

## 1. Basic Unix/Linux commands:

ls, date, help, info, man, who, pwd, cat, more, mv, rm, chmod, whoami, logout, wc, grep, sort, mkdir, rmdir, cd, tail, cmp, diff, cp, clear, df, du, uname, apt-get, find, wget, top, mpstat, netstat, sar, chown

### LS

ls is a Linux shell command that lists directory contents of files and directories.

```
maxmax@madmax:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  snap  Templates  Videos
maxmax@madmax:~$
```

### DATE

date command is used to display the system date and time.

```
maxmax@madmax:~$ date
Thursday 27 January 2022 10:56:34 AM IST
maxmax@madmax:~$
```

### HELP

Displays brief summaries of built-in commands.

```
maxmax@madmax:~$ help
GNU bash, version 5.0.17(1)-release (x86_64-pc-linux-gnu)
These shell commands are defined internally. Type 'help' to see this list.
Type 'help name' to find out more about the function 'name'.
Use 'info bash' to find out more about the shell in general.
Use 'man -k' or 'info' to find out more about commands not in this list.

A star (*) next to a name means that the command is disabled.

job_spec [&]
(( expression ))
. filename [arguments]
:
[ arg... ]
[[ expression ]]
alias [-p] [name=value] ... ]
bg [job_spec ...]
bind [-lpsvPSVX] [-m keymap] [-f filename] [-q name] [-u name] [-r k>
break [n]
builtin [shell-builtin [arg ...]]
caller [expr]
case WORD in [PATTERN] ([ PATTERN]...) COMMANDS ;;)... esac
cd [-L] [-P [-e]] [-@]] [dir]
command [-pVv] command [arg ...]
compgen [-abdefgjkuv] [-o option] [-A action] [-G globpat] [-W wor>
complete [-abdefgjkuv] [-pr] [-DEI] [-o option] [-A action] [-G gl>
compopt [-o] [+o option] [-DEI] [name ...]
continue [n]
coproc [NAME] command [redirections]
declare [-aAffgIlrtux] [-p] [name=value] ...]
dirs [-clpv] [+N] [-N]
disown [-h] [-ar] [jobspec ... | pid ...]
echo [-neE] [arg ...]
enable [-a] [-dnps] [-f filename] [name ...]
eval [arg ...]
exec [-cl] [-a name] [command [arguments ...]] [redirection ...]
exit [n]
export [-fn] [name=value] ...] or export -p

history [-c] [-d offset] [n] or history -anrw [filename] or history>
if COMMANDS; then COMMANDS; [ elif COMMANDS; then COMMANDS; ]... [ >
jobs [-lnprs] [jobspec ...] or jobs -x command [args]
kill [-s sigspec | -n signum | -sigspec] pid | jobspec ... or kill >
let arg [arg ...]
local [option] name[=value] ...
logout [n]
mapfile [-d delim] [-n count] [-O origin] [-s count] [-t] [-u fd] [>
popd [-n] [+N | -N]
printf [-v var] format [arguments]
pushd [-n] [+N | -N | dir]
pwd [-LP]
read [-ers] [-a array] [-d delim] [-i text] [-n nchars] [-N nchars]>
readarray [-d delim] [-n count] [-O origin] [-s count] [-t] [-u fd]>
readonly [-aAf] [name=value] ...] or readonly -p
return [n]
select NAME [in WORDS ... ;] do COMMANDS; done
set [-abefhknptuvxBCHP] [-o option-name] [--] [arg ...]
shift [n]
shopt [-pqsu] [-o] [optname ...]
source filename [arguments]
suspend [-f]
test [expr]
time [-p] pipeline
times
trap [-lp] [[arg] signal_spec ...]
true
type [-afptP] name [name ...]
typeset [-aAffgIlrtux] [-p] name[=value] ...]
```

### INFO

It will give detailed information for a command when compared with the man page.

```

file: dir,      Node: Top,      This is the top of the INFO tree.

This is the Info main menu (aka directory node).
A few useful Info commands:

'q' quits;
'H' lists all Info commands;
'h' starts the Info tutorial;
'mTexinfo RET' visits the Texinfo manual, etc.

* Menu:

Basics
* Common options: (coreutils)Common options.
* Coreutils: (coreutils).      Core GNU (file, text, shell) utilities.
* Date input formats: (coreutils)Date input formats.
* Ed: (ed).                  The GNU line editor
* File permissions: (coreutils)File permissions.
                                Access modes.
* Finding files: (find).      Operating on files matching certain criteria.

Compression
* Gzip: (gzip).              General (de)compression of files (lzw).

Development
* SSIP: (ssip).              Speech Synthesis Interface Protocol.
* Speech Dispatcher: (speech-dispatcher).
                                Speech Dispatcher.

DOS
* Mtools: (mtools).          Mtools: utilities to access DOS disks in Unix.

Editors
* nano: (nano).              Small and friendly text editor.

GNU organization
-----Info: (dir)Top, 212 lines --Top-----
Cannot find node 'Top'

```

## MAN

Used to display the manual of any command.

```

MAN(1)                                     Manual pager utils                                     MAN(1)

NAME
    man - an interface to the system reference manuals

SYNOPSIS
    man [man options] [[section] page ...] ...
    man -k [apropos options] regexp ...
    man -K [man options] [section] term ...
    man -f [whatis options] page ...
    man -l [man options] file ...
    man -w|-W [man options] page ...

DESCRIPTION
    man is the system's manual pager. Each page argument given to man is normally the name of a program, utility or function. The manual page associated with each of these arguments is then found and displayed. A section, if provided, will direct man to look only in that section of the manual. The default action is to search in all of the available sections following a pre-defined order (see DEFAULTS), and to show only the first page found, even if page exists in several sections.

    The table below shows the section numbers of the manual followed by the types of pages they contain.

    1 Executable programs or shell commands
    2 System calls (functions provided by the kernel)
    3 Library calls (functions within program libraries)
    4 Special files (usually found in /dev)
    5 File formats and conventions, e.g. /etc/passwd
    6 Games
    7 Miscellaneous (including macro packages and conventions), e.g. man(7), groff(7)
    8 System administration commands (usually only for root)
    9 Kernel routines [Non standard]

    A manual page consists of several sections.

    Conventional section names include NAME, SYNOPSIS, CONFIGURATION, DESCRIPTION, OPTIONS, EXIT STATUS, RETURN VALUE, ERRORS, ENVIRONMENT, FILES, VERSIONS, CONFORMING TO, NOTES, BUGS, EXAMPLE, AUTHORS, and SEE ALSO.

    The following conventions apply to the SYNOPSIS section and can be used as a guide in other sections.

```

Manual page man(1) line 1 (press h for help or q to quit)

## WHO

Displays the users that are currently logged in.

```

maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab1$ who
maxmax      :0                2022-01-26 14:15 (:0)
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab1$

```

## PWD

Prints the current working directory.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab1$ who
maxmax    :0                2022-01-26 14:15 (:0)
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab1$
```

## CAT

It reads data from the file and gives their content as output. It helps us to create, view, concatenate files.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ cat sample.txt
Lorem ipsum dolor sit amet consectetur adipisicing elit. Maxime mollitia, molestiae quas vel sint commodi repudiandae consequuntur voluptatum laborum numquam blanditiis harum quisquam eius sed odit fugiat iusto fuga praesentium optio, eaque rerum! Provident similique accusantium nemo autem. Veritatis obcaecati tenetur iure eius earum ut molestias architecto voluptate aliquam nihil, eveniet aliquid culpa officia aut! Impedit sit sunt quaerat, odit, tenetur error, harum nesciunt ipsum debitis quas aliquid. Reprehenderit, quia. Quo neque error repudiandae fuga? Ipsa laudantium molestias eos sapiente officiis modi at sunt excepturi expedita sint? Sed quibusdam recusandae alias error harum maxime adipisci amet laborum. Perspiciatis minima nesciunt dolorem! Officiis iure rerum voluptates a cumque velit quibusdam sed amet tempora. Sit laborum ab, eius fugit doloribus tenetur fugiat, temporibus enim commodi iusto libero magni deleniti quod quam consequuntur! Commodi minima excepturi repudiandae velit hic maxime doloremque. Quaerat provident commodi consectetur veniam similique ad earum omnis ipsum saepe, voluptas, hic voluptates pariatur est explicabo fugiat, dolorum eligendi quam cupiditate excepturi mollitia maiores labore suscipit quas? Nulla, placeat. Voluptatem quaerat non architecto ab laudantium modi minima sunt esse temporibus sint culpa, recusandae aliquam numquam totam ratione voluptas quod exercitationem fuga. Possimus quis earum veniam quasi aliquam eligendi, placeat qui corporis!
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

## 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.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ more sample.txt
Lorem ipsum dolor sit amet consectetur adipisicing elit. Maxime mollitia,
molestiae quas vel sint commodi repudiandae consequuntur voluptatum laborum
numquam blanditiis harum quisquam eius sed odit fugiat iusto fuga praesentium
optio, eaque rerum! Provident similique accusantium nemo autem. Veritatis
obcaecati tenetur iure eius earum ut molestias architecto voluptate aliquam
nihil, eveniet aliquid culpa officia aut! Impedit sit sunt quaerat, odit,
tenetur error, harum nesciunt ipsum debitis quas aliquid. Reprehenderit,
quia. Quo neque error repudiandae fuga? Ipsa laudantium molestias eos
sapiente officiis modi at sunt excepturi expedita sint? Sed quibusdam
recusandae alias error harum maxime adipisci amet laborum. Perspiciatis
minima nesciunt dolorem! Officiis iure rerum voluptates a cumque velit
quibusdam sed amet tempora. Sit laborum ab, eius fugit doloribus tenetur
fugiat, temporibus enim commodi iusto libero magni deleniti quod quam
consequuntur! Commodi minima excepturi repudiandae velit hic maxime
doloremque. Quaerat provident commodi consectetur veniam similique ad
earum omnis ipsum saepe, voluptas, hic voluptates pariat est explicabo
fugiat, dolorum eligendi quam cupiditate excepturi mollitia maiores labore
suscipit quas? Nulla, placeat. Voluptatem quaerat non architecto ab laudantium
modi minima sunt esse temporibus sint culpa, recusandae aliquam numquam
totam ratione voluptas quod exercitationem fuga. Possimus quis earum veniam
quasi aliquam eligendi, placeat qui corporis!
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

## MV

mv is used to move one or more files or directories from one place to another.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ mv sample.txt ./Lab2
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ cd Lab2/
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ ls -la
total 12
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:09 .
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:09 ..
-rw-rw-r-- 1 maxmax maxmax 1520 Jan 27 11:06 sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## RM

rm command is used to remove objects such as files, directories, symbolic links and so on.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ ls -la
total 12
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:09 .
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:09 ..
-rw-rw-r-- 1 maxmax maxmax 1520 Jan 27 11:06 sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ rm sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ ls -la
total 8
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:10 .
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:09 ..
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## CHMOD

chmod command is used to change the access mode of a file.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ touch sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ ls -la
total 8
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:11 .
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:09 ..
-rw-rw-r-- 1 maxmax maxmax    0 Jan 27 11:11 sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ chmod 777 sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ ls -la
total 8
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:11 .
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:09 ..
-rwxrwxrwx 1 maxmax maxmax    0 Jan 27 11:11 sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## WHOAMI

It displays the username of the current user when this command is invoked.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ whoami
maxmax
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## LOGOUT

logout command allows you to programmatically logout from your session.

## WC

It is mainly used for counting purpose. It can be run with various options.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ cat sample.txt
Hello examiners,

This is the sample file with sample input for the purpose of lab assignment noly.

maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ wc sample.txt
 4  17 101 sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## GREP

The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern. It can be run with various options.



```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ grep sample sample.txt
This is the sample file with sample input for the purpose of lab assignment noly.
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## SORT

The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern. It can be run with various options.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ cat sample.txt
Naman
Riddhi
Vivek
Akshat
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ sort sample.txt
Akshat
Naman
Riddhi
Vivek
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## MKDIR

mkdir command in Linux allows the user to create directories.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ ls -la
total 9616
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:20 .
drwxrwxr-x 6 maxmax maxmax 4096 Jan 11 14:50 ..
-rw-rw-r-- 1 maxmax maxmax 9826834 Jan 12 11:10 'Distributed Systems Principles and Paradigms.pdf ( PDFDrive ).pdf'
drwxrwxr-x 2 maxmax maxmax 4096 Jan 11 14:53 Lab1
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:18 Lab2
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ mkdir Lab3
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ ls -la
total 9620
drwxrwxr-x 5 maxmax maxmax 4096 Jan 27 11:21 .
drwxrwxr-x 6 maxmax maxmax 4096 Jan 11 14:50 ..
-rw-rw-r-- 1 maxmax maxmax 9826834 Jan 12 11:10 'Distributed Systems Principles and Paradigms.pdf ( PDFDrive ).pdf'
drwxrwxr-x 2 maxmax maxmax 4096 Jan 11 14:53 Lab1
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:18 Lab2
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:21 Lab3
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

## RMDIR

rm command in Linux allows the user to delete directories.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ ls -la
total 9620
drwxrwxr-x 5 maxmax maxmax 4096 Jan 27 11:21 .
drwxrwxr-x 6 maxmax maxmax 4096 Jan 11 14:50 ..
-rw-rw-r-- 1 maxmax maxmax 9826834 Jan 12 11:10 'Distributed Systems Principles and Paradigms.pdf ( PDFDrive ).pdf'
drwxrwxr-x 2 maxmax maxmax 4096 Jan 11 14:53 Lab1
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:18 Lab2
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:21 Lab3
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ rmdir Lab3/
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ ls -la
total 9616
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:22 .
drwxrwxr-x 6 maxmax maxmax 4096 Jan 11 14:50 ..
-rw-rw-r-- 1 maxmax maxmax 9826834 Jan 12 11:10 'Distributed Systems Principles and Paradigms.pdf ( PDFDrive ).pdf'
drwxrwxr-x 2 maxmax maxmax 4096 Jan 11 14:53 Lab1
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:18 Lab2
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

## CD

It is used to change current working directory.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ pwd
/home/maxmax/Desktop/u19cs019_sem6/Distributed_Systems
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ cd Lab2/
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ pwd
/home/maxmax/Desktop/u19cs019_sem6/Distributed_Systems/Lab2
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## TAIL

It prints the last N number of data of the given input.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ cat sample.txt
Naman
Riddhi
Vivek
Akshat
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ tail -n 2 sample.txt
Vivek
Akshat
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## CMP

cmp command is used to compare the two files byte by byte and helps you to find out whether the two files are identical or not.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ cmp text.txt sample.txt
text.txt sample.txt differ: byte 1, line 1
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## DIFF

This command is used to display the differences in the files by comparing the files line by line

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ diff text.txt sample.txt
1,2c1,4
< Hello all,
< This is "text.txt" file.
---
> Naman
> Riddhi
> Vivek
> Akshat
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$
```

## CP

This command is used to copy files or group of files or directory.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ ls -la
total 16
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:26 .
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:22 ..
-rwxrwxrwx 1 maxmax maxmax 26 Jan 27 11:18 sample.txt
-rw-rw-r-- 1 maxmax maxmax 36 Jan 27 11:26 text.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ cp text.txt ..
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems/Lab2$ cd ..
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ ls -la
total 9620
drwxrwxr-x 4 maxmax maxmax 4096 Jan 27 11:28 .
drwxrwxr-x 6 maxmax maxmax 4096 Jan 11 14:50 ..
-rw-rw-r-- 1 maxmax maxmax 9826834 Jan 12 11:10 'Distributed Systems Principles and Paradigms.pdf ( PDFDrive ).pdf'
drwxrwxr-x 2 maxmax maxmax 4096 Jan 11 14:53 Lab1
drwxrwxr-x 2 maxmax maxmax 4096 Jan 27 11:26 Lab2
-rw-rw-r-- 1 maxmax maxmax 36 Jan 27 11:28 text.txt
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

**CLEAR**

clear is a standard Unix computer operating system command that is used to clear the terminal screen.

**DF**

The df command is used to display information related to file systems about total space and available space.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ df
Filesystem      1K-blocks      Used Available Use% Mounted on
udev            6052656         0    6052656   0% /dev
tmpfs           1217216        2052    1215164   1% /run
/dev/sda7       298113544 41941444 240959096  15% /
tmpfs           6086068      138488    5947580   3% /dev/shm
tmpfs           5120           4         5116   1% /run/lock
tmpfs           6086068         0    6086068   0% /sys/fs/cgroup
/dev/loop0      222720        222720         0 100% /snap/code/85
/dev/loop1       128          128         0 100% /snap/bare/5
/dev/loop2      101888       101888         0 100% /snap/core/11993
/dev/loop3      113152       113152         0 100% /snap/core/12603
/dev/loop4       56832        56832         0 100% /snap/core18/2253
/dev/loop5       56960        56960         0 100% /snap/core18/2284
/dev/loop6       63488        63488         0 100% /snap/core20/1270
/dev/loop7      168832       168832         0 100% /snap/gnome-3-28-1804/161
/dev/loop8      224256       224256         0 100% /snap/gnome-3-34-1804/77
/dev/loop9      253952       253952         0 100% /snap/gnome-3-38-2004/87
/dev/loop10     66816        66816         0 100% /snap/gtk-common-themes/1519
/dev/loop11     66688        66688         0 100% /snap/gtk-common-themes/1515
/dev/loop12     28800        28800         0 100% /snap/node/5770
/dev/loop13     224256       224256         0 100% /snap/gnome-3-34-1804/72
/dev/loop14     192640       192640         0 100% /snap/postman/167
/dev/loop16     44544        44544         0 100% /snap/snapd/14549
/dev/loop15     331776       331776         0 100% /snap/telegram-desktop/3544
/dev/loop17     331776       331776         0 100% /snap/telegram-desktop/3530
/dev/loop18     52224        52224         0 100% /snap/snap-store/547
/dev/loop19     4352         4352         0 100% /snap/tree/18
/dev/loop20     55552        55552         0 100% /snap/snap-store/558
/dev/loop21     192640       192640         0 100% /snap/postman/166
/dev/loop23     44416        44416         0 100% /snap/snapd/14295
/dev/loop25     114432       114432         0 100% /snap/whatsapp-for-linux/30
/dev/loop22     302848       302848         0 100% /snap/vlc/2344
/dev/loop24     114432       114432         0 100% /snap/whatsapp-for-linux/31
/dev/sda1       262144        58308    203836  23% /boot/efi
tmpfs           1217212         76    1217136   1% /run/user/1000
/dev/loop26     16768        16768         0 100% /snap/mysql/3
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

**DU**

du command, short for disk usage, is used to estimate file space usage.



```
maxmax@madmax:~/Desktop/u19cs019_sem6$ cd Distributed_Systems/
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ du
52      ./Lab1
12      ./Lab2
9672    .
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

## UNAME

The command 'uname' displays the information about the system.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ uname -a
Linux madmax 5.13.0-27-generic #29~20.04.1-Ubuntu SMP Fri Jan 14 00:32:30 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

## APT-GET

Its main task is to retrieve the information and packages from the authenticated sources for installation, upgrade and removal of packages along with their dependencies.

```
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$ sudo apt-get update
[sudo] password for maxmax:
Hit:1 http://in.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:4 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:5 https://packages.microsoft.com/repos/vscode stable InRelease
Get:6 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Fetched 114 kB in 3s (44.5 kB/s)
Reading package lists... Done
maxmax@madmax:~/Desktop/u19cs019_sem6/Distributed_Systems$
```

## FIND

It can be used to find files and directories and perform subsequent operations on them. It can be used with other options.

```
maxmax@madmax:~/Desktop/u19cs019_sem6$ find . -name sample.txt
./System_software/lab1/sample.txt
./Distributed_Systems/Lab2/sample.txt
maxmax@madmax:~/Desktop/u19cs019_sem6$
```

## WGET

wget is the non-interactive network downloader which is used to download files from the server even when the user has not logged on to the system and it can work in the background without hindering the current process.

```
maxmax@madmax:~/Desktop/u19cs019_sem6$ wget www.google.com
--2022-01-27 11:37:20-- http://www.google.com/
Resolving www.google.com (www.google.com)... 2404:6800:4009:813::2004, 142.250.67.196
Connecting to www.google.com (www.google.com)|2404:6800:4009:813::2004|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [text/html]
Saving to: 'index.html'

index.html           [      <=>          ] 16.78K  12.0KB/s   in 1.4s

2022-01-27 11:37:23 (12.0 KB/s) - 'index.html' saved [17181]
maxmax@madmax:~/Desktop/u19cs019_sem6$
```

## TOP

This command shows the summary information of the system and the list of processes or threads which are currently managed by the Linux Kernel.

```
top - 11:38:26 up 21:25, 1 user, load average: 0.93, 0.75, 0.81
Tasks: 302 total, 1 running, 301 sleeping, 0 stopped, 0 zombie
%Cpu(s): 8.1 us, 3.9 sy, 0.0 ni, 84.1 id, 3.7 wa, 0.0 hi, 0.2 si, 0.0 st
MiB Mem : 11886.9 total, 3681.4 free, 4139.0 used, 4066.5 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used, 7001.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1462	maxmax	9	-11	3589592	22316	17044	S	7.9	0.2	15:30.50	pulseaudio
17595	maxmax	20	0	85.2g	612048	123056	S	7.6	5.0	6:34.56	WebKitWebProces
800	root	20	0	560616	22036	18428	S	7.3	0.2	0:30.37	NetworkManager
23039	maxmax	20	0	24.4g	104976	83000	S	5.9	0.9	0:00.67	chrome
16808	maxmax	20	0	24.4g	131904	82712	S	4.0	1.1	2:16.45	chrome
1702	maxmax	20	0	4776448	321708	108360	S	3.6	2.6	15:11.23	gnome-shell
16724	maxmax	20	0	16.5g	280744	163816	S	2.6	2.3	2:16.16	chrome
1546	maxmax	20	0	1022028	127276	79420	S	2.0	1.0	9:39.47	Xorg
16777	maxmax	20	0	16.6g	157048	108900	S	1.7	1.3	1:08.70	chrome
16779	maxmax	20	0	16.3g	115648	89864	S	1.0	1.0	0:53.49	chrome
16444	maxmax	20	0	36.6g	235556	136788	S	0.7	1.9	0:12.83	code
23027	maxmax	20	0	20632	3912	3256	R	0.7	0.0	0:00.14	top
13	root	20	0	0	0	0	I	0.3	0.0	0:17.45	rcu_sched
799	message+	20	0	10096	6304	3800	S	0.3	0.1	0:06.98	dbus-daemon
16059	maxmax	20	0	40.7g	159836	104856	S	0.3	1.3	0:06.86	code
16117	maxmax	20	0	46.7g	238132	116272	S	0.3	2.0	0:15.40	code
16148	maxmax	20	0	40.5g	136344	94180	S	0.3	1.1	0:07.53	code
16545	maxmax	20	0	707772	62928	35680	S	0.3	0.5	0:10.08	npm start
16841	maxmax	20	0	24.4g	209140	105036	S	0.3	1.7	0:14.72	chrome
17172	maxmax	20	0	24.4g	202780	109000	S	0.3	1.7	0:34.66	chrome
19216	root	0	-20	0	0	0	I	0.3	0.0	0:03.64	kworker/u9:2-rtw_tx_wq
19558	maxmax	20	0	1384608	274852	136712	S	0.3	2.3	1:32.68	soffice.bin
19738	maxmax	20	0	825780	52632	39280	S	0.3	0.4	0:19.17	gnome-terminal-
20618	root	20	0	0	0	0	I	0.3	0.0	0:01.24	kworker/2:1-events
21586	root	20	0	0	0	0	I	0.3	0.0	0:00.93	kworker/u8:0-phy0
23028	maxmax	20	0	24.3g	88648	70528	S	0.3	0.7	0:00.08	chrome
1	root	20	0	169132	12968	8164	S	0.0	0.1	0:04.82	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.01	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-events_highpri

## MPSTAT

It accurately displays the statistics of the CPU usage of the system. It displays information about CPU utilization and performance.

```

maxmax@madmax:~/Desktop/u19cs019_sem6$ mpstat
Linux 5.13.0-27-generic (madmax)      27/01/22      _x86_64_      (4 CPU)

11:40:31 AM IST  CPU      %usr    %nice    %sys %iowait    %irq    %soft  %steal  %guest  %gnice   %idle
11:40:31 AM IST  all      27.39    0.05    7.92    1.64    0.00    0.18    0.00    0.00    0.00   62.82
maxmax@madmax:~/Desktop/u19cs019_sem6$

```

## NETSTAT

Netstat command displays various network related information such as network connections, routing tables, interface statistics, masquerade connections, multicast memberships etc.

```

maxmax@madmax:~/Desktop/u19cs019_sem6$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:5000          0.0.0.0:*               LISTEN
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:3000            0.0.0.0:*               LISTEN
tcp        0      0 madmax:54864             server-13-227-178:https ESTABLISHED
tcp        0      0 madmax:48568             ec2-3-6-226-83.ap:27017 ESTABLISHED
tcp        0      0 madmax:44430             ec2-18-214-44-19.:https ESTABLISHED
tcp        0      0 madmax:48570             ec2-3-6-226-83.ap:27017 ESTABLISHED
tcp        0      0 madmax:48572             ec2-3-6-226-83.ap:27017 ESTABLISHED
tcp        0      0 madmax:34336             ec2-3-6-167-132.a:27017 ESTABLISHED
tcp        0      0 madmax:48474             ec2-13-234-107-18:27017 ESTABLISHED
tcp        0      0 madmax:34334             ec2-3-6-167-132.a:27017 ESTABLISHED
tcp        0      0 madmax:33428             ec2-35-163-112-24:https ESTABLISHED
tcp        0      0 madmax:48476             ec2-13-234-107-18:27017 ESTABLISHED
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
tcp6       0      0 madmax:44954             2403:8940:3:1::f:http   TIME_WAIT
tcp6      32      0 madmax:45898             whatsapp-cdn6-shv:https CLOSE_WAIT
tcp6       0      0 madmax:41470             bom05s12-in-x03.1:https ESTABLISHED
tcp6       0      0 madmax:47960             sa-in-xbc.1e100.ne:5228 ESTABLISHED
tcp6       0      0 madmax:47122             whatsapp-cdn6-shv:https ESTABLISHED
udp        0      0 0.0.0.0:38017           0.0.0.0:*               *
udp        0      0 224.0.0.251:mdns        0.0.0.0:*               *
udp        0      0 0.0.0.0:mdns            0.0.0.0:*               *
udp        0      0 localhost:domain        0.0.0.0:*               *
udp        0      0 madmax:bootpc           reliance.relianc:bootps ESTABLISHED
udp        0      0 0.0.0.0:631             0.0.0.0:*               *
udp6       0      0 madmax:37345             bom12s09-in-x0a.1e1:443 ESTABLISHED
udp6       0      0 [::]:mdns               [::]:*                  *
udp6       0      0 [::]:54989              [::]:*                  *
udp6       0      0 madmax:49656             bom05s12-in-x03.1e1:443 ESTABLISHED
udp6       0      0 madmax:dhcpv6-client     [::]:*                  *
udp6       0      0 madmax:58792             bom05s15-in-x0a.1e1:443 ESTABLISHED
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (servers and established)

```

## SAR

It can be used to monitor Linux system's resources like CPU usage, Memory utilization, I/O devices consumption, Network monitoring, Disk usage, process and thread allocation, battery performance, Plug and play devices, Processor performance, file system and more.

```

maxmax@madmax:~/Desktop/u19cs019_sem6$ sar -u 2 5
Linux 5.13.0-27-generic (madmax)      27/01/22      _x86_64_      (4 CPU)

11:43:45 AM IST      CPU      %user      %nice      %system      %iowait      %steal      %idle
11:43:47 AM IST      all      7.12      0.00      3.18      0.00      0.00      89.69
11:43:49 AM IST      all      6.45      0.00      3.41      3.29      0.00      86.85
11:43:51 AM IST      all      8.21      0.00      4.42      3.28      0.00      84.09
11:43:53 AM IST      all      10.63     0.00      3.92      0.00      0.00      85.44
11:43:55 AM IST      all      13.81     0.00      5.75      0.00      0.00      80.43
Average:             all      9.24      0.00      4.14      1.32      0.00      85.31
maxmax@madmax:~/Desktop/u19cs019_sem6$

```

## CHOWN

chown command is used to change the file owner or group.

## Q2

## PS

ps command is used to list the currently running processes and their PIDs along with some other information depends on different options.

```

maxmax@madmax:~/Desktop/u19cs019_sem6$ ps
  PID TTY          TIME CMD
 19785 pts/2        00:00:00 bash
 25056 pts/2        00:00:00 ps
maxmax@madmax:~/Desktop/u19cs019_sem6$

```

## KILL

kill command in Linux is a built-in command which is used to terminate processes manually.

```

maxmax@madmax:~/Desktop/u19cs019_sem6$ ps
  PID TTY          TIME CMD
 19785 pts/2        00:00:01 bash
 25350 pts/2        00:00:00 ps
maxmax@madmax:~/Desktop/u19cs019_sem6$ kill 19785

```

Any process in Linux can be started by adding '&' after the command.

```

maxmax@madmax:~/Desktop/u19cs019_sem6$ pwd &
[1] 25440
/home/maxmax/Desktop/u19cs019_sem6
maxmax@madmax:~/Desktop/u19cs019_sem6$

```