
Lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ history
1 whoami
2 who
3 pwd
4 cal
5 user
6 tty
7 mkdir
8 rm -dir demo
9 mkdir wipra
10 rmdir wipra
11 rmdir wipra
12 echo
13 vighnesh
14 echo vighnesh
15 man
16 man f ls
17 clear
18 exit
19 date
20 time
21 uptime
22 cat
23 cat vighnesh
24 vi demo
25 cat demo
26 vi vi
27 cat vi
28 history
29 which
30 which vlg
31 which vighnesh
32 id
33 history which
34 pwd
35 ping
36 ifconfig
37 ifconfig; vlg; vighnesh
38 pr
39 pr vi
40 lp
41 lp vi
42 lpr vi
43 yes
```

18. mail:

The Mail command in unix or linux system is used to send emails to the users, to read the received emails, to delete the emails etc. Mail command will come in handy especially when writing automated scripts. For example, you have written an automated script for taking weekly backup of oracle database. How to know the status of backup, whether it is succeeded or not? In this case, sending an email from the automated script at the end of the backup will be helpful in knowing the status.

Syntax: echo "Mail body" | mail -s "Mail subject" to@example.com

19. id

id command in unix is used to find out user and group names and numericID's (UID or group ID) of the current user or any other user in the server. This command is useful to find out the following information as listed below:

User name and real user

id. Find out the specific

Users UID.

Show the UID and all groups associated with a user. List out all the groups a user belongs to.

Display security context of the current user.

Synopsis:

id [OPTION]... [USER]

Options:

-g: Print only the effective group id.

-G: Print all Group ID's.

-h: Prints name instead of number.

-r: Prints real ID instead of numbers.

-u: Prints only the effective user ID.

--help: Display help messages and exit.

--version: Display the version information and exit.

```
*** Lab1003@Lab1003-HP-200-G4-MT-Business-PC:~ $ id  
*** uid=1000(lab1003) gid=1000(lab1003) groups=1000(lab1003),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),110(lpadmin),126(sambashare)  
*** Lab1003@Lab1003-HP-200-G4-MT-Business-PC:~ $
```

20. whoami

This command is used to show the user id logged in currently.

Syntax: whoami

```
*** Lab1003@Lab1003-HP-200-G4-MT-Business-PC:~ $ whoami  
*** lab1003  
*** Lab1003@Lab1003-HP-200-G4-MT-Business-PC:~ $
```

21. ping

PING (Packet Internet Groper) command is used to check the network

connectivity between host and server/host. This command takes as input the IP address or the URL and sends a data packet to the specified address with the message “PING” and get a response from the server/host this time is recorded which is called latency.

Fast ping low latency means faster connection.

The basic syntax of the ping command is as follows:

ping [options] host_or_IP_address

ifconfig (interface configuration) command is used to configure the kernel-resident network interfaces. It is used at the boot time to set up the interfaces as necessary. After

that, it is usually used when needed during debugging or when you need system tuning.

Also, this command is used to assign the IP address and netmask to an interface or to enable or disable a given interface.

Syntax of `ifconfig` Command in Linux
ifconfig [interface] [options]

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ ping www.google.com
PING www.google.com (142.250.192.132) 36(84) bytes of data:
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=1 ttl=57 time=3.53 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=2 ttl=57 time=2.46 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=3 ttl=57 time=2.28 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=4 ttl=57 time=2.68 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=5 ttl=57 time=4.43 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=6 ttl=57 time=2.37 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=7 ttl=57 time=2.39 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=8 ttl=57 time=2.47 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=9 ttl=57 time=2.52 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=10 ttl=57 time=2.51 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=11 ttl=57 time=3.73 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=12 ttl=57 time=2.33 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=13 ttl=57 time=2.36 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=14 ttl=57 time=2.59 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=15 ttl=57 time=2.53 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=16 ttl=57 time=2.46 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=17 ttl=57 time=2.25 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=18 ttl=57 time=2.25 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=19 ttl=57 time=2.37 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=20 ttl=57 time=2.23 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=21 ttl=57 time=2.51 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=22 ttl=57 time=2.46 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=23 ttl=57 time=2.53 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=24 ttl=57 time=6.65 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=25 ttl=57 time=2.69 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=26 ttl=57 time=5.33 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=27 ttl=57 time=2.58 ms
64 bytes from bom12s18-1n-f4.1e100.net (142.250.192.132): icmp_seq=28 ttl=57 time=2.53 ms
PC
--- www.google.com ping statistics ---
28 packets transmitted, 28 received, 0% packet loss, time 27035ms
rtt min/avg/max/mdev = 2.236/2.857/6.651/1.810 ms
```

22. Ipstat

Ipstat displays status information about the current classes, jobs, and printers. When run with no arguments, Ipstat will list jobs queued by the current user.

Syntax
Ipstat [-E] [-U username] [-h hostname[:port]] [-l] [-W which-jobs] [-a [destination(s)]

```
][ -c [ class(es) ] ][ -d ][ -o [ destination(s) ] ][ -p [ printer(s) ] ][ -r ][ -R ][ -s ][ -t ][ -u [ user(s) ] ][ -v [ printer(s) ] ]
```

23. lpq command:

The lpq command reports the status of the specified job or all jobs associated with the specified UserName and JobNumber variables. JobNumber variable specifies the number of the job in the spool queue that you want to view. A UserName variable specifies viewing the jobs for the name of the person who submitted the job to that queue

Syntax

```
lpq [ + [ Number ] ] [ -l | -W ] [ -P Printer ] [ JobNumber ] [ UserName ]
```

24. lprm command

The lprm command removes one or more jobs from the spool queue of a printer.

Syntax

```
lprm [ -P Printer ] [ JobNumber ] [ UserName ... ] [ - ]
```

25. cancel

cancel - cancel

jobs

SYNOPSIS

```
cancel [ -E ] [ -U username ] [ -a ] [ -h hostname[:port] ] [ -u username ] [ id ][ destination ]
```

[destination-id]DESCRIPTION cancel cancels existing print jobs. The -a option will remove all jobs from the specified Destination

```
cancel: Error - unknown destination "Jobs".  
***** lab100@lab100:~$ cancel -u test_user  
***** lab100@lab100:~$ cancel -u test_user  
***** lab100@lab100:~$
```

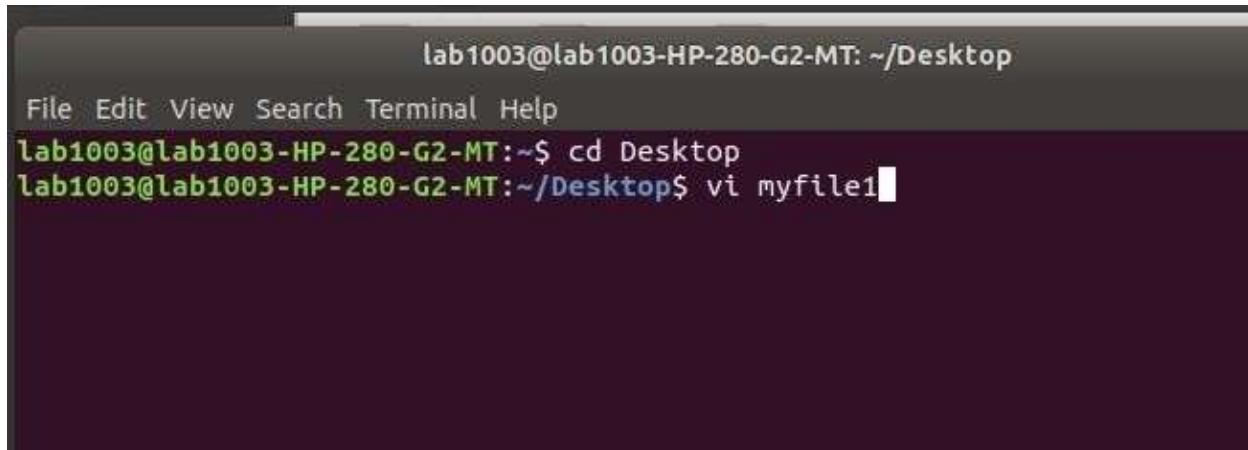
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S11-05

UNIX Lab

Assignment No. 2 – To Study VI Editor

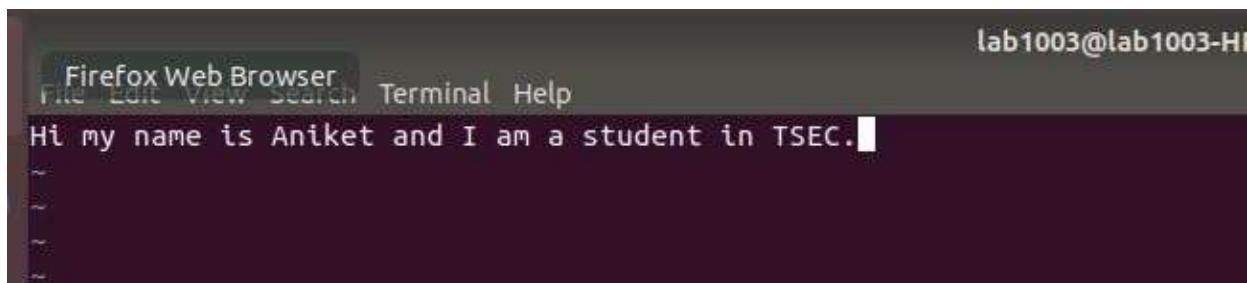
Step 1: Open the Vi editor.



```
lab1003@lab1003-HP-280-G2-MT: ~/Desktop
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~$ cd Desktop
lab1003@lab1003-HP-280-G2-MT:~/Desktop$ vi myfile1
```

Step 2: Get into insert mode by pressing the ‘i’ key.

Step 3: Write your text.



```
lab1003@lab1003-HP-280-G2-MT:~/Desktop
Firefox Web Browser
File Edit View Search Terminal Help
Hi my name is Aniket and I am a student in TSEC.
```

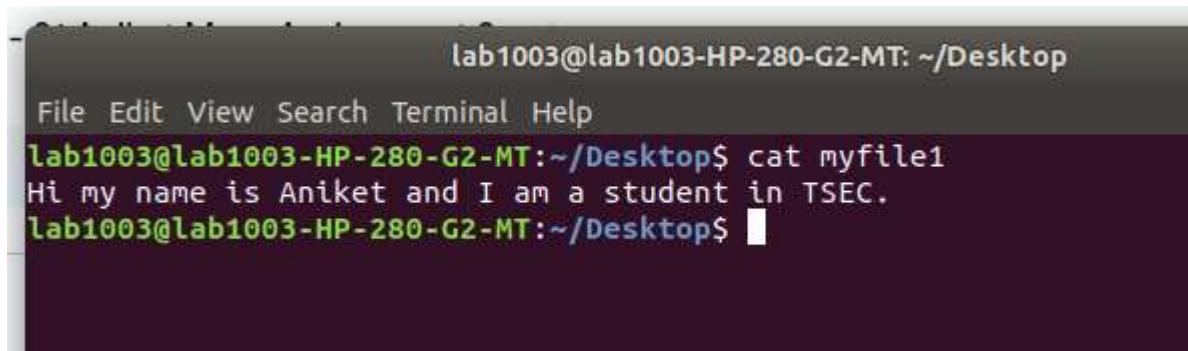
Step 4: Press ‘esc’ followed by ‘:’ to enter into Last Line Mode.

Step 5: Type ‘wq’ command to save your file and exit vi.

```
Firefox Web Browser File Edit View Search Terminal Help
Hi my name is Aniket and I am a student in TSEC.

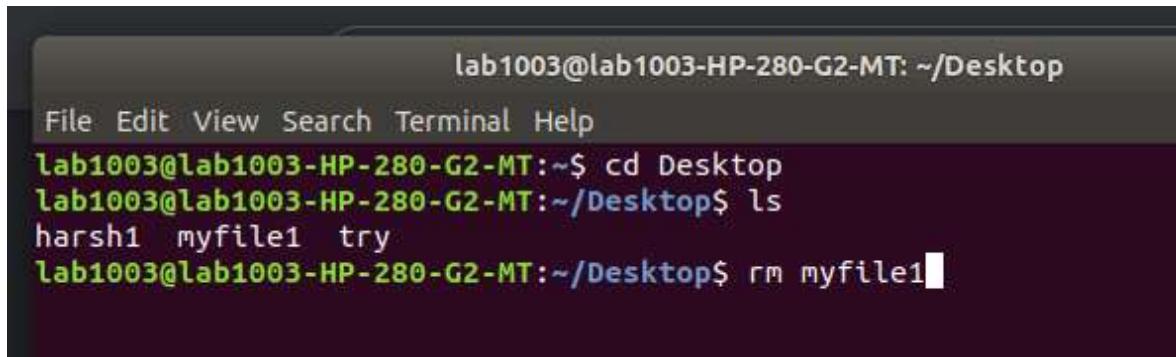
:
:wa
```

Step 6: To view the file use the ‘cat’ command.



```
lab1003@lab1003-HP-280-G2-MT: ~/Desktop
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~/Desktop$ cat myfile1
Hi my name is Aniket and I am a student in TSEC.
lab1003@lab1003-HP-280-G2-MT:~/Desktop$
```

Step 7: To delete the file we just created, use ‘rm’ command.



```
lab1003@lab1003-HP-280-G2-MT: ~/Desktop
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~$ cd Desktop
lab1003@lab1003-HP-280-G2-MT:~/Desktop$ ls
harsh1 myfile1 try
lab1003@lab1003-HP-280-G2-MT:~/Desktop$ rm myfile1
```

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S11-07

UNIX Lab

Assignment No. 3 – To study File System Management Commands.

1. ls:

List information about the FILES (the current directory by default). Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

- ls -C: list entries by columns
- ls-d, --directory
 - list directories themselves, not their contents
- ls-l: use a long listing format

```
labb1003@Lab1003-HP-280-G4-HT-Business-PC:~$ man ls
labb1003@Lab1003-HP-280-G4-HT-Business-PC:~$ 
labb1003@Lab1003-HP-280-G4-HT-Business-PC:~$ ls
demo  Downloads  Index.html  lab  Music  snap  vlg
Desktop  Examples.desktop  Index.html.2  Linux  Pictures  Templates
Documents  index.html  Index.html.3  Linux2  Public  Videos
labb1003@Lab1003-HP-280-G4-HT-Business-PC:~$ ls -c
snap  Index.html.2  Pictures  demo  Templates
Documents  index.html.3  index.html  Downloads  Videos
Pictures  Linux2  lab  Music  Examples.desktop
Index.html.3  Linux  vlg  Public
labb1003@Lab1003-HP-280-G4-HT-Business-PC:~$ ls -l
total 232
-rw-r--r-- 1 lab1003 lab1003 171 Jan 18 18:17 demo
drwxr-xr-x  3 lab1003 lab1003 4096 Jan 19 15:26 Desktop
drwxr-xr-x  2 lab1003 lab1003 4096 Jan 24 12:22 Documents
drwxr-xr-x  2 lab1003 lab1003 4096 Jan 19 12:03 Downloads
-rw-r--r--  1 lab1003 lab1003 9800 Jan 10 11:54 Examples.desktop
-rw-r--r--  1 lab1003 lab1003 29542 Jan 17 12:13 index.html
-rw-r--r--  1 lab1003 lab1003 20308 Jan 24 11:51 index.html.1
-rw-r--r--  1 lab1003 lab1003 56042 Jan 24 11:53 index.html.2
-rw-r--r--  1 lab1003 lab1003 28543 Jan 24 11:51 index.html.3
-rw-r--r--  1 lab1003 lab1003 23 Jan 15 10:59 lab
-rw-r--r--  1 lab1003 lab1003 12 Jan 19 15:40 Linux
-rw-r--r--  1 lab1003 lab1003 6 Jan 19 15:41 Linux2
drwxr-xr-x  2 lab1003 lab1003 4096 Jan 19 12:03 Music
drwxr-xr-x  2 lab1003 lab1003 4096 Jan 24 12:22 Pictures
drwxr-xr-x  2 lab1003 lab1003 4096 Jan 19 12:03 Public
drwxr-xr-x  2 lab1003 lab1003 4096 Jan 19 15:21 snap
drwxr-xr-x  2 lab1003 lab1003 4096 Jan 19 12:03 Templates
drwxr-xr-x  2 lab1003 lab1003 4096 Jan 19 12:01 Videos
-rw-r--r--  1 lab1003 lab1003 19 Jan 19 16:20 vlg
labb1003@Lab1003-HP-280-G4-HT-Business-PC:~$ ls -d
labb1003@Lab1003-HP-280-G4-HT-Business-PC:~$ 
```

2. Locate:

locate reads one or more databases prepared by updatedb(8) and writes file names matching at least one of the PATTERNs to standardoutput, one per line.

- **-A, --all**
Print only entries that match all PATTERNs instead of requiringonly one of them to match.
- **-b, --basename**
Match only the base name against the specified patterns. Thisis the opposite of --wholename.
- **-c, --count**
Instead of writing file names on standard output, write thenumber of matching entries only.
- **-d, --database DBPATH**
Replace the default database with DBPATH. DBPATH is a :-separated list of database file names. If more than one --database option is specified, the resulting path is a concatenation of the separate paths. An empty database file name is replaced by the default database. A database file name - refers to the standard input. Note that a database canbe read from the standard input only once.
- **-e, --existing**

Print only entries that refer to files existing at the time locate is run.

```
Lab1003@Lab1003-HP-280-G4-MT-Business-PC:~$ locate filenew
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/128/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/16/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/22/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/24/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/32/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/48/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/64/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Yaru/16x16/legacy/filenew.svg
/snap/gtk-common-themes/1515/share/icons/elementary-xfce/actions/128/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce/actions/16/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce/actions/22/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce/actions/24/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce/actions/32/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce/actions/48/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce/actions/64/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce/actions/128/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce-darker/actions/16/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce-darker/actions/22/filenew.png
/snap/gtk-common-themes/1515/share/icons/elementary-xfce-darker/actions/24/filenew.png
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/16/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/22/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/24/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/32/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/48/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Humanity/actions/64/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Yaru/16x16/legacy/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Yaru/16x16/actions/filenew.png
/snap/gtk-common-themes/1515/share/icons/Yaru/16x16/actions/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Yaru/12x12/actions/filenew.png
/snap/gtk-common-themes/1515/share/icons/Yaru/24x24/actions/filenew.png
/snap/gtk-common-themes/1515/share/icons/Yaru/24x24/actions/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Yaru/256x256/actions/filenew.png
/snap/gtk-common-themes/1515/share/icons/Yaru/256x256/actions/filenew.svg
/snap/gtk-common-themes/1515/share/icons/Yaru/32x32/actions/filenew.png
/snap/gtk-common-themes/1515/share/icons/Yaru/32x32/actions/filenew.svg
```

3. **unzip:**

unzip will list, test, or extract files from a ZIP archive, commonly found on MS-DOS systems. The default behavior (with no options) is to extract into the current directory (and subdirectories below it) all files from the specified ZIP archive. A companion program, zip(1), creates ZIP archives; both programs are compatible with archives created by PKWARE's PKZIP and PKUNZIP for MS-DOS, but in many cases the program options or default behaviors differ.

4. **Gzip:**

gzip command compresses files. Each single file is compressed into a single file. The compressed file consists of a GNU zip header and deflated data. If given a file as an argument, gzip compresses the file, adds a ".gz" suffix, and deletes the original file. With no arguments, gzip compresses the standard input and writes the compressed file to the standard output.

```
Activities Terminal Mon 11:28
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ unzip filenew
Archive: filenew
End-of-central-directory signature not found. Either this file is not
a zipfile, or it constitutes one disk of a multi-part archive. In the
latter case the central directory and zipfile comment will be found on
the last disk(s) of this archive.
unzip: cannot find zipfile directory in one of filenew or
      filenew.zip, and cannot find filenew.ZIP, period.
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ man gzip
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ gzip -k filenew
Archive: filenew
End-of-central-directory signature not found. Either this file is not
a zipfile, or it constitutes one disk of a multi-part archive. In the
latter case the central directory and zipfile comment will be found on
the last disk(s) of this archive.
unzip: cannot find zipfile directory in one of filenew or
      filenew.zip, and cannot find filenew.ZIP, period.
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ gzip -d filenew
gzip: filenew: unknown suffix -- ignored
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ man gzip
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ qztp -l
Command 'qztp' not found, did you mean:

  command 'zip' from deb zip
  command 'wzip' from deb wzip
  command 'hztp' from deb hztar
  command 'jztp' from deb jztp
  command 'rztp' from deb rztp
  command 'lztp' from deb clzip
  command 'lztp' from deb lunzip
  command 'lztp' from deb lztd
  command 'lztp' from deb lztp
  command 'lztp' from deb lztprecover
  command 'lztp' from deb minilzip
  command 'lztp' from deb pdlzip
```

5. Tar command:

GNU tar is an archiving program designed to store multiple files in a single file (an archive), and to manipulate such archives. The archive can be either a regular file or a device (e.g. a tape drive, hence the name of the program, which stands for tape archiver), which can be located either on the local or on a remote machine.

- **cvf :**

This command creates a tar file called file1.tar which is the Archive of all .cfiles in the current directory.

```
tar cvf file1.tar
```

'-c': Creates a new archive.

'-v': Displays verbose output, showing the progress of the archiving process.

'-f': Specifies the filename of the archive

- **Xvf:**

This command extracts files from tar archived file.tar.gz files.
tar xvzf file.tar.gz

```
[--version] [FILE]...
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ tar tf file1.tar
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ tar xvf file2.tar
tar: file2.tar: Cannot open: No such file or directory
tar: Error is not recoverable: exiting now
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ tar xvf file1.tar
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ tar xvzf file1.tar
bztpz: (stdin) is not a bztpz file.
tar: Child returned status 2
tar: Error is not recoverable: exiting now
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ tar tvf file1.tar
tar: file1.tar: Cannot open: No such file or directory
tar: Error is not recoverable: exiting now
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ tar tvf file1.tar
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ 
```

- **xvjf:**

This command will Untar a file in current directory or in a specified directory using -C option.

tar xvzf file.tar

```
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ ls
file1.tar  filenew
lab1003@lab1003-HP-280-G4-NT-Business-PC:~/pankaj$ 
```

6. **cmp:**

Compare two files byte by byte.

The optional SKIP1 and SKIP2 specify the number of bytes to skip at the beginning of each file (zero by default). Mandatory arguments to long options are mandatory for short options too.

- **-b, --print-bytes**
print differing bytes
- **-i, --ignore-initial=SKIP**
skip first SKIP bytes of both inputs
- **-l, --verbose**
output byte numbers and differing byte values

- **-n, --bytes=LIMIT**
compare at most LIMIT bytes

```
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ vi filenew
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ cmp filenew.txt filenew
cmp: filenew.txt: No such file or directory
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ cmp filenew filenew
filenew filenew differ: byte 16, line 2
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ man cmp
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ cmp -b filenew filenew
filenew filenew differ: byte 16, line 2 is 12 ^3 ~48
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ cmp -l filenew filenew
cmp: invalid --ignore-initial value 'filenew'
cmp: Try 'cmp --help' for more information.
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ cmp -l 10 filenew filenew
filenew filenew differ: byte 6, line 1
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ cmp -l filenew filenew
6 12 ~48
cmp: EOF on filenew after byte 16
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ cmp -m 10 filenew filenew
ab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$
```

7. **split:**

Output pieces of FILE to PREFIXaa, PREFIXab, ...; default size is 1000 lines, and default PREFIX is 'x'. With no FILE, or when FILE is -, read standard input. Mandatory arguments to long options are mandatory for short options too.

- **-b:**
Split file into bytes
- **-l:**
Split file into lines
- **split_:**
Split file with customize suffix. With this command, we can create split output files with customizing suffix. Assume, if we want to create split output files with **index** suffix, execute the following command.
`split -l 4 index.txt split_index_`
- **-n 2:**
Split the file into two files of equal length. To split a file equally into two files, we use the '-n' option. By specifying '-n 2' the file is split equally into two files.
`split -n 2 index.txt`

```

lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ man split
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ split fileneww
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww xaa
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ split -l 2 fileneww
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww xaa
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ split -l 2 fileneww split_file
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww split_file xaa
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ split -b 16 fileneww
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww split_file xaa
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ split -l 4 fileneww split_index_
split: cannot open 'fileneww' for reading: No such file or directory
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ split -l 4 fileneww split_index_
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww split_file xaa
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ split -n 2 fileneww
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww split_file xaa xab
lab1003@Lab1003-MP-280-G4-MT-Business-PC:~/pankaj$ []

```

8. bzip2:

bzip2 compresses files using the Burrows-Wheeler block sorting text compression algorithm, and Huffman coding. Compression is generally considerably better than that achieved by more conventional LZ77/LZ78-based compressors, and approaches the performance of the PPM family of statistical compressors.

- **-z :**

This option forces compression. It is an opposite command of decompression i.e. -d Option.

\$ bzip2 -z input.txt

- **-k:**

This option does compression but does not deletes the originalfile.

\$ bzip2 -k input.txt

- **-d :**

This option is used for decompression of compressed files.

\$ bzip2 -d input.txt.bz2

- **-t :**

This option does the integrity check of the file and does not decompresses the file. It gives us the idea that the file is corrupt or not.

\$ bzip2 -t input.txt.bz2

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ vi input
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ bzip2 input
lab1003@Lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww input.bz2 split_fileaa split_index_aa xaa xab
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ bzip2 -z input
bzip2: Can't open input file input: No such file or directory.
lab1003@Lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ bzip2 -z filenew
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew bz2 fileneww input.bz2 split_fileaa split_index_aa xaa xab
lab1003@Lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ bzip2 -k fileneww
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar fileneww bz2 fileneww input.bz2 split_fileaa split_index_aa xaa xab
lab1003@Lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ bzip2 -d fileneww.bz2
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww fileneww.bz2 input.bz2 split_fileaa split_index_aa xaa xab
lab1003@Lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ bzip2 -t input.bz2
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenew fileneww fileneww.bz2 input.bz2 split_fileaa split_index_aa xaa xab
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ []
```

9. vim:

Vim is a text editor that is upwards compatible to Vi. It can be used to edit all kinds of plain text. It is especially useful for editing programs.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ vim filenewer
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ ls
file1.tar filenewer filenew fileneww fileneww.bz2 input.bz2 split_fileaa split_index_aa xaa xab
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ cat filenewer
# this is pankaj operating on new text editor vim and i like it much better than the previous one.
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ []
```

10. -cd

The ‘cd’ command, which stands for “change directory,” is super important for doing this. It helps you go from one folder to another

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cd Desktop  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/Desktop$ █
```

11. -pwd

Print the full filename of the current working directory.

pwd -L This command is used to show the logical path of the current working directory with the name of the symbolic link if any.

pwd -R This command is used to show the physical path of the current working directory without the name of the symbolic link if any

--help It shows the help message.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ pwd --help  
pwd: pwd [-LP]  
      Print the name of the current working directory.  
  
Options:  
  -L      print the value of $PWD if it names the current working  
          directory  
  -P      print the physical directory, without any symbolic links  
  
By default, 'pwd' behaves as if '-L' were specified.  
  
Exit Status:  
  Returns 0 unless an invalid option is given or the current directory  
  cannot be read.  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ pwd -L  
/home/lab1003  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ pwd -P  
/home/lab1003  
█
```

12. cat

Concatenate FILE(s) to standard output.

-A, --show-all

equivalent to -vET

-b, --number-non-blank

number nonempty output lines, overrides -n

-e equivalent to -vE

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat demo  
hello world  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat demo -A  
hello world $  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat demo -b  
 1 hello world  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat demo -e  
hello world $  
█
```

13. mkdir

Make the Directory(ies), if they do not already exist.

-m, set file mode (as in chmod), not a=rwx - umask

-p, no error if existing, make parent directories as needed

-v, print a message for each created directory

```
lamb003@lab1003-HP-280-G4-HT-Business-PC:~$ mkdir test -p
lamb003@lab1003-HP-280-G4-HT-Business-PC:~$ mkdir test -v
mkdir: cannot create directory 'test': File exists
lamb003@lab1003-HP-280-G4-HT-Business-PC:~$ mkdir tester -v
mkdir: created directory 'tester'
lamb003@lab1003-HP-280-G4-HT-Business-PC:~$ mkdir --help
Usage: mkdir [OPTION]... DIRECTORY...
Create the DIRECTORY(ies), if they do not already exist.

Mandatory arguments to long options are mandatory for short options too.
-p, --parents    set file mode (as in chmod), not a=rwx - umask
-p, --parents    no error if existing, make parent directories as needed
-v, --verbose    print a message for each created directory
-z              set SELinux security context of each created directory
                to the default type
--context[=CTX]  like -z, or if CTX is specified then set the SELinux
                or SMACK security context to CTX
--help          display this help and exit
--version        output version information and exit

GNU coreutils online help: <http://www.gnu.org/software/coreutils/>
Full documentation at: <http://www.gnu.org/software/coreutils/mkdir>
or available locally via: Info '(coreutils) mkdir invocation'
```

14. rmdir

Remove the Directory(ies), if they are empty.

-p, --parents

remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b/c' is similar
to 'rmdir a/b/c a/b a'

-v, --verbose

output a diagnostic for every directory processed

--help display this help and exit

```
lamb003@lab1003-HP-280-G4-HT-Business-PC:~$ mkdir p
lamb003@lab1003-HP-280-G4-HT-Business-PC:~$ rmdir p
lamb003@lab1003-HP-280-G4-HT-Business-PC:~$
```

15. -rm

Remove file (rm) removes each specified file.

ignore nonexistent files and arguments, never prompt

-i prompt before every removal

- I prompt once before removing more than three files, or when removing recursively; less intrusive than -i, while still giving -r, remove directories and their contents recursively

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ rm -i demo  
rm: remove regular file 'demo'?  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ rm -I demo  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ rm -v demo
```

16. cp

Copy SOURCE to DEST, or multiple SOURCE(s) to DIRECTORY.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cp jordan jordan  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ cat jordan  
t hello sarthak
```

- a, same as -dR --preserve=all
- b like --backup but does not accept an argument
- d same as --no-dereference --preserve=links

17. mv

Move SOURCE to DEST, or move SOURCE(s) to DIRECTORY.

- b does not accept an argument
- f, do not prompt before overwriting
- i, prompt before overwrite

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ mv panka demo  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ ls  
29.tcl      demo  Destination_dir examples.desktop index.html jordan  natkdemo  Pictures  rohandemo  Shivan2  Templates  try  
40.tcl      demo2  Documents    harsh  jeyden.nam Krishna  out.nam  Public  rohan.odt  Shivanm  test  Videos  
assignment-02 Desktop Downloads  hello.odt  jeyden.tr  Music   out.tr   roham  routing.tcl  Shivanu  tester  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ ]
```

18. chmod

change file mode bits. chmod changes the file mode bits of each given file according to mode, which can be either a symbolic representation of changes to make, or an octal number representing the bit pattern for the new mode bits.

- c, --changes

like verbose but report only when a change is made

- f, --silent, --quiet

suppress most error messages

-v, --verbose

output a diagnostic for every file processed

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ chmod -v + Desktop
mode of 'Desktop' retained as 0755 (rwxr-xr-x)
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ [ ]
```

19. wc

wc stands for **word count**. As the name implies, it is mainly used for counting purpose.

-l: This option prints the **number of lines** present in a file.

w: This option prints the **number of words** present in a file.

-c: This option displays **count of bytes** present in a file.

```
o Desktop
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ wc -c out.tr
154836 out.tr
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ [ ]
```

20. piping

A pipe is a form of redirection that is used in Linux and other Unix-like operating systems to send the output of one command/program/process to another command/program/process for further processing.

```
lab1003@Lab1003-HP-280-G4-MT-Business-PC:~$ ls | grep temp1
temp1
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ [ ]
```

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ cat newfile | tail -3
I watch movies
I live in mumbai
I live at my house
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/panka$ [ ]
```

21. redirection

The output from a command normally intended for standard output can be easily diverted to a file instead.

Just as the output of a command can be redirected to a file, so can the input of a command be redirected from a file.

```
lab1003@lab1003-HP-280-G4-HT-Business-PC:~$ who > users
lab1003@lab1003-HP-280-G4-HT-Business-PC:~$
```

22. grep

(grep stands for global search for regular expression and printout). The grepfilter searches a file for a particular pattern of characters and displays all lines that contain that pattern

-E, --extended-regexp

Interpret PATTERN as an extended regular expression (ERE,
See below).

-c – This prints only a count of the lines that match a pattern.

-G, --basic-regexp

Interpret PATTERN as a basic regular expression (BRE, see below).

This is the default.

```
lab1003@lab1003-HP-280-G4-HT-Business-PC:~$ grep -c pattern pankaj
grep: pankaj: Is a directory
0
lab1003@lab1003-HP-280-G4-HT-Business-PC:~$
```

```
i live at my house
lab1003@lab1003-HP-280-G4-HT-Business-PC:~/pankajs$ ls | grep newfile
newfile
lab1003@lab1003-HP-280-G4-HT-Business-PC:~/pankajs$
```

23. tr

The tr command is a Linux command-line utility that translates or deletes characters from standard input (stdin) and writes the result to standard output

-c - Complements the values in SET1. Operations apply to characters that are not in the given set.

-d- Deletes characters from the **SET1** input.

-t- Truncates **SET1**to the length of **SET2**.

```
[lab1003@lab1003-HP-280-G4-MT-Business-PC:~]$ echo "hello"|tr l z  
hezzo  
[lab1003@lab1003-HP-280-G4-MT-Business-PC:~]$ ]
```

24. sort

SORT command is used to sort a file, arranging the records in a particular order.

-r- Sorts data in reverse order (descending).

-n- Sorts a file numerically

-k- Sorts a table based on a specific column number.

```
[lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj]$ sort -r filenew  
HI this is pankaj operating on new text editor vim and i like it much better than the previous one.  
[lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj]$ ]
```

```
[lab1003@lab1003-HP-280-G4-MT-Business-PC:~]$ ls | sort -ks  
29.tcl  
40.tcl  
assignment-02  
demo  
demo2  
Desktop  
Destination_dir  
Documents  
Downloads  
examples.desktop  
fol  
harsh  
hello.adt  
index.html  
jayden.nam  
jayden.tr  
jordan  
Krishna  
Mustc  
naiik  
naiikdemo  
out.nam  
out.tr  
pankaj  
Pictures  
Public  
rohan  
rohandemo  
rohan.adt  
rooting.tcl  
Shivam2  
Shivam  
Shivams  
Templates  
test
```

25. head

The head command options allow you to modify the output and display the wanted amount of data.

-n- show the specified number of lines

-c- show the specified number of bytes

-v- show the file name tag

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ head -v filenever
--> filenever <-->
Hi this is pankaj operating on new text editor vtm and i like it much better than the previous one.
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$
```

```
fruit
apple
hand
leg
thigh
fingers palm
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ cat newfile head -7 pipe tail -3
cat: invalid option -- -7
Try 'cat --help' for more information.
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ cat newfile| head -7 | tail -3
i watch movies
i live in mumbai
i live at my house
```

26. tail

It is the complementary of head command. The tail command, as the name implies, prints the last N numbers of data of the given input

- n-Prints the last ‘num’ lines instead of last 10 lines.
- c-Prints the last ‘num’ bytes from the file specified.
- q-It is used if more than 1 file is given.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ tail -n 2 filenever
This is pankaj
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$
```

27. diff

diff stands for difference. It's primary purpose is to compare the contents of two files and display the differences between them.

- c-Output differences in context mode
- u-Output differences in unified mode
- i-Perform a case-insensitive comparison

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ diff temp1 temp2
1,6c1
< Bl
< Bl
< again who am I
<
< D
< who am I
---
```

28. comm

comm compare two sorted files line by line and write to standard output;the lines that are common and the lines that are unique.

1. **-1** :suppress first column(lines unique to first file).
2. **-2** :suppress second column(lines unique to second file).
3. **-3** :suppress third column(lines common to both files).

```
> agani i am the one above all  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ comm temp1 temp2  
agani i am the one above all  
BI  
BI
```

29. less

Less command is a Linux utility that can be used to read the contents of a text file one page (one screen) at a time.

- p-Start at the first occurrence of the specified pattern in the file.
- s-Squeeze consecutive blank lines into a single line.
- i-Ignore cases when searching.

```
mumbai  
kolkata  
banglore  
dehli  
file1 (END)
```

• 30. more

more command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large

- d: Use this command in order to help the user to navigate.
- f: This option does not wrap the long lines and displays them as such.
- p: This option clears the screen and then displays the text.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ more -d filenever  
Hi this is pankaj operating on new text editor vim and i like it much better than the previous one.  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$
```

```
HI this is pankaj operating on new text editor vim and I like it much better than the previous one.  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ more -f filenever  
HI this is pankaj operating on new text editor vim and I like it much better than the previous one.  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ more -p filenever  
  
HI this is pankaj operating on new text editor vim and I like it much better than the previous one.  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ 
```

• 31. file

file command is used to determine the type of a file.

- b –brief : This is used to display just file type in brief mode.
- c option: Cause a checking printout of the parsed form of the magic file.
- f option: Read the names of the files to be examined from namefile (one per line) before the argument list.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ file -b filenew  
ASCII text  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~/pankaj$ 
```

• 32. type

The type command is used to describe how its argument would be translated if used as commands.

- a: This option is used to find out whether it is an alias, keyword or a function and it also displays the path of an executable, if available.
- t: This option will display a single word as an output.
- p: This option displays the name of the disk file which would be executed by the shell. It will return nothing if the command is not a disk file.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ type man  
man is /usr/bin/man  
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ 
```


ALPHONZ GEORGE

S11-05

UNIX Lab

Assignment No. 4 – To study User Management Commands.

User Management Commands:

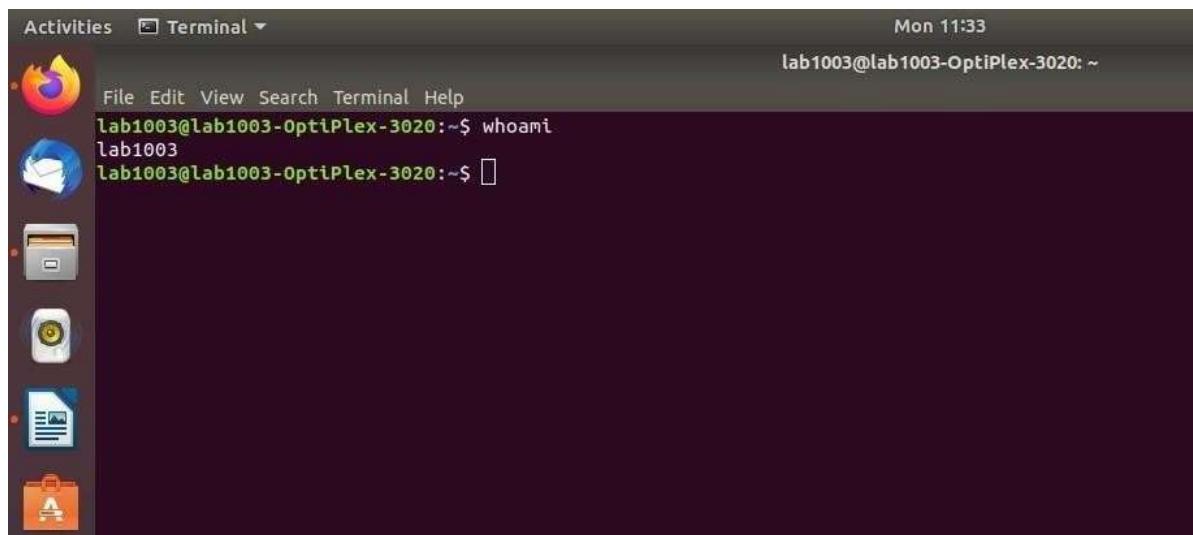
Who: The who command is a simple and effective way to display information about currently logged-in users.



A screenshot of a Linux desktop environment. On the left is a vertical dock with icons for a browser, file manager, terminal, and other applications. The main window is a terminal titled "Terminal". The terminal shows the command "who" being run at the prompt "lab1003@lab1003-OptiPlex-3020:~\$". The output of the command is displayed below the prompt, showing the user "lab1003" at terminal "0" on "2024-01-29 09:41". The terminal window has a dark background with light-colored text. The top bar shows the date and time as "Mon 11:37".

```
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ who
lab1003 :0          2024-01-29 09:41 (:0)
lab1003@lab1003-OptiPlex-3020:~$
```

Whoami: The ‘whoami’ command is a simple yet powerful utility designed to reveal the current username associated with the active user session



A screenshot of a Linux desktop environment, identical to the previous one, showing a terminal window titled "Terminal". The terminal shows the command "whoami" being run at the prompt "lab1003@lab1003-OptiPlex-3020:~\$". The output of the command is displayed below the prompt, showing the user "lab1003". The terminal window has a dark background with light-colored text. The top bar shows the date and time as "Mon 11:33".

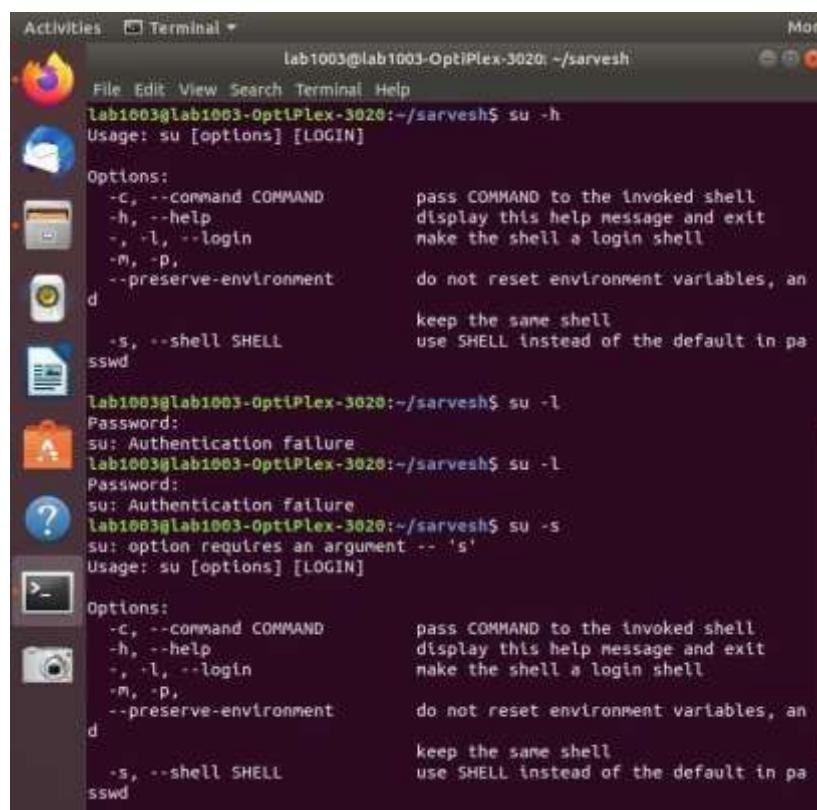
```
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ whoami
lab1003
lab1003@lab1003-OptiPlex-3020:~$
```

Su : The Unix command su, which stands for 'substitute user' (or historically 'superuser'), is used by a computer user to execute commands with the privileges of another user account.

-l: makes a login shell

-h: Help command

-s: uses shell instead of default password



The screenshot shows a terminal window in a Linux desktop environment. The terminal title is "Terminal". The command entered is "su -h". The output shows the usage information for the su command, including options like -c, -h, -l, -M, -p, --preserve-environment, and -s. It also shows a failed authentication attempt with the message "su: Authentication failure".

```
Activities Terminal lab1003@lab1003-OptiPlex-3020: ~/sarvesh
File Edit View Search Terminal Help
Usage: su [options] [LOGIN]
Options:
  -c, --command COMMAND      pass COMMAND to the invoked shell
  -h, --help                  display this help message and exit
  -, -l, --login              make the shell a login shell
  -M, -p,
  --preserve-environment     do not reset environment variables, an
d
  -s, --shell SHELL          keep the same shell
  sswd                         use SHELL instead of the default in pa
sswd
lab1003@lab1003-OptiPlex-3020:~/sarvesh$ su -l
Password:
su: Authentication failure
lab1003@lab1003-OptiPlex-3020:~/sarvesh$ su -l
Password:
su: Authentication failure
lab1003@lab1003-OptiPlex-3020:~/sarvesh$ su -s
su: option requires an argument -- 's'
Usage: su [options] [LOGIN]
Options:
  -c, --command COMMAND      pass COMMAND to the invoked shell
  -h, --help                  display this help message and exit
  -, -l, --login              make the shell a login shell
  -M, -p,
  --preserve-environment     do not reset environment variables, an
d
  -s, --shell SHELL          keep the same shell
  sswd                         use SHELL instead of the default in pa
sswd
```

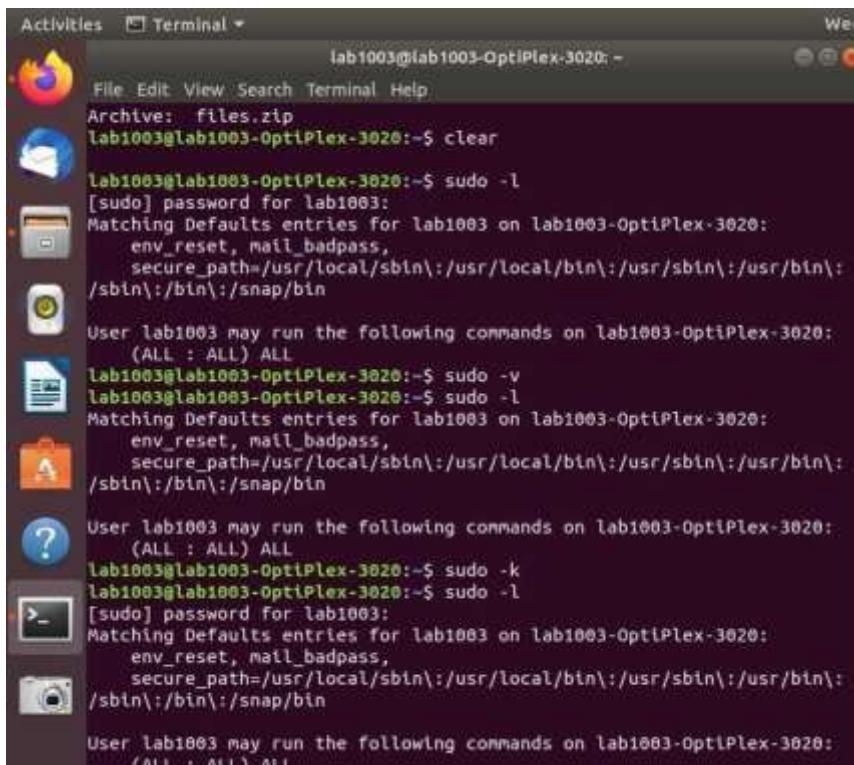
Sudo : Sudo is a program for Unix-like computer operating systems that enables users to run programs with the security privileges of another user, by default the superuser.

Sudo -l: will print out the commands allowed (and forbidden) the user on the current host.

Sudo -v: If, given the -v (validate) option, sudo will update the user's timestamp, prompting for the user's password if necessary.

Sudo -k: The -k (kill) option to sudo invalidates the user's timestamp. So, the next time sudo is run a password will be required.

Sudo -s: The -s option runs the shell specified by the SHELL environment variable if it is set



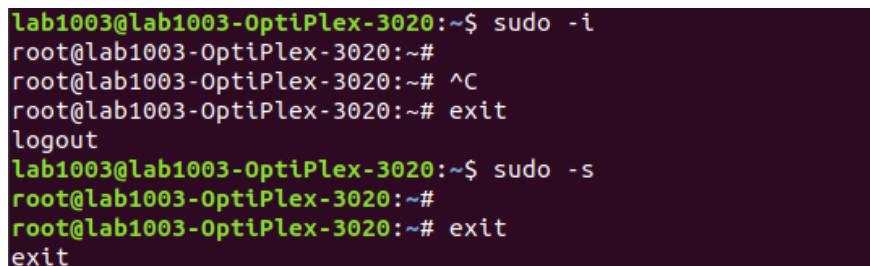
The screenshot shows a Linux desktop environment with a terminal window open. The terminal window title is "Terminal". The terminal content shows the following session:

```
lab1003@lab1003-OptiPlex-3020:~$ clear
lab1003@lab1003-OptiPlex-3020:~$ sudo -l
[sudo] password for lab1003:
Matching Defaults entries for lab1003 on lab1003-OptiPlex-3020:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:
    /sbin\:/bin\:/snap/bin

User lab1003 may run the following commands on lab1003-OptiPlex-3020:
    (ALL : ALL) ALL
lab1003@lab1003-OptiPlex-3020:~$ sudo -v
lab1003@lab1003-OptiPlex-3020:~$ sudo -l
Matching Defaults entries for lab1003 on lab1003-OptiPlex-3020:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:
    /sbin\:/bin\:/snap/bin

User lab1003 may run the following commands on lab1003-OptiPlex-3020:
    (ALL : ALL) ALL
lab1003@lab1003-OptiPlex-3020:~$ sudo -k
lab1003@lab1003-OptiPlex-3020:~$ sudo -l
[sudo] password for lab1003:
Matching Defaults entries for lab1003 on lab1003-OptiPlex-3020:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:
    /sbin\:/bin\:/snap/bin

User lab1003 may run the following commands on lab1003-OptiPlex-3020:
    (ALL : ALL) ALL
```



The screenshot shows a terminal window with the following session:

```
lab1003@lab1003-OptiPlex-3020:~$ sudo -i
root@lab1003-OptiPlex-3020:~#
root@lab1003-OptiPlex-3020:~# ^C
root@lab1003-OptiPlex-3020:~# exit
logout
lab1003@lab1003-OptiPlex-3020:~$ sudo -s
root@lab1003-OptiPlex-3020:~#
root@lab1003-OptiPlex-3020:~# exit
exit
```

Login: login is used when signing onto a system. It can also be used to switch from one user to another at any time

Login -f: Used to skip a second login authentication. This specifically does not work for root

Logout: The logout command in Unix is used to log out the currently logged-in user from the system in that session. It works programmatically and is typically executed in a login shell.

Exit: exit command in Unix is used to exit the shell where it is currently running

Passwd: The passwd command in Unix provides a straightforward and effective way to modify user passwords



```
Activities Terminal
File Edit View Search Terminal Help
Lab1003@Lab1003-OptiPlex-3020:~$ passwd
Changing password for lab1003.
(current) UNIX password:
Enter new UNIX password:
Retype new UNIX password:
Password unchanged
Enter new UNIX password:
Retype new UNIX password:
Password unchanged
Enter new UNIX password:
Retype new UNIX password:
You must choose a longer password
passwd: Authentication token manipulation error
passwd: password unchanged
Lab1003@Lab1003-OptiPlex-3020:~$
```

Useradd: useradd is a command in Unix that is used to add useraccounts to your system

sudo useradd -d /home/lab1003 lab1003: To give a home directory path for new users.

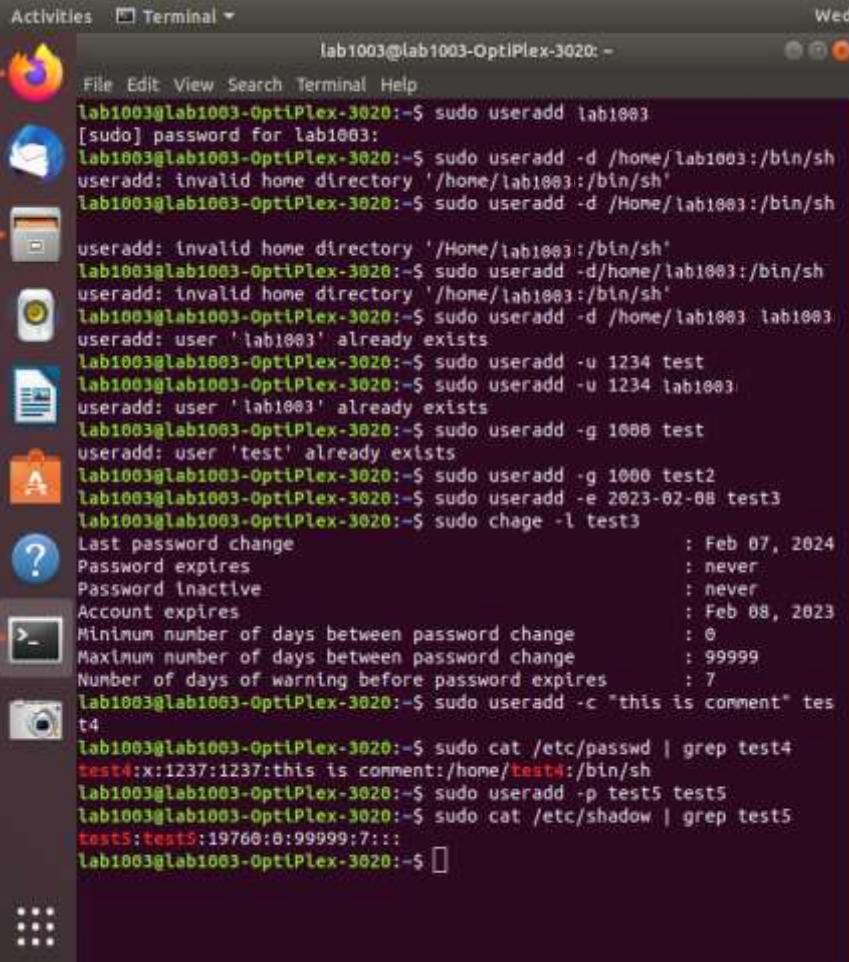
sudo useradd -u 1234 lab1003: To create a new user with a custom UID

sudo useradd -g 1000 lab1003: To create a new user and assign a specific group ID

sudo useradd -c "comment": To add a comment or description for a user

sudo useradd -p name1 name2: To set an unencrypted password for the user

user



```

Activities Terminal
lab1003@lab1003-OptiPlex-3020:~ - 
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd lab1003
[sudo] password for lab1003:
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -d /home/lab1003:/bin/sh
useradd: invalid home directory '/home/lab1003:/bin/sh'
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -d /Home/lab1003:/bin/sh
useradd: invalid home directory '/Home/lab1003:/bin/sh'
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -d /home/lab1003 lab1003
useradd: user 'lab1003' already exists
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -u 1234 test
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -u 1234 lab1003
useradd: user 'lab1003' already exists
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -g 1000 test
useradd: user 'test' already exists
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -g 1000 test2
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -e 2023-02-08 test3
lab1003@lab1003-OptiPlex-3020:~$ sudo chage -l test3
Last password change : Feb 07, 2024
Password expires : never
Password inactive : never
Account expires : Feb 08, 2023
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
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -c "this is comment" test4
test4:x:1237:1237:this is comment:/home/test4:/bin/sh
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd -p test5 test5
lab1003@lab1003-OptiPlex-3020:~$ sudo cat /etc/shadow | grep test5
test5:test5:19760:8:99999:7:::
lab1003@lab1003-OptiPlex-3020:~$ 

```

Usermod: usermod command or modify user is a command in Unix that is used to change the properties of a user in Unix through the commandline.

sudo usermod -c "comment" name: To add a comment for a user

sudo usermod -d /home/dir_name name: To change the home directory of a user

sudo usermod -e yyyy-mm-dd test_user: To change the expiry date of a user

sudo usermod -L test_user: To lock a user



```

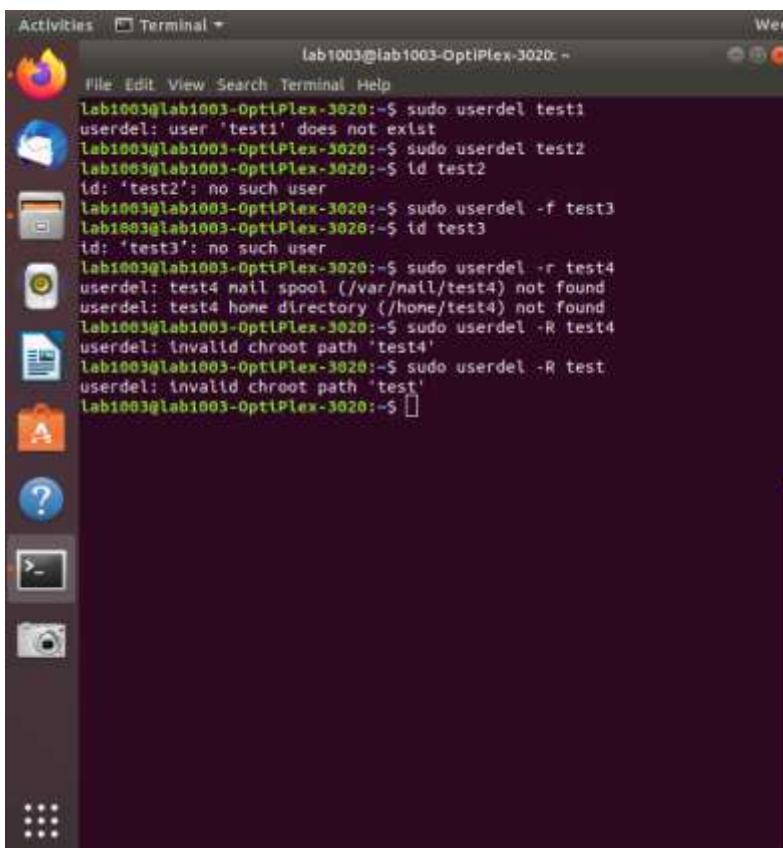
Activities Terminal
lab1003@lab1003-OptiPlex-3020:~ - 
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ ls
1           indexac  Music          outputaq
abcd        indexad  output2.txt.gz  output.txt.bz2
ball        indexae  outputaes     output.txt.gz
demo        indexaf  outputab      Pictures
Desktop    indexag  outputac      Public
dir         indexah  outputad      rishabh1
direc       indexal  outputae      rishabh2
Documents   indexaj  outputaf      rishabh2zz
Downloads  indexak  outputag      rishabh3
examples.desktop indexal  outputah      rishabh4
file1.txt   indexam  outputai      servers
file2.txt   indexan  outputaj      Templates
file3.txt   indexao  outputak      trial.vimrc
file4.txt   indexap  outputal      trial.zip
file5.txt   indexaq  outputam      unix1
file5.zip   it89    outputan      Videos
indexaa    ls -a'    outputao      xaa
indexab    mihir   outputap      
lab1003@lab1003-OptiPlex-3020:~$ sudo usermod -e 2023-05-09 test4
lab1003@lab1003-OptiPlex-3020:~$ sudo chage -l test4
Last password change : Feb 07, 2024
Password expires : never
Password inactive : never
Account expires : May 09, 2023
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
lab1003@lab1003-OptiPlex-3020:~$ sudo usermod -l testea test5
lab1003@lab1003-OptiPlex-3020:~$ id testas
uid=1238(testaa) gid=3238(test5) groups=1238(test5)
lab1003@lab1003-OptiPlex-3020:~$ sudo usermod -L test2
lab1003@lab1003-OptiPlex-3020:~$ sudo usermod -U test
usermod: unlocking the user's password would result in a passwordless account.
You should set a password with usermod -p to unlock this user's password.
lab1003@lab1003-OptiPlex-3020:~$ 

```

```
Activities Terminal * lab1003@lab1003-OptiPlex-3020: ~
lab1003@lab1003-OptiPlex-3020: ~$ sudo usermod -c "this is comment" test6
usermod: user 'test6' does not exist
lab1003@lab1003-OptiPlex-3020: ~$ sudo usermod -c "this is comment" test5
lab1003@lab1003-OptiPlex-3020: ~$ sudo usermod -d /home/sarvesh test5
lab1003@lab1003-OptiPlex-3020: ~$ ls
indexac Music outputaq
abcd indexad output2.txt.gz output.txt.bz2
ball indexae outputaa output.txt.gz
demo indexaf outputab Pictures
Desktop indexag outputac Public
dir indexah outputad rishabh1
dirct indexai outputae rishabh2
Documents indexaj outputaf rishabh22
Downloads indexak outputag rishabh3
examples.desktop indexal outputah rishabh4
file1.txt indexan outputai sarvesh
file2.txt indexao outputaj Templates
file3.txt indexao outputak trial.vimrc
file4.txt indexap outputal trial.zip
file5.txt indexaq outputam unixi
Files.zip itb9 outputan Videos
Indexaa 'ls -a' outputao xaa
Indexab minir outputap
lab1003@lab1003-OptiPlex-3020: ~$ sudo usermod -e 2023-05-09 test4
lab1003@lab1003-OptiPlex-3020: ~$ sudo chage -l test4
Last password change : Feb 07, 2024
Password expires : never
Password inactive : never
Account expires : May 09, 2023
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
lab1003@lab1003-OptiPlex-3020: ~$ sudo usermod -L testaa test5
lab1003@lab1003-OptiPlex-3020: ~$ id testaa
uid=1238(testaa) gid=1238(test5) groups=1238(test5)
lab1003@lab1003-OptiPlex-3020: ~$
```

Userdel: userdel command in unix system is used to delete a useraccount and related files.

- f : Force removal of the user account, including home directory and mailspool, even if the user is logged in.
- r: Remove the user's home directory along with the account. Usefulfor a complete cleanup.
- R: Apply changes in the specified CHROOT_DIR, useful for userdeletion operations within a chroot environment.

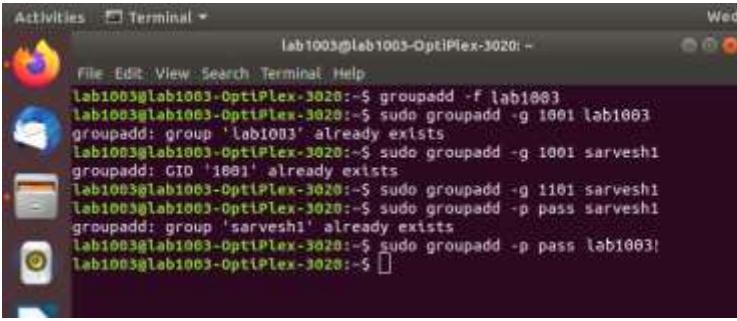


The screenshot shows a Linux desktop environment with a terminal window open. The terminal window title is "Terminal". The terminal content shows the following command history:

```
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ sudo userdel test1
userdel: user 'test1' does not exist
lab1003@lab1003-OptiPlex-3020:~$ sudo userdel test2
lab1003@lab1003-OptiPlex-3020:~$ id test2
id: 'test2': no such user
lab1003@lab1003-OptiPlex-3020:~$ sudo userdel -f test3
lab1003@lab1003-OptiPlex-3020:~$ id test3
id: 'test3': no such user
lab1003@lab1003-OptiPlex-3020:~$ sudo userdel -r test4
userdel: test4 mail spool (/var/mail/test4) not found
userdel: test4 home directory (/home/test4) not found
lab1003@lab1003-OptiPlex-3020:~$ sudo userdel -R test4
userdel: invalid chroot path 'test4'
lab1003@lab1003-OptiPlex-3020:~$ sudo userdel -R test
userdel: invalid chroot path 'test'
lab1003@lab1003-OptiPlex-3020:~$
```

Groupadd: The groupadd command creates a new group accountusing the values specified on the command line, plus the default values from the system. The new group is entered into the systemfiles as needed.

- f: This option forces the command to silently abort if the group withthe given name already exists.
- g: This option assigns a specific numeric group id to the newly createdgroup.
- p: Sets an encrypted password for the group.



```
Activities Terminal * lab1003@lab1003-OptiPlex-3020: ~
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ groupadd -f lab1003
groupadd: group 'lab1003' already exists
lab1003@lab1003-OptiPlex-3020:~$ sudo groupadd -g 1001 sarvesh1
groupadd: GID '1001' already exists
lab1003@lab1003-OptiPlex-3020:~$ sudo groupadd -g 1101 sarveshi
groupadd: group 'sarveshi' already exists
lab1003@lab1003-OptiPlex-3020:~$ sudo groupadd -p pass lab1003!
lab1003@lab1003-OptiPlex-3020:~$
```

Groupmod: groupmod command in unix is used to modify or change theexisting group on unix system. It can be handled by superuser or root user.

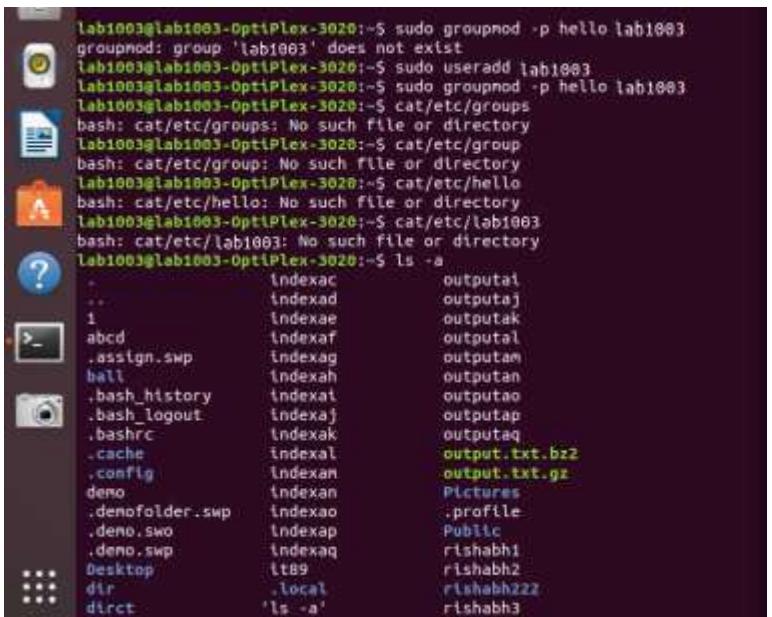
/etc/group: Group Account Information.

/etc/gshadow: Secured group account information.

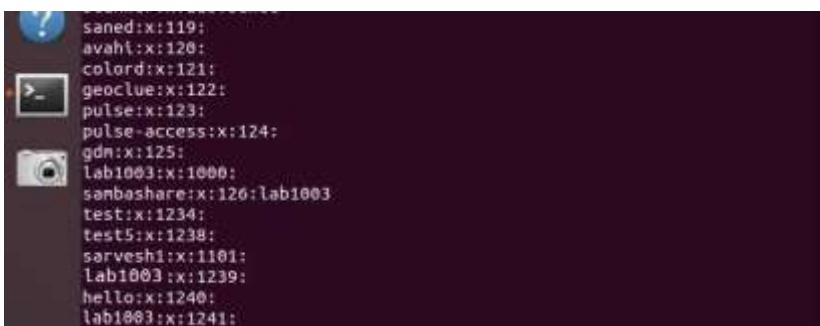
/etc/login.def: Shadow passwd suite configuration.

/etc/passwd: User account information.

-p: This gives the encrypted password.



```
lab1003@lab1003-OptiPlex-3020:~$ sudo groupmod -p hello lab1003
groupmod: group 'lab1003' does not exist
lab1003@lab1003-OptiPlex-3020:~$ sudo useradd lab1003
lab1003@lab1003-OptiPlex-3020:~$ sudo groupmod -p hello lab1003
lab1003@lab1003-OptiPlex-3020:~$ cat/etc/groups
bash: cat/etc/groups: No such file or directory
lab1003@lab1003-OptiPlex-3020:~$ cat/etc/group
bash: cat/etc/group: No such file or directory
lab1003@lab1003-OptiPlex-3020:~$ cat/etc/hello
bash: cat/etc/hello: No such file or directory
lab1003@lab1003-OptiPlex-3020:~$ cat/etc/lab1003
bash: cat/etc/lab1003: No such file or directory
lab1003@lab1003-OptiPlex-3020:~$ ls -a
.
..
indexac          outputai
indexad          outputaj
indexae          outputak
indexaf          outputal
indexag          outputam
indexah          outputan
indexai          outputao
indexaj          outputap
indexak          outputaq
indexal          outputi
indexan          outputt.txt.bz2
indexao          outputt.txt.gz
indexap          Pictures
indexaq          .profile
Desktop          Public
dir              .local
dirct            rishabh1
dirct            rishabh2
dirct            rishabh22
dirct            rishabh3
dirct            'ls -a'
```

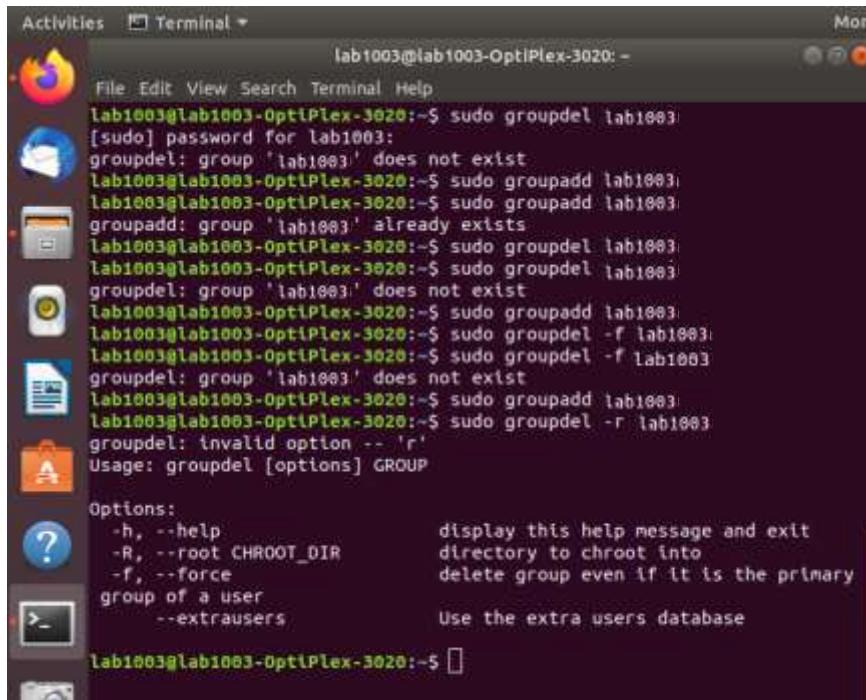


```
saned:x:119:
avahi:x:120:
colord:x:121:
geoclue:x:122:
pulse:x:123:
pulse-access:x:124:
gdm:x:125:
lab1003:x:1000:
sanbashare:x:120:lab1003
test:x:1234:
test5:x:1238:
sarveshi:x:1101:
lab1003 :x:1239:
hello:x:1240:
lab1003:x:1241:
```

Groupdel: The ‘groupdel’ command is a powerful tool in unix that allows system administrators to delete existing groups.

-f: deletes the group even if it is a primary one.

-h: displays help message.



The screenshot shows a terminal window titled 'Terminal' with the command line 'lab1003@lab1003-OptiPlex-3020: ~'. The user runs several commands related to the 'groupdel' command:

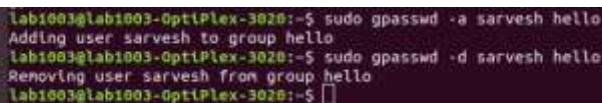
```
lab1003@lab1003-OptiPlex-3020:~$ sudo groupdel lab1003
[sudo] password for lab1003:
groupdel: group 'lab1003' does not exist
lab1003@lab1003-OptiPlex-3020:~$ sudo groupadd lab1003
lab1003@lab1003-OptiPlex-3020:~$ sudo groupadd lab1003
groupadd: group 'lab1003' already exists
lab1003@lab1003-OptiPlex-3020:~$ sudo groupdel lab1003
lab1003@lab1003-OptiPlex-3020:~$ sudo groupdel lab1003
groupdel: group 'lab1003' does not exist
lab1003@lab1003-OptiPlex-3020:~$ sudo groupadd lab1003
lab1003@lab1003-OptiPlex-3020:~$ sudo groupdel -f lab1003
lab1003@lab1003-OptiPlex-3020:~$ sudo groupdel -f lab1003
groupdel: group 'lab1003' does not exist
lab1003@lab1003-OptiPlex-3020:~$ sudo groupadd lab1003
lab1003@lab1003-OptiPlex-3020:~$ sudo groupdel -f lab1003
groupdel: invalid option -- 'f'
Usage: groupdel [options] GROUP

Options:
  -h, --help          display this help message and exit
  -R, --root CHROOT_DIR    directory to chroot into
  -f, --force          delete group even if it is the primary
                       group of a user
  --extrausers         Use the extra users database
```

Gpasswd: gpasswd command is used to administer the /etc/group and /etc/gshadow. As every group in unix has administrators, members, and a password.

-a: Used for adding a password to a group

-d: used for deleting a password from a group.



```
lab1003@lab1003-OptiPlex-3020:~$ sudo gpasswd -a sarvesh hello
Adding user sarvesh to group hello
lab1003@lab1003-OptiPlex-3020:~$ sudo gpasswd -d sarvesh hello
Removing user sarvesh from group hello
lab1003@lab1003-OptiPlex-3020:~$
```

Chown: The `chown` command, short for “change owner,” is a powerful tool that allows users to change the owner of files and directories.

```
Lab1003@Lab1003-HP-Z80-G2-HT:~$ chown -c master file_copy.txt
chown: invalid user: 'master'
Lab1003@Lab1003-HP-Z80-G2-HT:~$ chown -v Lab1003 file_copy.txt
Lab1003@Lab1003-HP-Z80-G2-HT:~$ ls -l file_copy.txt
-rw-r--r-- 1 Lab1003 Lab1003 30 Feb 7 18:55 file_copy.txt
Lab1003@Lab1003-HP-Z80-G2-HT:~$ chown -v Lab1003 file_copy.txt
ownership of 'file_copy.txt' retained as Lab1003
Lab1003@Lab1003-HP-Z80-G2-HT:~$ ls -l file_copy.txt
-rw-r--r-- 1 Lab1003 Lab1003 30 Feb 7 18:55 file_copy.txt
Lab1003@Lab1003-HP-Z80-G2-HT:~$
```

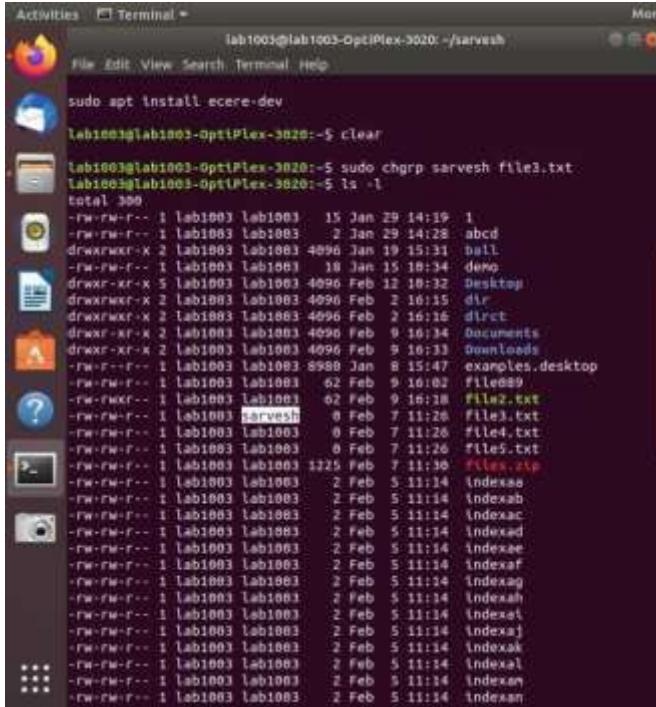
The `-c` option in the `chown` command is utilized to report when a filechange is made.

The `-v` option enhances the verbosity of the `chown` command by showing detailed information for every processed file.

Chage: The chage command is used to view and change the user password expiry information. This command is used when the login is to be provided for a user for a limited amount of time or when it is necessary to change the login password from time to time

```
Lab1003@Lab1003-HP-Z80-G2-HT:~$ sudo chage -l root
Last password change : Jan 10, 2024
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
```

Chgrp: The `chgrp` command in unix is used to change the group ownership of a file or directory. All files in unix belong to an owner



```
Activities Terminal
lab1003@lab1003-OptiPlex-3020: ~/sarvesh
File Edit View Search Terminal Help
sudo apt install ecere-dev
lab1003@lab1003-OptiPlex-3020: ~ clear
lab1003@lab1003-OptiPlex-3020: ~ sudo chgrp sarvesh file3.txt
lab1003@lab1003-OptiPlex-3020: ~ ls -l
total 300
-rw-rw-r-- 1 lab1003 lab1003 15 Jan 29 14:19 1
-rw-rw-r-- 1 lab1003 lab1003 2 Jan 29 14:28 abcd
drwxrwxr-x 2 lab1003 lab1003 4096 Jan 19 15:31 ball
-rw-rw-r-- 1 lab1003 lab1003 18 Jan 15 18:34 demo
drwxrwxr-x 5 lab1003 lab1003 4096 Feb 12 18:32 Desktop
drwxrwxr-x 2 lab1003 lab1003 4096 Feb 2 16:15 dir
drwxrwxr-x 2 lab1003 lab1003 4096 Feb 2 16:16 direct
drwxrwxr-x 2 lab1003 lab1003 4096 Feb 9 16:34 Documents
drwxrwxr-x 2 lab1003 lab1003 4096 Feb 9 16:33 Downloads
-rw-rw-r-- 1 lab1003 lab1003 8988 Jan 8 15:47 examples.desktop
-rw-rw-r-- 1 lab1003 lab1003 62 Feb 9 16:02 file009
-rw-rw-r-- 1 lab1003 lab1003 62 Feb 9 16:28 file2.txt
-rw-rw-r-- 1 lab1003 sarvesh 6 Feb 7 11:26 file3.txt
-rw-rw-r-- 1 lab1003 lab1003 6 Feb 7 11:26 file4.txt
-rw-rw-r-- 1 lab1003 lab1003 6 Feb 7 11:26 file5.txt
-rw-rw-r-- 1 lab1003 lab1003 3215 Feb 7 11:30 filex.zip
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexaa
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexab
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexac
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexad
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexae
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexaf
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexag
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexah
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexai
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexaj
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexak
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexal
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexam
-rw-rw-r-- 1 lab1003 lab1003 2 Feb 5 11:14 indexan
```

and agroup.

Chfn: chfn modifies a user's "finger" information. This information is stored in the file /etc/passwd, and includes the user's real name, workroom, work phone number, and home phone number.

-f full_name : Let you change the full name on the account

-w work_ph : Let you change the work phone number on the account

-r room_no : Let you change the room number on the account

```
Activities Terminal * Wed 12:03
lab1003@lab1003-HP-280-G2-MT: ~
File Edit View Search Terminal Help
total 4
drwxr-xr-x 2 lab1003 lab1003 4096 Feb  5 11:02 Ved
lab1003@lab1003-HP-280-G2-MT: ~ l s
ls: cannot access 's': No such file or directory
lab1003@lab1003-HP-280-G2-MT: ~ ls
46 abc4.txt abc5.txt  demo  dts      Help      files.zip  Home   Shivan  tempor
abc10.txt abc5.txt  abc5.tar  demo2  DirectorySample  Downloads  file.txt  Music  sort.txt  Unixx-1.odt
abc1.txt abc6.txt  abc6.tar  demo3  dtsa     examples.desktop  file.txt.BK  newdemo.txt  sujal  Vedanti.txt
abc2.txt abc7.txt  abc7.tar  demo4  dtsa     example.tar  folder    Pictures  tandem  Vedbir
abc3.txt abc8.txt  database.txt  desktop  Documents  file_copy.txt  folder  Public  Templates  Videos
Lab1003@lab1003-HP-280-G2-MT: ~ cd Dolp
Lab1003@lab1003-HP-280-G2-MT: ~/Dolp$ ls
Lab1003@lab1003-HP-280-G2-MT: ~/Dolp$ cd
Lab1003@lab1003-HP-280-G2-MT: ~ cd Hola
Lab1003@lab1003-HP-280-G2-MT: ~/Hola$ ls
file_copy.txt  file.txt  Ved.txt
Lab1003@lab1003-HP-280-G2-MT: ~/Hola$ cd
Lab1003@lab1003-HP-280-G2-MT: ~ sudo chgrp lab1003 Hola
Lab1003@lab1003-HP-280-G2-MT: ~ ls -l Hola
total 12
-rw-rw-r-- 1 lab1003 lab1003 25 Feb  5 10:44 file_copy.txt
-rw-rw-r-- 1 lab1003 lab1003 25 Feb  5 10:43 file.txt
-rw-rw-r-- 1 lab1003 lab1003 26 Jan 29 10:52 Ved.txt
Lab1003@lab1003-HP-280-G2-MT: ~ sudo chgrp -R lab1003 Hola
Lab1003@lab1003-HP-280-G2-MT: ~ ls -l Hola
total 12
-rw-rw-r-- 1 lab1003 lab1003 25 Feb  5 10:44 file_copy.txt
-rw-rw-r-- 1 lab1003 lab1003 25 Feb  5 10:43 file.txt
-rw-rw-r-- 1 lab1003 lab1003 26 Jan 29 10:52 Ved.txt
Lab1003@lab1003-HP-280-G2-MT: ~ sudo chage -l root
Last password change : Jan 18, 2024
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
Lab1003@lab1003-HP-280-G2-MT: ~
```

```
Activities Terminal - Wed 11:54
lab1003@lab1003-HP-280-G2-MT: ~

File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT: ~$ chfn -f lab1003 lab1003
chfn: Permission denied.
lab1003@lab1003-HP-280-G2-MT: ~$ sudo chfn -f lab1003 lab1003
lab1003@lab1003-HP-280-G2-MT: ~$ finger lab1003
Login: lab1003          Name: lab1003
Directory: /home/lab1003      Shell: /bin/bash
Office: 1003, lab1003        Home Phone: x1003
On since Wed Feb 7 18:33 (IST) on :0 from :0 (messages off)
No mail.
No Plan.
lab1003@lab1003-HP-280-G2-MT: ~$ sudo chfn -w 12345 lab1003
lab1003@lab1003-HP-280-G2-MT: ~$ finger lab1003
Login: lab1003          Name: lab1003
Directory: /home/lab1003      Shell: /bin/bash
Office: 1003, x1-2345        Home Phone: x1003
on since Wed Feb 7 18:33 (IST) on :0 from :0 (messages off)
No mail.
No Plan.
lab1003@lab1003-HP-280-G2-MT: ~$ sudo chfn -r 999 lab1003
lab1003@lab1003-HP-280-G2-MT: ~$ finger lab1003
Login: lab1003          Name: lab1003
Directory: /home/lab1003      Shell: /bin/bash
Office: 999, x1-2345        Home Phone: x1003
On since Wed Feb 7 18:33 (IST) on :0 from :0 (messages off)
No Mail.
No Plan.
```

ALPHONZ GEORGE

S11-05

UNIX Lab

Assignment No. 5 – To study Process Management and Memory Management Commands.

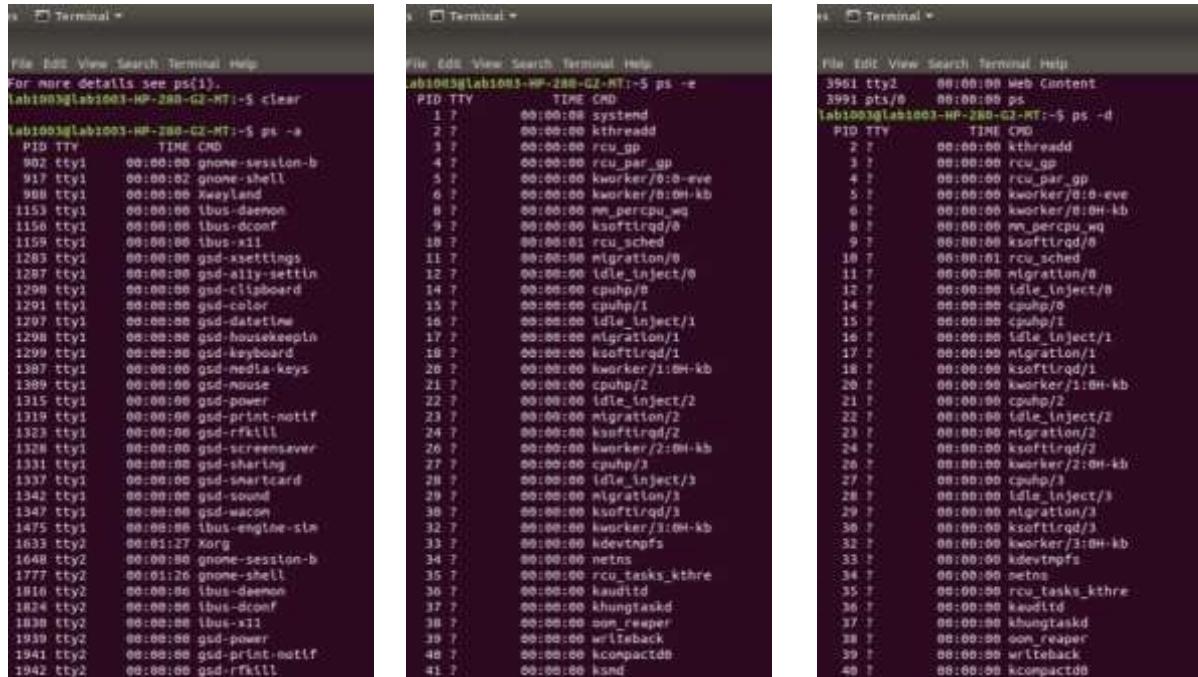
Process Management Commands:

Ps: `ps` displays information about the processes associated with the current terminal session.

Ps -a: List all processes except session leaders (instances where the process ID is the same as the session ID) and processes not associated with a terminal.

Ps -e: Lists all processes on the entire system, offering a complete overview of running tasks and programs.

Ps -d: Lists all processes except session leaders, providing a filtered view of processes running on the system.



Pstree: Pstree command in Unix that shows the running processes as a tree which is a more convenient way to display the processes hierarchy and makes the output more visually appealing.

```
Activities Terminal * 19:10:17
lakshmi@Lab1003-HP-280-G3-RT1:~$ pstree -a
systemd--+modemanager--2*[{ModemManager}]
          +networkmanager--2*[{NetworkManager}]
          +accounts-daemon--3*[{Accounts-Daemon}]
          +acpid
          +avahi-daemon--avahi-daemon
          +botld--2*[{Botld}]
          +colord--2*[{ColorD}]
          +cron
          +cups-browsed--2*[{Cups-Browsed}]
          +cupsd
          +dbus-daemon
          +firefox--4*[{Isolated Web Co}]
              +--19*[{Isolated Web Co}]
              +--19*[{Isolated Web Co}]
              +--19*[{Isolated Web Co}]
              +--19*[{Isolated Web Co}]
          +privileged-cont--10*[{Privileged Cont}]
          +app-processes--8*[{App Process}]
          +soccer-process--2*[{Soccer Process}]
          +utility-process--3*[{Utility Process}]
          +--3*[{Web Content}]
          +--3*[{Web Content}]
          +--3*[{Web Extensions}]
          +--3*[{Web Extensions}]
          +--3*[{Firefox}]
          +wpad--4*[{Wpad}]
gnome-session-wm--gnome-wayland-ses--gnome-session-b--gnome-shell--Xwayland--2*[{Xwayland}]
          +ibus-dæmon--ibus-dconf--2*[{IBus-DConf}]
              +ibus-engine-sla--2*[{IBus-Engine-SLA}]
                  +--2*[{ibus-dæmon}]
          +2*[{gnome-shell}]
          +gsm-ally-settin--3*[{GSM-Ally-Settin}]
          +gsm-clipboard--4*[{GSM-Clipboard}]
          +gsm-color--7*[{GSM-Color}]
          +gsm-datetime--3*[{GSM-Datetime}]
          +gsm-housekeeping--2*[{GSM-Housekeeping}]
          +gsm-keyboard--4*[{GSM-Keyboard}]
          +gsm-media-keys--4*[{GSM-Media-Keys}]
          +gsm-mouse--2*[{GSM-Mouse}]
```

Pstree -a: This command now displays command line options for some processes.

Pstree -p: To display PIDs for each process name, we use “-p” option

The image shows two terminal windows side-by-side. The left terminal window displays a detailed process tree for a Firefox session on a Linux system. The command run was `lsm1003@lab1003-HP-200-G2-MT: ~`. The tree starts with `systemd` and branches down through various daemons like `NetworkManager`, `accounts-daemon`, `aptdaemon`, `avahi-daemon`, `boldt`, `calamares`, `cron`, `cups-browsed`, `cupsd`, and `dbus-daemon`. It also shows multiple instances of `Isolated Web Co.` and `Isolated Web Co. -contentproc` processes, each with specific arguments like `-isForBrowser`, `-prefsum`, and `-prefMapSize`.

The right terminal window shows a file tree for the directory `/var/lib/mozilla/firefox/`. The command run was `lsm1003@lab1003-HP-200-G2-MT: ~`. The tree includes sub-directories for `accounts`, `certs`, `cookies`, `domestic`, `downloads`, `extensions`, `global`, `history`, `localStorage`, `places`, `profile`, `sessionstore`, `storage`, and `tempfiles`.

Nice: nice command in Unix helps in execution of a program/process with modified scheduling priority

nic -10 gnome-terminal: To set the priority of a process

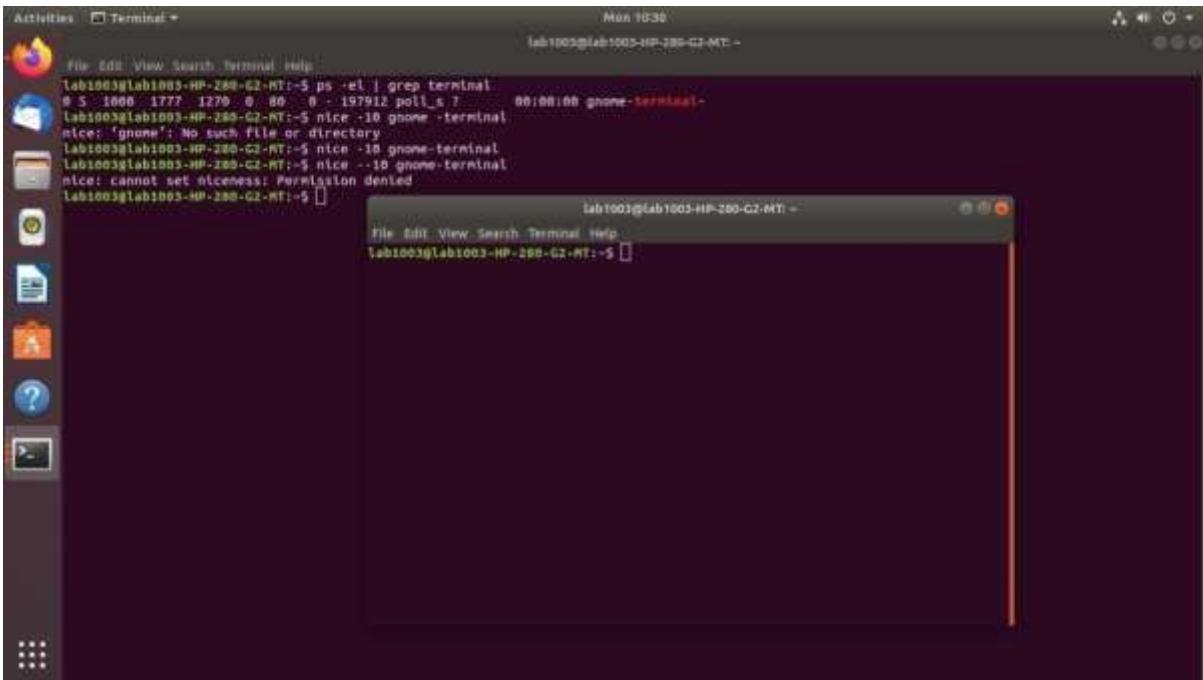
nice --10 gnome-terminal: To set the negative priority for a process

Renice: the renice command allows you to change and modify the scheduling priority of an already running process.

sudo renice -n 15 -p 1777: changing priority of the running process.

renice -n 10 -g 4: To change the priority of all programs of a specific group.

sudo renice -n 10 -u 2: To change the priority of all programs of a specific user.



```
Lab1003@lab1003-HP-200-G2-MT:~ nice
0
Lab1003@lab1003-HP-200-G2-MT:~ ps -l
F S  UID  PID  PPI  C PRI  NI ADDR SZ WCHAN TTY          TIME CMD
0 S 1000 1055 1777 0 80 0 - 5845 Wait  pts/0    00:00:00 bash
4 H 1000 2779 1855 0 80 0 - 7230 -      pts/0    00:00:00 ps
Lab1003@lab1003-HP-200-G2-MT:~ sudo renice -n 15 -p 1777
1777 (process ID) old priority 0, new priority 15
Lab1003@lab1003-HP-200-G2-MT:~ sudo renice -n 10 -u 0
0 (user ID) old priority -20, new priority 10
Lab1003@lab1003-HP-200-G2-MT:~ sudo renice -n 10 -g 5
renice: Failed to get priority for 5 (process group ID): No such process
Lab1003@lab1003-HP-200-G2-MT:~
```

Kill: Kill is a built-in command which is used to terminate processes manually. kill command sends a signal to a process that terminates the process.

kill number PID: We can specify a signal using a number. For example, we have a PID `1212` and want to send a `SIGKILL` signal to kill this PID.

kill -SIGTERM PID: We can also specify signal using SIG prefix.

```

File Edit View Search Terminal Help
1596 tty2 00:00:00 gsd-datetime
1601 tty2 00:00:00 gsd-color
1604 tty2 00:00:00 gsd-keyboard
1606 tty2 00:00:00 gsd-housekeepin
1608 tty2 00:00:00 gsd-mouse
1612 tty2 00:00:00 gsd-media-keys
1633 tty2 00:00:00 gsd-printer
1651 tty2 00:00:00 nautilus-deskt
1654 tty2 00:00:00 gsd-disk-utilit
1678 tty2 00:00:00 ibus-engine-sim
1920 tty2 00:00:13 firefox
2016 tty2 00:00:00 Socket Process
2037 tty2 00:00:02 Privileged Cont
2081 tty2 00:00:00 WebExtensions
2205 tty2 00:00:00 sd_espeak-ng
2311 tty2 00:00:00 sd_dummy
2314 tty2 00:00:00 sd_generic
2452 tty2 00:00:00 update-notifier
2495 tty2 00:00:00 deja-dup-monito
2672 tty2 00:00:00 RDP Process
2674 tty2 00:00:00 Utility Process
3160 tty2 00:00:15 Isolated Web Co
3225 tty2 00:00:00 Isolated Web Co
3259 tty2 00:00:02 Isolated Web Co
3285 tty2 00:00:00 Isolated Web Co
3309 tty2 00:00:00 Isolated Web Co
3338 tty2 00:00:00 Isolated Web Co
3341 tty2 00:00:00 Isolated Web Co
3390 tty2 00:00:00 Isolated Web Co
3414 tty2 00:00:00 Isolated Web Co
3439 tty2 00:00:00 Web Content
3442 tty2 00:00:00 Web Content
3445 tty2 00:00:00 Web Content
3509 tty2 00:00:00 gnome-mines
3531 tty2 00:00:00 nosplash
3571 tty2 00:00:02 soffice.bin
3644 pts/0 00:00:00 ps
lab1005@lab1003:~$ kill -18 3574

```

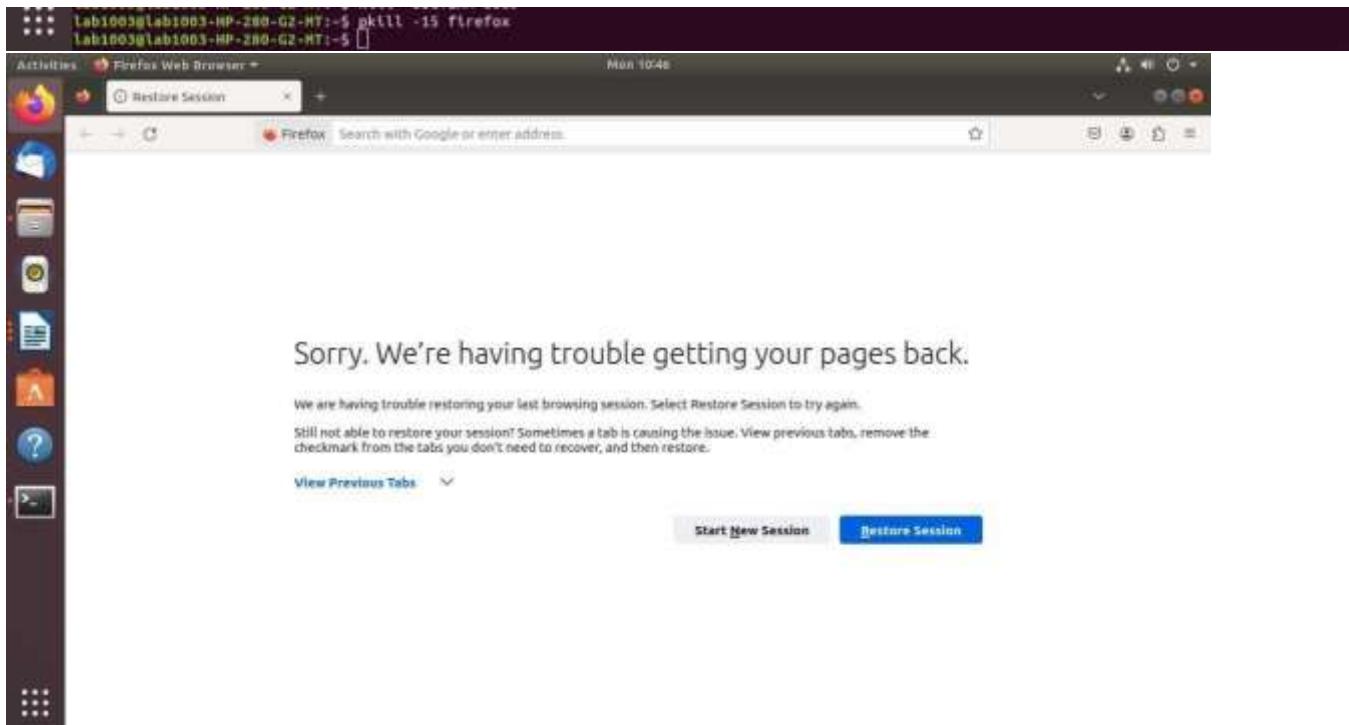
```

Activities Terminal +
File Edit View Search Terminal Help
1594 tty2 00:00:00 gsd-clipboard
1595 tty2 00:00:00 gsd-alloy-settin
1596 tty2 00:00:00 gsd-datetime
1601 tty2 00:00:00 gsd-color
1604 tty2 00:00:00 gsd-keyboard
1606 tty2 00:00:00 gsd-housekeepin
1608 tty2 00:00:00 gsd-mouse
1612 tty2 00:00:00 gsd-media-keys
1633 tty2 00:00:00 gsd-printer
1651 tty2 00:00:00 nautilus-deskt
1654 tty2 00:00:00 gsd-disk-utilit
1678 tty2 00:00:00 ibus-engine-sim
1920 tty2 00:00:18 firefox
2016 tty2 00:00:00 Socket Process
2037 tty2 00:00:02 Privileged Cont
2081 tty2 00:00:00 WebExtensions
2205 tty2 00:00:00 sd_espeak-ng
2311 tty2 00:00:00 sd_dummy
2314 tty2 00:00:00 sd_generic
2452 tty2 00:00:00 update-notifier
2495 tty2 00:00:00 deja-dup-monito
2672 tty2 00:00:00 RDP Process
2674 tty2 00:00:00 Utility Process
3160 tty2 00:00:21 Isolated Web Co
3225 tty2 00:00:00 Isolated Web Co
3255 tty2 00:00:02 Isolated Web Co
3285 tty2 00:00:00 Isolated Web Co
3309 tty2 00:00:00 Isolated Web Co
3338 tty2 00:00:00 Isolated Web Co
3341 tty2 00:00:00 Isolated Web Co
3390 tty2 00:00:00 Isolated Web Co
3414 tty2 00:00:00 Isolated Web Co
3439 tty2 00:00:00 Web Content
3442 tty2 00:00:00 Web Content
3445 tty2 00:00:00 gnome-mines
3633 pts/0 00:00:00 ps
Lab1005@Lab1003:~$ kill -SIGTERM 3445

```

Pkill: The pkill command uses name of the process instead of PID number. Signal can be send to a process either by typing full name or partial name.

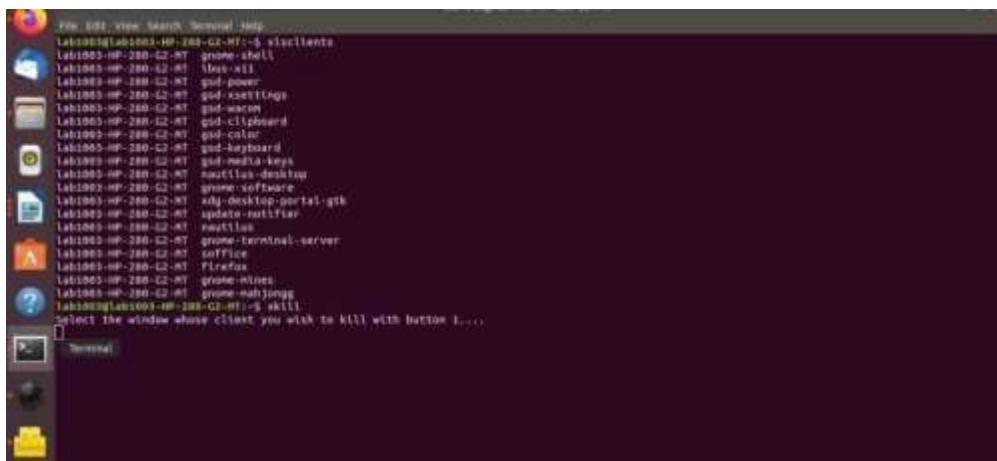
Pkill -n name: Kills the process name mentioned



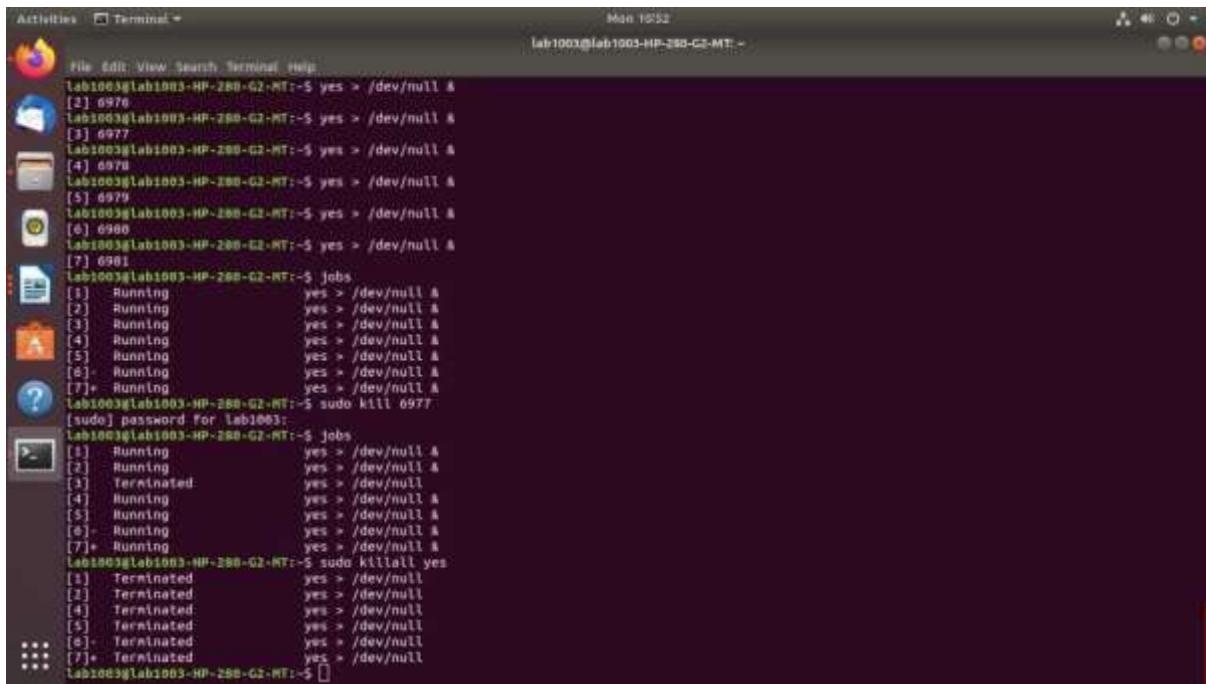
Xclients: This command will show the list of all open windows with the hostname.

Xkill: xkill is a command-line utility that can kill the undesired windows on the user's screen. Basically, xkill force the X server to close the connection to the client. This utility kills the programs without providing PID with a command.

For using xkill to kill the open window, just run the xkill command. Then your cursor will turn into an X sign. Then right-click on the windows which you have to kill.



killall: Ending each cycle individually can end up being hard and repetitive work. We should see whether we can get some assistance by utilizing killall order and process cycle name



```

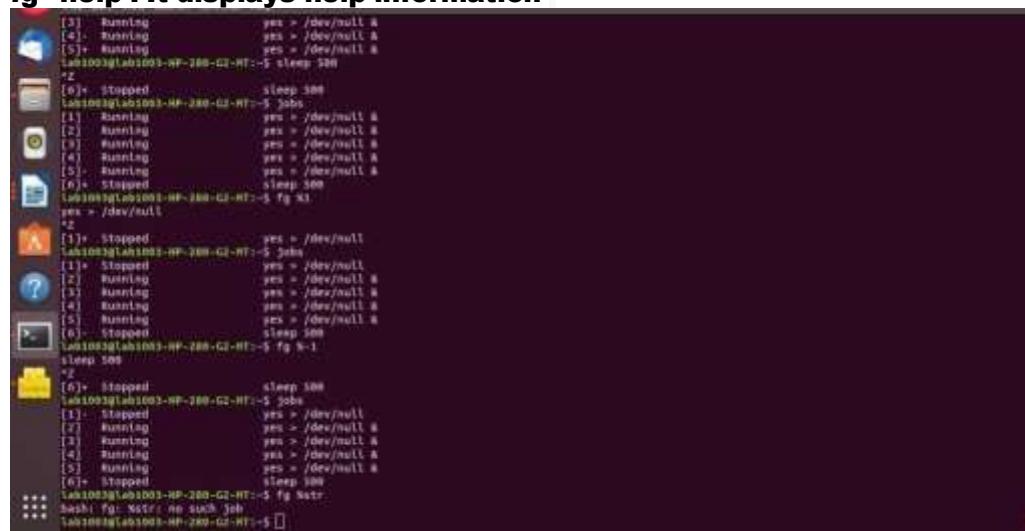
activities Terminal Mon 10:52
lab1003@lab1003-HP-280-G2-MT:~ lab1003@lab1003-HP-280-G2-MT:~ 
File Edit View Search Terminal Help
[lab1003@lab1003-HP-280-G2-MT:~] yes > /dev/null &
[2] 6976
[lab1003@lab1003-HP-280-G2-MT:~] yes > /dev/null &
[3] 6977
[lab1003@lab1003-HP-280-G2-MT:~] yes > /dev/null &
[4] 6978
[lab1003@lab1003-HP-280-G2-MT:~] yes > /dev/null &
[5] 6979
[lab1003@lab1003-HP-280-G2-MT:~] yes > /dev/null &
[6] 6980
[lab1003@lab1003-HP-280-G2-MT:~] yes > /dev/null &
[7] 6981
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]-+ Running yes > /dev/null &
[2]-+ Running yes > /dev/null &
[3]-+ Running yes > /dev/null &
[4]-+ Running yes > /dev/null &
[5]-+ Running yes > /dev/null &
[6]-+ Running yes > /dev/null &
[7]-+ Running yes > /dev/null &
lab1003@lab1003-HP-280-G2-MT:~$ sudo kill 6977
[sudo] password for lab1003:
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]-+ Running yes > /dev/null &
[2]-+ Running yes > /dev/null &
[3]+ Terminated yes > /dev/null
[4]-+ Running yes > /dev/null &
[5]-+ Running yes > /dev/null &
[6]-+ Running yes > /dev/null &
[7]++ Running yes > /dev/null &
lab1003@lab1003-HP-280-G2-MT:~$ sudo killall yes
[1]+ Terminated yes > /dev/null
[2]+ Terminated yes > /dev/null
[3]+ Terminated yes > /dev/null
[4]+ Terminated yes > /dev/null
[5]+ Terminated yes > /dev/null
[6]+ Terminated yes > /dev/null
[7]+ Terminated yes > /dev/null
lab1003@lab1003-HP-280-G2-MT:~$ 

```

Fg: fg command in unix used to put a background job in foreground.
 %n: Refer to job number n.

%str: Refer to a job which was started by a command beginning with str.

fg -help : It displays help information



```

[3]-+ Running yes > /dev/null
[4]-+ Running yes > /dev/null
[5]-+ Running yes > /dev/null
lab1003@lab1003-HP-280-G2-MT:~$ sleep 500
[2]+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]-+ Running yes > /dev/null
[2]-+ Running yes > /dev/null
[3]-+ Running yes > /dev/null
[4]-+ Running yes > /dev/null
[5]-+ Running yes > /dev/null
[6]+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %3
yes > /dev/null
+
[1]+ Stopped yes > /dev/null
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]+ Stopped yes > /dev/null
[2]-+ Running yes > /dev/null
[3]-+ Running yes > /dev/null
[4]-+ Running yes > /dev/null
[5]-+ Running yes > /dev/null
[6]-+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %1
sleep 500
+
[6]+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]-+ Stopped yes > /dev/null
[2]-+ Running yes > /dev/null
[3]-+ Running yes > /dev/null
[4]-+ Running yes > /dev/null
[5]-+ Running yes > /dev/null
[6]+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %6
sleep 500
+
[6]+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ jobs
[1]-+ Stopped bash > /dev/null
[2]-+ Running yes > /dev/null
[3]-+ Running yes > /dev/null
[4]-+ Running yes > /dev/null
[5]-+ Running yes > /dev/null
[6]+ Stopped sleep 500
lab1003@lab1003-HP-280-G2-MT:~$ fg %1
bash: fg: %6: no such job
lab1003@lab1003-HP-280-G2-MT:~$ 

```

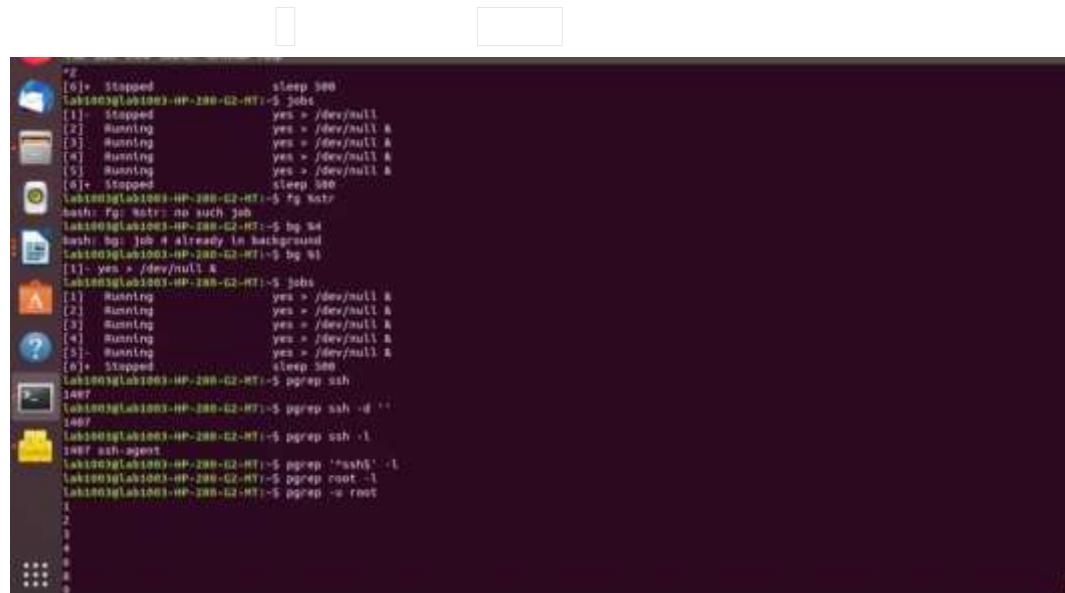
Bg: The 'bg' command is primarily used when you wish to run a job/process in the background after it has been stopped or paused.
 %n: Refer to job number n.

%str: Refer to a job which was started by a command beginning with str.

Pgrep: The pgrep command is a tool that searches for processes based on their name and other attributes, and returns their PIDs.

Pgrep ssh: If there are running processes with names matching "ssh", their

PIDs will be displayed on the screen. If no matches are found, the output is empty.



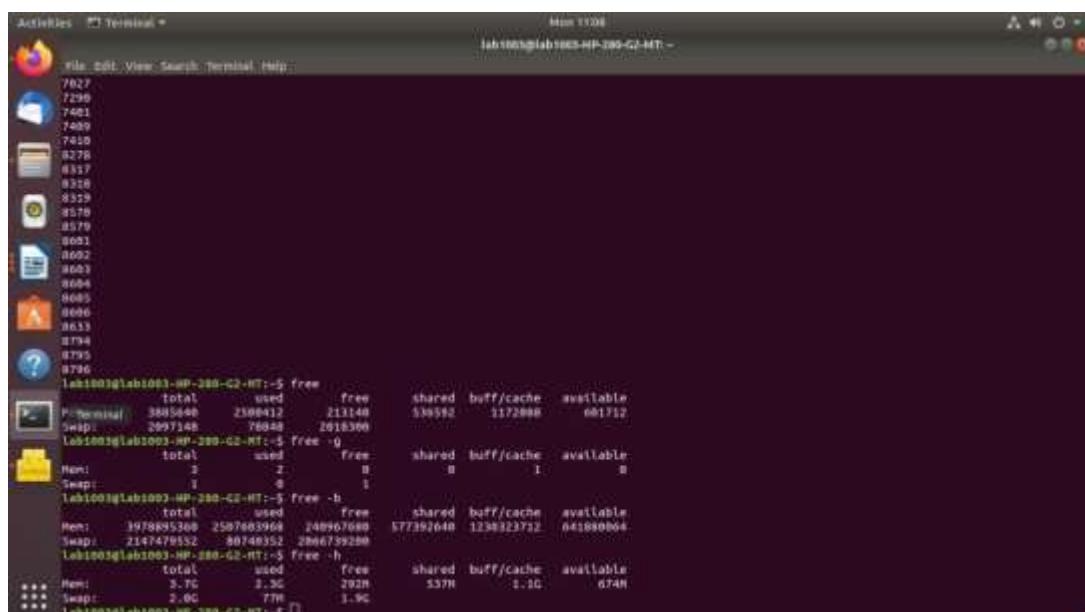
```
[2]+ Stopped sleep 300
Lak1003@Lak1003-HP-280-G2-HT1:~$ jobs
[1]- Stopped yes > /dev/null
[2]+ Running yes > /dev/null &
[3] Running yes > /dev/null &
[4] Running yes > /dev/null &
[5] Running yes > /dev/null &
[6]+ Stopped sleep 300
Lak1003@Lak1003-HP-280-G2-HT1:~$ fg %2
bash: fg: No job is currently running
Lak1003@Lak1003-HP-280-G2-HT1:~$ bg %4
bash: bg: job %4 already in background
Lak1003@Lak1003-HP-280-G2-HT1:~$ bg %5
[1]- yes > /dev/null &
Lak1003@Lak1003-HP-280-G2-HT1:~$ jobs
[1] Running yes > /dev/null &
[2] Running yes > /dev/null &
[3] Running yes > /dev/null &
[4] Running yes > /dev/null &
[5]- Running yes > /dev/null &
[6]+ Stopped sleep 300
Lak1003@Lak1003-HP-280-G2-HT1:~$ pgrep ssh
1487
Lak1003@Lak1003-HP-280-G2-HT1:~$ pgrep ssh -d
1487
Lak1003@Lak1003-HP-280-G2-HT1:~$ pgrep ssh -l
1487 ssh-agent
Lak1003@Lak1003-HP-280-G2-HT1:~$ pgrep '^ssh5$' -l
Lak1003@Lak1003-HP-280-G2-HT1:~$ pgrep root -l
Lak1003@Lak1003-HP-280-G2-HT1:~$ pgrep -u root
1
2
3
4
5
6
7
8
9
```

Memory Management Commands:

Free: The free command is a Unix command that allows you to check for memory RAM on your system or to check the memory statics of the Unix operating system.

Free -g: It displays the amount of memory in gigabytes. Free -b: It displays the memory in bytes.

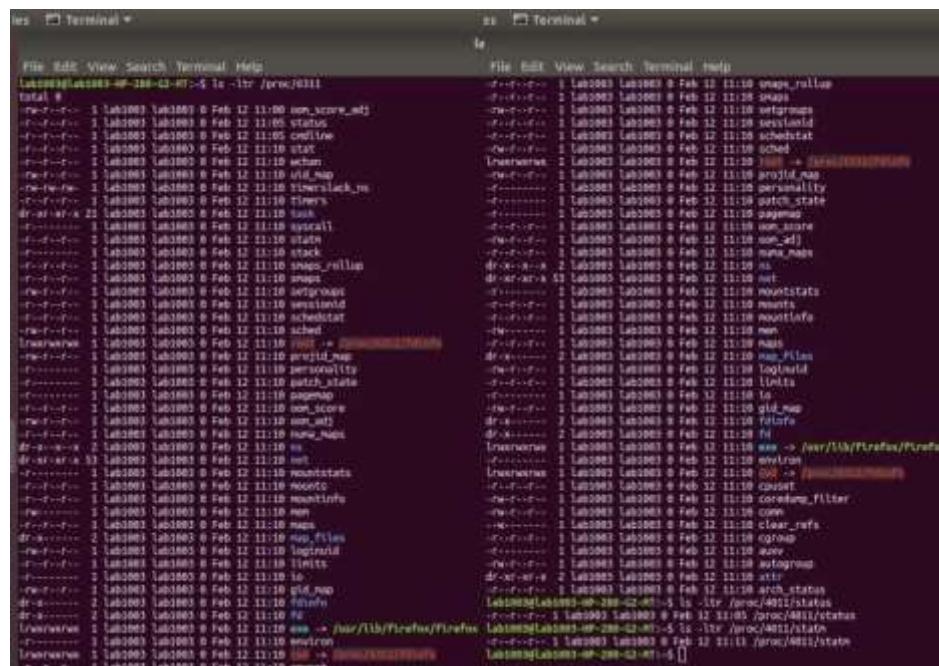
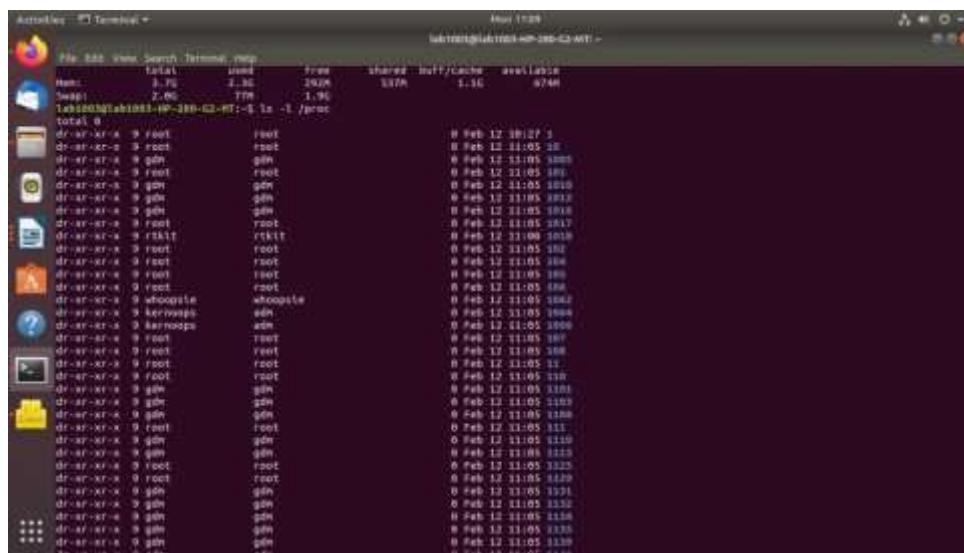
Free -h: It shows all output columns automatically scaled to shortest three digit unit and display the units also of print out.



```
Lak1003@Lak1003-HP-280-G2-HT1:~$ free
total used free shared buff/cache available
Mem: 3885440 2308412 211140 539582 1172888 681712
Swap: 2997348 76848 2018390
Lak1003@Lak1003-HP-280-G2-HT1:~$ free -b
total used free shared buff/cache available
Mem: 3978895360 2587683968 280967680 577392640 1234323712 64188064
Swap: 2147479532 80748352 2864739280
Lak1003@Lak1003-HP-280-G2-HT1:~$ free -h
total used free shared buff/cache available
Mem: 3.7G 2.3G 292M 537M 1.1G 674M
Swap: 2.0G 778 3.9G
```

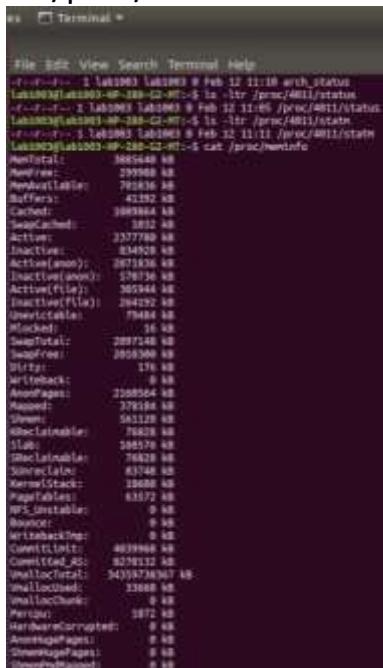
Proc: Proc file system (procfs) is a virtual file system created on the fly when the system boots and is dissolved at the time of system shutdown. ls -l /proc: This command will list all the files and directories under the '/proc' directory with detailed information like permissions, ownership, size, and time of modifications.

`ls -l /proc/6311`: gives information about the process with PID 6311.



Meminfo: Displays the memory information.

cat/proc/meminfo: to determine how much memory the computer has.



A screenshot of a terminal window titled "Terminal". The window displays the output of the command "cat /proc/meminfo". The output lists various memory statistics in kilobytes (kB), such as MemTotal, Active, Inactive, and SwapTotal. The terminal window has a dark background with white text and a standard OS X-style interface.

```
File Edit View Search Terminal Help
-rw-r--r-- 1 lab3903 lab3903 8 Feb 12 11:18 arch_status
-rw-r--r-- 1 lab3903 lab3903 8 Feb 12 11:18 /proc/4811/status
-rw-r--r-- 1 lab3903 lab3903 8 Feb 12 11:45 /proc/4811/statm
-rw-r--r-- 1 lab3903 lab3903 8 Feb 12 11:11 /proc/4811/stat
[User@Ubuntu:~]# cat /proc/meminfo
MemTotal:       388948 kB
MemFree:        299988 kB
Buffers:         70000 kB
Cached:          4232 kB
SharedCached:   3812 kB
Active:         237798 kB
Inactive:       83492 kB
Active(anon):   367386 kB
Inactive(anon): 57876 kB
Active(file):   305944 kB
Inactive(file): 294429 kB
Unevictable:    7848 kB
Mlocked:        36 kB
SwapTotal:      289736 kB
SwapFree:       289736 kB
Dirty:           18 kB
Writeback:       8 kB
AnonPages:      208854 kB
Readahead:      37934 kB
Shmem:          58128 kB
KbcLatencies:  76828 kB
Slab:            39579 kB
SlabLatencies: 76828 kB
SyncTLatency:   83748 kB
KernelStack:    18688 kB
PageTables:     63572 kB
pTE_Untable:    9 kB
DMA:             1 kB
WritebackTmp:   8 kB
CommitLimit:   483998 kB
Comitted_AS:   827812 kB
UnallocTotal:  943973897 kB
UnallocUsed:   23868 kB
SmallAllocChnk: 9 kB
Percpu:         3872 kB
HardwareCorrupted: 8 kB
AnomalousPages: 8 kB
ShmemPtePages: 8 kB
DmaMemPages:   8 kB
```

Top: The top command is used to show the active Unix processes. It provides a dynamic real-time view of the running system.

Top -n 10: Top output keep refreshing until you press 'q'. Top command will automatically exit after 10 number of repetition.

Top -h: Shows top command syntax

A screenshot of a Linux desktop environment, likely elementary OS, featuring a dock at the bottom with icons for Home, Dash, Activities, Terminal, File Manager, and others. Two terminal windows are open in the top panel: the first shows a terminal session with a large amount of log output from 'princeps' and 'princeps-0.3.3', and the second shows a terminal session with a similar log output. The desktop background is a light blue gradient.

Htop: htop is a useful command-line tool in the Unix environment to determine the cause of load by each process.

Htop -h: Used to display the help message and exit.

Htop -c: Start htop in monochrome mode.

```
Lubuntu@Lubuntu:~$ http -v
Reading package lists... Done
Building dependency tree
Reading state information... Done
http 2.0.0-1 is already the newest version (2.0.0-3).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Lubuntu@Lubuntu:~$ http -v
http 2.0.0-1 (C) 2004-2018 Michael Mahdav
Released under the GNU GPL.

Lubuntu@Lubuntu:~$ http -q
Usage: http [options] [URL]
  --color           Use a monochrome color scheme.
  -d,--delay=DELAY  Set the delay between updates, in tenths of seconds.
  -h,--help          Print this help screen.
  -s,--sort=KEYCOLUMN  Sort by KEYCOLUMN (try --sort=keyhelp for a list)
  -u,--user=USERNAME Show only processes of a given user
  -p,--pid=PID,...  Show only the given PID(s)
  -V,--version       Print version info

long options may be passed with a single dash.

Press F1 inside http for online help,
See 'man http' for more information.
Lubuntu@Lubuntu:~$ http -C
Lubuntu@Lubuntu:~$ http -v
```

Df: The df command displays information about total space and available space on a file system.

Df -h: Prints sizes in a human-readable format using power of 1024.

Filesystem: The name of the mounted storage device (e.g.,

/dev/sda4). Size: The total size of the filesystem in bytes.Used: The amount of space currently occupied by data in bytes. Avail: The amount of free space available in bytes.

Use%: The percentage of the filesystem used.

Mounted on: The directory where the filesystem is mounted (e.g., `/`, `/home`).

Du: The 'du' command in Unix is used to estimate file and directory space usage. Du -h: If we want to print sizes in human readable format (K, M, G), use -h option

Du -a: Displays disk usage information for all files and directories, including hidden ones.



Vmstat: vmstat command in Unix is a performance monitoring command of the system as it gives the information about processes, memory, paging, block IO, disk, and CPU scheduling.

Vmstat -f: It displays the number of forks since boot. Each process is represented by one or more task, depending on thread usage.

Vmstat -a: It displays active and inactive memory of the system running.

Vmstat -m: It displays the number of forks since boot. Each process is represented by one or more tasks, depending on thread usage.

Vmstat -s: This command is used to display a table of various event counters and memory statistics.

Pagesize: The pagesize command prints the size, in bytes, of a page of memory, as returned by the getpagesize subroutine

Pagesize -a: Prints all of the page size values (in bytes) supported on the system.

Pagesize -H: Shows only huge page size.

```
Lab1003@Lab1003-OptiPlex-3020:~$ pagesize -h  
4096  
2097152  
1073741824  
Lab1003@Lab1003-OptiPlex-3020:~$ pagesize -h  
2097152  
1073741824  
Lab1003@Lab1003-OptiPlex-3020:~$
```

Sar: sar (System Activity Report) It can be used to monitor Unix system's resources like CPU usage, Memory utilization, I/O devicesconsumption etc.

sar -V: Displays The current version.

sar -u 2 5: To report CPU details a total of 5 times with the interval of 2seconds.

sar -r 1 3 :To report about the amount of memory used, amount of memory free, available cache, available buffers total 3 times with the interval of 1 second.

sar -F 2 5: To report about file systems mountedon the device total 5 times with the interval of 2 seconds.

sar -q 2 5:To report run queue length, number of processes and loadaverage

```

lab1003@lab1003:~$ sar -V
        Task creation and system switching statistics
        TTY devices statistics
version 11.6.1
(C) Sebastien Godard (sysstat <sar> orange.fr)
lab1003@lab1003:~$ sar -u 2 5
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:22:38 IST    CPU    nuser   nice  nsystem  nwait   nsteal
1   idle
11:22:40 IST    all    1.87   0.00   1.75   0.00   0.0
0   96.38
11:22:42 IST    all    3.77   0.00   1.38   1.81   0.0
0   93.84
11:22:44 IST    all    1.25   0.00   0.88   0.13   0.0
0   97.74
11:22:46 IST    all    0.75   0.00   0.58   0.58   0.0
0   98.24
11:22:48 IST    all    1.13   0.00   0.38   0.08   0.0
0   98.49
Average:  all    1.76   0.00   0.98   0.33   0.00
99.94
lab1003@lab1003:~$ sar -r 1 3
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:22:59 IST  kbmemfree  kbavail  kbmemused  kbmemused  kbuffers  kbcac
hed  kbcommit  Ncommit  Kactive  kbInact  kbDirty
11:23:00 IST  298216  885888  3652760  92.64  71968  1168
072  8567536  141.84  2424288  898836  348
11:23:01 IST  292104  887780  3658872  92.59  71968  1166
180  8567536  141.84  2424240  898836  348
11:23:02 IST  292304  887780  3658872  92.59  71988  1166
140  8567536  141.84  2424248  898836  348
Average:  291475  887140  3651581  92.81  71968  116679
7  8567536  141.84  2424232  898836  348
lab1003@lab1003:~$ sar -d 1 3
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:23:56 IST    DEV    tps    rkb/s    wkb/s    areq-sz    aqu
-sr   await   svctm   Rutil
11:23:57 IST    dev7-0  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-1  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-2  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-3  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-4  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-5  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-6  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-7  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-8  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-9  0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-10 0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-11 0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-12 0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
11:23:57 IST    dev7-13 0.00   0.00   0.00   0.00   0
0.00   0.00   0.00
Average:  0.00   0.00   0.00   0.00   0.00
0.00   0.00   0.00
lab1003@lab1003:~$ sar -q 2 5
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:24:12 IST    runq-sr  plist-sr  ldavg-1  ldavg-5  ldavg-15  bloc
sed
11:24:14 IST    0     1118   0.14   0.42   0.55
0
11:24:16 IST    0     1118   0.14   0.42   0.55
0
11:24:18 IST    1     1118   0.13   0.41   0.54
0
11:24:20 IST    0     1118   0.13   0.41   0.54
0
11:24:22 IST    0     1118   0.12   0.40   0.54
0
Average:  0     1118   0.13   0.41   0.54
0
lab1003@lab1003:~$ sar -P 1 3 3
Linux 5.4.0-150-generic (lab1003-OptiPlex-3020)      Monday 12 Febr
uary 2024      _x86_64_      (4 CPU)

11:24:48 IST    CPU    nuser   nice  nsystem  nwait   nsteal
1   idle
11:24:41 IST    1    0.00   0.00   0.00   0.00   0.0
0   100.00
11:24:42 IST    1    3.00   0.00   1.00   0.00   0.0
0   96.00
11:24:43 IST    1    7.00   0.00   2.00   0.00   0.0
0   91.00
Average:  1    3.34   0.00   1.06   0.00   0.00
0.95
lab1003@lab1003:~$ dmicodec -C

```

Dmicoded: dmidecode also referred as Desktop Management
Interfacetable decoder, record data from DMI table and produce it in human readable format.

Sudo dmicodec | more: Running a simple dmidecode command to get hardware information.

Sudo dmicodec -t processor: To get information about

Processor. Sudo dmicode -t bios: To get BIOS information.

```
File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ sudo dmidecode | more
[sudo] password for lab1003:
# dmidecode 3.1
Getting SMBIOS data from sysfs.
SMBIOS 2.7 present.
88 structures occupying 3575 bytes.
Table at 0x0000EA390.

Handle 0x0000, DMI type 21B, 251 bytes
DMI-specific Type
Header and Data:
DA FB BB DA B2 00 37 4F 1E 36 00 05 00 05 00 03
00 00 00 00 05 00 0F 00 06 00 00 11 00 11
00 02 00 12 00 00 04 00 22 00 00 00 00 23
00 23 00 00 00 28 00 28 00 00 00 29 00 29 00 01
00 2A 00 2A 00 00 00 28 00 28 00 FF FF 2C 00 2C
00 FF FF 2D 00 2D 00 02 00 2E 00 2E 00 00 00 40
00 40 00 01 00 41 00 41 00 00 00 42 00 42 00 01
00 43 00 43 00 00 00 00 35 00 33 00 00 00 5C 00 5C
00 81 00 50 00 50 00 00 00 00 00 00 00 00 00 00 00
00 00 00 01 00 90 00 00 00 00 00 00 00 00 00 00 00 00
00 92 00 92 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 9E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 A1 00 A1 00 00 00 A2 00 A2 00 A2 00 A2 00 A3
00 01 00 00 00 01 00 01 00 02 00 02 00 00 00 00 ED
00 ED 00 00 00 FF FF FF FF 00 00

Handle 0x0001, DMI type 21B, 251 bytes
DMI-specific Type
Header and Data:
DA FB 01 DA B2 00 37 4F 1E 30 00 F0 00 F0 00 01
00 F5 00 F5 00 04 00 F0 00 F0 00 00 00 00 00 01 09
01 00 00 17 01 17 01 00 00 18 01 18 01 01 00 19
01 19 01 00 00 1A 01 1A 01 00 00 19 01 18 01 00
01 IC 01 IC 01 00 28 01 28 01 00 00 2C 01 2C
01 88 00 2D 01 2D 01 00 00 00 00 00 00 00 00 00 35
01 35 01 FF 00 37 01 37 01 00 00 3E 01 38 01 01

File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ sudo dmidecode -t processor
# dmidecode 3.1
Getting SMBIOS data from sysfs.
SMBIOS 2.7 present.

Handle 0x0003, DMI type 4, 42 bytes
Processor Information
  Socket Designation: SOCKET 0
  Type: Central Processor
  Family: Core i5
  Manufacturer: Intel
  ID: C3 06 03 00 FF FB EB BF
  Signature: Type 0, Family 0, Model 00, Stepping 3
  Flags:
    FPU (Floating-point unit on-chip)
    VME (Virtual mode extension)
    DE (Debugging extension)
    PSE (Page size extension)
    TSC (Time stamp counter)
    MSR (Model specific registers)
    PAE (Physical address extension)
    MCE (Machine check exception)
    CX8 (CMPEXC8 instruction supported)
    APIC (On-chip APIC hardware supported)
    SEP (Fast system call)
    HTRR (Memory type range registers)
    PGE (Page global enable)
    MCA (Machine check architecture)
    CMOV (Conditional move instruction supported)
    PAT (Page attribute table)
    PSE-36 (36-bit page size extension)
    CLFSH (CLFLUSH instruction supported)
    DS (Debug store)
    ACPI (ACPI supported)

File Edit View Search Terminal Help
lab1003@lab1003-OptiPlex-3020:~$ sudo dmidecode -t bios
# dmidecode 3.1
Getting SMBIOS data from sysfs.
SMBIOS 2.7 present.

Handle 0x0000, DMI type 8, 24 bytes
BIOS Information
  Vendor: Dell Inc.
  Version: A02
  Release Date: 01/07/2014
  Address: 0x00008
  Runtime Size: 64 kB
  ROM Size: 8192 kB
  Characteristics:
    PCI is supported
    PNP is supported
    BIOS is upgradeable
    BIOS shadowing is allowed
    Boot from CD is supported
    Selectable boot is supported
    BIOS ROM is socketed
    EDD is supported
    $1.25M/1.2 MB Floppy services are supported (int 13h)
    3.5"/720 kB Floppy services are supported (int 13h)
    3.5"/1.8M kB Floppy services are supported (int 13h)
    Print screen service is supported (int 5h)
    8042 keyboard services are supported (int 9h)
    Serial services are supported (int 14h)
    Printer services are supported (int 17h)
    ACPI is supported
    USB legacy is supported
    BIOS boot specification is supported
    Function key-initiated network boot is supported
    Targeted content distribution is supported
    UEFI is supported

BIOS Revision: 4.6
```

ALPHONZ GEORGE

S11-05

UNIX Lab

Assignment No. 6 – To study grep, awk and sed commands.

Create a student file of students in S1 with the following fields (For all 3 assignments):

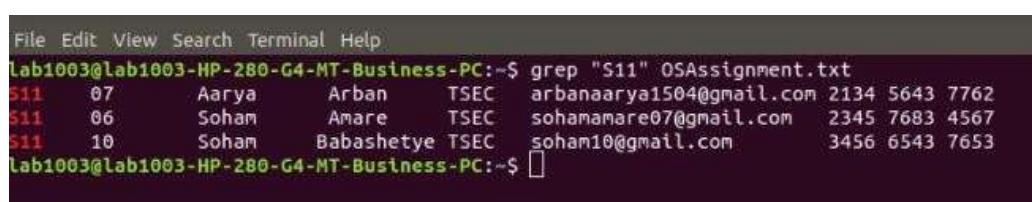
Batch, Roll number, First name, last name, College name, E-mail ID and Aadhar card.

Student File (OSAssignment.txt):

Batch	Roll No.	First name	Last name	College	Email-ID	Aadhar number
S11	07	Aarya	Arban	TSEC	arbanaarya1504@gmail.com	2134 5643 7762
S11	06	Soham	Amare	TSEC	sohamamare07@gmail.com	2345 7683 4567
S11	10	Soham	Babashetye	TSEC	soham10@gmail.com	3456 6543 7653
S12	30	Shreyash	Devre	TSEC	shreyash90@gmail.com	3996 6903 7903
S12	29	Jayden	Desouza	TSEC	jayden13@gmail.com	1456 6533 7693
S12	26	Shawn	Dcosta	TSEC	shawn111@gmail.com	1111 6903 7789
S13	51	Vighnesh	Hinge	TSEC	vighnesh120@gmail.com	2222 6873 7673
S13	58	Jorden	Mathew	TSEC	jorden990@gmail.com	3434 6543 7231
S13	59	Pankaj	Joshi	TSEC	pankajjoshi19@gmail.com	7676 6890 7653
S13	69	Sarthak	Kuwar	TSEC	sarthak69@gmail.com	3322 7654 8798

Grep Commands:

1. List students of batch S11



```
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ grep "S11" OSAssignment.txt
S11 07 Aarya Arban TSEC arbanaarya1504@gmail.com 2134 5643 7762
S11 06 Soham Amare TSEC sohamamare07@gmail.com 2345 7683 4567
S11 10 Soham Babashetye TSEC soham10@gmail.com 3456 6543 7653
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$
```

2. List of students of not from S12

```
grep -v "S12" OSAssignment.txt
```

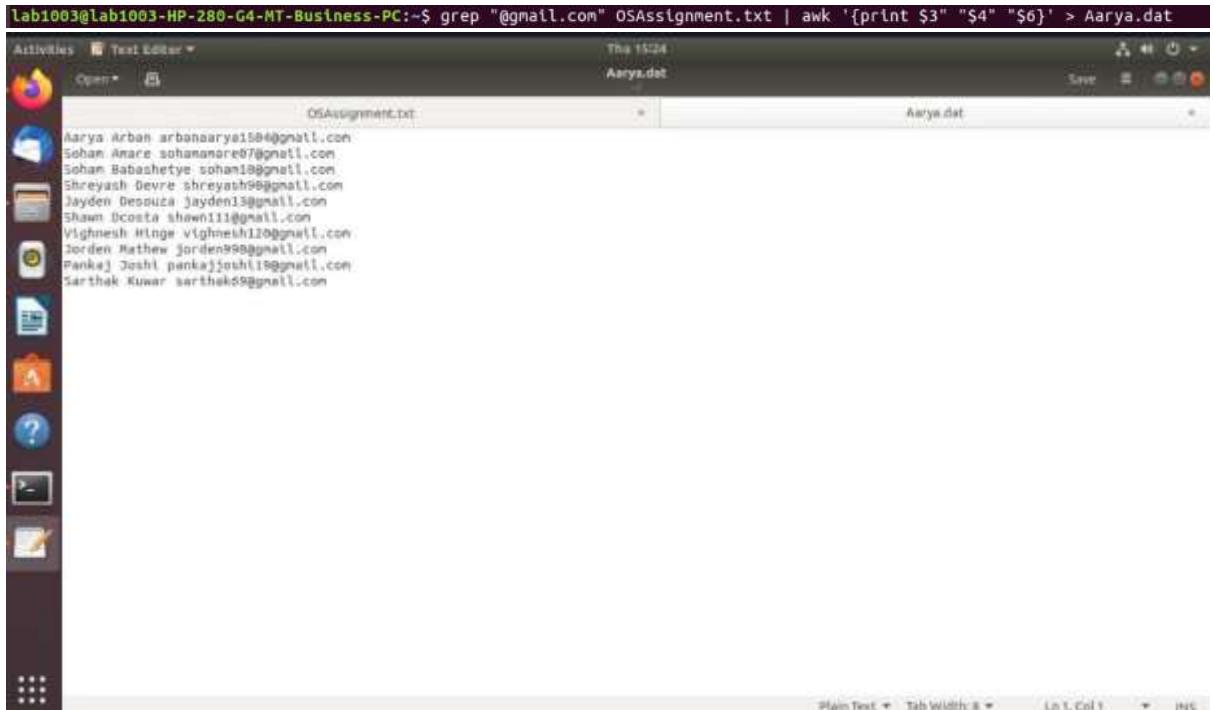
S11	06	Soham	Amare	TSEC	sohamamare07@gmail.com	2345	7683	4567
S11	10	Soham	Babashetye	TSEC	soham10@gmail.com	3456	6543	7653
S13	51	Vighnesh	Hinge	TSEC	vighnesh120@gmail.com	2222	6873	7673
S13	58	Jorden	Mathew	TSEC	jorden99@gmail.com	3434	6543	7231
S13	59	Pankaj	Joshi	TSEC	pankajjoshi19@gmail.com	7676	6890	7653
S13	69	Sarthak	Kuwar	TSEC	sarthak69@gmail.com	3322	7654	8798

3. Print 2 lines before and after specific roll number

lab1003@lab1003-HP-280-G4-MT-Business-PC:~\$ grep -B 2 -A 2 "10" OSAssignment.txt
S11 07 Aarya Arban TSEC arbanaarya1504@gmail.com 2134 5643 7762
S11 06 Soham Amare TSEC sohamamare07@gmail.com 2345 7683 4567
S11 10 Soham Babashetye TSEC soham10@gmail.com 3456 6543 7653
S12 30 Shreyash Devre TSEC shreyash90@gmail.com 3996 6903 7903
S12 29 Jayden Desouza TSEC jayden13@gmail.com 1456 6533 7693

4. Extract all student records who have an email ID and pass it to a file which is your name (Aarya).dat. Print first name, last name and email address with proper spacing.

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ grep "@gmail.com" OSAssignment.txt | awk '{print $3" "$4" "$6}' > Aarya.dat
```



The screenshot shows a terminal window and a text editor window. The terminal window displays the command and its execution results:

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ grep "@gmail.com" OSAssignment.txt | awk '{print $3" "$4" "$6}' > Aarya.dat
```

The text editor window shows the file 'Aarya.dat' with the following content:

```
Aarya Arban arbanaarya1504@gmail.com
Soham Amare sohamamare07@gmail.com
Soham Babashetye soham10@gmail.com
Shreyash Devre shreyash90@gmail.com
Jayden Desouza jayden13@gmail.com
Soham Amare sohamamare07@gmail.com
Vighnesh Hinge vighnesh120@gmail.com
Jorden Mathew jorden99@gmail.com
Pankaj Joshi pankajjoshi19@gmail.com
Sarthak Kuwar sarthak69@gmail.com
```

Awk Commands:

1. Display student names where student roll numbers are greater than 20

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ awk '$2>20' OSAssignment.txt
Batch Roll No. First name Last name College Email-ID Aadhar number
S12    30      Shreyash   Devre     TSEC    shreyash90@gmail.com 3996 6903 7903
S12    29      Jayden     Desouza   TSEC    jayden13@gmail.com 1456 6533 7693
S12    26      Shawn      Dcosta   TSEC    shawn111@gmail.com 1111 6903 7789
S13    51      Vighnesh   Hinge    TSEC    vighnesh120@gmail.com 2222 6873 7673
S13    58      Jorden     Mathew   TSEC    jorden990@gmail.com 3434 6543 7231
S13    59      Pankaj     Joshi    TSEC    pankajjoshi19@gmail.com 7676 6890 7653
S13    69      Sarthak   Kuwar   TSEC    sarthak69@gmail.com 3322 7654 8798
```

2. Display names of students which begin with S (First name and last name)

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ awk '$3~/^S/ {print $3}' OSAssignment.txt
Soham
Soham
Shreyash
Shawn
Sarthak
```

3. Count the number of students in S13

```
lab1003@lab1003-HP-280-G4-MT-Business-PC:~$ awk '/S13/ {count++} END {print count}' OSAssignment.txt
4
```

ALPHONZ GEORGE

S11-05

Unix lab

Assignment No. 7 – Basic Shell Programming

7-A) Display the system date. Extract and identify if its leap year.

```
lab1003@lab1003-HP-280-G2-MT:~$ nano assignment7.sh
```

```
lab1003@lab1003-HP-280-G2-MT:~$ bash assignment7.sh
```

2024 is a leap year.

```
#!/bin/bash
# Get the current year using the date command
current_year=$(date '+%Y')

# Check if the year is divisible by 4 but not divisible by 100, or divisible by 400
if ((current_year % 4 == 0 && current_year % 100 != 0) || (current_year % 400 == 0)); then
    echo "$current_year is a leap year."
else
    echo "$current_year is not a leap year."
fi
```

```
File Edit View Search Terminal Help
lab1003@lab1003-HP-280-G2-MT:~$ nano assignment7.sh
lab1003@lab1003-HP-280-G2-MT:~$ bash assignment7.sh
2024 is a leap year.
```

7-B) Calculate area and perimeter of a rectangle. Take user input length and breadth.

```
lab1003@lab1003-HP-280-G2-MT:~$ nano assignment7b.sh
```

```
lab1003@lab1003-HP-280-G2-MT:~$ bash assignment7b.sh
```

Enter the length of the rectangle:

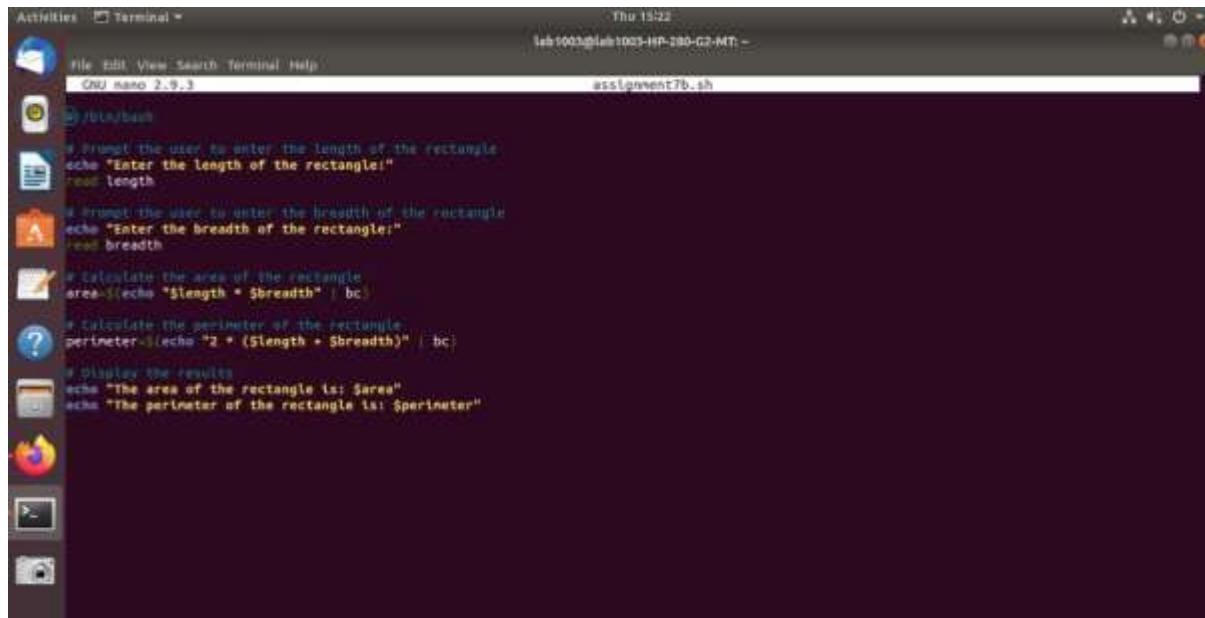
5

Enter the breadth of the rectangle:

6

The area of the rectangle is: 30

The perimeter of the rectangle is: 22

A screenshot of a Linux desktop environment. In the top right corner, there is a system tray icon. Below it, the desktop background is dark. A terminal window titled "Terminal" is open in the foreground. The terminal shows a script named "assignment7b.sh". The script prompts the user for the length and breadth of a rectangle, calculates its area and perimeter using the bc command, and then displays the results.

```
File Edit View Search Terminal Help
GNU nano 2.9.3
assignment7b.sh
Thu 15:22
lab1003@lab1003-HP-280-G2-MT: ~

# Prompt the user to enter the length of the rectangle
echo "Enter the length of the rectangle"
read length

# Prompt the user to enter the breadth of the rectangle
echo "Enter the breadth of the rectangle"
read breadth

# Calculate the area of the rectangle
area=$(echo "$length * $breadth" | bc)

# Calculate the perimeter of the rectangle
perimeter=$(echo "2 * ($length + $breadth)" | bc)

# Display the results
echo "The area of the rectangle is: $area"
echo "The perimeter of the rectangle is: $perimeter"

exit
```

```
lab1003@lab1003-HP-280-G2-MT:~$ nano assignment7b.sh
lab1003@lab1003-HP-280-G2-MT:~$ bash assignment7b.sh
Enter the length of the rectangle:
5
Enter the breadth of the rectangle:
6
The area of the rectangle is: 30
The perimeter of the rectangle is: 22
```

ALPHONZ GEORGE

S11-05

Unix lab

Assignment No. 8 – Advance Shell Programming

8-A) Enter roll number using command line. Display table of your number up to 12 using a loop.

```
lab1003@lab1003-HP-280-G2-MT:~$ nano assignment8a.sh
```

```
lab1003@lab1003-HP-280-G2-MT:~$ bash assignment8a.sh
```

Enter your roll no

7

$7 \times 1 = 7$

$7 \times 2 = 14$

$7 \times 3 = 21$

$7 \times 4 = 28$

$7 \times 5 = 35$

$7 \times 6 = 42$

$7 \times 7 = 49$

$7 \times 8 = 56$

$7 \times 9 = 63$

$7 \times 10 = 70$

$7 \times 11 = 77$

$7 \times 12 = 84$



```
lab1003@lab1003-HP-280-G2-MT: ~
File Edit View Search Terminal Help
GNU nano 2.9.3           assignment8a.sh           Modified
#!/bin/bash
echo "Enter your roll no"
read roll_no

for i in {1..12}
do
echo "$roll_no x $i  =$(($roll_no*i))"
done
```

8-B) Write a shell script.

- 1.Accept first name and surname from command line
2. Create a surname .c file. The file should display a message - First name welcomes you to surname palace.

lab1003@lab1003-HP-280-G2-MT:~\$ nano assignment8b.sh

lab1003@lab1003-HP-280-G2-MT:~\$ bash assignment8b.sh

Enter your first name

Aarya

Enter your surname

Arban

Aarya welcomes you to Arban palace

File Edit View Search Terminal Help
GNU nano 2.9.3 assignment8b.sh

```
#!/bin/bash

echo "Enter your first name"
read fname
echo "Enter your surname"
read lname
# Create the C file
echo "#include <stdio.h>

int main() {
    printf(\"%s welcomes you to %s residence.\n\", \"$first_name\", \"$surname\");
    return 0;
}" > first.c

# Compile the C file
gcc -o first first.c

# Execute the compiled program
./first

# Clean up intermediate files
rm -f first.c first
```

ALPHONZ GEORGE

S11-05

Unix lab

Assignment No. 9 – Basic Perl Script

9-A) Calculate area and perimeter of a square when the length of side is given.

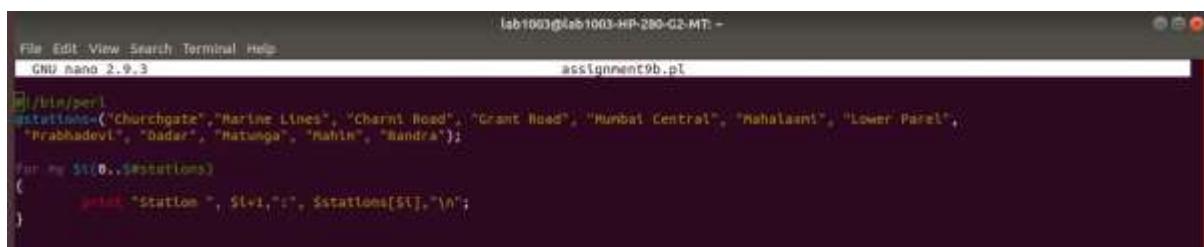


```
File Edit View Search Terminal Help
GNU nano 2.9.3                                     lab1003@lab1003-HP-280-G2-MT: ~
                                                        assignment9.pl

#!/bin/perl
$length = 6;
$area = $length*$length;
print "Area of square = $area\n";
$perimeter = 4 *$length;
print "Perimeter of square = $perimeter\n";
```

```
lab1003@lab1003-HP-280-G2-MT:~$ nano assignment9.pl
lab1003@lab1003-HP-280-G2-MT:~$ perl assignment9.pl
Area of square = 36
Perimeter of square = 24
```

9-B) Create an array of names of local train stations from Churchgate to Bandra. Display a station name when station number is given. (Churchgate is No. 1)



```
File Edit View Search Terminal Help
GNU nano 2.9.3                                     lab1003@lab1003-HP-280-G2-MT: ~
                                                        assignment9b.pl

#!/bin/perl
@stations = ("Churchgate", "Marine Lines", "Charni Road", "Grant Road", "Mumbai Central", "Mahalaxmi", "Lower Parel",
             "Prabhadevi", "Dadar", "Matunga", "Mahim", "Bandra");
for my $i(0..$#stations)
{
    print "Station ", $i+1, ": ", $stations[$i], "\n";
}
```

```
lab1003@lab1003-HP-280-G2-MT:~$ nano assignment9b.pl
lab1003@lab1003-HP-280-G2-MT:~$ perl assignment9b.pl
Station 1:Churchgate
Station 2:Marine Lines
Station 3:Charni Road
Station 4:Grant Road
Station 5:Mumbai Central
Station 6:Mahalaxmi
Station 7:Lower Parel
Station 8:Prabhadevi
Station 9:Dadar
Station 10:Matunga
Station 11:Mahim
Station 12:Bandra
```

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S11-05

Unix lab

Assignment No. 10 – Advanced Perl Script

10-A) Display names and size of station list (of 9b) using Variable context.

```
@stations=("Churchgate","Marine Lines", "Charni Road", "Grant Road",
"Mumbai Central", "Mahalaxmi", "Lower Parel",
"Prabhadevi", "Dadar", "Matunga", "Mahim", "Bandra");

($names, $size) = (\@stations, scalar @stations);

print "Station Names:\n";
for my $i(0..$#stations)

{
    print "Station ", $i+1,":", $stations[$i],"\n";
}

print "Size of the station list: $size\n";
```

Output:

```
lab1003@lab1003-HP-280-G2-MT:~$ nano assignment10a.pl
lab1003@lab1003-HP-280-G2-MT:~$ perl assignment10a.pl
Station Names:
Station 1:Churchgate
Station 2:Marine Lines
Station 3:Charni Road
Station 4:Grant Road
Station 5:Mumbai Central
Station 6:Mahalaxmi
Station 7:Lower Parel
Station 8:Prabhadevi
Station 9:Dadar
Station 10:Matunga
Station 11:Mahim
Station 12:Bandra
Size of the station list: 12
```

10-B) Display power table of your roll no + 10 up to 5th power

```
$no=17;
```

```
print "Power Table of 17 (7+10):\n";
```

```
for my $i (0..5) {  
    $result=$no**$i;  
    print "$no^$i = ".$result;  
    print"\n"  
}
```

Output:

Power Table of 17 (7+10):

$17^0 = 1$

$17^1 = 17$

$17^2 = 289$

$17^3 = 4913$

$17^4 = 83521$

$17^5 = 1419857$

Topic: Operating System Architecture

Aim: Explain with diagram architecture of monolithic operating system, layered OS, micro kernel OS. Explain architecture by Linux, windows and mac OS.

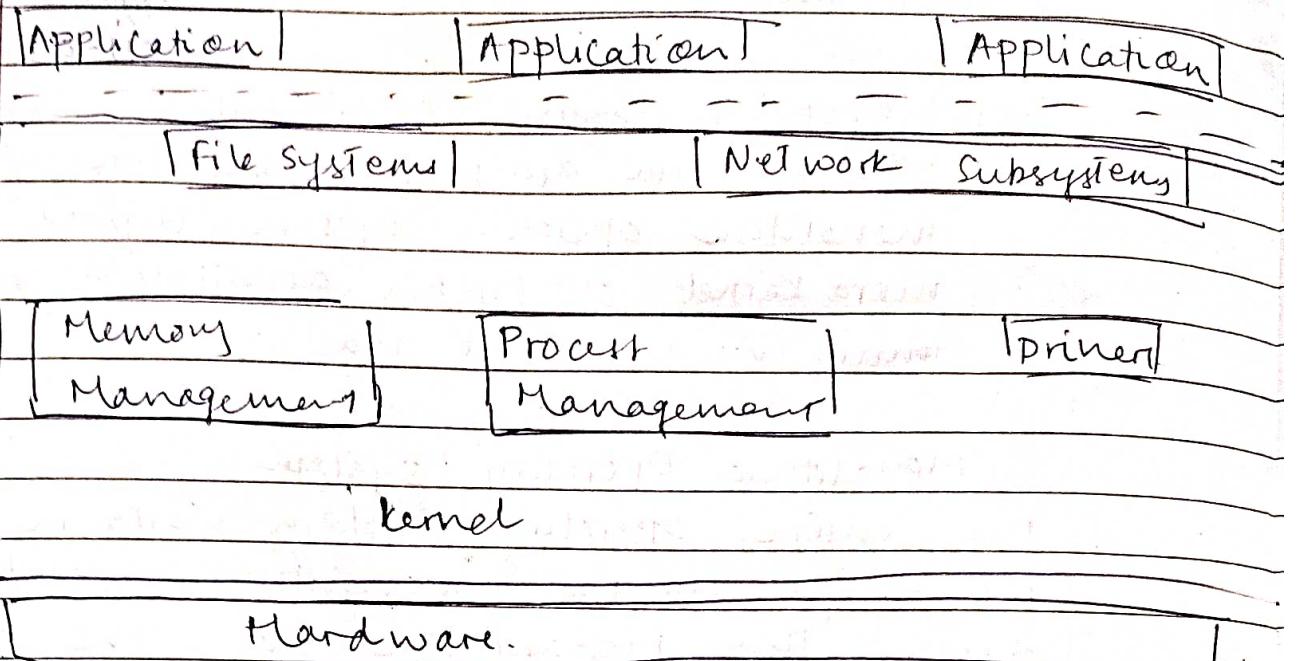
Monolithic Operating system

The entire operating system works in the kernel space in the monolithic operating system. This increases the size of the kernel as well as the OS. This is different than micro processors kernel system where the minimum software that is required to correctly implement an OS is kept in kernel. The significant single piece of software contains the entire OS, including device drivers, file management, memory management and system calls.

Components:

- 1) Kernel: The core of OS is to manage hardware resources, schedule tasks and provide system calls.
- 2) Device Drivers: Interface b/w the OS and hardware devices.
- 3) File system: Manages file storage & retrieval.
- 4) Memory Management: Allocates and deallocates memory for process.

Diagram:



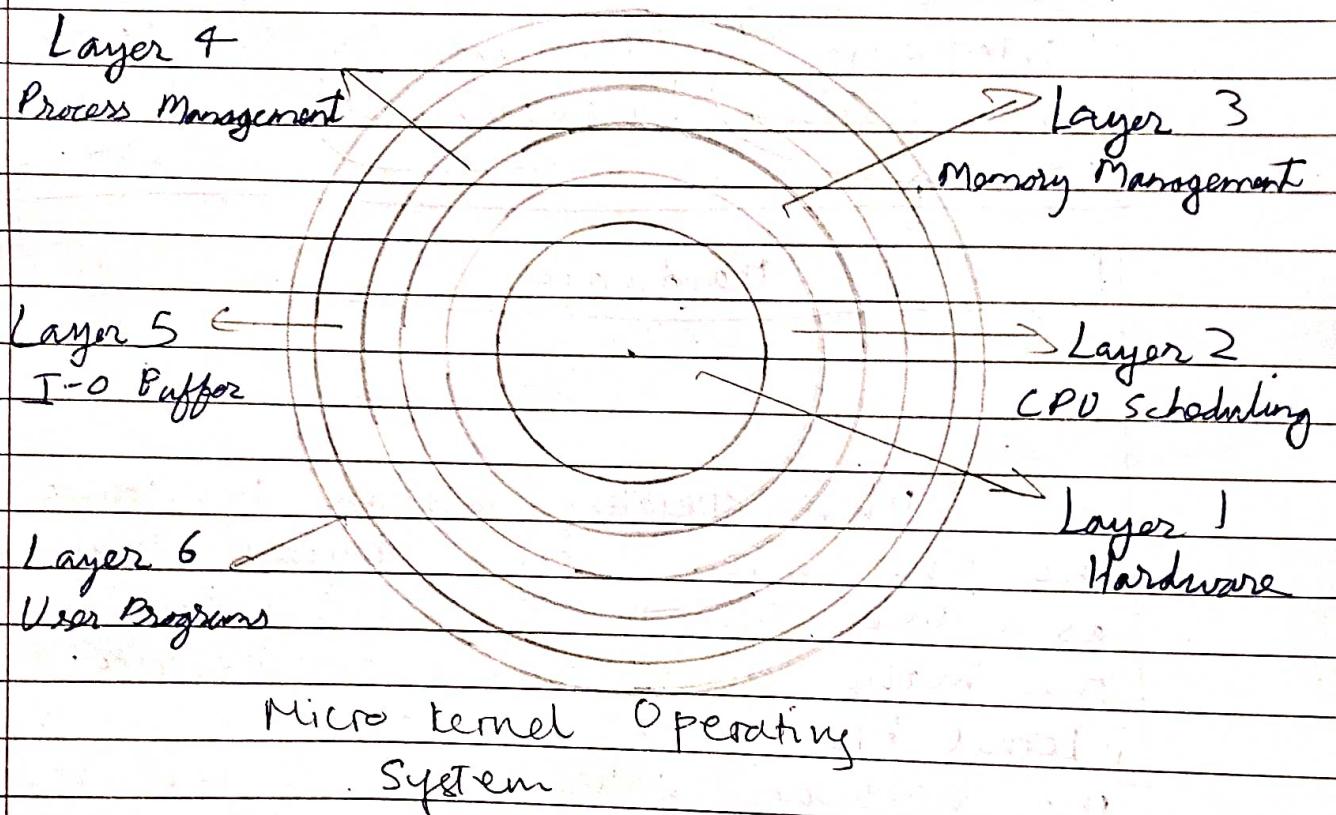
layered operating System

The layered OS approach breaks up the OS into different layers and retains much more detail on system. The bottom layer is hardware and the topmost layer is the user interface. These layers are so designed that each layer adds more functions of lower-level layers.

The six levels of layered OS are:

- 1) Hardware: The hardware being the lowest layer interacts with system hardware and coordinates with all the peripheral devices.
- 2) CPU Scheduling: This layer deals with scheduling the process for the CPU.
- 3) Memory management: The third layer that deals w memory. It moves processes from the disk to primary memory for execution & back again.

- 4) Process management: This layer is responsible for management of processes i.e. assigning the processor to a process at a time.
- 5) I/O Buffer: Handles the buffer for I/O devices and make them work correctly.
- 6) User programs: The highest layer that deals with the many user programs and applications that run in an operating system such as word processors, games, browsers, etc.

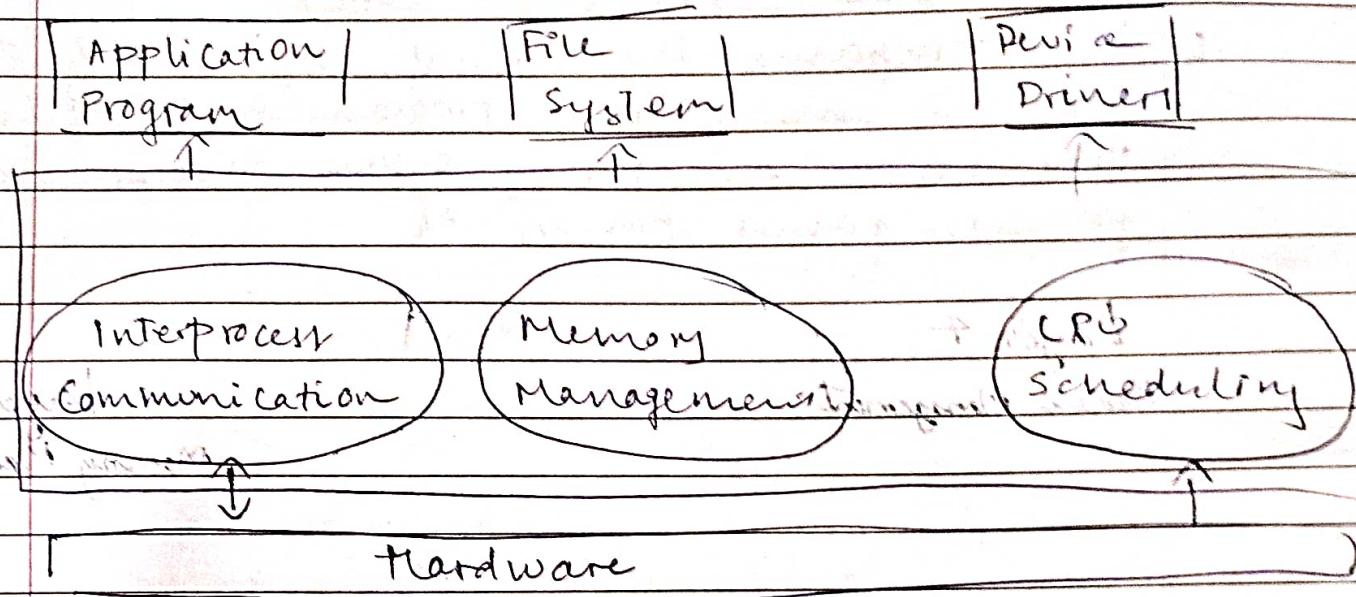


It contains basic requirement such as memory, process scheduling mechanisms and basic interprocess communications. The only software executing at privileged level i.e. kernel mode is microkernel additional services such as file systems and device drivers are implemented as userspace processes.

- Components:

→ Microkernel: Provides essential services like inter process communication & basic memory management.

- 2) User space Servers: Implement additional services such as file systems & device drivers.
- 3) User Application: Runs on the top/ microkernel.



Unit Operating System Architecture

- The Unix OS is a set of programs that act as a link b/w the computer & the user. The main concept of unix architecture:
- 1) Kernel : Is the heart of OS. It interacts with the hardware & the most of the tasks like memory management, task scheduling & file management.
 - 2) Shell : The shell is the utility that processes your request. When you type in a command at your terminal, the shell interprets the command and calls the program you want.
 - 3) Commands & Utilities : System management tools.
 - 4) Files & Directories : All data of Unix is organized into files. All files are then organized into directories.

Window Operating System Architecture

Windows OS use a hybrid architecture that incorporate elements of both monolithic & micro kernel architectures. It includes the kernel, executive services and user mode components.

• Components:

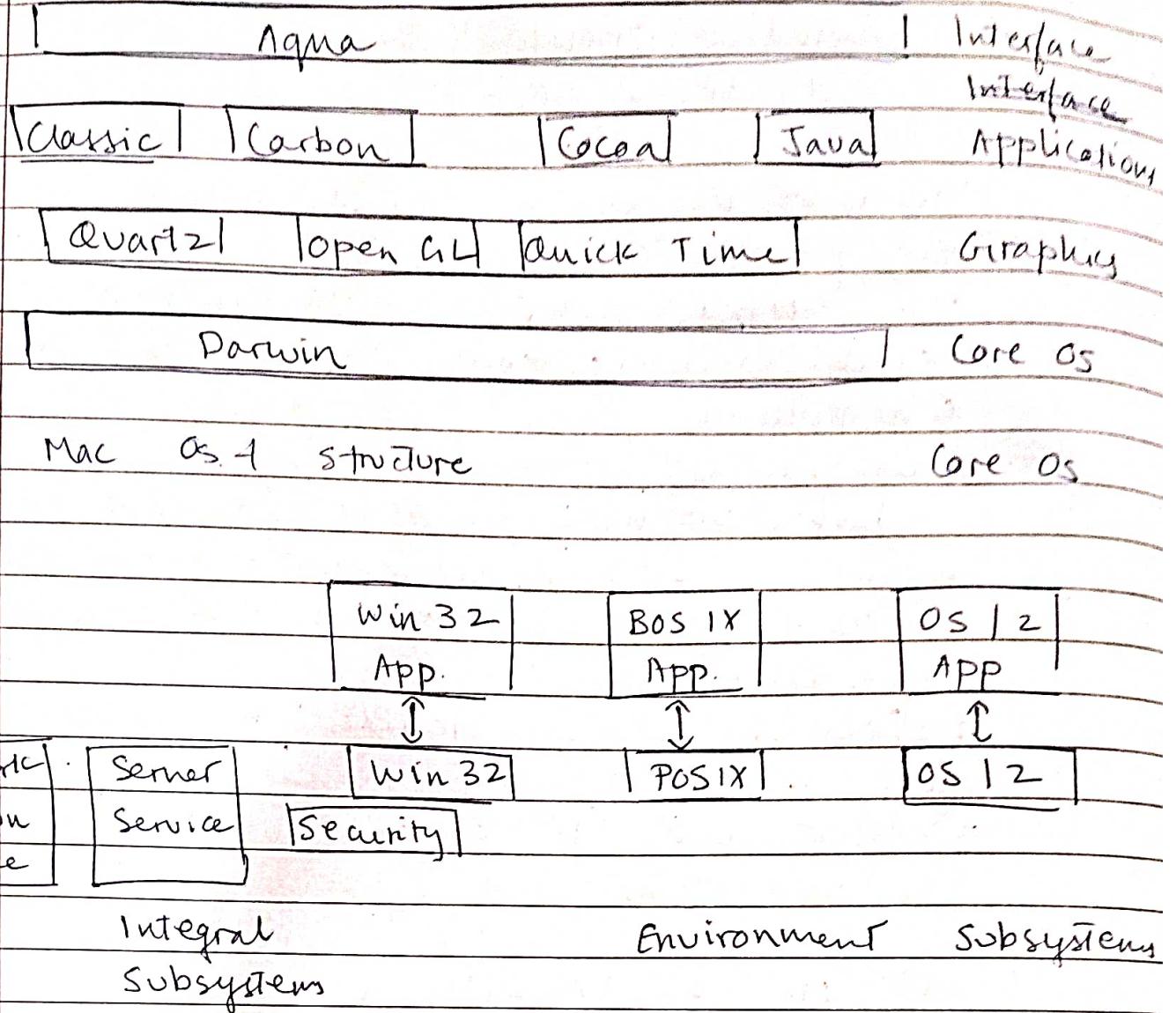
- 1) Kernel : It manages core functions such as memory & process management. It includes windows kernel and hardware abstraction layer (HAL)
- 2) Executive Services : Provides higher level services like memory & process management & I/O
- 3) User mode : It contains user application

• Subsystems:

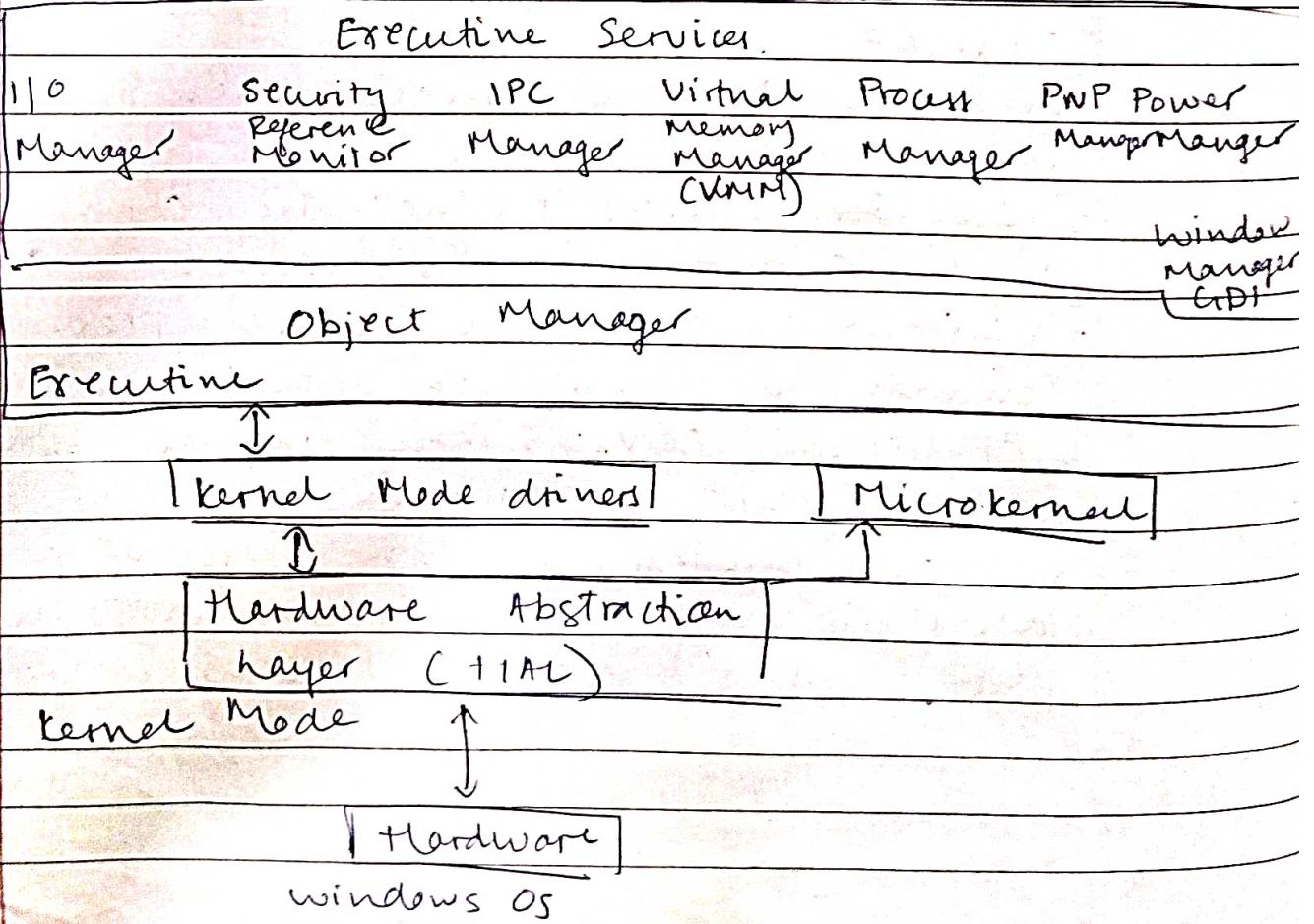
MAC OS Architecture

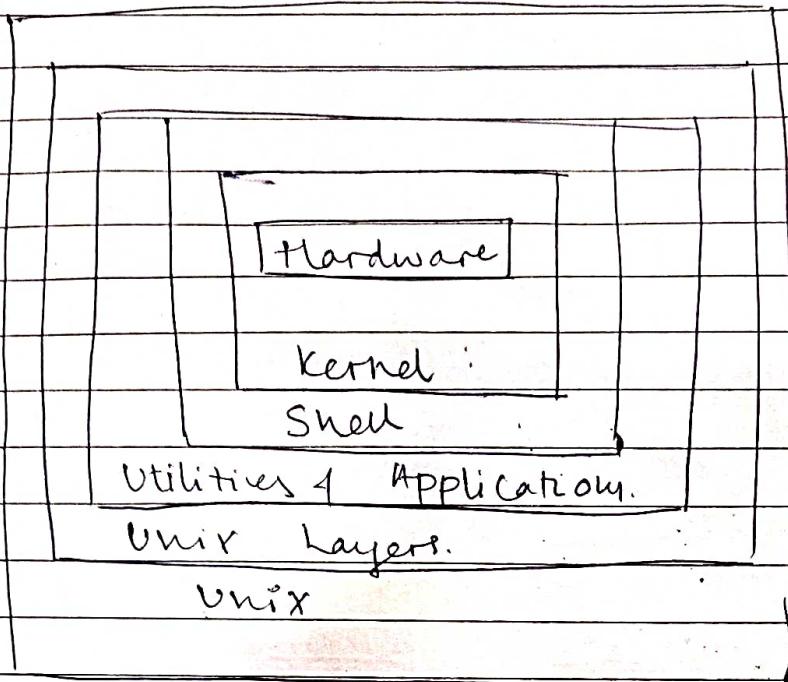
Mac OS follows layered architecture. It consists of:

- 1) Kernel : Manages process, memory, file systems & device drivers
- 2) Core ~~Services~~ Services : It facilitates communication b/w user level processes & kernel.
- 3) Libraries : Higher level libraries provide common functionality to application.
- 4) Application Services : These include graphics, audio & other multimedia.
- 5) Application layer : This is where user app runs. It includes system applications & third party apps developed for MAC OS.



User mode.





Roll no: 05

$$5 \times 100 = 500$$

$$500 - 266 = 234$$

$$\frac{234}{256} \approx 0.91$$

