

OS LAB ASSIGNMENT 1
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2020BTCSE004

QUESTION 1

CD Command -----

CD command in linux is known as change directory command. It is used to change current working directory.

Syntax:

cd [directory]

To move inside a subdirectory in linux we use

cd [directory_name]

In below screenshots I have shown example of CD command.

Activities Terminal ▾

Termina

Feb 6 01:37

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```
ankit-jain@ubuntu:~$ cd /home/ankit-jain/department
ankit-jain@ubuntu:~/department$ pwd
/home/ankit-jain/department
ankit-jain@ubuntu:~/department$ ls
btech msc other
ankit-jain@ubuntu:~/department$ cd btech/
ankit-jain@ubuntu:~/department/btech$ ls
bme cse ece
ankit-jain@ubuntu:~/department/btech$ pwd
/home/ankit-jain/department/btech
ankit-jain@ubuntu:~/department/btech$ cd ../../..
ankit-jain@ubuntu:~$ pwd
/home/ankit-jain
ankit-jain@ubuntu:~$ cd ~
ankit-jain@ubuntu:~$ cd /
ankit-jain@ubuntu:/$ pwd
/
ankit-jain@ubuntu:/$/
```

ankit-lain@ubuntu: /



----- mkdir Command -----

mkdir command in Linux allows the user to create directories/folders. This command can create multiple directories at once.

Syntax :- mkdir [options] [Directories.....]

Some Important options :-

(1) -v :- It displays a message for every directory created..

(2) -p :- this option enables the command to create parent directories as necessary. If the directories exist, no error is specified..

If –p option is not given and user gives a directory path in which parent directory not exist then user will get error message.

```
ankit-jain@ubuntu:~$ man mkdir
ankit-jain@ubuntu:~$ ls
- Desktop Documents Downloads files Music p photos Pictures Public Templates Videos
ankit-jain@ubuntu:~$ mkdir -v date time
mkdir: created directory 'date'
mkdir: created directory 'time'
ankit-jain@ubuntu:~$ ls
- date Desktop Documents Downloads files Music p photos Pictures Public Templates time Videos
ankit-jain@ubuntu:~$ mkdir -v ~/files/important files
mkdir: created directory '/home/ankit-jain/files/important'
mkdir: cannot create directory 'files': File exists
ankit-jain@ubuntu:~$ mkdir -p ~/department/{msc,bsc,btech/{cse,ece,bme}}
ankit-jain@ubuntu:~$ ls department
bsc btech msc
ankit-jain@ubuntu:~$ ls department/btech
bme cse ece
ankit-jain@ubuntu:~$ 
```

----- rmdir Command -----

rmdir command is used to remove empty directories from the file system in Linux. The rmdir command removes each and every directory specified in the command line only if these directories are empty. So if the specified directory has some directories or files in it then this cannot be removed by rmdir command

(1) **rmdir -p =**

In this option each of the directory argument is treated as a pathname of which all components will be removed, if they are already empty, starting from the last component

(2) **rmdir -v =**

This option displays verbose information for every directory being processed

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```
ankit-jain@ubuntu:~$ man rmdir
ankit-jain@ubuntu:~$ ls
- date department Desktop Documents Downloads files Music p photos Pictures Public Templates time Videos
ankit-jain@ubuntu:~$ rmdir -v date time
rmdir: removing directory, 'date'
rmdir: removing directory, 'time'
ankit-jain@ubuntu:~$ ls files/
document
ankit-jain@ubuntu:~$ rmdir -v files/document files
rmdir: removing directory, 'files/document'
rmdir: removing directory, 'files'
ankit-jain@ubuntu:~$ ls department
bsc btech msc
ankit-jain@ubuntu:~$ ls department/btech
bme cse ece
ankit-jain@ubuntu:~$ cd department/btech/
ankit-jain@ubuntu:~/department/btech$ ls
bme cse ece
ankit-jain@ubuntu:~/department/btech$ rmdir cse ece bme
ankit-jain@ubuntu:~/department/btech$ cd ~
ankit-jain@ubuntu:~$
```

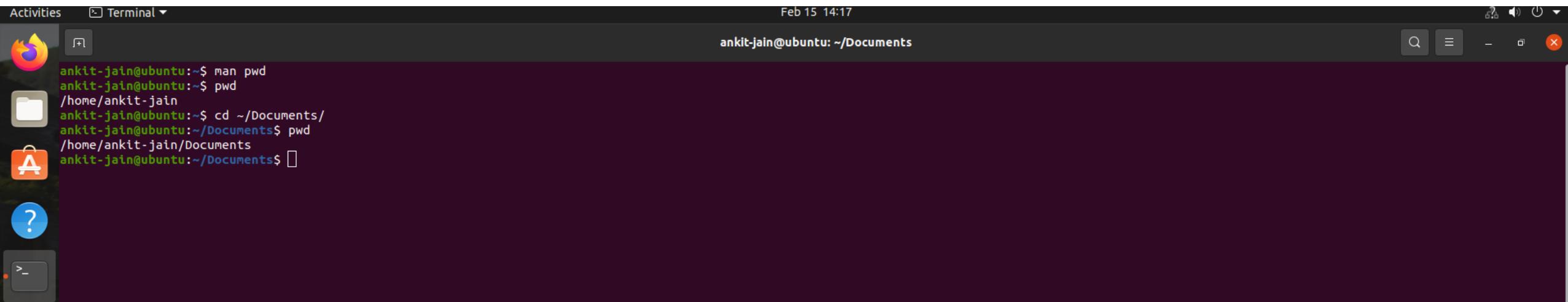
Activities Terminal ▾ Feb 6 02:38

```
ankit-jain@ubuntu:~$ ls
- department Desktop Documents Downloads Music p photos Pictures Public Templates Videos
ankit-jain@ubuntu:~$ rmdir -vp Public/hello
rmdir: removing directory, 'Public/hello'
rmdir: removing directory, 'Public'
ankit-jain@ubuntu:~$
```

----- pwd Command -----

pwd stands for Print Working Directory. It prints the path of the working directory, starting from the root.

pwd is shell built-in command(pwd) or an actual binary(/bin/pwd).

A screenshot of an Ubuntu desktop environment. On the left, there's a dock with icons for the Dash, Home, Activities, Terminal, and other applications. The main area shows a terminal window titled "Terminal". The terminal has a dark background and contains the following text:

```
Activities Terminal ▾ Feb 15 14:17
ankit-jain@ubuntu:~$ man pwd
ankit-jain@ubuntu:~$ pwd
/home/ankit-jain
ankit-jain@ubuntu:~$ cd ~/Documents/
ankit-jain@ubuntu:~/Documents$ pwd
/home/ankit-jain/Documents
ankit-jain@ubuntu:~/Documents$
```

The terminal window has a standard title bar with a search icon, minimize, maximize, and close buttons.

----chmod Command----

The chmod command is used to change the access mode of a file. The name is an abbreviation of change mode.

SYNTAX = chmod [reference] [operator] [mode] file.

REFERENCE are =

1. u = files owner
2. g = user who are the member of files group
3. o = other than above
4. a = all of above.

Modes are =

1. r = permission to read the file.
2. w = permission to write the file
3. x = permission to execute the file

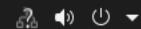
Operator are =

1. + :- add a mode
2. - :- delete a mode

Activities

Terminal ▾

Feb 6 03:05



ankit-jain@ubuntu: ~/files

```
ankit-jain@ubuntu:~$ man chmod
ankit-jain@ubuntu:~$ pwd
/home/ankit-jain
ankit-jain@ubuntu:~/files$ ls
12marksheet.pdf record.txt
ankit-jain@ubuntu:~/files$ ls -al
total 8
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 02:53 .
drwxr-xr-x 19 ankit-jain ankit-jain 4096 Feb 6 02:51 ..
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 02:52 12marksheet.pdf
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 02:53 record.txt
ankit-jain@ubuntu:~/files$ chmod o=rw record.txt
ankit-jain@ubuntu:~/files$ ls -al
total 8
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 02:53 .
drwxr-xr-x 19 ankit-jain ankit-jain 4096 Feb 6 02:51 ..
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 02:52 12marksheet.pdf
-rw-rw-rw- 1 ankit-jain ankit-jain 0 Feb 6 02:53 record.txt
ankit-jain@ubuntu:~/files$ chmod g-w record.txt
ankit-jain@ubuntu:~/files$ ls -al
total 8
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 02:53 .
drwxr-xr-x 19 ankit-jain ankit-jain 4096 Feb 6 02:51 ..
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 02:52 12marksheet.pdf
-rw-r--rw- 1 ankit-jain ankit-jain 0 Feb 6 02:53 record.txt
ankit-jain@ubuntu:~/files$ 
```

----- mv command -----

mv is used to move one or more files or directories from one place to another in a file system.
has two distinct functions:

- 1.** It renames a file or folder.
- 2.** It moves a group of files to a different directory.

OPTIONS =

1. -i = the -i option makes the command ask the user for confirmation before moving a file that would overwrite an existing file,

2. -f = mv prompts for confirmation overwriting the destination file if a file is write protected.
The **-f** option overrides this minor protection and overwrites the destination file forcefully and deletes the source file.

Activities

Terminal ▾

Feb 6 03:47



ankit-jain@ubuntu: ~/files



```
ankit-jain@ubuntu:~/files$ man mv
ankit-jain@ubuntu:~/files$ cd ~/files
ankit-jain@ubuntu:~/files$ ls
12marksheet.pdf record.txt
ankit-jain@ubuntu:~/files$ mv -v 12marksheet.pdf hy.pdf
renamed '12marksheet.pdf' -> 'hy.pdf'
ankit-jain@ubuntu:~/files$ ls
hy.pdf record.txt
ankit-jain@ubuntu:~/files$ touch hellow.txt data.txt
ankit-jain@ubuntu:~/files$ ls
data.txt hellow.txt hy.pdf record.txt
ankit-jain@ubuntu:~/files$ mv -vi record.txt data.txt
mv: overwrite 'data.txt'? y
renamed 'record.txt' -> 'data.txt'
ankit-jain@ubuntu:~/files$ ls
data.txt hellow.txt hy.pdf
ankit-jain@ubuntu:~/files$ mv -v data.txt hellow.txt ~/
renamed 'data.txt' -> '/home/ankit-jain/data.txt'
renamed 'hellow.txt' -> '/home/ankit-jain/hellow.txt'
ankit-jain@ubuntu:~/files$ ls ~/
- data.txt department Desktop Documents Downloads files hellow.txt Music p photos Pictures Templates Videos
```

----- rm command -----

rm command is used to remove objects such as files, directories, symbolic links and so on from the file system

rm removes references to objects from the filesystem, where those objects might have had multiple references (for example, a file with two different names). By default it does not removes directory.

OPTIONS =

1. **-i** = -i option makes the command ask the user for confirmation before removing each file.
2. **-f** = rm prompts for confirmation overwriting the destination file if a file is write protected. The –f option overrides this minor protection and overwrites the destination file forcefully and deletes the source file.
3. **-r or -R** = option rm will delete all the files and sub-directories recursively of the parent directory. At each stage it deletes everything it finds.

```
ankit-jain@ubuntu:~$ man rm
ankit-jain@ubuntu:~$ ls
- data.txt department Desktop Documents Downloads files hellow.txt Music p photos Pictures Templates Videos
ankit-jain@ubuntu:~$ rm -v data.txt hellow.txt
removed 'data.txt'
removed 'hellow.txt'
ankit-jain@ubuntu:~$ ls
- department Desktop Documents Downloads files Music p photos Pictures Templates Videos
ankit-jain@ubuntu:~$ ls files
hy.pdf
ankit-jain@ubuntu:~$ rm -ri files
rm: descend into directory 'files'? y
rm: remove regular empty file 'files/hy.pdf'? y
rm: remove directory 'files'? y
ankit-jain@ubuntu:~$ ls department/
bsc msc
ankit-jain@ubuntu:~$ rm -rv department/
removed directory 'department/bsc'
removed directory 'department/msc'
removed directory 'department/'
ankit-jain@ubuntu:~$ rm --version
rm (GNU coreutils) 8.30
Copyright (C) 2018 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Paul Rubin, David MacKenzie, Richard M. Stallman,
and Jim Meyering.
ankit-jain@ubuntu:~$
```

----- **locate command** -----

Locate command in Linux is used to find the files by name. The locate utility works better and faster than *find* command because instead of searching the file system when a file search is initiated, it would look through a database. This database contains bits and parts of files and their corresponding paths on your system.

SYNTAX = **locate [option].... pattern....**

OPTIONS are =

1. **-c** = Instead of writing file names on standard output, write the number of matching entries only.
2. **-i** = Ignore case distinctions when matching patterns.
3. **-e** = Print only entries that refer to files existing at the time locate is run.

Activities Terminal Feb 6 04:51

ankit-jain@ubuntu:~

```
ankit-jain@ubuntu:~$ info locate
ankit-jain@ubuntu:~$ locate hello.txt
/home/ankit-jain/hello.txt
ankit-jain@ubuntu:~$ locate -c "*.txt"
399
ankit-jain@ubuntu:~$ locate -c "*.html"
388
ankit-jain@ubuntu:~$ locate "*.txt" -n 25
/boot/grub/gfxblacklist.txt
/etc/X11/rgb.txt
/etc/brltty/Input/ba/all.txt
/etc/brltty/Input/bd/all.txt
/etc/brltty/Input/bl/18.txt
/etc/brltty/Input/bl/40_m20_m40.txt
/etc/brltty/Input/ec/all.txt
/etc/brltty/Input/ec/spanish.txt
/etc/brltty/Input/eu/all.txt
/etc/brltty/Input/lb/all.txt
/etc/brltty/Input/lt/all.txt
/etc/brltty/Input(mb/all.txt
/etc/brltty/Input/mn/all.txt
/etc/brltty/Input/tn/all.txt
/etc/brltty/Input/tt/all.txt
/etc/brltty/Input/vd/all.txt
/etc/brltty/Input/vr/all.txt
/etc/brltty/Input/vs/all.txt
/home/ankit-jain/hello.txt
/home/ankit-jain/.cache/tracker/db-locale.txt
/home/ankit-jain/.cache/tracker/db-version.txt
/home/ankit-jain/.cache/tracker/first-index.txt
/home/ankit-jain/.cache/tracker/last-crawl.txt
/home/ankit-jain/.cache/tracker/locale-for-miner-apps.txt
/home/ankit-jain/.cache/tracker/parser-version.txt
```

Activities Terminal Feb 6 04:53

ankit-jain@ubuntu:~

```
ankit-jain@ubuntu:~$ touch hello.txt HELlow.txt
ankit-jain@ubuntu:~$ sudo updatedb
ankit-jain@ubuntu:~$ locate -i hello.txt
/home/ankit-jain/hello.txt
/home/ankit-jain/hello.txt
/home/ankit-jain/hello.txt
ankit-jain@ubuntu:~$ 
```

-----**find command** -----

find command is used to find files and directories and perform subsequent operations on them. It supports searching by file, folder, name, creation date, modification date, owner and permissions. By using the ‘-exec’ other UNIX commands can be executed on files or folders found.

SYNTAX = find [options] [paths] [expression]

Some expressions are =

1. –name pattern= search for the files that are specified by “pattern”
2. –iname pattern= search for the files that are specified by “pattern”. Here matching is case insensitive.
3. –empty = Search for the empty files and directories.
4. –size n = Search for the files of n block. You can use the following suffixes to specify the file size.
 - (i) c : bytes
 - (ii) k : kilobytes
 - (III) M : Megabytes
 - (iv)G : gigabytes
5. –inum N = search for the files with inode number N
6. –exec command : The file being searched which meets the above criteria and returns 0 for as its exit status for successful command execution.

```
ankit-jain@ubuntu:~$ find ~/ -name first.txt
/home/ankit-jain/Documents/first.txt
ankit-jain@ubuntu:~$ find ~/ -name *.txt
find: paths must precede expression: 'hello.txt'
find: possible unquoted pattern after predicate '-name'?
ankit-jain@ubuntu:~$ find ~ -name *.txt
find: paths must precede expression: 'hello.txt'
find: possible unquoted pattern after predicate '-name'?
ankit-jain@ubuntu:~$ find ~/ -name "*.*"
/home/ankit-jain/.cache/tracker/db-version.txt
/home/ankit-jain/.cache/tracker/first-index.txt
/home/ankit-jain/.cache/tracker/locale-for-miner-apps.txt
/home/ankit-jain/.cache/tracker/parser-version.txt
/home/ankit-jain/.cache/tracker/last-crawl.txt
/home/ankit-jain/.cache/tracker/db-locale.txt
/home/ankit-jain/Hellow.txt
/home/ankit-jain/hello.txt
/home/ankit-jain/hello.txt
/home/ankit-jain/Hello.txt
/home/ankit-jain/Documents/first.txt
/home/ankit-jain/Documents/second.txt
/home/ankit-jain/HEllow.txt
ankit-jain@ubuntu:~$ find . -name first.txt -exec rm -iv {} \;
>
find: missing argument to '-exec'
ankit-jain@ubuntu:~$ find . -name first.txt -exec rm -iv {} \;
rm: remove regular empty file './Documents/first.txt'? y
removed './Documents/first.txt'
```

ankit-jain@ubuntu:~

Q ⌂ ⌂ ⌂

Activities Terminal ▾

Feb 6 07:51

2 0 0



```
rm: remove regular empty file './Documents/first.txt'? y
removed './Documents/first.txt'
ankit-jain@ubuntu:~$ find . -type d -empty
./Music
./.cache/libgweather
./.cache/evolution/addressbook/trash
./.cache/evolution/memos/trash
./.cache/evolution/sources/trash
./.cache/evolution/tasks/trash
./.cache/evolution/calendar/trash
./.cache/evolution/mail/trash
./.cache/ibus-table
./.cache/vmware/drag_and_drop/PXcf38
./Templates
./gnupg/private-keys-v1.d
./Desktop/hellow
./department/msc
./department/btech/cse
./department/btech/ece
./department/btech/bme
./local/share/nautilus/scripts
./local/share/evolution/addressbook/trash
./local/share/evolution/addressbook/system/photos
./local/share/evolution/memos/trash
./local/share/evolution/tasks/trash
./local/share/evolution/calendar/trash
./local/share/evolution/calendar/system
./local/share/evolution/mail/trash
./local/share/flatpak/db
./local/share/ibus-table
./local/share/icc
./local/share/Trash/expunged
./local/share/Trash/files/HHello
./local/share/applications
./local/share/sounds
./-
./Pictures
./ssh
./photos
./Videos
./p
./config/nautilus
./config/gnome-session/saved-session
./config/goa-1.0
./config/update-notifier
./Downloads
ankit-jain@ubuntu:~$
```

Activities Terminal ▾

Feb 6 08:04

2 0 0 0

```
ankit-jain@ubuntu:~$ find . -type f -size +1M
./.cache/tracker/meta.db
./.cache/tracker/meta.db-wal
ankit-jain@ubuntu:~$ find . -type d -mmin -60
.
./.cache/thumbnails/large
./.cache/thumbnails/fail/gnome-thumbnail-factory
./.cache/thumbnails/normal
./.cache/tracker
./.local/share
./.local/share/evolution/addressbook/system
./.local/share/gnome-shell
./.local/share/keyrings
./.local/share/xorg
./.local/share/tracker/data
./.local/share/gvfs-metadata
./Pictures
./.config
./.config/gtk-3.0
./.config/dconf
./.config/ibus/bus
./Documents
ankit-jain@ubuntu:~$
```

----- grep command -----

The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern. grep stands for global search for regular expression and print out.

SYNTAX = grep [options..] pattern [files..]

Options =

1. **-c** = This prints only a count of the lines that match a pattern
2. **-i** = Ignores case for matching
3. **-n** = Display the matched lines and their line numbers
4. **-v** = This prints out all the lines that do not matches the pattern
5. **-h** = Display the matched lines, but do not display the filenames

Activities Terminal ▾

Feb 6 08:34

2 0 0

```
ankit-jain@ubuntu:~$ man grep
ankit-jain@ubuntu:~$ cat hello.txt
My name is Ankit Jain
2020btcse004
assignment 1 OS
Unix command
ankit-jain@ubuntu:~$ cat hy.txt
hellow
good morning
have a great day
unix commands are important
ankit-jain@ubuntu:~$ grep -i "Unix" hello.txt
Unix command
ankit-jain@ubuntu:~$ grep -ic "unix" hello.txt
1
ankit-jain@ubuntu:~$ grep -in "^ass" hello.txt
3:assignment 1 OS
ankit-jain@ubuntu:~$ grep -in "tant$" hy.txt
4:unix commands are important
ankit-jain@ubuntu:~$ grep -in "comm" hy.txt hello.txt
hy.txt:4:unix commands are important
hello.txt:4:Unix command
ankit-jain@ubuntu:~$ grep -A2 "^assignment" hello.txt
assignment 1 OS
Unix command
ankit-jain@ubuntu:~$ grep -in -A2 "hellow" hy.txt
1:hellow
2-good morning
3-have a great day
ankit-jain@ubuntu:~$
```

ankit-jain@ubuntu: ~

Q E - o x

----- **cut command** -----

The cut command in UNIX is a command for cutting out the sections from each line of files and writing the result to standard output. It can be used to cut parts of a line by byte position, character and field.

SYNTAX = `cut [options..] [file..]`

Options =

1. **-b** = To extract the specific bytes, you need to follow -b option with the list of byte numbers separated by comma. Range of bytes can also be specified using the hyphen(-).
2. **-c** = To cut by character use the -c option. This selects the characters given to the -c option. This can be a list of numbers separated comma or a range of numbers separated by hyphen(-).

Activities Terminal ▾

Feb 6 08:52

2 4 0 ⌂

```
ankit-jain@ubuntu:~$ man cut
ankit-jain@ubuntu:~$ cat hy.txt
hellow
good morning
have a great day
unix commands are important
ankit-jain@ubuntu:~$ cut -b -3 hy.txt
hel
goo
hav
uni
ankit-jain@ubuntu:~$ cut -b 2-
ellow
ood morning
ave a great day
nix commands are important
ankit-jain@ubuntu:~$ cut -b 3-5 hy.txt
llo
od
ve
ix
ankit-jain@ubuntu:~$ cut -c 3-5 hy.txt
llo
od
ve
ix
ankit-jain@ubuntu:~$ cut -f 1 hy.txt
hellow
good morning
have a great day
unix commands are important
ankit-jain@ubuntu:~$ cut -d " " -f 1 hy.txt
hellow
good
have
unix
ankit-jain@ubuntu:~$ cut -d " " -f 2 hy.txt
morning
a
commands
ankit-jain@ubuntu:~$ cut -d " " -f 1-2 hy.txt
hellow
good morning
have a
unix commands
ankit-jain@ubuntu:~$
```

ankit-jain@ubuntu:~

Q E - o x

----- head command -----

The head command print the top N number of data of the given input. By default, it prints the first 10 lines of the specified files. If more than one file name is provided then data from each file is preceded by its file name.

SYNTAX = head [option..] [file..]

Options are :-

1. **-n num** = prints the first 'num' lines instead of first 10 lines.
2. **-c num**= Prints the first 'num' bytes from the file specified
3. **-q** = It is used if more than 1 file is given. Because of this command, data from each file is not precedes by its file name.

```
? ankit-jain@ubuntu:~$ head hello.txt
My name is Ankit Jain
2020btcse004
assignment 1 OS
Unix command
jaipur
ajmer
agra
udaipur
kishangarh
up
ankit-jain@ubuntu:~$ head -n 2 hello.txt
My name is Ankit Jain
2020btcse004
ankit-jain@ubuntu:~$ head -n -8 hello.txt
My name is Ankit Jain
2020btcse004
assignment 1 OS
Unix command
ankit-jain@ubuntu:~$ head -c 8 hello.txt
My name ankit-jain@ubuntu:~$ head -n 3 hello.txt hy.txt
==> hello.txt <==
My name is Ankit Jain
2020btcse004
assignment 1 OS

==> hy.txt <==
hellow
good morning
have a great day
ankit-jain@ubuntu:~$ head -q -n 3 hello.txt hy.txt
My name is Ankit Jain
2020btcse004
assignment 1 OS
hellow
good morning
have a great day
ankit-jain@ubuntu:~$
```

----- tail command -----

The tail command print the last N number of data of the given input. By default it prints the last 10 lines of the specified files. If more than one file name is provided then data from each file is precedes by its file name.

SYNTAX = tail [option..] [file..]

Options are :-

1. -n num = prints the last ‘num’ lines instead of last 10 lines.

2. -c num= Prints the last ‘num’ bytes from the file specified.

By +num , it display all the data after skipping num bytes from starting of the specified file and

By –num , it display the last num bytes from the file specified.

3. -q = It is used if more than 1 file is given. Because of this command, data from each file is not precedes by its file name

A

```
ankit-jain@ubuntu:~$ man tail
ankit-jain@ubuntu:~$ cat hello.txt
My name is Ankit Jain
2020btcse004
assignment 1 OS
Unix command
>
jaipur
ajjmer
agra
udaipur
kishangarh
up
rajasthan
ankit-jain@ubuntu:~$ cat hy.txt
hellow
good morning
have a great day
unix commands are important
ankit-jain@ubuntu:~$ tail hello.txt
2020btcse004
assignment 1 OS
Unix command
jaipur
ajjmer
agra
udaipur
kishangarh
up
rajasthan
ankit-jain@ubuntu:~$ tail -n 4 hello.txt
udaipur
kishangarh
up
rajasthan
ankit-jain@ubuntu:~$ tail -n -6 hello.txt
ajjmer
agra
udaipur
kishangarh
up
rajasthan
```

?

>

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Activities Terminal ▾

Feb 6 09:26

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```
ankit-jain@ubuntu:~$ tail +5 hello.txt
jaipur
ajjmer
agra
udaipur
kishangarh
up
rajasthan
ankit-jain@ubuntu:~$ tail -c 6 hello.txt
sthan
ankit-jain@ubuntu:~$ tail -c -6 hello.txt
sthan
ankit-jain@ubuntu:~$ tail -c +6 hello.txt
me is Ankit Jain
2020btcse004
assignment 1 OS
Unix command
jaipur
ajjmer
agra
udaipur
kishangarh
up
rajasthan
ankit-jain@ubuntu:~$ tail hy.txt hello.txt
==> hy.txt <==
hellow
good morning
have a great day
unix commands are important

==> hello.txt <==
2020btcse004
assignment 1 OS
Unix command
jaipur
ajjmer
agra
udaipur
kishangarh
up
rajasthan
ankit-jain@ubuntu:~$
```

Q E - ⌂

----- man command -----

man command in Linux 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

SYNTAX = man [option].... [command name]....

```
ankit-jain@ubuntu:~$ man man  
ankit-jain@ubuntu:~$ man -w head  
/usr/share/man/man1/head.1.gz  
ankit-jain@ubuntu:~$ man 1 ls
```

LS(1)

User Commands

LS(1)

NAME
ls - list directory contents

SYNOPSIS
ls [OPTION]... [FILE]...

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

Mandatory arguments to long options are mandatory for short options too.

-a, --all
do not ignore entries starting with .

-A, --almost-all
do not list implied . and ..

--author
with -l, print the author of each file

-b, --escape
print C-style escapes for nongraphic characters

--block-size=SIZE
with -l, scale sizes by SIZE when printing them; e.g., '--block-size=M'; see SIZE format below

-B, --ignore-backups
do not list implied entries ending with ~

-c
with -lt: sort by, and show, ctime (time of last modification of file status information); with -l: show ctime and sort by name; otherwise: sort by ctime, newest first

-C
list entries by columns

--color[=WHEN]
colorize the output; WHEN can be 'always' (default if omitted), 'auto', or 'never'; more info below

-d, --directory
list directories themselves, not their contents

-D, --direfd
generate output designed for Emacs' direfd mode

-f
do not sort, enable -aU, disable -ls --color

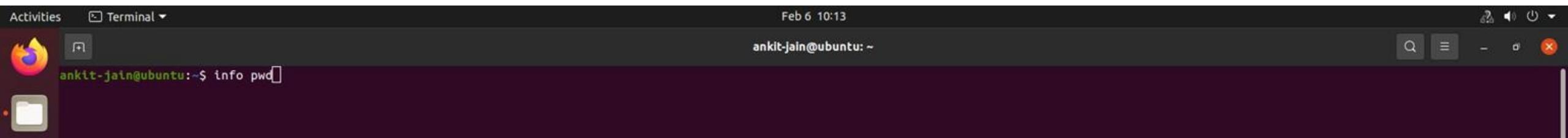
-F, --classify

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

----- info command -----

Info command reads documentation in the info format. It will give detailed information for a command when compared with the man page. The pages are made using the texinfo tools because of which it can link with other pages, create menus and easy navigation.

SYNTAX = info [OPTION] . . . [MENU ITEM . . .]



```
Next: stty invocation, Up: Working context  
19.1 'pwd': Print working directory  
=====  
'pwd' prints the name of the current directory. Synopsis:  
  pwd [OPTION]...  
  
The program accepts the following options. Also see *note Common  
options::.  
  
  '-L'  
  '--logical'  
    If the contents of the environment variable 'PWD' provide an  
    absolute name of the current directory with no '.' or '..'  
    components, but possibly with symbolic links, then output those  
    contents. Otherwise, fall back to default '-P' handling.  
  
  '-P'  
  '--physical'  
    Print a fully resolved name for the current directory. That is,  
    all components of the printed name will be actual directory  
    names--none will be symbolic links.  
  
    If '-L' and '-P' are both given, the last one takes precedence. If  
    neither option is given, then this implementation uses '-P' as the  
    default unless the 'POSIXLY_CORRECT' environment variable is set.  
  
    Due to shell aliases and built-in 'pwd' functions, using an unadorned  
    'pwd' interactively or in a script may get you different functionality  
    than that described here. Invoke it via 'env' (i.e., 'env pwd ...') to  
    avoid interference from the shell.  
  
    An exit status of zero indicates success, and a nonzero value  
    indicates failure.  
  
-----Info: (coreutils)pwd invocation, 37 lines --All-----  
Welcome to Info version 6.7. Type H for help, h for tutorial.
```

----- whatis command -----

whatis command in Linux is used to get a one-line manual page descriptions.

In Linux, each manual page has some sort of description within it.

So this command search for the manual pages names and show the manual page description of the specified filename or argument.

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ankit-jain@ubuntu:~\$ whatis -h

Usage: whatis [OPTION...] KEYWORD...

-d, --debug emit debugging messages
-v, --verbose print verbose warning messages
-r, --regex interpret each keyword as a regex
-w, --wildcard the keyword(s) contain wildcards
-l, --long do not trim output to terminal width
-C, --config-file=FILE use this user configuration file
-L, --locale=LOCALE define the locale for this search
-m, --systems=SYSTEM use manual pages from other systems
-M, --manpath=PATH set search path for manual pages to PATH
-s, --sections=LIST, --section=LIST search only these sections (colon-separated)
-?, --help give this help list
--usage give a short usage message
-V, --version print program version

Mandatory or optional arguments to long options are also mandatory or optional for any corresponding short options.

Report bugs to cjwatson@debian.org.

ankit-jain@ubuntu:~\$ whatis -v ls

ls (1) - list directory contents

ankit-jain@ubuntu:~\$ whatis -w ls

ls (1) - list directory contents

ankit-jain@ubuntu:~\$ whatis -l cat

cat (1) - concatenate files and print on the standard output

ankit-jain@ubuntu:~\$ whatis cd

cd: nothing appropriate.

ankit-jain@ubuntu:~\$

----- whereis command -----

whereis command is used to find the location of source/binary file of a command and manuals sections for a specified file in Linux system

SYNTAX = whereis [OPTIONS] filename...

OPTIONS =

1. **-b** = This option is used when we only want to search for binaries.
2. **-m** = This option is used when we only want to search for manual sections

A screenshot of a Linux desktop environment, likely Ubuntu, featuring a dark purple background. At the top, there's a horizontal bar with the title "Activities Terminal" and the date "Feb 6 10:35". The main area shows a terminal window titled "ankit-jain@ubuntu: ~". The terminal displays a command-line session where the user has run several commands: "man whereis", "whereis apropos", "apropos /usr/bin/apropos /usr/share/man/man1/apropos.1.gz", "whereis lshw", "lshw: /usr/bin/lshw /usr/share/man/man1/lshw.1.gz", "whereis -b gunzip", "gunzip: /usr/bin/gunzip", "whereis -m cd", and "cd:". The terminal window has a standard red close button in the top right corner. To the left of the terminal, there's a vertical dock with icons for a file browser, a terminal, a help center, and a dash. The bottom of the screen features a dock with various application icons.

----- tar and untar command -----

The Linux ‘tar’ stands for tape archive, is used to create Archive and extract the Archive files. tar command in Linux is one of the important command which provides archiving functionality in Linux. We can use tar command to create compressed or uncompressed Archive files

SYNTAX = tar [OPTIONS] [ARCHIEVE FILE] [file or directory to be archived]

OPTIONS =

1. –c = Create archives
2. –x = Extract archives
3. –f = Create archives with given file name
4. –t = displays or lists files in archived file
5. –v = Displays Verbose Information
6. –z = zip, tells tar command that creates tar file using gzip
7. –j = filter archive tar file using tbzip

```
ankit-jain@ubuntu:~$ man tar
ankit-jain@ubuntu:~$ tar cvf file.tar *.txt
hello.txt
hello0.txt
hell0.txt
HelloW.txt
HEllow.txt
hy.txt
ankit-jain@ubuntu:~$ tar xvf file.tar
hello.txt
hello0.txt
hell0.txt
HelloW.txt
HEllow.txt
hy.txt
ankit-jain@ubuntu:~$ tar cvzf file.tar.gz *.txt
hello.txt
hello0.txt
hell0.txt
HelloW.txt
HEllow.txt
hy.txt
ankit-jain@ubuntu:~$ tar xvzf file.tar.gz
hello.txt
hello0.txt
hell0.txt
HelloW.txt
HEllow.txt
hy.txt
```

```
ankit-jain@ubuntu:~$ tar cvfj sample1.tar.tbz hy.txt
hy.txt
ankit-jain@ubuntu:~$ tar xvfvj sample1.tar.tbz -C ~/Documents/
hy.txt
ankit-jain@ubuntu:~$ ls Documents/
fourth.pdf  hy.txt  second.txt  third.pdf
ankit-jain@ubuntu:~$ tar -tvf files.tar
-rw-rw-r-- ankit-jain/ankit-jain 115 2022-02-06 09:11 hello.txt
-rw-rw-r-- ankit-jain/ankit-jain  0 2022-02-06 04:48 hello0.txt
-rw-rw-r-- ankit-jain/ankit-jain  0 2022-02-06 04:53 hell0.txt
-rw-rw-r-- ankit-jain/ankit-jain  0 2022-02-06 04:42 HelloW.txt
-rw-rw-r-- ankit-jain/ankit-jain  0 2022-02-06 04:53 HEllow.txt
-rw-rw-r-- ankit-jain/ankit-jain 65 2022-02-06 08:14 hy.txt
ankit-jain@ubuntu:~$ tar xvf files.tar "HelloW.txt" "hy.txt"
HelloW.txt
hy.txt
ankit-jain@ubuntu:~$
```

----- bzip2 command -----

bzip2 command in Linux is used to compress and decompress the files i.e. it helps in binding the files into a single file which takes less storage space as the original file use to take. It has a slower decompression time and higher memory use. Each file is replaced by a compressed version of itself, with the name original name of the file followed by extension bz2.

SYNTAX = bzip2 [OPTIONS] filenames ..

OPTIONS =

1. **-z** = This option forces compression
2. **-k** = This option does compression but does not deletes the original file.
3. **-d** = This option is used for decompression of compressed files.

Activities Terminal ▾

Feb 7 01:50

25% 🔍 ⌂ ⌂ ⌂

ankit-jain@ubuntu: ~/Documents

```
ankit-jain@ubuntu:~/Documents$ man bzip2
ankit-jain@ubuntu:~/Documents$ ls
HEllo.txt hy.txt
ankit-jain@ubuntu:~/Documents$ bzip2 -z hy.txt
ankit-jain@ubuntu:~/Documents$ ls
HEllo.txt hy.txt.bz2
ankit-jain@ubuntu:~/Documents$ bzip2 -k HEllo.txt
ankit-jain@ubuntu:~/Documents$ ls
HEllo.txt HEllo.txt.bz2 hy.txt.bz2
ankit-jain@ubuntu:~/Documents$ bzip2 -d hy.txt.bz2
ankit-jain@ubuntu:~/Documents$ ls
HEllo.txt HEllo.txt.bz2 hy.txt
ankit-jain@ubuntu:~/Documents$
```

----- bunzip2 command -----

bunzip2 can decompress .bz2 compressed file format. bunzip2 is actually a symbolic link bzip2, implementation bunzip2 with bzip2 -d same effect.

SYNTAX = bunzip2 [options] [.bz2 archive]

OPTIONS =

1. **-f** = if the output file with the same name as an existing file, the default will not overwrite the existing file. To override, use this parameter.
2. **-k** = this option does decompression but does not delete original archive file
3. **-v** = Displays Verbose Information

Activities Terminal ▾ Feb 7 02:40

ankit-jain@ubuntu: ~/Documents

```
ankit-jain@ubuntu:~/Documents$ ls
HEllow.txt.bz2 hy.txt z
ankit-jain@ubuntu:~/Documents$ bunzip2 -k HEllow.txt.bz2
ankit-jain@ubuntu:~/Documents$ ls
HEllow.txt HEllow.txt.bzz hy.txt z
ankit-jain@ubuntu:~/Documents$ bzip2 -z hy.txt
ankit-jain@ubuntu:~/Documents$ ls
HEllow.txt HEllow.txt.bzz hy.txt.bzz z
ankit-jain@ubuntu:~/Documents$ bunzip2 hy.txt.bzz
ankit-jain@ubuntu:~/Documents$ ls
HEllow.txt HEllow.txt.bzz hy.txt z
ankit-jain@ubuntu:~/Documents$ 
```

----- gzip command -----

gzip command compresses files. Each single file is compressed into a single file. If given a file as an argument, gzip compresses the file, adds a “.gz” suffix, and deletes the original file.

SYNTAX = gzip [OPTIONS...] filenames ..

OPTIONS =

1. **-f** = if the output file with the same name as an existing file, the default will not overwrite the existing file. To override, use this parameter.
2. **-k** = this option does compression but does not delete original archive file.
3. **-r** = This option can compress every file in a folder and its subfolders. This option doesn't create one file called `filename.gz`. Instead, it traverses the directory structure and compresses each file in that folder structure.
4. **-v** = displays the name and percentage reduction for each file compressed or decompressed.

```
ankit-jain@ubuntu:~/Documents$ ls  
HEllow.txt hy.txt  
ankit-jain@ubuntu:~/Documents$ man gzip  
ankit-jain@ubuntu:~/Documents$ gzip hy.txt  
ankit-jain@ubuntu:~/Documents$ ls  
HEllow.txt hy.txt.gz  
ankit-jain@ubuntu:~/Documents$ gzip -k HEllow.txt  
ankit-jain@ubuntu:~/Documents$ ls  
HEllow.txt HEllow.txt.gz hy.txt.gz  
ankit-jain@ubuntu:~/Documents$ gzip HEllow.txt  
gzip: HEllow.txt.gz already exists; do you wish to overwrite (y or n)? y  
ankit-jain@ubuntu:~/Documents$ ls  
HEllow.txt.gz hy.txt.gz  
ankit-jain@ubuntu:~/Documents$ 
```

----- gunzip command -----

gunzip command used to compress or expand a file or a list of files in Linux. It accepts all the files having extension as **.gz, .Z, _z, -gz, -z , .Z, .taz or.tgz** and replace the compressed file with the original file by default

SYNTAX = gunzip [Option] [archive name/file name]

OPTIONS are =

1. **-c** = This option is used to view the text within a compressed file without uncompressing it
2. **-f** = To decompress a file forcefully
3. **-k** = this option does decompression but does not delete original archive file
4. **-r** = This option is used to uncompress all the files within the folder and subfolder recursively.

```
ankit-jain@ubuntu:~/Documents$ ls  
HEllow.txt.gz hy.txt.gz  
ankit-jain@ubuntu:~/Documents$ gunzip HEllow.txt.gz  
ankit-jain@ubuntu:~/Documents$ ls  
HEllow.txt hy.txt.gz  
ankit-jain@ubuntu:~/Documents$ gunzip -k hy.txt.gz  
ankit-jain@ubuntu:~/Documents$ ls  
HEllow.txt hy.txt hy.txt.gz  
ankit-jain@ubuntu:~/Documents$ gunzip -f hy.txt.gz  
ankit-jain@ubuntu:~/Documents$ ls  
HEllow.txt hy.txt  
ankit-jain@ubuntu:~/Documents$
```

----- top command -----

top command is used to show the Linux processes. It provides a dynamic real-time view of the running system. Usually, this command shows the summary information of the system and the list of processes or threads which are currently managed by the Linux Kernel.

as you will run this command it will open an interactive command mode where the top half portion will contain the statistics of processes and resource usage. And Lower half contains a list of the currently running processes.

OPTIONS =

1. **-n num** = Top output keep refreshing until you press ‘q’. With below command top command will automatically exit after ‘num’ number of repetition.
2. **-u username** = display specific user process

ankit-jain@ubuntu:~/Documents\$ man top
ankit-jain@ubuntu:~/Documents\$ top

```
top - 02:53:17 up 2:41, 1 user, load average: 0.14, 0.17, 0.14
Tasks: 283 total, 1 running, 282 sleeping, 0 stopped, 0 zombie
%Cpu(s): 7.3 us, 2.4 sy, 0.0 ni, 90.3 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 5961.3 total, 3967.0 free, 1124.3 used, 869.9 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used. 4571.0 avail Mem

          PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM TIME+ COMMAND
 1620 ankit-j+  20   0 3624136 256872 102256 S  4.0  4.2  3:42.11 gnome-shell
 1447 ankit-j+  20   0 428040 107248 49380 S  3.0  1.8  2:55.25 Xorg
 1401 ankit-j+  9 -11 2728452 20508 15772 S  1.0  0.3  0:12.95 pulseaudio
 2203 ankit-j+  20   0 827576 53268 39620 S  1.0  0.9  0:35.61 gnome-terminal-
 721 root     20   0 321808 7404 6232 S  0.7  0.1  0:43.63 vmtoolsd
 4263 ankit-j+  20   0 20636 3912 3096 R  0.7  0.1  0:00.06 top
 346 root     19 -1 123576 69768 67860 S  0.3  1.1  0:12.25 systemd-journal
 1455 ankit-j+  20   0 325356 8684 7656 S  0.3  0.1  0:02.18 gvfs-afc-volume
 1812 ankit-j+  20   0 30064 40708 29744 S  0.3  0.7  0:40.75 vmtoolsd
 4121 root     20   0 0 0 0 I  0.3  0.0  0:00.70 kworker/0:0-mm_percpu_wq
 1 root     20   0 167708 11152 8068 S  0.0  0.2  0:11.22 systemd
 2 root     20   0 0 0 0 S  0.0  0.0  0:00.00 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
 9 root     0 -20 0 0 0 I  0.0  0.0  0:00.00 mm_percpu_wq
10 root    20   0 0 0 0 S  0.0  0.0  0:00.00 rcu_tasks_rude_
11 root    20   0 0 0 0 S  0.0  0.0  0:00.00 rcu_tasks_trace
12 root    20   0 0 0 0 S  0.0  0.0  0:02.17 ksoftirqd/0
13 root    20   0 0 0 0 I  0.0  0.0  0:04.30 rcu_sched
14 root    rt 0 0 0 0 S  0.0  0.0  0:00.35 migration/0
15 root   -51 0 0 0 0 S  0.0  0.0  0:00.00 idle_inject/0
16 root    20   0 0 0 0 S  0.0  0.0  0:00.00 cpuhp/0
17 root    20   0 0 0 0 S  0.0  0.0  0:00.00 kdevtmpfs
18 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 netns
19 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 inet_frag_wq
20 root    20   0 0 0 0 S  0.0  0.0  0:00.00 kaudittd
21 root    20   0 0 0 0 S  0.0  0.0  0:00.01 khungtaskd
22 root    20   0 0 0 0 S  0.0  0.0  0:00.00 oom_reaper
23 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 writeback
24 root    20   0 0 0 0 S  0.0  0.0  0:01.69 kcompactd0
25 root    25 5 0 0 0 S  0.0  0.0  0:00.00 ksmd
26 root   39 19 0 0 0 S  0.0  0.0  0:00.00 khugepaged
72 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 kintegrityd
73 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 kblockd
74 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 blkcg_punt_bio
75 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 tpm_dev_wq
76 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 ata_sff
77 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 md
78 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 edac-poller
79 root    0 -20 0 0 0 I  0.0  0.0  0:00.00 devfreq_wq
```

ankit-jain@ubuntu:~/Documents\$ top -u ankit-jain

```
top - 02:56:44 up 2:45, 1 user, load average: 0.20, 0.12, 0.11
Tasks: 283 total, 1 running, 282 sleeping, 0 stopped, 0 zombie
%Cpu(s): 29.7 us, 11.2 sy, 7.2 ni, 51.4 id, 0.0 wa, 0.0 hi, 0.4 si, 0.0 st
MiB Mem : 5961.3 total, 3964.2 free, 1125.7 used, 871.4 buff/cache
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used. 4569.4 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
1620 ankit-j+ 20 0 3624136 256852 102256 S 15.2 4.2 3:48.72 gnome-shell
4372 ankit-j+ 39 19 763592 34644 24228 S 7.6 0.6 0:00.23 tracker-extract
1401 ankit-j+ 9 -11 2728480 20580 15844 S 7.3 0.3 0:14.11 pulseaudio
4365 ankit-j+ 20 0 443460 25480 15004 S 5.9 0.4 0:00.18 tracker-store
1447 ankit-j+ 20 0 428040 107248 49380 S 5.3 1.8 3:01.91 Xorg
3808 ankit-j+ 20 0 1006104 74144 46852 S 2.0 1.2 0:15.78 nautilus
2203 ankit-j+ 20 0 828408 53768 39620 S 1.3 0.9 0:38.26 gnome-terminal-
1409 ankit-j+ 20 0 11000 8016 3896 S 1.0 0.1 0:02.32 dbus-daemon
4359 ankit-j+ 20 0 20636 4004 3168 R 0.7 0.1 0:00.06 top
1394 ankit-j+ 20 0 19088 10320 8056 S 0.3 0.2 0:01.38 systemd
1404 ankit-j+ 39 19 520132 24632 16452 S 0.3 0.4 0:00.98 tracker-miner-f
1449 ankit-j+ 20 0 244332 6396 5800 S 0.3 0.1 0:00.09 gvfs-mtp-volume
1455 ankit-j+ 20 0 325356 8684 7656 S 0.3 0.1 0:02.23 gvfs-afc-volume
1659 ankit-j+ 20 0 162836 7512 6736 S 0.3 0.1 0:00.78 at-spi2-registr
1752 ankit-j+ 20 0 961476 33800 22640 S 0.3 0.6 0:00.98 gsd-media-keys
1812 ankit-j+ 20 0 300064 40708 29744 S 0.3 0.7 0:41.64 vmtoolsd
1947 ankit-j+ 20 0 170928 6328 5672 S 0.3 0.1 0:00.11 gvfsd-metadata
2388 ankit-j+ 20 0 760656 62476 37156 S 0.3 1.0 0:11.55 file-roller
3915 ankit-j+ 20 0 898040 65648 44372 S 0.3 1.1 0:01.46 eog
1395 ankit-j+ 20 0 103580 3436 4 S 0.0 0.1 0:00.00 (sd-pam)
1406 ankit-j+ 20 0 248792 7412 6424 S 0.0 0.1 0:00.28 gnome-keyring-d
1415 ankit-j+ 20 0 248428 7708 6732 S 0.0 0.1 0:00.24 gvfsd
1420 ankit-j+ 20 0 382064 8156 7276 S 0.0 0.1 0:00.03 gvfsd-fuse
1439 ankit-j+ 20 0 326048 10984 9380 S 0.0 0.2 0:00.14 gvfs-udisks2-vo
1442 ankit-j+ 20 0 172652 6344 5712 S 0.0 0.1 0:00.05 gdm-x-session
1460 ankit-j+ 20 0 246740 6628 5920 S 0.0 0.1 0:00.08 gvfs-gphoto2-vo
1464 ankit-j+ 20 0 244508 5832 5296 S 0.0 0.1 0:00.07 gvfs-goa-volume
1468 ankit-j+ 20 0 553760 36136 30176 S 0.0 0.6 0:00.20 goa-daemon
1476 ankit-j+ 20 0 327240 11124 9776 S 0.0 0.2 0:00.09 goa-identity-se
1502 ankit-j+ 20 0 199368 15236 13504 S 0.0 0.2 0:00.12 gnome-session-b
1569 ankit-j+ 20 0 6040 456 0 S 0.0 0.0 0:00.21 ssh-agent
1589 ankit-j+ 20 0 383504 9372 8392 S 0.0 0.2 0:00.03 at-spi1-bus-laun
1595 ankit-j+ 20 0 7248 4256 3792 S 0.0 0.1 0:00.24 dbus-daemon
1599 ankit-j+ 20 0 98696 4208 3788 S 0.0 0.1 0:00.00 gnome-session-c
1606 ankit-j+ 20 0 495220 17136 14388 S 0.0 0.3 0:00.39 gnome-session-b
1638 ankit-j+ 20 0 323332 10232 8644 S 0.0 0.2 0:00.17 ibus-daemon
1642 ankit-j+ 20 0 175188 8888 8032 S 0.0 0.1 0:00.04 ibus-memconf
1643 ankit-j+ 20 0 286720 33112 19388 S 0.0 0.5 0:02.19 ibus-extension-
1645 ankit-j+ 20 0 209672 29724 19692 S 0.0 0.5 0:00.62 ibus-x11
1647 ankit-j+ 20 0 248988 9200 8328 S 0.0 0.2 0:00.24 ibus-portal
1665 ankit-j+ 20 0 244228 4540 4104 S 0.0 0.1 0:00.02 xdg-permission-
```



ankit-jain@ubuntu: ~/Documents

```
top - 02:58:06 up 2:46, 1 user, load average: 0.05, 0.09, 0.10
Tasks: 281 total, 2 running, 279 sleeping, 0 stopped, 0 zombie
CPU(s): 1.7 us, 1.3 sy, 0.0 nt, 97.0 td, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 5961.3 total, 3985.6 free, 1103.6 used, 872.1 buff/cache
Swap: 2048.0 total, 2048.0 free, 0.0 used, 4591.6 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1447	ankit-j+	20	0	428040	107240	49380	S	0.8	1.8	3:02.43	Xorg
721	root	20	0	321888	7404	6232	S	0.4	0.1	0:44.98	vmtoolsd
1628	ankit-j+	20	0	3624136	256812	102256	S	0.4	4.2	3:49.98	gnome-shell
1812	ankit-j+	20	0	300064	40708	29744	S	0.4	0.7	0:41.98	vmtoolsd
2203	ankit-j+	20	0	827624	53348	39620	S	0.4	0.9	0:38.54	gnome-terminal-
4121	root	20	0	0	0	0	I	0.4	0.0	0:01.45	kworker/0:0-events
4426	ankit-j+	20	0	20636	3984	3168	R	0.4	0.1	0:00.03	top
1	root	20	0	167708	11152	8868	S	0.8	0.2	0:11.25	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.06	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
9	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
10	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_rude_
11	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_trace
12	root	20	0	0	0	0	S	0.0	0.0	0:02.23	ksoftirqd/0
13	root	20	0	0	0	0	R	0.0	0.0	0:04.42	rcu_sched
14	root	rt	0	0	0	0	S	0.0	0.0	0:00.36	migration/0
15	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
16	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
17	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kdevtmpfs
18	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
19	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	inet_frag_wq
20	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kaudittd
21	root	20	0	0	0	0	S	0.0	0.0	0:00.01	khungtaskd
22	root	20	0	0	0	0	S	0.0	0.0	0:00.00	oom_reaper
23	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	writeback
24	root	20	0	0	0	0	S	0.0	0.0	0:01.73	kcompactd0
25	root	25	5	0	0	0	S	0.0	0.0	0:00.00	ksmd
26	root	39	19	0	0	0	S	0.0	0.0	0:00.00	khugepaged
72	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kintegrityd
73	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kblockd
74	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	blkcg_punt_bio
75	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	tpm_dev_wq
76	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	ata_stf
77	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	md
78	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	edac_poller
79	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	devfreq_wq
80	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	watchdogd
82	root	0	-20	0	0	0	I	0.0	0.0	0:15.50	kworker/0:1H-kblockd
84	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kswapd0

----- ps command -----

ps command is used to list the currently running processes and their PIDs along with some other information depends on different options. It reads the process information from the virtual files in **/proc** file-system. /proc contains virtual files, this is the reason it's referred as a virtual file system.

SYNTAX = ps [options]

OPTIONS =

1. -A or -e = View all the running processes
2. -T = View all the processes associated with terminal
3. -r = View all the running processes
4. -a = View all the processes not associated with terminal

ankit-jain@ubuntu:~\$ man ps
ankit-jain@ubuntu:~\$ ps
 PID TTY TIME CMD
 2211 pts/0 00:00:00 bash
 4487 pts/0 00:00:00 ps
ankit-jain@ubuntu:~\$ ps -A
 PID TTY TIME CMD
 1 ? 00:00:11 systemd
 2 ? 00:00:00 kthreadd
 3 ? 00:00:00 rcu_gp
 4 ? 00:00:00 rcu_par_gp
 6 ? 00:00:00 kworker/0:0H-events_highpri
 9 ? 00:00:00 mm_percpu_wq
 10 ? 00:00:00 rcu_tasks_rude_
 11 ? 00:00:00 rcu_tasks_trace
 12 ? 00:00:02 ksoftirqd/0
 13 ? 00:00:04 rcu_sched
 14 ? 00:00:00 migration/0
 15 ? 00:00:00 idle_inject/0
 16 ? 00:00:00 cpuhp/0
 17 ? 00:00:00 kdevtmpfs
 18 ? 00:00:00 netns
 19 ? 00:00:00 inet_frag_wq
 20 ? 00:00:00 kaudittd
 21 ? 00:00:00 khungtaskd
 22 ? 00:00:00 oom_reaper
 23 ? 00:00:00 writeback
 24 ? 00:00:01 kcompactd0
 25 ? 00:00:00 ksmd
 26 ? 00:00:00 khugepaged
 72 ? 00:00:00 kintegrityd
 73 ? 00:00:00 kblockd
 74 ? 00:00:00 blkcg_punt_bio
 75 ? 00:00:00 tpm_dev_wq
 76 ? 00:00:00 ata_sff
 77 ? 00:00:00 md
 78 ? 00:00:00 edac-poller
 79 ? 00:00:00 devfreq_wq
 80 ? 00:00:00 watchdogd
 82 ? 00:00:15 kworker/0:1H-kblockd
 84 ? 00:00:00 kswapd0
 85 ? 00:00:00 ecryptfs-kthrea
 87 ? 00:00:00 kthrotld
 88 ? 00:00:00 irq/24-pciehp
 89 ? 00:00:00 irq/25-pciehp
 90 ? 00:00:00 irq/26-pciehp
 91 ? 00:00:00 irq/27-pciehp
 92 ? 00:00:00 irq/28-pciehp
 93 ? 00:00:00 irq/29-pciehp

Activities Terminal

Feb 7 03:02

2 0 0

```
ankit-jain@ubuntu:~$ ps -a
  PID TTY      TIME CMD
 1447 tty2    00:03:05 Xorg
 1502 tty2    00:00:00 gnome-session-b
 4528 pts/0    00:00:00 ps
ankit-jain@ubuntu:~$ ps -T
  PID   SPID TTY      TIME CMD
 2211    2211 pts/0    00:00:00 bash
 4529    4529 pts/0    00:00:00 ps
ankit-jain@ubuntu:~$ 
```



----- fg command -----

fg command in linux used to put a background job in foreground.

SYNTAX = fg [job-spec]

Job-spec may be:

%n : Refer to job number n.

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

%% or %+ : Refer to the current job. fg and bg will operate on this job if no job_spec is given.

%- : Refer to the previous job.

```
ankit-jain@ubuntu:~$ ping flipkart.com
^Z
[1]+  Stopped                  ping flipkart.com
ankit-jain@ubuntu:~$ jobs
[1]+  Stopped                  ping flipkart.com
ankit-jain@ubuntu:~$ fg %1
ping flipkart.com
ping: flipkart.com: Temporary failure in name resolution
ankit-jain@ubuntu:~$ 
```

----- bg command -----

bg command in linux used to put a foreground job in background.

SYNTAX = bg [job-spec]

Job-spec may be:

%n : Refer to job number n.

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

%% or %+ : Refer to the current job. fg and bg will operate on this job if no job_spec is given.

%- : Refer to the previous job.

Activities Terminal ▾ Feb 7 03:26

ankit-jain@ubuntu:~\$ jobs -l
ankit-jain@ubuntu:~\$ ping www.yahoo.com
^Z
[1]+ Stopped ping www.yahoo.com
ankit-jain@ubuntu:~\$ ping gjhg.biz
^Z
[2]+ Stopped ping gjhg.biz
ankit-jain@ubuntu:~\$ jobs -l
[1]- 4657 Stopped ping www.yahoo.com
[2]+ 4660 Stopped ping gjhg.biz
ankit-jain@ubuntu:~\$ bg %1
[1]- ping www.yahoo.com &
ankit-jain@ubuntu:~\$ PING new-fp-shed.wg1.b.yahoo.com (202.165.107.49) 56(84) bytes of data.
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=1 ttl=128 time=219 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=2 ttl=128 time=318 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=3 ttl=128 time=189 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=4 ttl=128 time=110 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=5 ttl=128 time=192 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=6 ttl=128 time=332 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=7 ttl=128 time=341 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=8 ttl=128 time=134 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=9 ttl=128 time=181 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=10 ttl=128 time=254 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=11 ttl=128 time=129 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=12 ttl=128 time=135 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=14 ttl=128 time=410 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=15 ttl=128 time=122 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=16 ttl=128 time=118 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=17 ttl=128 time=266 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=18 ttl=128 time=152 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=19 ttl=128 time=118 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=20 ttl=128 time=121 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=23 ttl=128 time=327 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=24 ttl=128 time=124 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=25 ttl=128 time=132 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=26 ttl=128 time=258 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=27 ttl=128 time=182 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=28 ttl=128 time=121 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=29 ttl=128 time=308 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=30 ttl=128 time=186 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=31 ttl=128 time=165 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=32 ttl=128 time=134 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=33 ttl=128 time=124 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=34 ttl=128 time=147 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=35 ttl=128 time=251 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=36 ttl=128 time=108 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=37 ttl=128 time=127 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp_seq=38 ttl=128 time=416 ms
64 bytes from media-router-fp73.prod.media.vip.sg3.yahoo.com (202.165.107.49): icmp seq=39 ttl=128 time=193 ms

----- ping command -----

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.

Ping uses ICMP(Internet Control Message Protocol) to send an ICMP echo message to the specified host if that host is available then it sends ICMP reply message.

```
ankit-jain@ubuntu:~$ ping www.curaj.ac.in
PING www.curaj.ac.in (14.139.244.219) 56(84) bytes of data.
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=1 ttl=128 time=672 ms
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=2 ttl=128 time=204 ms
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=3 ttl=128 time=225 ms
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=4 ttl=128 time=143 ms
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=5 ttl=128 time=478 ms
^C
--- www.curaj.ac.in ping statistics ---
6 packets transmitted, 5 received, 16.6667% packet loss, time 7045ms
rtt min/avg/max/mdev = 143.157/344.195/671.834/199.771 ms
ankit-jain@ubuntu:~$ ping -c 4 www.curaj.ac.in
PING www.curaj.ac.in (14.139.244.219) 56(84) bytes of data.
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=1 ttl=128 time=1039 ms
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=2 ttl=128 time=110 ms
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=3 ttl=128 time=124 ms
64 bytes from 14.139.244.219 (14.139.244.219): icmp_seq=4 ttl=128 time=278 ms

--- www.curaj.ac.in ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3015ms
rtt min/avg/max/mdev = 109.896/387.526/1038.804/381.752 ms, pipe 2
ankit-jain@ubuntu:~$ ping -i 2 -c 4 www.flipkart.com
PING flipkart.com (163.53.78.110) 56(84) bytes of data.
64 bytes from 163.53.78.110 (163.53.78.110): icmp_seq=3 ttl=128 time=480 ms
64 bytes from 163.53.78.110 (163.53.78.110): icmp_seq=4 ttl=128 time=104 ms

--- flipkart.com ping statistics ---
4 packets transmitted, 2 received, 50% packet loss, time 6039ms
rtt min/avg/max/mdev = 104.162/291.858/479.555/187.696 ms
ankit-jain@ubuntu:~$ ping -c 4 -q www.curaj.ac.in
PING www.curaj.ac.in (14.139.244.219) 56(84) bytes of data.

--- www.curaj.ac.in ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 6231ms
rtt min/avg/max/mdev = 138.779/333.538/874.298/312.376 ms
ankit-jain@ubuntu:~$ 
```

ankit-jain@ubuntu:~

Q E - x

----- ifconfig command -----

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.

SYNTAX = inconfig [OPTIONS] [INTERFACE]

OPTIONS =

1. **-a** = This option is used to display all the interfaces available, even if they are down.
2. **-s** = Display a short list, instead of details
3. **-v** = Run the command in verbose mode – log more details about execution

```
ankit-jain@ubuntu:~$ man ifconfig
ankit-jain@ubuntu:~$ ifconfig -a
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.30.129 netmask 255.255.255.0 broadcast 192.168.30.255
        inet6 fe80::6773:8971::40c:8613 prefixlen 64 scopeid 0x20<link>
          ether 00:0c:29:ba:ee:63 txqueuelen 1000 (Ethernet)
            RX packets 80997 bytes 7577525 (7.5 MB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 53428 bytes 4163231 (4.1 MB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
          loop txqueuelen 1000 (Local Loopback)
            RX packets 9725 bytes 762424 (762.4 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 9725 bytes 762424 (762.4 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

ankit-jain@ubuntu:~$ ifconfig -s
Iface      MTU   RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
ens33     1500    80997     0     0     0      53428     0     0     0 BMRU
lo       65536     9725     0     0     0      9725     0     0     0 LRU
ankit-jain@ubuntu:~$ ifconfig -v
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.30.129 netmask 255.255.255.0 broadcast 192.168.30.255
        inet6 fe80::6773:8971::40c:8613 prefixlen 64 scopeid 0x20<link>
          ether 00:0c:29:ba:ee:63 txqueuelen 1000 (Ethernet)
            RX packets 80997 bytes 7577525 (7.5 MB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 53428 bytes 4163231 (4.1 MB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
          loop txqueuelen 1000 (Local Loopback)
            RX packets 9725 bytes 762424 (762.4 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 9725 bytes 762424 (762.4 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
ankit-jain@ubuntu:~$ 
```

----- ifup command -----

ifup command basically brings the network interface up, allowing it to transmit and receive data. Technically ifup command is used to configure network interfaces based on interface definitions in the file `/etc/network/interfaces`.

OPTIONS =

- `-a(–all)`: If used this option it affects all the interfaces marked as auto. Brings up interfaces in order they are defined `/etc/network/interfaces`. Combined with `–allow`, acts on all interfaces of a specified class instead.
- `–force`: Force configuration or deconfiguration of the interface.
- `-V`: Prints the version information.
- `-v`: Verbose the output as they are executed.

```
ankit-jain@ubuntu:~$ sudo ifup -av
ifup: reading directory /etc/network/interfaces.d
/bin/run-parts --exit-on-error --verbose /etc/network/if-pre-up.d
run-parts: executing /etc/network/if-pre-up.d/wireless-tools
run-parts: executing /etc/network/if-pre-up.d/wpa_supplicant
/sbin/ip link set up dev lo 2>/dev/null

ifup: configuring interface lo=lo (inet)
/bin/run-parts --exit-on-error --verbose /etc/network/if-pre-up.d
run-parts: executing /etc/network/if-pre-up.d/wireless-tools
run-parts: executing /etc/network/if-pre-up.d/wpa_supplicant
/bin/run-parts --exit-on-error --verbose /etc/network/if-up.d
run-parts: executing /etc/network/if-up.d/avahi-autoipd
run-parts: executing /etc/network/if-up.d/openvpn
run-parts: executing /etc/network/if-up.d/wpa_supplicant
/bin/run-parts --exit-on-error --verbose /etc/network/if-up.d
run-parts: executing /etc/network/if-up.d/avahi-autoipd
run-parts: executing /etc/network/if-up.d/openvpn
run-parts: executing /etc/network/if-up.d/wpa_supplicant
ankit-jain@ubuntu:~$ 
```

----- ifdown command -----

user can use ifdown command to bring network interface down, not allowing the user to transmit and receive data.

Technically it places the network interface in a state where it cannot transmit or receive data. It is used to configure network interfaces based on interface definitions in the file /etc/network/interfaces.

OPTIONS =

1. -a(--all): This option is used to bring all the interface down which are defined in /etc/network/interfaces.
2. --allow=CLASS: This option will only allow interfaces listed in an allow-CLASS line in /etc/network/interfaces to be acted upon
3. -v(--verbose): Show or verbose commands as they are executed.
4. -V(--version): Prints the Copyright and version information.

```
ankit-jain@ubuntu:~$ man ifdown
ankit-jain@ubuntu:~$ ping -c 4 www.google.com
PING www.google.com (142.250.193.196) 56(84) bytes of data.
64 bytes from del11s17-in-f4.1e100.net (142.250.193.196): icmp_seq=1 ttl=128 time=824 ms
64 bytes from del11s17-in-f4.1e100.net (142.250.193.196): icmp_seq=2 ttl=128 time=408 ms
64 bytes from del11s17-in-f4.1e100.net (142.250.193.196): icmp_seq=3 ttl=128 time=234 ms
64 bytes from del11s17-in-f4.1e100.net (142.250.193.196): icmp_seq=4 ttl=128 time=352 ms

--- www.google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3032ms
rtt min/avg/max/mdev = 234.449/454.665/824.157/222.355 ms
ankit-jain@ubuntu:~$ sudo ifdown -av
ifdown: reading directory /etc/network/interfaces.d
/bin/run-parts --verbose /etc/network/if-down.d
run-parts: executing /etc/network/if-down.d/avahi-autoipd
run-parts: executing /etc/network/if-down.d/openvpn
run-parts: executing /etc/network/if-down.d/wpa_supplicant
ifdown: configuring interface lo=lo (inet)
/bin/run-parts --verbose /etc/network/if-down.d
run-parts: executing /etc/network/if-down.d/avahi-autoipd
run-parts: executing /etc/network/if-down.d/openvpn
run-parts: executing /etc/network/if-down.d/wpa_supplicant
/bin/run-parts --verbose /etc/network/if-post-down.d
run-parts: failed to stat component /etc/network/if-post-down.d/avahi-daemon: No such file or directory
run-parts: executing /etc/network/if-post-down.d/wireless-tools
run-parts: executing /etc/network/if-post-down.d/wpa_supplicant
/sbin/ip link set down dev lo 2>/dev/null

/bin/run-parts --verbose /etc/network/if-post-down.d
run-parts: failed to stat component /etc/network/if-post-down.d/avahi-daemon: No such file or directory
run-parts: executing /etc/network/if-post-down.d/wireless-tools
run-parts: executing /etc/network/if-post-down.d/wpa_supplicant
ankit-jain@ubuntu:~$ ping -c 4 www.google.com
ping: www.google.com: Temporary failure in name resolution
ankit-jain@ubuntu:~$ 
```

----- ifquery command -----

The ifquery command displays information about a network interface's configuration.
The ifquery command is used to parse interface configuration data

OPTIONS =

1. -v(--verbose): Show or verbose commands as they are executed.
2. -V(--version): Prints the Copyright and version information.
3. --allow=CLASS: This option will only allow interfaces listed in an allow-CLASS line in /etc/network/interfaces to be acted upon

```
ankit-jain@ubuntu:~$ man ifquery
ankit-jain@ubuntu:~$ ifquery -l
lo
ankit-jain@ubuntu:~$ 
```

----- netstat command -----

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

Options =

1. -a -all : Show both listening and non-listening sockets. With the –interfaces option, show interfaces that are not up
2. –at = to list all tcp ports.
3. –au = list all udp ports.
4. –l = To list only the listening ports



```
ankit-jain@ubuntu:~$ man netstat
ankit-jain@ubuntu:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 localhost:domain        0.0.0.0:*              LISTEN
tcp      0      0 localhost:ipp          0.0.0.0:*              LISTEN
tcp6     0      0 ip6-localhost:ipp       [::]:*                LISTEN
udp      0      0 0.0.0.0:mdns          0.0.0.0:*
udp      0      0 0.0.0.0:56697         0.0.0.0:*
udp      0      0 localhost:domain        0.0.0.0:*
udp      0      0 ubuntu:bootpc          192.168.30.254:bootps ESTABLISHED
udp      0      0 0.0.0.0:631           0.0.0.0:*
udp6     0      0 [::]:mdns            [::]:*
udp6     0      0 [::]:37875           [::]:*
raw6     0      0 [::]:ipv6-icmp        [::]:*                7

Active UNIX domain sockets (servers and established)
Proto RefCnt Flags    Type      State      I-Node  Path
unix  2      [ ]      DGRAM          51808   /run/user/1000/systemd/notify
unix  2      [ ACC ]   STREAM          LISTENING  51811   /run/user/1000/systemd/private
unix  2      [ ACC ]   STREAM          LISTENING  51846   /run/user/1000/bus
unix  2      [ ACC ]   STREAM          LISTENING  51878   /run/user/1000/gnupg/S.dirmngr
unix  2      [ ACC ]   STREAM          LISTENING  51879   /run/user/1000/gnupg/S.gpg-agent.browser
unix  2      [ ACC ]   STREAM          LISTENING  51880   /run/user/1000/gnupg/S.gpg-agent.extra
unix  2      [ ACC ]   STREAM          LISTENING  51881   /run/user/1000/gnupg/S.gpg-agent.ssh
unix  2      [ ACC ]   STREAM          LISTENING  51882   /run/user/1000/gnupg/S.gpg-agent
unix  2      [ ACC ]   STREAM          LISTENING  51883   /run/user/1000/pk-debconf-socket
unix  2      [ ACC ]   STREAM          LISTENING  54273   @/tmp/.ICE-unix/1606
unix  2      [ ACC ]   STREAM          LISTENING  51884   /run/user/1000/pulse/native
unix  2      [ ACC ]   STREAM          LISTENING  51885   /run/user/1000/snapd-session-agent.socket
unix  2      [ ACC ]   STREAM          LISTENING  52070   /run/user/1000/keyring/control
unix  2      [ ACC ]   STREAM          LISTENING  52631   @/tmp/.X11-unix/X0
unix  2      [ ACC ]   STREAM          LISTENING  52632   /tmp/.X11-unix/X0
unix  2      [ ACC ]   STREAM          LISTENING  53706   /tmp/ssh-JVx0v7R6qqei/agent.1502
unix  2      [ ACC ]   STREAM          LISTENING  54274   @/tmp/.ICE-unix/1606
unix  2      [ ACC ]   STREAM          LISTENING  58039   @/dbus-vfs-daemon/socket-Ut9tbzAE
unix  2      [ ACC ]   STREAM          LISTENING  54193   /run/user/1000/keyring/pkcs11
unix  2      [ ACC ]   STREAM          LISTENING  53856   @/tmp/dbus-s6AeiDATH0
unix  2      [ ACC ]   STREAM          LISTENING  43516   @/tmp/dbus-T5eJlQjL
unix  2      [ ACC ]   STREAM          LISTENING  54384   /run/user/1000/keyring/ssh
unix  4      [ ]      DGRAM          26639   /run/systemd/notify
unix  2      [ ACC ]   STREAM          LISTENING  26642   /run/systemd/private
unix  2      [ ACC ]   STREAM          LISTENING  43517   @/tmp/dbus-vsoaoF7X
unix  2      [ ACC ]   STREAM          LISTENING  26644   /run/systemd/userdb/io.systemd.DynamicUser
unix  2      [ ]      DGRAM          26653   /run/systemd/journal/syslog
unix  2      [ ACC ]   STREAM          LISTENING  26655   /run/systemd/fsck.progress
unix 16     [ ]      DGRAM          26663   /run/systemd/journal/dev-log
unix  2      [ ACC ]   STREAM          LISTENING  26665   /run/systemd/journal/stdout
unix  8      [ ]      DGRAM          26667   /run/systemd/journal/socket
unix  2      [ ACC ]   SEQPACKET    LISTENING  26669   /run/udev/control
```





```
ankit-jain@ubuntu:~$ netstat -at
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 localhost:domain          0.0.0.0:*              LISTEN
tcp      0      0 localhost:ipp             0.0.0.0:*              LISTEN
tcp      0      0 ubuntu:36584              84.170.224.35.bc.g:http ESTABLISHED
tcp      0      0 ubuntu:36582              84.170.224.35.bc.g:http FIN_WAIT2
tcp6     0      0 ip6-localhost:ipp        [::]:*                LISTEN
ankit-jain@ubuntu:~$ netstat -au
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp      0      0 0.0.0.0:mdns            0.0.0.0:*
udp      0      0 0.0.0.0:56697           0.0.0.0:*
udp      0      0 localhost:domain        0.0.0.0:*
udp      0      0 ubuntu:bootpc           192.168.30.254:bootps  ESTABLISHED
udp      0      0 0.0.0.0:631            0.0.0.0:*
udp6     0      0 [::]:mdns             [::]:*
udp6     0      0 [::]:37875            [::]:*
ankit-jain@ubuntu:~$ netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 localhost:domain          0.0.0.0:*              LISTEN
tcp      0      0 localhost:ipp             0.0.0.0:*              LISTEN
tcp6     0      0 ip6-localhost:ipp        [::]:*                LISTEN
udp      0      0 0.0.0.0:mdns            0.0.0.0:*
udp      0      0 0.0.0.0:56697           0.0.0.0:*
udp      0      0 localhost:domain        0.0.0.0:*
udp      0      0 0.0.0.0:631            0.0.0.0:*
udp6     0      0 [::]:mdns             [::]:*
udp6     0      0 [::]:37875            [::]:*
raw6    0      0 [::]:ipv6-icmp          [::]:*                7
Active UNIX domain sockets (only servers)
Proto RefCnt Flags       Type      State      I-Node  Path
unix  2      [ ACC ]     STREAM   LISTENING  51811   /run/user/1000/systemd/private
unix  2      [ ACC ]     STREAM   LISTENING  51846   /run/user/1000/bus
unix  2      [ ACC ]     STREAM   LISTENING  51878   /run/user/1000/gnupg/S.dirmngr
unix  2      [ ACC ]     STREAM   LISTENING  51879   /run/user/1000/gnupg/S.gpg-agent.browser
unix  2      [ ACC ]     STREAM   LISTENING  51880   /run/user/1000/gnupg/S.gpg-agent.extra
unix  2      [ ACC ]     STREAM   LISTENING  51881   /run/user/1000/gnupg/S.gpg-agent.ssh
unix  2      [ ACC ]     STREAM   LISTENING  51882   /run/user/1000/gnupg/S.gpg-agent
unix  2      [ ACC ]     STREAM   LISTENING  51883   /run/user/1000/pk-debconf-socket
unix  2      [ ACC ]     STREAM   LISTENING  54273   @/tmp/.ICE-unix/1606
unix  2      [ ACC ]     STREAM   LISTENING  51884   /run/user/1000/pulse/native
unix  2      [ ACC ]     STREAM   LISTENING  51885   /run/user/1000/snapd-session-agent.socket
unix  2      [ ACC ]     STREAM   LISTENING  52070   /run/user/1000/keyring/control
unix  2      [ ACC ]     STREAM   LISTENING  52631   @/tmp/.X11-unix/X0
unix  2      [ ACC ]     STREAM   LISTENING  52632   /tmp/.X11-unix/X0
unix  2      [ ACC ]     STREAM   LISTENING  53706   /tmp/ssh-JVx0v7R6qqe/agent.1502
unix  2      [ ACC ]     STREAM   LISTENING  54274   @/tmp/.ICE-unix/1606
```





```
ankit-jain@ubuntu:~$ netstat -lt  
Active Internet connections (only servers)
```

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
tcp	0	0	localhost:domain	0.0.0.0:*	LISTEN
tcp	0	0	localhost:ipp	0.0.0.0:*	LISTEN
tcp6	0	0	ip6-localhost:ipp	[::]:*	LISTEN

```
ankit-jain@ubuntu:~$ netstat -lu  
Active Internet connections (only servers)
```

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
udp	0	0	0.0.0.0:mdns	0.0.0.0:*	
udp	0	0	0.0.0.0:56697	0.0.0.0:*	
udp	0	0	localhost:domain	0.0.0.0:*	
udp	0	0	0.0.0.0:631	0.0.0.0:*	
udp6	0	0	[::]:mdns	[::]:*	
udp6	0	0	[::]:37875	[::]:*	

```
ankit-jain@ubuntu:~$ 
```

----- free command -----

free command displays the total amount of free space available along with the amount of memory used and swap memory in the system, and also the buffers used by the kernel.

SYNTAX = free [option]

OPTIONS are =

- -b: It displays the memory in bytes.
- -k: It displays the amount of memory in kilobytes(default).
- -m: It displays the amount of memory in megabytes.
- -g: It displays the amount of memory in gigabytes.
- – – tera : It displays the amount of memory in terabytes.
- -h: It shows all output columns automatically scaled to shortest three digit unit and display the units also of print out. The units used are B(bytes), K(kilos), M(megas), G(gigas), and T(teras).
- -c: It displays the output c number of times

```
ankit-jain@ubuntu:~$ man free
ankit-jain@ubuntu:~$ free
      total        used        free      shared  buff/cache   available
Mem:    6104352     1122428    3977176      17456    1004748    4700804
Swap:  2097148         0    2097148
ankit-jain@ubuntu:~$ free -b
      total        used        free      shared  buff/cache   available
Mem:  6250856448 1149304832 4072681472 17874944 1028870144 4813676544
Swap: 2147479552         0 2147479552
ankit-jain@ubuntu:~$ free -k
      total        used        free      shared  buff/cache   available
Mem:    6104352     1122316    3977228      17456    1004808    4700916
Swap:  2097148         0    2097148
ankit-jain@ubuntu:~$ free -m
      total        used        free      shared  buff/cache   available
Mem:      5961      1096      3884        17      981       4590
Swap:  2047         0      2047
ankit-jain@ubuntu:~$ free -t
      total        used        free      shared  buff/cache   available
Mem:    6104352     1122308    3977228      17456    1004816    4700924
Swap:  2097148         0    2097148
Total:  8201500     1122308    6074376
ankit-jain@ubuntu:~$
```

----- vmstat command -----

vmstat command in Linux/Unix is a performance monitoring command of the system as it gives the information about processes, memory, paging, block IO, disk, and CPU scheduling. All these functionalities makes the command vmstat also known as virtual memory statistic reporter.

SYNTAX = vmstat [options] [delay [count]]

OPTIONS =

1. **-a** = It displays active and inactive memory of the system running.
2. **-f** = It displays the number of forks since boot. Each process is represented by one or more task, depending on thread usage.
3. **-m** = This command is used to display slab information.
4. **-d** = This command is used to display all disk statistics.

Activities Terminal ▾ Feb 7 05:01

ankit-jain@ubuntu:~\$

```
procs -----memory----- swap-- io--- system-- cpu-----
 r b swpd free buff cache si so bi bo in cs us sy id wa st
 0 0 0 3977076 100164 904920 0 0 48 31 106 280 3 2 94 0 0
ankit-jain@ubuntu:~$ vmstat -a
procs -----memory----- swap-- io--- system-- cpu-----
 r b swpd free inact active si so bi bo in cs us sy id wa st
 0 0 0 3977084 1058704 463788 0 0 48 31 106 280 3 2 94 0 0
ankit-jain@ubuntu:~$ vmstat -f
    7812 forks
ankit-jain@ubuntu:~$ vmstat -s
 6104352 K total memory
 1122120 K used memory
 463836 K active memory
 1058672 K inactive memory
 3977084 K free memory
 100188 K buffer memory
 904960 K swap cache
 2097148 K total swap
     0 K used swap
 2097148 K free swap
 54039 non-nice user cpu ticks
 4259 nice user cpu ticks
 35592 system cpu ticks
 1590803 idle cpu ticks
   350 IO-wait cpu ticks
     0 IRQ cpu ticks
 2986 softirq cpu ticks
     0 stolen cpu ticks
 808465 pages paged in
 521753 pages paged out
     0 pages swapped in
     0 pages swapped out
1781625 interrupts
4705088 CPU context switches
1644221494 boot time
 7813 forks
ankit-jain@ubuntu:~$
```

```
ankit-jain@ubuntu:~$ vmstat -d
disk- -----reads-----writes-----IO-----
total merged sectors      ms   total merged sectors      ms   cur    sec
loop0     14     0     34       1     0     0     0     0     0     0
loop1    267     0   1674      39     0     0     0     0     0     0
loop2    274     0   1714      45     0     0     0     0     0     0
loop3    276     0   1716      40     0     0     0     0     0     0
loop4    441     0   3626      49     0     0     0     0     0     0
loop5    460     0   3698      47     0     0     0     0     0     0
loop6    945     0   5504      62     0     0     0     0     0     0
loop7   1429     0   7582      61     0     0     0     0     0     0
sda   22238   11244 1483988  20704   61075  20414 1045250 125453     0     83
sr0     11     0     5       2     0     0     0     0     0     0
loop8   319     0   1730      42     0     0     0     0     0     0
loop9   1192    0 102678     384     0     0     0     0     0     4
loop10    49     0   722      32     0     0     0     0     0     0
loop11   446     0   2236      47     0     0     0     0     0     0
loop12    11     0    28       0     0     0     0     0     0     0
ankit-jain@ubuntu:~$
```

----- /proc/meminfo -----

The **/proc** filesystem is pseudo filesystem. It does not exist on a disk. Instead, the kernel creates it in memory. It is used to provide information about the system (originally about processes, hence the name).

The '**/proc/meminfo**' is used by to report the amount of free and used memory (both physical and swap) on the system as well as the shared memory and buffers used by the kernel.

We can use command `cat /proc/meminfo` to view this file.

```
ankit-jain@ubuntu:~$ cat /proc/meminfo
MemTotal:       6104352 kB
MemFree:        3949432 kB
MemAvailable:   4674780 kB
Buffers:         100888 kB
Cached:          790992 kB
SwapCached:      0 kB
Active:          465036 kB
Inactive:        1088380 kB
Active(anon):    1824 kB
Inactive(anon):  671092 kB
Active(file):   463212 kB
Inactive(file): 417288 kB
Unevictable:     0 kB
Mlocked:         0 kB
SwapTotal:      2097148 kB
SwapFree:        2097148 kB
Dirty:           248 kB
Writeback:        0 kB
AnonPages:      661536 kB
Mapped:          299400 kB
Shmem:           17868 kB
KReclaimable:   115112 kB
Slab:            195312 kB
SReclaimable:   115112 kB
SUnreclaim:     80200 kB
KernelStack:    10176 kB
PageTables:     13660 kB
NFS_Unstable:    0 kB
Bounce:          0 kB
WritebackTmp:    0 kB
CommitLimit:    5149324 kB
Committed_AS:   3563196 kB
VmallocTotal:   34359738367 kB
VmallocUsed:    58640 kB
VmallocChunk:    0 kB
Percpu:          116736 kB
HardwareCorrupted: 0 kB
AnonHugePages:   0 kB
ShmemHugePages:  0 kB
ShmemPmdMapped: 0 kB
FileHugePages:   0 kB
FilePmdMapped:   0 kB
HugePages_Total: 0
HugePages_Free:  0
HugePages_Rsvd:  0
HugePages_Surp:  0
Hugepagesize:    2048 kB
Hugetlb:         0 kB
```

```
ankit-jain@ubuntu:~$ cat /proc/meminfo | grep -i "memfree"
MemFree:        3942224 kB
ankit-jain@ubuntu:~$
```

----- touch command -----

touch command is used to create, change and modify timestamps of a file.

It is used to create a file without any content. The file created using touch command is empty.

SYNTAX = touch [options] filename

OPTIONS =

1. -a = This command is used to change access time only.
2. -c = This command is used to check whether a file is created or not. If not created then don't create it. This command avoids creating files.
3. -m = This is used to change the modification time only

```
ankit-jain@ubuntu:~$ man touch
ankit-jain@ubuntu:~$ cd Desktop/
ankit-jain@ubuntu:~/Desktop$ touch sample.txt
ankit-jain@ubuntu:~/Desktop$ ls
sample.txt
ankit-jain@ubuntu:~/Desktop$ touch sample1 sample2 sample3
ankit-jain@ubuntu:~/Desktop$ ls -l
total 0
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb  7 05:23 sample1
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb  7 05:23 sample2
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb  7 05:23 sample3
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb  7 05:22 sample.txt
ankit-jain@ubuntu:~/Desktop$
```

----- last command -----

The last command in Linux is used to display the list of all the users logged in and out since the file /var/log/wtmp was created. One or more usernames can be given as an argument to display their login in (and out) time and their host-name.

SYNTAX = last [options] [username..] [tty..]

OPTIONS =

1. – [number] = This option is used to specify the number of lines to display.
2. –R = This option is used to hide the host-name field
3. –F = This option is used to display the login and logout time including the dates.



```
ankit-jain@ubuntu:~/Desktop$ man last
ankit-jain@ubuntu:~/Desktop$ last
ankit-ja :0      :0      Mon Feb 7 00:12  still logged in
reboot  system boot 5.13.0-28-generic Mon Feb 7 00:11  still running
ankit-ja :0      :0      Sun Feb 6 10:55 - down  (00:00)
ankit-ja :0      :0      Sun Feb 6 07:09 - 10:55 (03:45)
reboot  system boot 5.13.0-28-generic Sun Feb 6 07:08 - 10:56 (03:47)
ankit-ja :0      :0      Sun Feb 6 00:45 - down  (04:16)
reboot  system boot 5.13.0-28-generic Sun Feb 6 00:44 - 05:02 (04:17)
ankit-ja :0      :0      Fri Feb 4 23:29 - down  (00:16)
reboot  system boot 5.13.0-28-generic Fri Feb 4 23:28 - 23:45 (00:17)
ankit-ja :0      :0      Fri Feb 4 23:20 - down  (00:04)
reboot  system boot 5.13.0-28-generic Fri Feb 4 23:17 - 23:25 (00:08)
```

```
wtmp begins Fri Feb 4 23:17:05 2022
ankit-jain@ubuntu:~/Desktop$ last -5
ankit-ja :0      :0      Mon Feb 7 00:12  still logged in
reboot  system boot 5.13.0-28-generic Mon Feb 7 00:11  still running
ankit-ja :0      :0      Sun Feb 6 10:55 - down  (00:00)
ankit-ja :0      :0      Sun Feb 6 07:09 - 10:55 (03:45)
reboot  system boot 5.13.0-28-generic Sun Feb 6 07:08 - 10:56 (03:47)
```

```
wtmp begins Fri Feb 4 23:17:05 2022
ankit-jain@ubuntu:~/Desktop$ last -a
ankit-ja :0      Mon Feb 7 00:12  still logged in  :0
reboot  system boot Mon Feb 7 00:11  still running  5.13.0-28-generic
ankit-ja :0      Sun Feb 6 10:55 - down  (00:00)  :0
ankit-ja :0      Sun Feb 6 07:09 - 10:55 (03:45)  :0
reboot  system boot Sun Feb 6 07:08 - 10:56 (03:47) 5.13.0-28-generic
ankit-ja :0      Sun Feb 6 00:45 - down  (04:16)  :0
reboot  system boot Sun Feb 6 00:44 - 05:02 (04:17) 5.13.0-28-generic
ankit-ja :0      Fri Feb 4 23:29 - down  (00:16)  :0
reboot  system boot Fri Feb 4 23:28 - 23:45 (00:17) 5.13.0-28-generic
ankit-ja :0      Fri Feb 4 23:20 - down  (00:04)  :0
reboot  system boot Fri Feb 4 23:17 - 23:25 (00:08) 5.13.0-28-generic
```

```
wtmp begins Fri Feb 4 23:17:05 2022
ankit-jain@ubuntu:~/Desktop$ [ ]
```

----- lastb command -----

The lastb command functions similarly to last. By default, lastb lists the contents of file **/var/log/btmp**, which contains all bad login attempts made on the system.

```
ankit-jain@ubuntu:~$ man lastb
ankit-jain@ubuntu:~$ sudo lastb
btmp begins Fri Feb  4 22:51:19 2022
ankit-jain@ubuntu:~$ 
```

----- reboot command -----

reboot command is used restart or reboot the system. In a Linux system administration, there comes a need to restart the server after the completion of some network and other major updates. It can be of software or hardware that are being carried on the server. The reboot is needed so that the changes that the user have done can be affected on the server.

SYNTAX = reboot [Options ..]

OPTIONS =

1. -halt : This option halt the machine, regardless of which one of the three commands is invoked.
2. -p, --poweroff : This option will going to power-off the machine, regardless of which one of the three commands is being invoked.

```
ankit-jain@ubuntu:~$ man reboot  
ankit-jain@ubuntu:~$ sudo reboot
```

----- shutdown command -----

The shutdown command in Linux is used to shutdown the system in a safe way. You can shutdown the machine immediately, or schedule a shutdown using 24 hour format. It brings the system down in a secure way. When the shutdown is initiated, all logged-in users and processes are notified that the system is going down, and no further logins are allowed

SYNTAX = shutdown [OPTIONS] [TIME] [MESSAGE]

OPTIONS =

1. **-r** : Requests that the system be rebooted after it has been brought down.
2. **-H** : Requests that the system be halted after it has been brought down.
3. **-P** : Requests that the system be powered off after it has been brought down.



[

```
ankit-jain@ubuntu:~$ sudo shutdown -r now
```



```
ankit-jain@ubuntu:~$ sudo shutdown -r +5
[sudo] password for ankit-jain:
Shutdown scheduled for Mon 2022-02-07 07:33:08 PST, use 'shutdown -c' to cancel.
ankit-jain@ubuntu:~$ sudo shutdown -c
ankit-jain@ubuntu:~$ sudo shutdown -r 02:00
Shutdown scheduled for Tue 2022-02-08 02:00:00 PST, use 'shutdown -c' to cancel.
ankit-jain@ubuntu:~$ sudo shutdown -c
ankit-jain@ubuntu:~$ sudo shutdown +10 "system update"
Shutdown scheduled for Mon 2022-02-07 07:45:25 PST, use 'shutdown -c' to cancel.
ankit-jain@ubuntu:~$ shutdown -c
ankit-jain@ubuntu:~$ sudo shutdown -H +5
Shutdown scheduled for Mon 2022-02-07 07:42:15 PST, use 'shutdown -c' to cancel.
ankit-jain@ubuntu:~$ shutdown -c
ankit-jain@ubuntu:~$
```



ankit-jain@ubuntu:~

Q E X

----- at command -----

at command is used to schedule a command to be executed at a particular time in the future. Jobs created with at command are executed only once. The at command can be used to execute any program or mail at any time in the future.

SYNTAX = at [OPTION...] runtime

OPTIONS =

1. **-l** = Command to list the user's pending jobs
2. **-r num** = at -r command is used to deletes job , here used to deletes job no 'num' .



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:

```
Activities Terminal ▾
Feb 7 08:46
ankit-jain@ubuntu: ~
ankit-jain@ubuntu:~$ at -l
4      Sun Feb 13 08:24:00 2022 a ankit-jain
3      Sun Feb 13 08:50:00 2022 a ankit-jain
1      Mon Feb 14 08:30:00 2022 a ankit-jain
ankit-jain@ubuntu:~$ at Friday +8 minutes
warning: commands will be executed using /bin/sh
at> ^Cankit-jain@ubuntu:~$ at 3pm + 4 days
warning: commands will be executed using /bin/sh
at> ^Cankit-jain@ubuntu:~$ at 2:45 090922
warning: commands will be executed using /bin/sh
ankit-jain@ubuntu:~$ at -l
4      Sun Feb 13 08:24:00 2022 a ankit-jain
3      Sun Feb 13 08:50:00 2022 a ankit-jain
1      Mon Feb 14 08:30:00 2022 a ankit-jain
ankit-jain@ubuntu:~$ at -r 1
ankit-jain@ubuntu:~$ at -l
4      Sun Feb 13 08:24:00 2022 a ankit-jain
3      Sun Feb 13 08:50:00 2022 a ankit-jain
ankit-jain@ubuntu:~$
```

----- apropos command -----

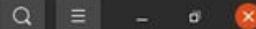
apropos command helps the user when they don't remember the exact command but knows a few keywords related to the command that define its uses or functionality. It searches the Linux man page with the help of the keyword provided by the user to find the command and its functions.

SYNTAX = apropos [OPTION..] KEYWORD...

```
ankit-jain@ubuntu:~$ man apropos
ankit-jain@ubuntu:~$ apropos compress
bunzip2 (1)          - a block-sorting file compressor, v1.0.8
bzcat (1)            - decompresses files to stdout
bzcmp (1)            - compare bzip2 compressed files
bzdiff (1)           - compare bzip2 compressed files
bzgrep (1)           - search possibly bzip2 compressed files for a regular expression
bzexe (1)            - compress executable files in place
bzfgrep (1)          - search possibly bzip2 compressed files for a regular expression
bzgrep (1)           - search possibly bzip2 compressed files for a regular expression
bzip2 (1)             - a block-sorting file compressor, v1.0.8
bzless (1)            - file perusal filter for crt viewing of bzip2 compressed text
bzmore (1)            - file perusal filter for crt viewing of bzip2 compressed text
Dpkg::Compression (3perl) - simple database of available compression methods
Dpkg::Compression::FileHandle (3perl) - object dealing transparently with file compression
Dpkg::Compression::Process (3perl) - run compression/decompression processes
fsck.cramfs (8)      - fsck compressed ROM file system
gunzip (1)            - compress or expand files
gzexe (1)             - compress executable files in place
gzip (1)              - compress or expand files
logrotate (8)          - rotates, compresses, and mails system logs
logrotate.conf (5)     - rotates, compresses, and mails system logs
lz4 (1)                - lz4, unlz4, lz4cat - Compress or decompress .lz4 files
lz4c (1)               - lz4, unlz4, lz4cat - Compress or decompress .lz4 files
lz4cat (1)             - lz4, unlz4, lz4cat - Compress or decompress .lz4 files
lzcatt (1)             - Compress or decompress .xz and .lzma files
lzcmp (1)              - compare compressed files
lzdifff (1)            - compare compressed files
lzegrep (1)            - search compressed files for a regular expression
lzfgrep (1)            - search compressed files for a regular expression
lzgrep (1)             - search compressed files for a regular expression
lzless (1)              - view xz or lzma compressed (text) files
lzma (1)                - Compress or decompress .xz and .lzma files
lzmore (1)              - view xz or lzma compressed (text) files
mkfs.cramfs (8)        - make compressed ROM file system
mkzftree (1)            - Create a zisofs/RockRidge compressed file tree
mscompress (1)          - compress data using LZ77 algorithm
msexpand (1)            - decompress data compressed using mscompress(1) or COMPRESS.EXE
precat (1)              - prefix delta compressor for Aspell
preunzip (1)            - prefix delta compressor for Aspell
prezip (1)              - prefix delta compressor for Aspell
prezip-bin (1)           - prefix zip delta word list compressor/decompressor
uncompress (1)           - compress or expand files
unlz4 (1)                - lz4, unlz4, lz4cat - Compress or decompress .lz4 files
unlzma (1)               - Compress or decompress .xz and .lzma files
unsquashfs (1)           - tool to uncompress squashfs filesystems
unxz (1)                 - Compress or decompress .xz and .lzma files
unzip (1)                 - list, test and extract compressed files in a ZIP archive
word-list-compress (1)    - word list compressor/decompressor for GNU Aspell
```



```
ankit-jain@ubuntu:~$ apropos search
apropos (1)           - search the manual page names and descriptions
apt-patterns (7)       - Syntax and semantics of apt search patterns
badblocks (8)          - search a device for bad blocks
bzgrep (1)              - search possibly bzip2 compressed files for a regular expression
bzfgrep (1)             - search possibly bzzip2 compressed files for a regular expression
bzgrep (1)              - search possibly bzip2 compressed files for a regular expression
find (1)                - search for files in a directory hierarchy
lzgrep (1)              - search compressed files for a regular expression
lzfgrep (1)             - search compressed files for a regular expression
lzgrep (1)              - search compressed files for a regular expression
manpath (1)             - determine search path for manual pages
tracker-search (1)       - Search for content by type or across all types
xzgrep (1)              - search compressed files for a regular expression
xzfgrep (1)             - search compressed files for a regular expression
xzgrep (1)              - search compressed files for a regular expression
zgrep (1)                - search possibly compressed files for a regular expression
zfgrep (1)              - search possibly compressed files for a regular expression
zgrep (1)                - search possibly compressed files for a regular expression
zipgrep (1)              - search files in a ZIP archive for lines matching a pattern
ankit-jain@ubuntu:~$
```

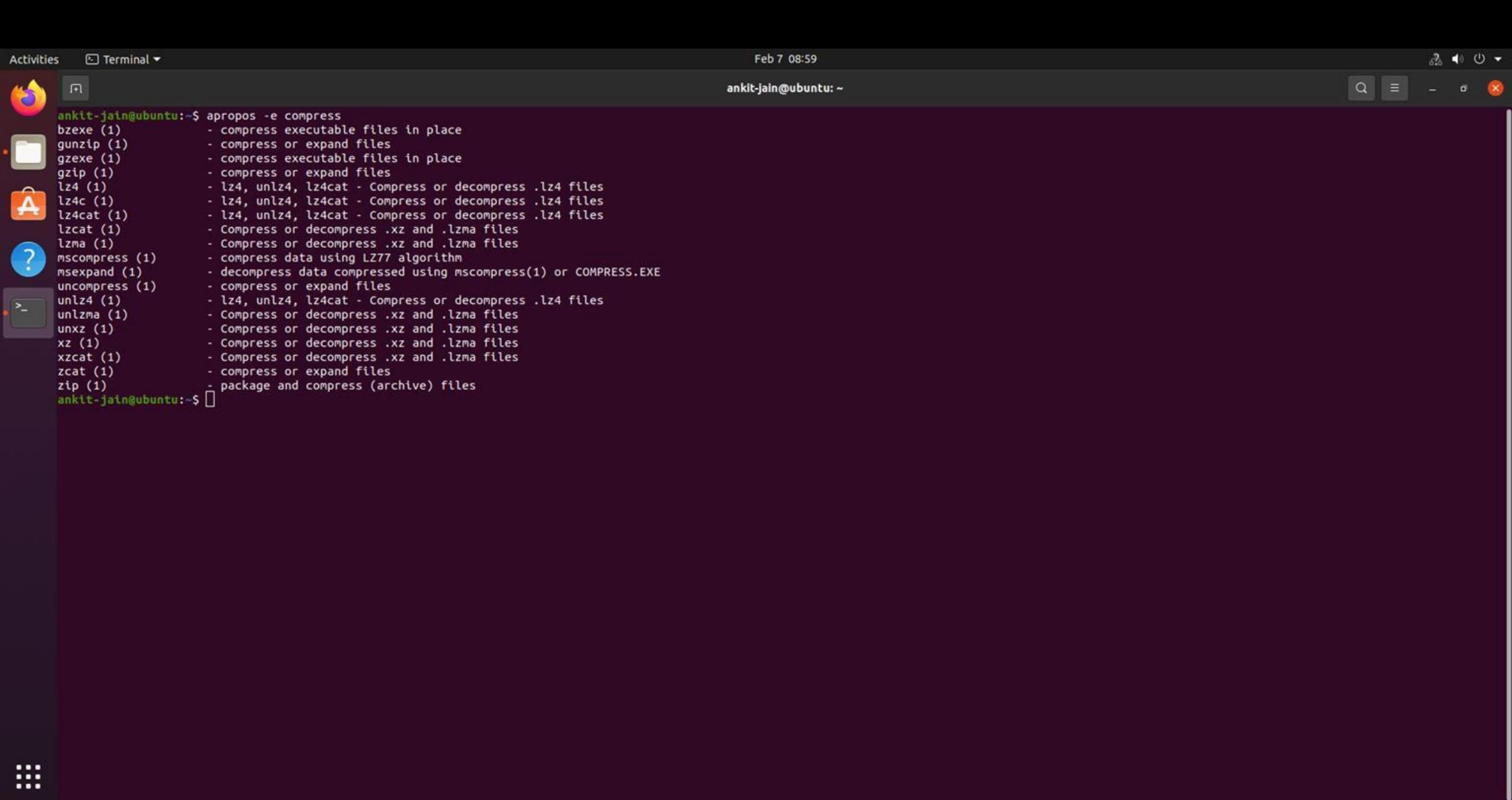




ankit-jain@ubuntu:~

```
ankit-jain@ubuntu:~$ apropos compress search
apropos (1)          - search the manual page names and descriptions
apt-patterns (7)      - Syntax and semantics of apt search patterns
badblocks (8)         - search a device for bad blocks
bunzip2 (1)           - a block-sorting file compressor, v1.0.8
bzip (1)               - decompresses files to stdout
bzcmp (1)              - compare bzip2 compressed files
bzdiff (1)             - compare bzip2 compressed files
bzegrep (1)            - search possibly bzip2 compressed files for a regular expression
bzexe (1)              - compress executable files in place
bzfgrep (1)            - search possibly bzip2 compressed files for a regular expression
bzgrep (1)              - search possibly bzip2 compressed files for a regular expression
bzip2 (1)               - a block-sorting file compressor, v1.0.8
bzless (1)              - file perusal filter for crt viewing of bzip2 compressed text
bzmore (1)              - file perusal filter for crt viewing of bzip2 compressed text
Dpkg::Compression (3perl) - simple database of available compression methods
Dpkg::Compression::FileHandle (3perl) - object dealing transparently with file compression
Dpkg::Compression::Process (3perl) - run compression/decompression processes
find (1)                - search for files in a directory hierarchy
fsck.cramfs (8)         - fsck compressed ROM file system
gunzip (1)               - compress or expand files
gzexe (1)                - compress executable files in place
gzip (1)                 - compress or expand files
logrotate (8)             - rotates, compresses, and mails system logs
logrotate.conf (5)        - rotates, compresses, and mails system logs
lz4 (1)                  - lz4, unlz4, lz4cat - Compress or decompress .lz4 files
lz4c (1)                 - lz4, unlz4, lz4cat - Compress or decompress .lz4 files
lz4cat (1)                - lz4, unlz4, lz4cat - Compress or decompress .lz4 files
lzcat (1)                 - Compress or decompress .xz and .lzma files
lzcmp (1)                 - compare compressed files
lzdif (1)                 - compare compressed files
lzgrep (1)                - search compressed files for a regular expression
lzfgrep (1)               - search compressed files for a regular expression
lzgrep (1)                - search compressed files for a regular expression
lzless (1)                - view xz or lzma compressed (text) files
lzma (1)                  - Compress or decompress .xz and .lzma files
lzmore (1)                - view xz or lzma compressed (text) files
manpath (1)               - determine search path for manual pages
mkfs.cramfs (8)            - make compressed ROM file system
mkzftree (1)              - Create a zisofs/RockRidge compressed file tree
mscompress (1)             - compress data using LZ77 algorithm
msexpand (1)               - decompress data compressed using mscompress(1) or COMPRESS.EXE
precat (1)                 - prefix delta compressor for Aspell
preunzip (1)               - prefix delta compressor for Aspell
prezip (1)                 - prefix delta compressor for Aspell
prezip-bin (1)              - prefix zip delta word list compressor/decompressor
tracker-search (1)          - Search for content by type or across all types
uncompress (1)              - compress or expand files
unlz4 (1)                 - lz4, unlz4, lz4cat - Compress or decompress .lz4 files
```

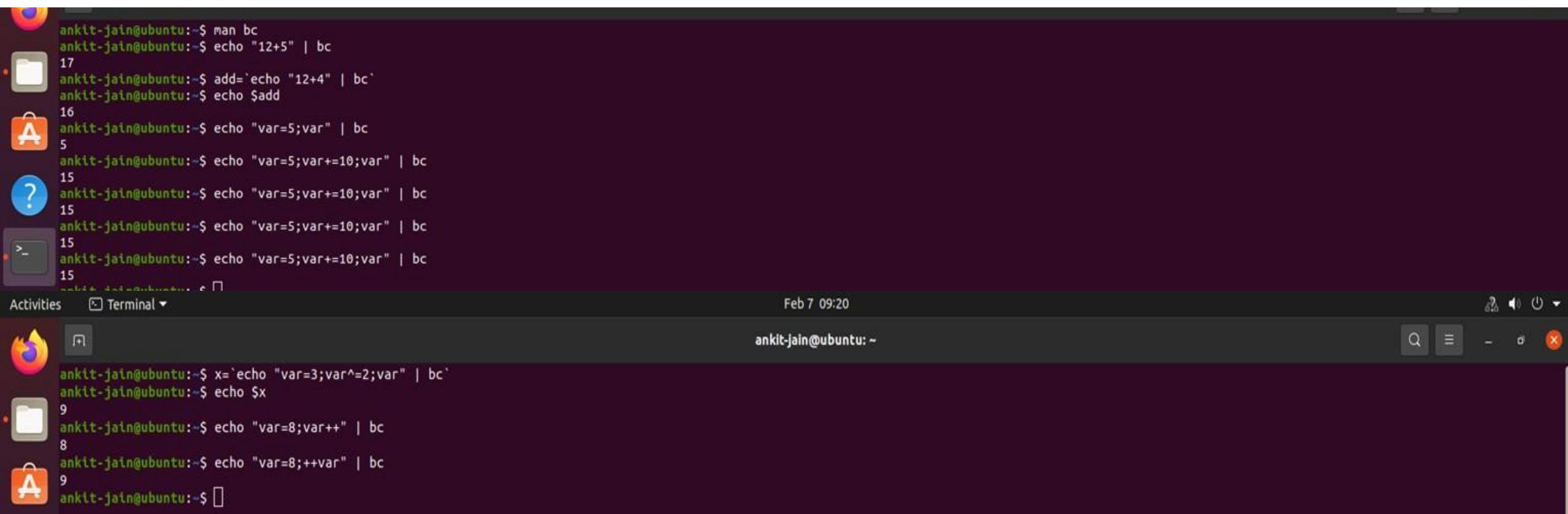




----- bc command -----

bc command is used for command line calculator. It is similar to basic calculator by using which we can do basic mathematical calculations.

Arithmetic operations are the most basic in any kind of programming language. Linux or Unix operating system provides the bc command and expr command for doing arithmetic calculations



The image shows a screenshot of an Ubuntu desktop environment. On the left, there's a dock with icons for the Dash, Home, Activities, and Terminal. The terminal window is open and displays several examples of the bc command:

```
ankit-jain@ubuntu:~$ man bc
ankit-jain@ubuntu:~$ echo "12+5" | bc
17
ankit-jain@ubuntu:~$ add=`echo "12+4" | bc`
ankit-jain@ubuntu:~$ echo $add
16
ankit-jain@ubuntu:~$ echo "var=5;var" | bc
5
ankit-jain@ubuntu:~$ echo "var=5;var+=10;var" | bc
15
```

At the bottom of the terminal window, it says "ankit-jain@ubuntu: ~". The status bar at the bottom of the screen shows the date and time as "Feb 7 09:20".

----- chown command -----

chown command is used to change the file Owner or group. Whenever you want to change ownership you can use chown command.

Different users in the operating system have ownership and permission to ensure that the files are secure and put restrictions on who can modify the contents of the files.

SYNTAX = chown [OPTIONS] USER[:GROUP] FILE(s)

OPTIONS =

1. **-c** = Reports when a file change is made
2. **-v** = It is used to show the verbose information for every file processed.

```
ankit-jain@ubuntu:~$ man chown
ankit-jain@ubuntu:~$ ls -l
total 304
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 00:57 -
drwxrwxr-x 5 ankit-jain ankit-jain 4096 Feb 7 00:53 department
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 7 05:23 Desktop
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 7 02:50 Documents
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 4 23:20 Downloads
-rw-rw-r-- 1 ankit-jain ankit-jain 112640 Feb 7 01:02 file1.tar
-rw-rw-r-- 1 ankit-jain ankit-jain 10240 Feb 7 01:01 files.tar
-rw-rw-r-- 1 ankit-jain ankit-jain 115 Feb 6 09:11 hello.txt
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 04:48 hello.txt
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 04:53 helLO.txt
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 04:42 HelloW.txt
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 04:53 Hellow.txt
-rw-rw-r-- 1 ankit-jain ankit-jain 10240 Feb 7 01:23 j
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 04:12 main.c
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 4 23:20 Music
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 00:57 p
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 01:49 photos
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 7 09:21 Pictures
-rw-rw-r-- 1 ankit-jain ankit-jain 188 Feb 7 01:25 sample1.tar.tbz
-rw-rw-r-- 1 ankit-jain ankit-jain 207 Feb 7 02:10 sample.tar.gz
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 4 23:20 Templates
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 4 23:20 Videos
-rw-rw-r-- 1 ankit-jain ankit-jain 112640 Feb 7 01:06 z
ankit-jain@ubuntu:~$ sudo chown root main.c
ankit-jain@ubuntu:~$ ls -l main.c
-rw-rw-r-- 1 root ankit-jain 0 Feb 6 04:12 main.c
ankit-jain@ubuntu:~$ sudo chown -c ankit-jain main.c
changed ownership of 'main.c' from root to ankit-jain
ankit-jain@ubuntu:~$ ls -l main.c
-rw-rw-r-- 1 ankit-jain ankit-jain 0 Feb 6 04:12 main.c
ankit-jain@ubuntu:~$ 
```

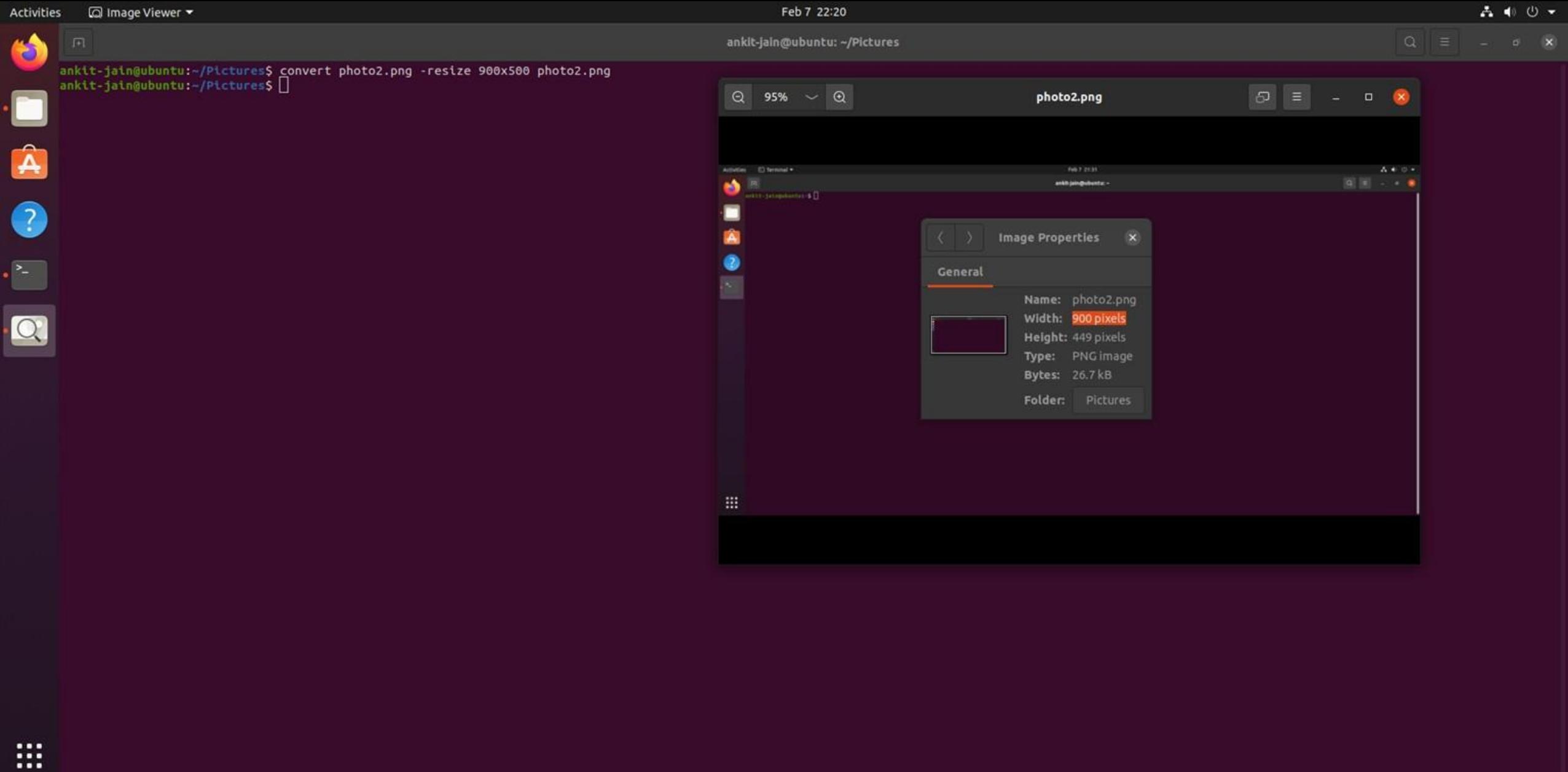
```
ankit-jain@ubuntu:~$ sudo chown -v :root main.c
changed ownership of 'main.c' from ankit-jain:ankit-jain to :root
ankit-jain@ubuntu:~$ ls -l main.c
-rw-rw-r-- 1 ankit-jain root 0 Feb 6 04:12 main.c
ankit-jain@ubuntu:~$ sudo chown -v :ankit-jain main.c
changed ownership of 'main.c' from ankit-jain:root to :ankit-jain
ankit-jain@ubuntu:~$ 
```

----- convert command -----

The convert command is used to =

1. convert one image format to another.
2. resize an image
3. rotate an image
4. adjusting of file size of image

```
ankit-jain@ubuntu:~/Pictures$ man convert
ankit-jain@ubuntu:~/Pictures$ ls
photo1.png photo2.png
ankit-jain@ubuntu:~/Pictures$ convert photo1.png newphoto1.jpg
ankit-jain@ubuntu:~/Pictures$ ls
newphoto1.jpg photo1.png photo2.png
ankit-jain@ubuntu:~/Pictures$ convert newphoto1.jpg newphoto1.png
ankit-jain@ubuntu:~/Pictures$ ls
newphoto1.jpg newphoto1.png photo1.png photo2.png
ankit-jain@ubuntu:~/Pictures$ 
```



Activities Image Viewer ▾

Feb 7 22:25



90% pho...

```
ankit-jain@ubuntu:~/Pictures$ convert photo2.png -rotate 90 photo2.png  
ankit-jain@ubuntu:~/Pictures$
```

----- diff command -----

diff stands for difference. This command is used to display the differences in the files by comparing the files line by line

it tells us which lines in one file have to be changed to make the two files identical.

SYNTAX = diff [options] File1 File2

OPTIONS =

1. -c = To view differences in context mode, use the -c option.
2. -u = To view differences in unified mode, use the -u option
3. -i = By default this command is *case sensitive*. To make this command *case in-sensitive* use -i option with diff

Terminal ▾

Terminal ▾

Feb 7 22:48

ankit-jain@ubuntu: ~/Documents

```
ankit-jain@ubuntu:~$ man diff
ankit-jain@ubuntu:~$ cd Documents/
ankit-jain@ubuntu:~/Documents$ ls
hello.txt hy.txt
ankit-jain@ubuntu:~/Documents$ cat hello.txt
hellow
good morning
have a great
unix commands
ankit-jain@ubuntu:~/Documents$ cat hy.txt
hello
good morning
have a great day
unix commands are important
ankit-jain@ubuntu:~/Documents$ diff hello.txt hy.txt
1c1
< hellow
---
> hello
3,4c3,4
< have a great
< unix commands
---
> have a great day
> unix commands are important
ankit-jain@ubuntu:~/Documents$ □
```

Activities Terminal ▾

Feb 7 22:55

ankit-jain@ubuntu: ~/Documents



```
ankit-jain@ubuntu:~/Documents$ cat hello.txt
hellow
good morning
have a great day
unix commands are important
fdkfdf
ankit-jain@ubuntu:~/Documents$ cat hy.txt
hello
good morning
have a great day
unix commands are important
ankit-jain@ubuntu:~/Documents$ diff hello.txt hy.txt
1c1
< hellow
---
> hello
5d4
< fdkfdf
ankit-jain@ubuntu:~/Documents$ diff -c hello.txt hy.txt
*** hello.txt 2022-02-07 22:49:19.190456905 -0800
--- hy.txt 2022-02-07 22:44:24.788222031 -0800
*****
*** 1,5 ****
! hellow
good morning
have a great day
unix commands are important
- fdkfdf
--- 1,4 ----
! hello
good morning
have a great day
unix commands are important
ankit-jain@ubuntu:~/Documents$
```

----- cmp command -----

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

When cmp is used for comparison between two files, it reports the location of the first mismatch to the screen if difference is found.

OPTIONS=

1. **-b** = If you want cmp displays the differing bytes in the output when used with -b option
- 2 **-i num** = this option when used with cmp command helps to skip a particular number of initial bytes from both the files and then after skipping it compares the files.
3. **-l** = This option makes the cmp command print byte position and byte value for all differing bytes.

```
ankit-jain@ubuntu:~/Documents$ cat hello.txt
```

```
hello  
good morning  
have a great day  
unix commands are important  
aoad
```

```
ankit-jain@ubuntu:~/Documents$ cat hy.txt
```

```
hello  
good morning  
have a great day  
unix commands are important  
good
```

```
ankit-jain@ubuntu:~/Documents$ cmp hello.txt hy.txt
```

```
hello.txt hy.txt differ: byte 65, line 5  
ankit-jain@ubuntu:~/Documents$ cmp -l 65 hello.txt hy.txt  
hello.txt hy.txt differ: byte 2, line 1  
ankit-jain@ubuntu:~/Documents$ cmp -b hello.txt hy.txt  
hello.txt hy.txt differ: byte 65, line 5 is 141 a 147 g  
ankit-jain@ubuntu:~/Documents$ cmp -s hello.txt hy.txt  
ankit-jain@ubuntu:~/Documents$ cmp -n 64 hello.txt hy.txt  
ankit-jain@ubuntu:~/Documents$
```

----- df command -----

df command that displays the amount of disk space available on the file system containing each file name argument. If no filename is provided, the free space on all currently mounted file systems is displayed.

SYNTAX = df [OPTION]... [FILE]...

OPTIONS =

- -a : It includes all the dummy files also in the output which are actually having zero block sizes.
- -t total : It is used to display the grand total for size.
- -h : It prints sizes in human readable format.
- -i : This option is used when you want to display the inode information instead of block usage.
- -l : This will display the disk usage of only local file systems.

```
ankit-jain@ubuntu:~$ man df  
ankit-jain@ubuntu:~$ df
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
udev	3018712	0	3018712	0%	/dev
tmpfs	610436	1828	608608	1%	/run
/dev/sda5	61145932	8621464	49388724	15%	/
tmpfs	3052176	0	3052176	0%	/dev/shm
tmpfs	5120	4	5116	1%	/run/lock
tmpfs	3052176	0	3052176	0%	/sys/fs/cgroup
/dev/loop0	56960	56960	0	100%	/snap/core18/2284
/dev/loop1	56832	56832	0	100%	/snap/core18/2128
/dev/loop2	63488	63488	0	100%	/snap/core20/1328
/dev/loop3	224256	224256	0	100%	/snap/gnome-3-34-1804/72
/dev/loop4	128	128	0	100%	/snap/bare/5
/dev/loop5	224256	224256	0	100%	/snap/gnome-3-34-1804/77
/dev/loop6	66688	66688	0	100%	/snap/gtk-common-themes/1515
/dev/loop7	66816	66816	0	100%	/snap/gtk-common-themes/1519
/dev/loop8	55552	55552	0	100%	/snap/snap-store/558
/dev/loop9	44544	44544	0	100%	/snap/snapd/14549
/dev/loop10	52224	52224	0	100%	/snap/snap-store/547
/dev/loop11	33152	33152	0	100%	/snap/snapd/12784
/dev/sda1	523248	4	523244	1%	/boot/efi
tmpfs	610432	24	610408	1%	/run/user/1000

```
ankit-jain@ubuntu:~$ df -h  
Filesystem      Size  Used Avail Use% Mounted on  
udev            2.9G   0    2.9G  0% /dev  
tmpfs           597M  1.8M  595M  1% /run  
/dev/sda5        59G   8.3G  48G  15% /  
tmpfs           3.0G   0    3.0G  0% /dev/shm  
tmpfs           5.0M  4.0K  5.0M  1% /run/lock  
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup  
/dev/loop0        56M   56M   0 100% /snap/core18/2284  
/dev/loop1        56M   56M   0 100% /snap/core18/2128  
/dev/loop2        62M   62M   0 100% /snap/core20/1328  
/dev/loop3        219M  219M   0 100% /snap/gnome-3-34-1804/72  
/dev/loop4        128K  128K   0 100% /snap/bare/5  
/dev/loop5        219M  219M   0 100% /snap/gnome-3-34-1804/77  
/dev/loop6        66M   66M   0 100% /snap/gtk-common-themes/1515  
/dev/loop7        66M   66M   0 100% /snap/gtk-common-themes/1519  
/dev/loop8        55M   55M   0 100% /snap/snap-store/558  
/dev/loop9        44M   44M   0 100% /snap/snapd/14549  
/dev/loop10       51M   51M   0 100% /snap/snap-store/547  
/dev/loop11       33M   33M   0 100% /snap/snapd/12784  
/dev/sda1         511M  4.0K  511M  1% /boot/efi  
tmpfs           597M  24K  597M  1% /run/user/1000
```

```
ankit-jain@ubuntu:~$ 
```



```
ankit-jain@ubuntu:~$ df -T
Filesystem      Type      1K-blocks   Used Available Use% Mounted on
udev            devtmpfs    3018712     0  3018712  0% /dev
tmpfs           tmpfs       610436   1828  608608  1% /run
/dev/sda5        ext4      61145932 8621776 49388412 15% /
tmpfs           tmpfs       3052176     0  3052176  0% /dev/shm
tmpfs           tmpfs       5120      4   5116  1% /run/lock
tmpfs           tmpfs       3052176     0  3052176  0% /sys/fs/cgroup
/dev/loop0       squashfs    56960    56960     0 100% /snap/core18/2284
/dev/loop1       squashfs    56832    56832     0 100% /snap/core18/2128
/dev/loop2       squashfs    63488    63488     0 100% /snap/core20/1328
/dev/loop3       squashfs   224256   224256     0 100% /snap/gnome-3-34-1804/72
/dev/loop4       squashfs    128      128     0 100% /snap/bare/5
/dev/loop5       squashfs   224256   224256     0 100% /snap/gnome-3-34-1804/77
/dev/loop6       squashfs   66688   66688     0 100% /snap/gtk-common-themes/1515
/dev/loop7       squashfs   66816   66816     0 100% /snap/gtk-common-themes/1519
/dev/loop8       squashfs   55552   55552     0 100% /snap/snap-store/558
/dev/loop9       squashfs   44544   44544     0 100% /snap/snapd/14549
/dev/loop10      squashfs   52224   52224     0 100% /snap/snap-store/547
/dev/loop11      squashfs   33152   33152     0 100% /snap/snapd/12704
/dev/sda1        vfat       523248     4   523244  1% /boot/efi
tmpfs           tmpfs       610432    24   610408  1% /run/user/1000
ankit-jain@ubuntu:~$ df -t tmpfs
Filesystem      1K-blocks   Used Available Use% Mounted on
tmpfs           610436   1828  608608  1% /run
tmpfs           3052176     0  3052176  0% /dev/shm
tmpfs           5120      4   5116  1% /run/lock
tmpfs           3052176     0  3052176  0% /sys/fs/cgroup
tmpfs           610432    24   610408  1% /run/user/1000
ankit-jain@ubuntu:~$ df -x tmpfs
Filesystem      1K-blocks   Used Available Use% Mounted on
udev            3018712     0  3018712  0% /dev
/dev/sda5        61145932 8621796 49388392 15% /
/dev/loop0       56960    56960     0 100% /snap/core18/2284
/dev/loop1       56832    56832     0 100% /snap/core18/2128
/dev/loop2       63488    63488     0 100% /snap/core20/1328
/dev/loop3       224256   224256     0 100% /snap/gnome-3-34-1804/72
/dev/loop4       128      128     0 100% /snap/bare/5
/dev/loop5       224256   224256     0 100% /snap/gnome-3-34-1804/77
/dev/loop6       66688   66688     0 100% /snap/gtk-common-themes/1515
/dev/loop7       66816   66816     0 100% /snap/gtk-common-themes/1519
/dev/loop8       55552   55552     0 100% /snap/snap-store/558
/dev/loop9       44544   44544     0 100% /snap/snapd/14549
/dev/loop10      52224   52224     0 100% /snap/snap-store/547
/dev/loop11      33152   33152     0 100% /snap/snapd/12704
/dev/sda1        523248     4   523244  1% /boot/efi
ankit-jain@ubuntu:~$ 
```

----- du command -----

du command, short for disk usage, is used to estimate file space usage. The du command can be used to track the files and directories which are consuming excessive amount of space on hard disk drive.

SYNTAX = du [OPTION]... [FILE]...

OPTIONS =

- 0, –null : end each output line with NULL
- a : write count of all files, not just directories
- c : produce grand total
- h : print sizes in human readable format

Activities Terminal ▾ Feb 8 07:59

ankit-jain@ubuntu:~\$ man du
ankit-jain@ubuntu:~\$ du

```
4 ./Music
4 ./cache/libgweather
4 ./cache/evolution/addressbook/trash
8 ./cache/evolution/addressbook
4 ./cache/evolution/memos/trash
8 ./cache/evolution/memos
4 ./cache/evolution/sources/trash
8 ./cache/evolution/sources
4 ./cache/evolution/tasks/trash
8 ./cache/evolution/tasks
4 ./cache/evolution/calendar/trash
8 ./cache/evolution/calendar
4 ./cache/evolution/mail/trash
8 ./cache/evolution/mail
52 ./cache/evolution
1228 ./cache-thumbnails/large
52 ./cache-thumbnails/fail/gnome-thumbnail-factory
56 ./cache-thumbnails/fail
172 ./cache-thumbnails/normal
1460 ./cache-thumbnails
4 ./cache/ibus-table
8 ./cache/ubuntu-report
4 ./cache/vmware/drag_and_drop/PXcf38
8 ./cache/vmware/drag_and_drop
12 ./cache/vmware
12 ./cache/update-manager-core
20 ./cache/ibus/bus
24 ./cache/ibus
360 ./cache/gstreamer-1.0
4436 ./cache/tracker
60 ./cache/fontconfig
6448 ./cache
4 ./Templates
4 ./gnupg/private-keys-v1.d
16 ./gnupg
4 ./Desktop
4 ./department/bsc
4 ./department/msc
4 ./department/btech/cse
4 ./department/btech/ece
4 ./department/btech/bme
16 ./department/btech
28 ./department
4 ./local/share/nautilus/scripts
8 ./local/share/nautilus
4 ./local/share/gnome-settings-daemon
4 ./local/share/evolution/addressbook/trash
```

```
ankit-jain@ubuntu:~$ du -a
4      ./Music
4      ./sample.tar.gz
12     ./files.tar
4      ./sample1.tar.tbz
4      ./profile
12     ./j
16     ./bash_history
4      ./cache/libgweather
4      ./cache/evolution/addressbook/trash
8       ./cache/evolution/addressbook
4      ./cache/evolution/memos/trash
8       ./cache/evolution/memos
4      ./cache/evolution/sources/trash
8       ./cache/evolution/sources
4      ./cache/evolution/tasks/trash
8       ./cache/evolution/tasks
4      ./cache/evolution/calendar/trash
8       ./cache/evolution/calendar
4      ./cache/evolution/mail/trash
8       ./cache/evolution/mail
52     ./cache/evolution
12     ./cache/event-sound-cache.tdb.b31d984526274d07b81704281d0a3d97.x86_64-pc-linux-gnu
12     ./cache-thumbnails/large/7140353f9c8a7bdf5460069d6d683545.png
20     ./cache-thumbnails/large/4ee78ae017b8c3432d01b62a15ad474.png
4      ./cache-thumbnails/large/ed2e2e520cba00e2b69965db3f1cc1b7.png
12     ./cache-thumbnails/large/14ba6c08c50b627afadb9d12f412bc72.png
12     ./cache-thumbnails/large/89cea9888b502bf33f69ad1fe978e8f5.png
12     ./cache-thumbnails/large/3a500f55c2dc3c3f437e4e0d207aeb0.png
8       ./cache-thumbnails/large/6657fe9ca6cf7ba55cbec81e49809164.png
24     ./cache-thumbnails/large/3b943e495e9cdefd7f168ffd881e2ba8.png
24     ./cache-thumbnails/large/4bd4d5ac9c0e3b9ea9c4630315b2f534.png
12     ./cache-thumbnails/large/bc560e345441f23c6f833dd26944f4a1.png
12     ./cache-thumbnails/large/8194db3f216062c4a88fb8d44bc931e9.png
12     ./cache-thumbnails/large/1cce7f40a08bbd1395e755f454c02d5.png
12     ./cache-thumbnails/large/d593fc90f51e1573558674be7e1f0dd5.png
8       ./cache-thumbnails/large/40efab8b752319a4a535c6b760d7f753c.png
4      ./cache-thumbnails/large/cc76c8097dff2c6a758fb5e850108dd5.png
8       ./cache-thumbnails/large/8f004b4f7bef0426eaf52c4bf8b2e467.png
16     ./cache-thumbnails/large/1f37367fae79be79eb71fcdb30a544f4.png
12     ./cache-thumbnails/large/6e0dff1c9cd7a0972ca154151b0cfec5.png
4      ./cache-thumbnails/large/87559b25df232c676ffffbb5febfc1f6.png
8       ./cache-thumbnails/large/8b9765e6f92f1973461b1f62463147f2.png
8       ./cache-thumbnails/large/6c8447c15670a537bc1cfbd4730b423c.png
16     ./cache-thumbnails/large/f3a3dc05115300da7e59fbaf98082860.png
8       ./cache-thumbnails/large/85e422e4d3806f64a1519b69767972a4.png
4      ./cache-thumbnails/large/5710fb09f2eedd678592b026d0e2c7a5.png
20     ./cache-thumbnails/large/95633d074d0312f49e5353a9b9bab0d.png
8       ./cache-thumbnails/large/3887eca0a2fdff87a8749ad2b0240caa.png
```

Activities Terminal ▾

Feb 8 08:00

2 0 0

Q E - o X

ankit-jain@ubuntu: ~

```
ankit-jain@ubuntu:~$ du -h
4.0K ./Music
4.0K ./cache/libgweather
4.0K ./cache/evolution/addressbook/trash
8.0K ./cache/evolution/addressbook
4.0K ./cache/evolution/memos/trash
8.0K ./cache/evolution/memos
4.0K ./cache/evolution/sources/trash
8.0K ./cache/evolution/sources
4.0K ./cache/evolution/tasks/trash
8.0K ./cache/evolution/tasks
4.0K ./cache/evolution/calendar/trash
8.0K ./cache/evolution/calendar
4.0K ./cache/evolution/mail/trash
8.0K ./cache/evolution/mail
52K ./cache/evolution
1.2M ./cache-thumbnails/large
52K ./cache-thumbnails/fail/gnome-thumbnail-factory
56K ./cache-thumbnails/fail
172K ./cache-thumbnails/normal
1.5M ./cache-thumbnails
4.0K ./cache/ibus-table
8.0K ./cache/ubuntu-report
4.0K ./cache/vmware/drag_and_drop/PXcf38
8.0K ./cache/vmware/drag_and_drop
12K ./cache/vmware
12K ./cache/update-manager-core
20K ./cache/ibus/bus
24K ./cache/ibus
360K ./cache/gstremer-1.0
4.4M ./cache/tracker
60K ./cache/fontconfig
6.4M ./cache
4.0K ./Templates
4.0K ./gnupg/private-keys-v1.d
16K ./gnupg
4.0K ./Desktop
4.0K ./department/bsc
4.0K ./department/msc
4.0K ./department/btech/cse
4.0K ./department/btech/ece
4.0K ./department/btech/bme
16K ./department/btech
28K ./department
4.0K ./local/share/nautilus/scripts
8.0K ./local/share/nautilus
4.0K ./local/share/gnome-settings-daemon
4.0K ./local/share/evolution/addressbook/trash
4.0K ./local/share/evolution/addressbook/system/photos
```

Activities Terminal ▾

Feb 8 08:01

2 0 0

Q E - o x

```
ankit-jain@ubuntu:~$ du ~/department/
4      /home/ankit-jain/department/bsc
4      /home/ankit-jain/department/msc
4      /home/ankit-jain/department/btech/cse
4      /home/ankit-jain/department/btech/ece
4      /home/ankit-jain/department/btech/bme
16     /home/ankit-jain/department/btech
28     /home/ankit-jain/department/
ankit-jain@ubuntu:~$
```

----- egrep command -----

egrep is a pattern searching command which belongs to the family of grep functions. It works the same way as grep -E does. It treats the pattern as an extended regular expression and prints out the lines that match the pattern.

SYNTAX = egrep [options] 'PATTERN' files

OPTIONS =

1. -c = Used to counts and prints the number of lines that matched the pattern and not the lines.
2. -v = It prints the lines that does not match with the pattern
3. -i = Ignore the case of the pattern while matching.
4. -l = Prints only the names of the files that matched. It does not mention the matching line numbers or any other information

Activities Terminal ▾

Feb 8 08:14

2 0 0

ankit-jain@ubuntu: ~/Documents

```
ankit-jain@ubuntu:~/Documents$ egrep have hello.txt
have a great day
ankit-jain@ubuntu:~/Documents$ egrep have hy.txt
have a great day
ankit-jain@ubuntu:~/Documents$ egrep day hello.txt hy.txt
hello.txt:have a great day
hy.txt:have a great day
ankit-jain@ubuntu:~/Documents$ egrep great *.txt
hello.txt:have a great day
hy.txt:have a great day
ankit-jain@ubuntu:~/Documents$ egrep -i HELlo hello.txt
Hello
ankit-jain@ubuntu:~/Documents$ egrep -w great hy.txt
have a great day
ankit-jain@ubuntu:~/Documents$
```

----- fgrep command -----

The *fgrep* filter is used to search for the fixed-character strings in a file. There can be multiple files also to be searched. This command is useful when you need to search for strings which contain lots of regular expression metacharacters, such as “^”, “\$”, etc.

SYNTAX = fgrep [options] [-e pattern_list] [pattern] [file]

OPTIONS =

- -c : It is used to print only a count of the lines which contain the pattern.
- -h : Used to display the matched lines.
- -i : During comparisons, it will ignore upper/lower case distinction.
- -l : Used to print the names of files with matching lines once, separated by new-lines. It will not repeat the names of files when the pattern is found more than once.
- -n : It is used precede each line by its line number in the file

```
ankit-jain@ubuntu:~/Documents$ man fgrep
ankit-jain@ubuntu:~/Documents$ cat hello.txt
hello
good morning
have a great day
unix commands are important
aoad
ankit-jain@ubuntu:~/Documents$ fgrep -c "are" hello.txt
1
ankit-jain@ubuntu:~/Documents$ fgrep -h "are" hello.txt
unix commands are important
ankit-jain@ubuntu:~/Documents$ fgrep -i "ARE" hello.txt
unix commands are important
ankit-jain@ubuntu:~/Documents$ fgrep -l "aoad" hy.txt hello.txt
hello.txt
ankit-jain@ubuntu:~/Documents$ fgrep -n "are" hello.txt
4:unix commands are important
ankit-jain@ubuntu:~/Documents$ fgrep -in "ArE" hy.txt
4:unix commands are important
ankit-jain@ubuntu:~/Documents$
```

ankit-jain@ubuntu: ~/Documents

Q E - o X

----- pgrep command -----

`pgrep` is a command-line utility that allows you to find the process IDs of a running program based on given criteria. It can be a full or partial process name, a user running the process, or other attributes

SYNTAX = `pgrep [OPTIONS] <PATTERN>`

Activities Terminal ▾

Feb 8 08:39

2 0 0

Q E - o x



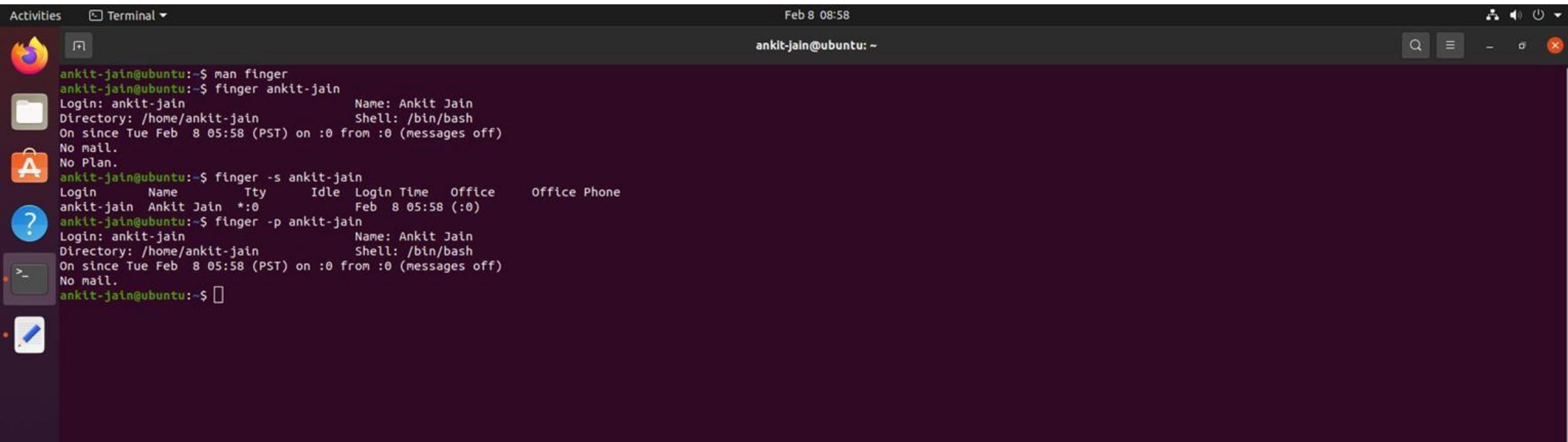
```
ankit-jain@ubuntu:~$ man pgrep  
ankit-jain@ubuntu:~$ pgrep ssh  
1618  
ankit-jain@ubuntu:~$ pgrep ssh -l  
1618 ssh-agent  
ankit-jain@ubuntu:~$ pgrep -u root  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
72  
73  
74  
75  
76  
77  
78  
79  
80  
82  
84  
85  
87  
88  
89  
90  
91  
92  
93  
94
```

```
ankit-jain@ubuntu:~$ pgrep -l -u ankit-jain
1440 systemd
1441 (sd-pam)
1446 pulseaudio
1449 tracker-miner-f
1451 dbus-daemon
1453 gnome-keyring-d
1457 gvfsd
1464 gvfsd-fuse
1482 gvfs-udisks2-vo
1486 gdm-x-session
1490 Xorg
1493 gvfs-mtp-volume
1499 gvfs-afc-volume
1504 gvfs-gphoto2-vo
1508 gvfs-goa-volume
1512 goa-daemon
1522 goa-identity-se
1551 gnome-session-b
1618 ssh-agent
1637 at-spi-bus-laun
1643 dbus-daemon
1647 gnome-session-c
1654 gnome-session-b
1668 gnome-shell
1690 ibus-daemon
1696 ibus-memconf
1697 ibus-extension-
1699 ibus-x11
1701 ibus-portal
1713 at-spi2-registr
1719 xdg-permission-
1724 gnome-shell-cal
1730 evolution-sourc
1740 evolution-calen
1748 dconf-service
1751 evolution-addre
1772 gjs
1774 gvfsd-trash
1793 gsd-a11y-settin
1794 gsd-color
1797 gsd-datetime
1802 gsd-housekeepin
1803 gsd-keyboard
1806 gsd-media-keys
1810 gsd-power
1812 gsd-print-notif
1815 gsd-rfkill
1818 gsd-screensaver
```

```
ankit-jain@ubuntu:~$ pgrep -c -u ankit-jain
65
ankit-jain@ubuntu:~$ pgrep -c -u root
200
```

----- finger command -----

finger command is a user information lookup command which gives details of all the users logged in. This tool is generally used by system administrators. It provides details like login name, user name, idle time, login time, and in some cases their email address even.



The image shows a screenshot of a Ubuntu desktop environment. On the left, there's a dock with icons for Dash, Home, File Explorer, Terminal, and others. The main area features a dark-themed window titled "Terminal". Inside the terminal, the user has run several "finger" commands:

```
ankit-jain@ubuntu:~$ man finger
ankit-jain@ubuntu:~$ finger ankit-jain
Login: ankit-jain          Name: Ankit Jain
Directory: /home/ankit-jain   Shell: /bin/bash
On since Tue Feb  8 05:58 (PST) on :0 from :0 (messages off)
No mail.
No Plan.

ankit-jain@ubuntu:~$ finger -s ankit-jain
Login      Name      Tty      Idle  Login Time  Office      Office Phone
ankit-jain  Ankit Jain *:0        Feb  8 05:58 (:0)

ankit-jain@ubuntu:~$ finger -p ankit-jain
Login: ankit-jain          Name: Ankit Jain
Directory: /home/ankit-jain   Shell: /bin/bash
On since Tue Feb  8 05:58 (PST) on :0 from :0 (messages off)
No mail.

ankit-jain@ubuntu:~$
```

----- cron and crontab command -----

It is a daemon process, which runs as a background process and performs the specified operations at the predefined time when a certain event or condition is triggered without the intervention of a user. It enables the users to execute the scheduled task on a regular basis unobtrusively

The crontab (abbreviation for “cron table”) is list of commands to execute the scheduled tasks at specific time. It allows the user to add, remove or modify the scheduled tasks. The crontab command syntax has six fields separated by space where the first five represent the time to run the task and the last one is for the command.

- Minute (holds a value between 0-59)
- Hour (holds value between 0-23)
- Day of Month (holds value between 1-31)
- Month of the year (holds a value between 1-12 or Jan-Dec, the first three letters of the month's name shall be used)
- Day of the week (holds a value between 0-6 or Sun-Sat, here also first three letters of the day shall be used)
- Command

Activities Terminal ▾

Feb 9 20:56

2 0 0

ankit-jain@ubuntu: ~/script

```
ankit-jain@ubuntu:~$ man cron
ankit-jain@ubuntu:~$ mkdir script
ankit-jain@ubuntu:~$ cd ~/script/
ankit-jain@ubuntu:~/script$ vim file1.sh
ankit-jain@ubuntu:~/script$ vim file2.sh
ankit-jain@ubuntu:~/script$ chmod u+x file1.sh
ankit-jain@ubuntu:~/script$ chmod u+x file2.sh
ankit-jain@ubuntu:~/script$ ls -l
total 8
-rwxrw-r-- 1 ankit-jain ankit-jain 57 Feb  9 20:52 file1.sh
-rwxrw-r-- 1 ankit-jain ankit-jain 55 Feb  9 20:53 file2.sh
ankit-jain@ubuntu:~/script$ cat file1.sh
#!/bin/bash

touch /home/ankit-jain/Documents/sample.txt
ankit-jain@ubuntu:~/script$ cat file2.sh
#!/bin/bas

mkdir /home/ankit-jain/Documents/newfolder
ankit-jain@ubuntu:~/script$ crontab -e
```

ankit-jain@ubuntu: ~/script

Q E X

```
ankit-jain@ubuntu: ~/script
8 21 * * * /home/ankit-jain/script/file1.sh
8 21 * * * /home/ankit-jain/script/file2.sh

# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command
~
```

ankit-jain@ubuntu: ~/script

X

:wd

Activities Files Feb 9 21:13 ankit-jain@ubuntu:~/script

The screenshot shows a Linux desktop environment with a terminal window and a file manager window.

Terminal Window:

```
ankit-jain@ubuntu:~$ man cron
ankit-jain@ubuntu:~$ mkdir script
ankit-jain@ubuntu:~$ cd ~/script/
ankit-jain@ubuntu:~/script$ vim file1.sh
ankit-jain@ubuntu:~/script$ vim file2.sh
ankit-jain@ubuntu:~/script$ chmod u+x file1.sh
ankit-jain@ubuntu:~/script$ chmod u+x file2.sh
ankit-jain@ubuntu:~/script$ ls -l
total 8
-rwxrw-r-- 1 ankit-jain ankit-jain 57 Feb  9 20:52 file1.sh
-rwxrw-r-- 1 ankit-jain ankit-jain 55 Feb  9 20:53 file2.sh
ankit-jain@ubuntu:~/script$ cat file1.sh
#!/bin/bash

touch /home/ankit-jain/Documents/sample.txt
ankit-jain@ubuntu:~/script$ cat file2.sh
#!/bin/bas

mkdir /home/ankit-jain/Documents/newfolder
ankit-jain@ubuntu:~/script$ crontab -
crontab: installing new crontab
ankit-jain@ubuntu:~/script$ ls -l
total 8
-rwxrw-r-- 1 ankit-jain ankit-jain 57 Feb  9 20:52 file1.sh
-rwxrw-r-- 1 ankit-jain ankit-jain 55 Feb  9 20:53 file2.sh
ankit-jain@ubuntu:~/script$ ls -l ~/Documents/
total 4
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb  9 21:12 newfolder
-rw-rw-r-- 1 ankit-jain ankit-jain     0 Feb  9 21:08 sample.txt
ankit-jain@ubuntu:~/script$
```

File Manager Window:

The file manager window shows the following contents:

- Recent
- Starred
- Home
- Desktop
- Documents** (selected)
- Downloads
- Music
- Pictures
- Videos
- Trash
- + Other Locations

In the Documents folder, there is a folder named "newfolder" and a file named "sample.txt".

----- date command -----

date command is used to display the system date and time. date command is also used to set date and time of the system. By default the date command displays the date in the time zone on which unix/linux operating system is configured.

OPTIONS =

1. **-u** = Displays the time in GMT(Greenwich Mean Time)/UTC(Coordinated Universal Time)time zone.
2. **-d** = Displays the given date string in the format of date.
3. **-s** = To set the system date and time -s or –set option is used.

Activities Terminal ▾

Feb 9 21:28

2 0 0

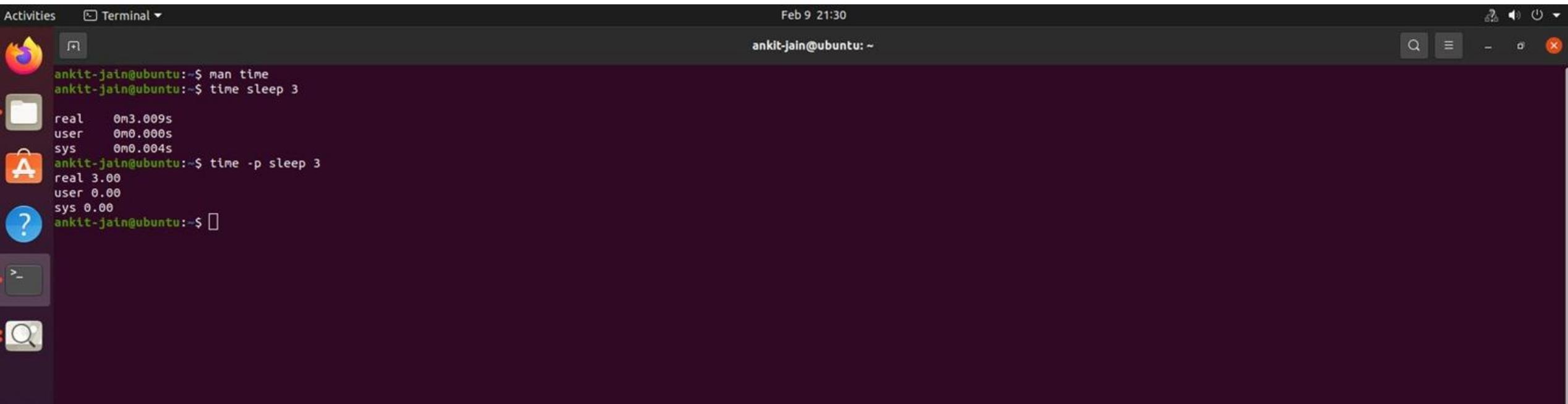
Q E - o x

```
ankit-jain@ubuntu:~$ man date
ankit-jain@ubuntu:~$ date
Wed 09 Feb 2022 09:21:54 PM IST
ankit-jain@ubuntu:~$ date -u
Wed 09 Feb 2022 03:52:28 PM UTC
ankit-jain@ubuntu:~$ date --date="2 year ago"
Sun 09 Feb 2020 09:24:14 PM IST
ankit-jain@ubuntu:~$ date --date="5 sec ago"
Wed 09 Feb 2022 09:24:36 PM IST
ankit-jain@ubuntu:~$ date --date="yesterday"
Tue 08 Feb 2022 09:25:52 PM IST
ankit-jain@ubuntu:~$ date --date="next tue"
Tue 15 Feb 2022 12:00:00 AM IST
ankit-jain@ubuntu:~$ 
```

----- time command -----

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

SYNTAX = time [option] [COMMAND]



A screenshot of a Ubuntu desktop environment. On the left, there's a dock with icons for the Dash, Home, Activities, Terminal, and Dash search. The main area shows a terminal window titled 'Terminal'. The terminal window has a dark background and light-colored text. It displays the following command-line session:

```
ankit-jain@ubuntu:~$ man time
ankit-jain@ubuntu:~$ time sleep 3
real    0m3.009s
user    0m0.000s
sys     0m0.004s
ankit-jain@ubuntu:~$ time -p sleep 3
real 3.00
user 0.00
sys 0.00
ankit-jain@ubuntu:~$
```

----- cat command -----

cat(concatenate) command is very frequently used in Linux. It reads data from the file and gives their content as output. It helps us to create, view, concatenate files.

SYNTAX = cat [options] [file] ...

OPTIONS =

1. **-n** = To view contents of a file preceding with line numbers.
2. **-s** = Cat command can suppress repeated empty lines in output

```
ankit-jain@ubuntu:~$ man cat
ankit-jain@ubuntu:~$ cat hello.txt
My name is Ankit Jain
2020btcse004
assignment 1 OS
Unix command
jaipur
ajmer
agra
udaipur
kishangarh
up
rajasthan
ankit-jain@ubuntu:~$ cat hello.txt hello.txt
My name is Ankit Jain
2020btcse004
assignment 1 OS
Unix command
jaipur
ajmer
agra
udaipur
kishangarh
up
rajasthan
hy
good morning
ankit-jain@ubuntu:~$ cat -n hello.txt
 1 hy
 2 good morning
ankit-jain@ubuntu:~$ cat > newfile.txt
good morning
have a nice day
ankit-jain@ubuntu:~$ cat newfile.txt
good morning
have a nice day
ankit-jain@ubuntu:~$ cat newfile.txt > hello.txt
ankit-jain@ubuntu:~$ cat hello.txt
good morning
have a nice day
ankit-jain@ubuntu:~$ cat hello.txt >> newfile.txt
ankit-jain@ubuntu:~$ cat newfile.txt
good morning
have a nice day
good morning
have a nice day
ankit-jain@ubuntu:~$
```

ankit-jain@ubuntu: ~

Q E - o x



```
ankit-jain@ubuntu:~$ cat hello.txt hello.txt newfile.txt > file1.txt
ankit-jain@ubuntu:~$ cat file1.txt
good morning
have a nice day
My name is Ankit Jain
2020btcse004
assignment 1 OS
Unix command
jatpur
ajmer
agra
udaipur
kishangarh
up
rajasthan
good morning
have a nice day
good morning
have a nice day
ankit-jain@ubuntu:~$
```



----- make command -----

The Linux make command is used to build and maintain groups of programs and files from the source code. The main motive of the make command is to determine a large program into parts and to check whether it needs to be recompiled or not. Also, it issues the necessary orders to recompile them.

```
ankit-jain@ubuntu:~$ man make
ankit-jain@ubuntu:~$ mkdir project
ankit-jain@ubuntu:~$ cd project/
ankit-jain@ubuntu:~/project$ vim Makefile
ankit-jain@ubuntu:~/project$ make
echo "hello world"
hello world
ankit-jain@ubuntu:~/project$ 
```

```
hello: echo "hello world"
```

----- ls Command -----

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

Important options :-

- (1) ls -l = To show long listing information about the file/directory.**
- (2) ls -a = list files or directories including hidden files or directories. In Linux, anything that begins with a . is considered a hidden file:**
- (3) ls -s =list files or directories with their sizes:**
- (4) ls -S = list files or directories and sort by size in descending order (biggest to smallest).**

You can also add a -r flag to reverse the sorting order like so ls -Sr

```
ankit-jain@ubuntu:~$ man ls
ankit-jain@ubuntu:~$ pwd
/home/ankit-jain
ankit-jain@ubuntu:~$ ls
- department Desktop Documents Downloads file1.txt file.txt hello.txt hello0.txt Music newfile.txt p photos Pictures project script snap Templates Videos
ankit-jain@ubuntu:~$ ls -a
- . bash_logout .cache department Documents file1.txt .gnupg hello.txt .local newfile.txt photos .profile script snap .sudo_as_admin_successful Videos
. .bash_history .bashrc .config Desktop Downloads file.txt hello.txt .lessht Music p Pictures project .selected_editor .ssh Templates .viminfo
ankit-jain@ubuntu:~$ ls -al
total 152
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 14:27 -
drwxr-xr-x 21 ankit-jain ankit-jain 4096 Feb 9 22:47 .
drwxr-xr-x 3 root root 4096 Feb 5 12:33 ..
-rw----- 1 ankit-jain ankit-jain 14967 Feb 9 21:13 .bash_history
-rw-r--r-- 1 ankit-jain ankit-jain 220 Feb 5 12:33 .bash_logout
-rw-r--r-- 1 ankit-jain ankit-jain 3771 Feb 5 12:33 .bashrc
drwx----- 13 ankit-jain ankit-jain 4096 Feb 8 10:54 .cache
drwx----- 15 ankit-jain ankit-jain 4096 Feb 7 16:23 .config
drwxrwxr-x 5 ankit-jain ankit-jain 4096 Feb 7 14:23 department
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 9 20:49 Desktop
drwxr-xr-x 3 ankit-jain ankit-jain 4096 Feb 9 21:12 Documents
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 5 12:50 Downloads
-rw-rw-r-- 1 ankit-jain ankit-jain 202 Feb 9 22:20 file1.txt
-rw-rw-r-- 1 ankit-jain ankit-jain 537 Feb 8 21:22 file.txt
drwx----- 3 ankit-jain ankit-jain 4096 Feb 9 18:20 .gnupg
-rw-rw-r-- 1 ankit-jain ankit-jain 115 Feb 6 22:41 hello.txt
-rw-rw-r-- 1 ankit-jain ankit-jain 29 Feb 9 22:17 hello0.txt
-rw----- 1 ankit-jain ankit-jain 28 Feb 8 22:36 .lessht
drwxr-xr-x 3 ankit-jain ankit-jain 4096 Feb 5 12:50 .local
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 5 12:50 Music
-rw-rw-r-- 1 ankit-jain ankit-jain 58 Feb 9 22:18 newfile.txt
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 14:27 p
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 6 15:19 photos
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 9 22:52 Pictures
-rw-r--r-- 1 ankit-jain ankit-jain 807 Feb 5 12:33 .profile
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 9 22:47 project
drwxrwxr-x 2 ankit-jain ankit-jain 4096 Feb 9 21:10 script
-rw-rw-r-- 1 ankit-jain ankit-jain 74 Feb 8 22:48 .selected_editor
drwx----- 3 ankit-jain ankit-jain 4096 Feb 8 11:54 snap
drwx----- 2 ankit-jain ankit-jain 4096 Feb 5 12:53 .ssh
-rw-r--r-- 1 ankit-jain ankit-jain 0 Feb 6 17:50 .sudo_as_admin_successful
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 5 12:50 Templates
drwxr-xr-x 2 ankit-jain ankit-jain 4096 Feb 5 12:50 Videos
-rw----- 1 ankit-jain ankit-jain 8930 Feb 9 22:47 .viminfo
ankit-jain@ubuntu:~$ 
```

Activities Terminal ▾

Feb 9 22:56

2 0 0

```
ankit-jain@ubuntu:~$ ls Documents/
newfolder sample.txt
ankit-jain@ubuntu:~$ ls Pictures/
'Screenshot from 2022-02-09 22-54-14.png'
ankit-jain@ubuntu:~$ ls -al script/
total 16
drwxrwxr-x  2 ankit-jain ankit-jain 4096 Feb  9 21:10 .
drwxr-xr-x 21 ankit-jain ankit-jain 4096 Feb  9 22:47 ..
-rwxrw-r--  1 ankit-jain ankit-jain   57 Feb  9 20:52 file1.sh
-rwxrw-r--  1 ankit-jain ankit-jain   55 Feb  9 20:53 file2.sh
ankit-jain@ubuntu:~$ █
```



----- **hostname Command** -----

hostname command in Linux is used to obtain the DNS(Domain Name System) name and set the system's hostname or NIS(Network Information System) domain name. A hostname is a name which is given to a computer and it attached to the network. Its main purpose is to uniquely identify over a network

SYNTAX = `hostname [option] [file]`

OPTIONS =

1. `-a` = This option is used to get alias name of the host system (if any)
2. `-A` = This option is used to get all FQDNs(Fully Qualified Domain Name) of the host system.

Activities Terminal ▾

Feb 9 23:03

2 0 0

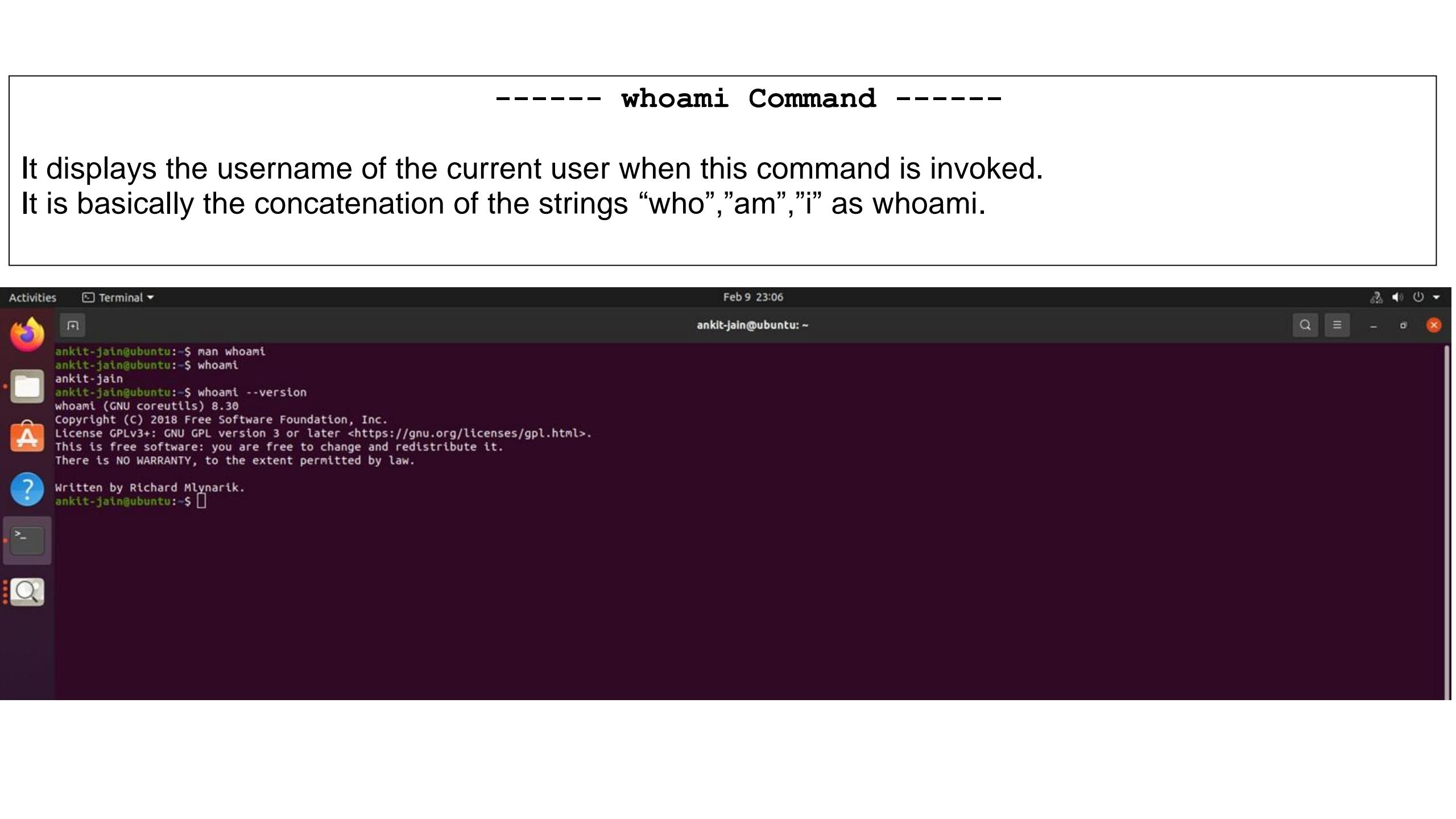


```
ankit-jain@ubuntu:~$ man hostname  
ankit-jain@ubuntu:~$ hostname  
ubuntu  
ankit-jain@ubuntu:~$ hostname -a  
ankit-jain@ubuntu:~$ hostname -A  
ankit-jain@ubuntu:~$ hostname -b  
ubuntu  
ankit-jain@ubuntu:~$ hostname -f  
ubuntu  
ankit-jain@ubuntu:~$ 
```



----- whoami Command -----

It displays the username of the current user when this command is invoked.
It is basically the concatenation of the strings “who”, “am”, “i” as whoami.

A screenshot of an Ubuntu desktop environment. On the left, there's a dock with icons for the Dash, Home, and other applications. The main area shows a terminal window titled "Terminal". The terminal window has a dark background and contains the following text:

```
ankit-jain@ubuntu:~$ man whoami
ankit-jain@ubuntu:~$ whoami
ankit-jain
ankit-jain@ubuntu:~$ whoami --version
whoami (GNU coreutils) 8.30
Copyright (C) 2018 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Richard Mlynarik.
ankit-jain@ubuntu:~$
```

The terminal window is located at the top of the screen, with the status bar showing the date and time as "Feb 9 23:06".

Activities Terminal ▾ Feb 9 23:06 ankit-jain@ubuntu: ~ Q E - x

```
ankit-jain@ubuntu:~$ man whoami
ankit-jain@ubuntu:~$ whoami
ankit-jain
ankit-jain@ubuntu:~$ whoami --version
whoami (GNU coreutils) 8.30
Copyright (C) 2018 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Richard Mlynarik.
ankit-jain@ubuntu:~$
```

----- **ln Command** -----

The ln command is used to create links between files.

Basically, ln command is used to create hard links and soft links for files in Linux

Symbolic links are most useful for avoiding complicated paths

Symbolic links make it easy to make some set of files appear to exist in multiple locations without having to make separate copies

Hard links are most useful for keeping file content in a single location by avoiding duplication of what might be a very large amount of data.

Activities Text Editor ▾

Feb 9 23:18

2 0 0



```
ankit-jain@ubuntu:~$ man ln  
ankit-jain@ubuntu:~$ vim program.py  
ankit-jain@ubuntu:~$ ln program.py linkfile.py  
ankit-jain@ubuntu:~$ python3 linkfile.py  
3  
ankit-jain@ubuntu:~$
```

Open Save

program.py

```
1 a = 3  
2 print(a)
```

Python Tab Width: 8 Ln 1, Col 1 INS

Activities Terminal ▾

Feb 9 23:27

2 4 0



```
ankit-jain@ubuntu:~$ cd Documents/  
ankit-jain@ubuntu:~/Documents$ vim program2.py  
ankit-jain@ubuntu:~/Documents$ ls  
dir linkfile.py program2.py program.py  
ankit-jain@ubuntu:~/Documents$ ln program2.py dir/  
ankit-jain@ubuntu:~/Documents$ cd dir/  
ankit-jain@ubuntu:~/Documents/dir$ ls  
program2.py  
ankit-jain@ubuntu:~/Documents/dir$ 
```



----- cp Command -----

cp stands for copy. This command is used to copy files or group of files or directory. It creates an exact image of a file on a disk with different file name. cp command require at least two filenames in its arguments.

SYNTAX =

cp [OPTION] Source Destination

cp [OPTION] Source Directory

cp [OPTION] Source-1 Source-2 Source-3 Source-n Directory

OPTIONS =

1. **-i** = stands for Interactive copying. With this option system first warns the user before overwriting the destination file.

2. **-b** = With this option cp command creates the backup of the destination file in the same folder with the different name and in different format.

3. **-r or -R** = Copying directory structure. With this option cp command shows its recursive behavior by copying the entire directory structure recursively.

Activities Terminal ▾

Feb 9 23:41

85 🔍 ⏹ ⏷ ⏸

```
ankit-jain@ubuntu:~$ ls
- department Desktop Documents Downloads file1.txt file.txt hello.txt hello0.txt Music newfile.txt p photos Pictures program project script snap Templates Videos
ankit-jain@ubuntu:~$ cat file1.txt
good morning
have a nice day
My name is Ankit Jain
2020btcse004

ankit-jain@ubuntu:~$ cat file.txt
ankit-jain@ubuntu:~$ cp file1.txt file.txt
ankit-jain@ubuntu:~$ cat file.txt
good morning
have a nice day
My name is Ankit Jain
2020btcse004

ankit-jain@ubuntu:~$ cp file1.txt file.txt Downloads/
ankit-jain@ubuntu:~$ ls Downloads/
file1.txt file.txt
```

```
ankit-jain@ubuntu:~$ cp -R Downloads/ Desktop/
ankit-jain@ubuntu:~$ ls Desktop/
Downloads
ankit-jain@ubuntu:~$ ls Desktop/Downloads/
file1.txt file.txt
ankit-jain@ubuntu:~$ █
```



----- su Command -----

The **su** (short for substitute or switch user) utility allows you to run commands with another user's privileges, by default the root user.

SYNTAX = `su [OPTIONS] [USER [ARGUMENT...]]`

```
ankit-jain@ubuntu:~$ man su
ankit-jain@ubuntu:~$ su ankit-2
Password:
ankit-2@ubuntu:/home/ankit-jain$ whoami
ankit-2
ankit-2@ubuntu:/home/ankit-jain$ cd ~
ankit-2@ubuntu:~$ pwd
/home/ankit-2
ankit-2@ubuntu:~$ 
```

----- login Command -----

On Unix-like operating systems, the login command begins a new login session on the system. We can also specify environment variables to be added to the user's environment.

SYNTAX = `login [-h HostName] [-p] [-f User] [User [Environment]]`

```
ankit-2@ubuntu:~$ man login  
ankit-2@ubuntu:~$ login: ankit-2
```

----- wall Command -----

wall command in Linux system is used to write a message to all users. This command displays a message, or the contents of a file, or otherwise its standard input, on the terminals of all currently logged in users.

SYNTAX = wall [-n] [-t timeout] [message | file]

```
ankit-2@ubuntu:~$ man wall
ankit-2@ubuntu:~$ wall -h
Usage:
wall [options] [<file> | <message>]
A Write a message to all users.
Options:
-g, --group <group>      only send message to group
-n, --nobanner            do not print banner, works only for root
-t, --timeout <timeout>   write timeout in seconds
-h, --help                 display this help
-V, --version              display version
For more details see wall(1).
ankit-2@ubuntu:~$ wall -V
wall from util-linux 2.34
ankit-2@ubuntu:~$ 
```

----- vi Command -----

The default editor that comes with the UNIX operating system is called vi (visual editor). Using vi editor, we can edit an existing file or create a new file from scratch. we can also use this editor to just read a text file.

SYNTAX = vi filename

There are following way you can start using vi editor :

1. vi filename: *Creates a new file if it already not exist, otherwise opens existing file.*
2. vi -R filename : Opens an existing file in read only mode.

----- vim Command -----

Vim is an advanced and highly configurable text editor built to enable efficient text editing.

On Unix-like operating systems, vim, which stands for "Vi Improved", is a text editor. It can be used for editing any kind of text and is especially suited for editing computer programs.

SYNTAX = vim [options] file

Activities Terminal ▾ Feb 10 14:30 ankit-jain@ubuntu: ~/script

ankit-jain@ubuntu: ~/script

```
#!/bin/bash
echo welcome ankit
a=2
b=3
c=$(expr $a + $b)
echo the sum of a and b is $c
```

ankit-jain@ubuntu: ~/script

```
ankit-jain@ubuntu:~$ man vim
ankit-jain@ubuntu:~$ cd script/
ankit-jain@ubuntu:~/script$ vim sample.sh
ankit-jain@ubuntu:~/script$ chmod u+x sample.sh
ankit-jain@ubuntu:~/script$ ./sample.sh
welcome ankit
the sum of a and b is 5
ankit-jain@ubuntu:~/script$
```

----- rename Command -----

rename command in Linux is used to rename the named files according to the regular expression *perlexpr*. It can change the name of the multiple files. If the user will not specify any file names on the command line with this command then it will take the file name from the standard input.

SYNTAX = rename [options] expression replacement file...

OPTION =

1. **-s** = This option renames the files ignoring the symbolic links.
2. **-v** = This option is used to show which files is being renamed, if there is any.
3. **-o** = This option will not going to overwrite the existing files.

```
ankit-jain@ubuntu:~/Downloads$ ls
abc.jpg cde.jpg file1.txt file.txt
ankit-jain@ubuntu:~/Downloads$ man rename
ankit-jain@ubuntu:~/Downloads$ rename 's/jpg/html/' *.jpg
ankit-jain@ubuntu:~/Downloads$ ls
abc.html cde.html file1.txt file.txt
ankit-jain@ubuntu:~/Downloads$ rename 's/abc/pqr/' *.html
ankit-jain@ubuntu:~/Downloads$ ls
cde.html file1.txt file.txt pqr.html
ankit-jain@ubuntu:~/Downloads$
```


----- kill Command -----

kill command in Linux (located in /bin/kill), is a built-in command which is used to terminate processes manually. kill command sends a signal to a process which terminates the process. If the user doesn't specify any signal which is to be sent along with kill command then default *TERM* signal is sent that terminates the process

OPTIONS =

1. kill -l = To display all the available signals.
2. kill pid = kill the process having particular pid

ankit-jain@ubuntu: ~/Downloads

```
ankit-jain@ubuntu:~/Downloads$ man kill
ankit-jain@ubuntu:~/Downloads$ ps
  PID TTY      TIME CMD
 3138 pts/0    00:00:00 bash
 5585 pts/0    00:00:00 ping
 5629 pts/0    00:00:00 ps
ankit-jain@ubuntu:~/Downloads$ kill -9 5585
[1]+  Killed                  ping www.google.com
ankit-jain@ubuntu:~/Downloads$ ping www.flipkart.com
^Z
[1]+  Stopped                  ping www.flipkart.com
ankit-jain@ubuntu:~/Downloads$ ping www.curaj.ac.in
^Z
[2]+  Stopped                  ping www.curaj.ac.in
ankit-jain@ubuntu:~/Downloads$ ps
  PID TTY      TIME CMD
 3138 pts/0    00:00:00 bash
 5633 pts/0    00:00:00 ping
 5634 pts/0    00:00:00 ping
 5635 pts/0    00:00:00 ps
ankit-jain@ubuntu:~/Downloads$ kill -9 5633 5634
[1]-  Killed                  ping www.flipkart.com
[2]+  Killed                  ping www.curaj.ac.in
ankit-jain@ubuntu:~/Downloads$ ps
  PID TTY      TIME CMD
 3138 pts/0    00:00:00 bash
 5636 pts/0    00:00:00 ps
ankit-jain@ubuntu:~/Downloads$ 
```

----- fdisk Command -----

fdisk also known as format disk is a dialog-driven command in Linux used for creating and manipulating disk partition table. It is used for the view, create, delete, change, resize, copy and move partitions on a hard drive using the dialog-driven interface.

SYNTAX = fdisk [options] device

OPTIONS =

1. **-l** = view all disk partition

ankit-jain@ubuntu:~

```
ankit-jain@ubuntu:~$ man fdisk
ankit-jain@ubuntu:~$ sudo fdisk -l
[sudo] password for ankit-jain:
Disk /dev/loop0: 55.45 MiB, 58130432 bytes, 113536 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
Disk /dev/loop1: 4 KiB, 4096 bytes, 8 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
Disk /dev/loop2: 55.52 MiB, 58204160 bytes, 113680 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
Disk /dev/loop3: 219 MiB, 229638144 bytes, 448512 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
Disk /dev/loop4: 61.93 MiB, 64917504 bytes, 126792 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
Disk /dev/loop5: 219 MiB, 229638144 bytes, 448512 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
Disk /dev/loop6: 65.1 MiB, 68259840 bytes, 133320 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
Disk /dev/loop7: 65.22 MiB, 68378624 bytes, 133552 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/loop7: 65.22 MiB, 68378624 bytes, 133552 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/sda: 60 GiB, 64424509440 bytes, 125829120 sectors
Disk model: VMware Virtual S
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x19966ccf

Device      Boot   Start     End   Sectors  Size Id Type
/dev/sda1    *      2048  1050623   1048576  512M  b W95 FAT32
/dev/sda2        1052670 125827071 124774402 59.5G  5 Extended
/dev/sda5        1052672 125827071 124774400 59.5G  83 Linux

Disk /dev/loop8: 54.24 MiB, 56872960 bytes, 111080 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/loop9: 50.98 MiB, 53432320 bytes, 104360 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/loop10: 43.44 MiB, 45543424 bytes, 88952 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/loop11: 32.3 MiB, 33865728 bytes, 66144 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
ankit-jain@ubuntu:~$ 
```



```
ankit-jain@ubuntu:~$ sudo fdisk -l /dev/sda
Disk /dev/sda: 60 GiB, 64424509440 bytes, 125829120 sectors
Disk model: VMware Virtual S
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x19966ccf
```

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sda1	*	2048	1050623	1048576	512M	b	W95 FAT32
/dev/sda2		1052670	125827071	124774402	59.5G	5	Extended
/dev/sda5		1052672	125827071	124774400	59.5G	83	Linux

```
ankit-jain@ubuntu:~$ sudo fdisk /dev/sda
```

```
Welcome to fdisk (util-linux 2.34).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.
```

```
Command (m for help): m
```

```
Help:
```

DOS (MBR)
a toggle a bootable flag
b edit nested BSD disklabel
c toggle the dos compatibility flag

Generic
d delete a partition
F list free unpartitioned space
l list known partition types
n add a new partition
p print the partition table
t change a partition type
v verify the partition table
i print information about a partition

Misc
m print this menu
u change display/entry units
x extra functionality (experts only)

Script
I load disk layout from sfdisk script file
O dump disk layout to sfdisk script file

Save & Exit

----- md5sum Command -----

The md5sum is designed to verify data integrity using MD5 (Message Digest Algorithm 5). MD5 is 128-bit cryptographic hash and if used properly it can be used to verify file authenticity and integrity.

SYNTAX = md5sum [OPTION]... [FILE]...

```
ankit-jain@ubuntu:~$ man md5sum
ankit-jain@ubuntu:~$ md5sum ~/Downloads/file1.txt
d32b013cd6733963ad024ab6f0bfff16  /home/ankit-jain/Downloads/file1.txt
ankit-jain@ubuntu:~$ md5sum ~/Downloads/file1.txt > check.md5
ankit-jain@ubuntu:~$ md5sum -c check.md5
/home/ankit-jain/Downloads/file1.txt: OK
ankit-jain@ubuntu:~$ 
```

----- **dpkg Command** -----

dpkg is software at the package management base within the free OS Debian and its several derivatives. In Debian, it is the Debian-based system and primary package management program. It is used for installing, building, removing, and managing several packages.

```
ankit-jain@ubuntu:~$ man dpkg
ankit-jain@ubuntu:~$ dpkg -l
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Inst/Conf-files/Unpacked/half-conf/Half-inst/trig-aWait/Trig-pend
||/ Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
/// Name                                Version                         Architecture Description
====-=====
ii accountsservice                      0.6.55-0ubuntu12~20.04.5      amd64   query and manipulate user account information
ii acl                                 2.2.53-6                      amd64   access control list - utilities
ii acpi-support                         0.143                          amd64   scripts for handling many ACPI events
ii acpid                               1:2.0.32-1ubuntu1              amd64   Advanced Configuration and Power Interface event daemon
ii adduser                             3.118ubuntu2                  all     add and remove users and groups
ii adwaita-icon-theme                   3.36.1-2ubuntu0.20.04.2       all     default icon theme of GNOME (small subset)
ii alsa-base                            1.0.25+dfsg-0ubuntu5          all     ALSA driver configuration files
ii alsa-topology-conf                  1.2.2-1                        all     ALSA topology configuration files
ii alsa-ucm-conf                        1.2.2-1ubuntu0.9              all     ALSA Use Case Manager configuration files
ii alsa-utils                           1.2.2-1ubuntu2.1              amd64   Utilities for configuring and using ALSA
ii amd64-microcode                     3.20191218.1ubuntu1           amd64   Processor microcode firmware for AMD CPUs
ii anacron                            2.3-29                         amd64   cron-like program that doesn't go by time
ii apg                                2.2.3.dfsg.1-5                amd64   Automated Password Generator - Standalone version
ii app-install-data-partner            19.04                          all     Application Installer (data files for partner applications/repositories)
ii apparmor                           2.13.3-7ubuntu5.1             amd64   user-space parser utility for AppArmor
ii apport                             2.20.11-0ubuntu27.21          all     automatically generate crash reports for debugging
ii apport-gtk                          2.20.11-0ubuntu27.21          all     GTK+ frontend for the apport crash report system
ii apport-symptoms                    0.23                           all     symptom scripts for apport
ii appstream                          0.12.10-2                      amd64   Software component metadata management
ii apt                                2.0.6                           amd64   commandline package manager
ii apt-config-icons                   0.12.10-2                      all     APT configuration snippet to enable icon downloads
ii apt-config-icons-hidpi            0.12.10-2                      all     APT configuration snippet to enable HiDPI icon downloads
ii apt-utils                           2.0.6                           amd64   package management related utility programs
ii aptdaemon                          1.1.1+bzr982-0ubuntu32.3       all     transaction based package management service
ii aptdaemon-data                     1.1.1+bzr982-0ubuntu32.3       all     data files for clients
ii apturl                             0.5.2ubuntu19                 amd64   install packages using the apt protocol - GTK+ frontend
ii apturl-common                      0.5.2ubuntu19                 amd64   install packages using the apt protocol - common data
ii aspell                             0.60.8-1ubuntu0.1              amd64   GNU Aspell spell-checker
ii aspell-en                          2018.04.16-0-1                all     English dictionary for GNU Aspell
ii at                                3.1.23-1ubuntu1               amd64   Delayed job execution and batch processing
ii at-spi2-core                       2.36.0-2                      amd64   Assistive Technology Service Provider Interface (dbus core)
ii avahi-autoipd                      0.7-4ubuntu7.1                amd64   Avahi IPv4LL network address configuration daemon
ii avahi-daemon                       0.7-4ubuntu7.1                amd64   Avahi mDNS/DNS-SD daemon
ii avahi-utils                        0.7-4ubuntu7.1                amd64   Avahi browsing, publishing and discovery utilities
ii base-files                         11ubuntu5.4                  amd64   Debian base system miscellaneous files
ii base-passwd                        3.5.47                         amd64   Debian base system master password and group files
ii bash                              5.0-6ubuntu1.1                amd64   GNU Bourne Again SHell
ii bash-completion                    1:2.10-1ubuntu1               all     programmable completion for the bash shell
ii bc                                1.07.1-2build1               amd64   GNU bc arbitrary precision calculator language
ii bind9-dnsutils                     1:9.16.1-0ubuntu2.9             amd64   Clients provided with BIND 9
ii bind9-host                          1:9.16.1-0ubuntu2.9             amd64   DNS Lookup Utility
ii bind9-libs:amd64                   1:9.16.1-0ubuntu2.9             amd64   Shared Libraries used by BIND 9
```

```
ankit-jain@ubuntu:~$ dpkg -l appstream
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Inst/Conf-files/Unpacked/half-inst/trig-aWait/Trig-pend
||/ Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
||/ Name          Version       Architecture Description
+++-+-----+-----+-----+-----+
ii  appstream    0.12.10-2   amd64      Software component metadata management
```

----- **dmesg Command** -----

dmesg command also called as “driver message” or “display message” is used to examine the kernel ring buffer and print the message buffer of kernel. The output of this command contains the messages produced by the device drivers.

SYNTAX = dmesg [options]

Activities Terminal ▾ Feb 10 17:22

ankit-jain@ubuntu:~

```
ankit-jain@ubuntu:~$ man dmesg
ankit-jain@ubuntu:~$ sudo dmesg
[sudo] password for ankit-jain:
[    0.000000] Linux version 5.13.0-28-generic (buildd@lgw01-amd64-035) (gcc (Ubuntu 9.3.0-17ubuntu1~20.04) 9.3.0, GNU ld (GNU Binutils for Ubuntu) 2.34) #31~20.04.1-Ubuntu SMP Wed Jan 19 14:08:10 UTC 20
22 (Ubuntu 5.13.0-28.31-20.04.1-generic 5.13.19)
[    0.000000] Command line: BOOT_IMAGE=/boot/vmlinuz-5.13.0-28-generic root=UUID=3561732a-62e2-41ac-88be-f3e8f4c4f661 ro find_preseed=/preseed.cfg auto noprompt priority=critical locale=en_US quiet
[    0.000000] KERNEL supported cpus:
[    0.000000]   Intel GenuineIntel
[    0.000000]   AMD AuthenticAMD
[    0.000000]   Hygon HygonGenuine
[    0.000000]   Centaur CentaurHauls
[    0.000000]   zhixin Shanghai
[    0.000000] [Firmware Bug]: TSC doesn't count with P0 frequency!
[    0.000000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point registers'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
[    0.000000] x86/fpu: xstate_offset[2]: 576, xstate_sizes[2]: 256
[    0.000000] x86/fpu: Enabled xstate features 0x7, context size is 832 bytes, using 'compacted' format.
[    0.000000] BIOS-provided physical RAM map:
[    0.000000] BIOS-e820: [mem 0x0000000000000000-0x000000000009e7ff] usable
[    0.000000] BIOS-e820: [mem 0x000000000009e800-0x000000000009ffff] reserved
[    0.000000] BIOS-e820: [mem 0x0000000000dc000-0x000000000000ffff] reserved
[    0.000000] BIOS-e820: [mem 0x0000000000100000-0x00000000bfecffff] usable
[    0.000000] BIOS-e820: [mem 0x000000000bfed0000-0x00000000bfefffff] ACPI data
[    0.000000] BIOS-e820: [mem 0x000000000bfefff000-0x00000000bfefffff] ACPI NVS
[    0.000000] BIOS-e820: [mem 0x000000000bffff000-0x00000000bfffffff] usable
[    0.000000] BIOS-e820: [mem 0x000000000f000000-0x000000000f7fffff] reserved
[    0.000000] BIOS-e820: [mem 0x000000000fec00000-0x000000000fec0ffff] reserved
[    0.000000] BIOS-e820: [mem 0x000000000fee00000-0x000000000fee0ffff] reserved
[    0.000000] BIOS-e820: [mem 0x000000000fffe0000-0x000000000ffffffff] reserved
[    0.000000] BIOS-e820: [mem 0x0000000100000000-0x00000001c3fffff] usable
[    0.000000] NX (Execute Disable) protection: active
[    0.000000] SMBIOS 2.7 present.
[    0.000000] DMI: VMware, Inc. VMware Virtual Platform/440BX Desktop Reference Platform, BIOS 6.00 11/12/2020
[    0.000000] vmware: hypercall mode: 0x01
[    0.000000] Hypervisor detected: VMware
[    0.000000] vmware: TSC freq read from hypervisor : 2595.038 MHz
[    0.000000] vmware: Host bus clock speed read from hypervisor : 66000000 Hz
[    0.000000] vmware: using clock offset of 69499682543 ns
[    0.000067] tsc: Detected 2595.038 MHz processor
[    0.003727] e820: update [mem 0x00000000-0x00000fff] usable ==> reserved
[    0.003739] e820: remove [mem 0x000a0000-0x000fffff] usable
[    0.003753] last_pfn = 0x1c4000 max_arch_pfn = 0x40000000
[    0.003942] x86/PAT: Configuration [0-7]: WB WC UC- UC WB WP UC- WT
[    0.003977] total RAM covered: 130048M
[    0.004992] Found optimal setting for mtrr clean up
[    0.004995] gran_size: 64K chunk_size: 64K num_reg: 7 lose cover RAM: 0G
[    0.005187] e820: update [mem 0xc0000000-0xffffffff] usable ==> reserved
[    0.005217] last pfn = 0xc0000 max arch pfn = 0x40000000
```

```
ankit-jain@ubuntu:~$ sudo dmesg | less
```

```
[ 0.000000] Linux version 5.13.0-28-generic (buildd@lgw01-amd64-035) (gcc (Ubuntu 9.3.0-17ubuntu1-20.04) 9.3.0, GNU ld (GNU Binutils for Ubuntu) 2.34) #31-20.04.1-Ubuntu SMP Wed Jan 19 14:08:10 UTC 2022 (Ubuntu 5.13.0-28.31~20.04.1-generic 5.13.19)
[ 0.000000] Command line: BOOT_IMAGE=/boot/vmlinuz-5.13.0-28-generic root=UUID=3561732a-62e2-41ac-88be-f3e8f4c4f661 ro find_preseed=/preseed.cfg auto noprompt priority=critical locale=en_US quiet
[ 0.000000] KERNEL supported cpus:
[ 0.000000]   Intel GenuineIntel
[ 0.000000]   AMD AuthenticAMD
[ 0.000000]   Hygon HygonGenuine
[ 0.000000]   Centaur CentaurHauls
[ 0.000000]   zhaixin Shanghai
[ 0.000000] [Firmware Bug]: TSC doesn't count with P0 frequency!
[ 0.000000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point registers'
[ 0.000000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
[ 0.000000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
[ 0.000000] x86/fpu: xstate_offset[2]: 576, xstate_sizes[2]: 256
[ 0.000000] x86/fpu: Enabled xstate features 0x7, context size is 832 bytes, using 'compacted' format.
[ 0.000000] BIOS-provided physical RAM map:
[ 0.000000] BIOS-e820: [mem 0x0000000000000000-0x0000000000009e7ff] usable
[ 0.000000] BIOS-e820: [mem 0x0000000000009e800-0x0000000000009ffff] reserved
[ 0.000000] BIOS-e820: [mem 0x0000000000dc000-0x000000000000fffff] reserved
[ 0.000000] BIOS-e820: [mem 0x0000000000100000-0x000000000bfecffff] usable
[ 0.000000] BIOS-e820: [mem 0x000000000bfed0000-0x000000000bfefefff] ACPI data
[ 0.000000] BIOS-e820: [mem 0x000000000bfeff000-0x000000000bfefffff] ACPI NVS
[ 0.000000] BIOS-e820: [mem 0x000000000bfff0000-0x000000000bfffffff] usable
[ 0.000000] BIOS-e820: [mem 0x000000000f000000-0x000000000f7fffff] reserved
[ 0.000000] BIOS-e820: [mem 0x000000000fec0000-0x000000000fec0fff] reserved
[ 0.000000] BIOS-e820: [mem 0x000000000fee00000-0x000000000fee00ff] reserved
[ 0.000000] BIOS-e820: [mem 0x000000000fffe0000-0x000000000fffffff] reserved
[ 0.000000] BIOS-e820: [mem 0x0000000010000000-0x000000001c3fffff] usable
[ 0.000000] NX (Execute Disable) protection: active
[ 0.000000] SMBIOS 2.7 present.
[ 0.000000] DMI: VMware, Inc. VMware Virtual Platform/440BX Desktop Reference Platform, BIOS 6.00 11/12/2020
[ 0.000000] vmware: hypercall mode: 0x01
[ 0.000000] Hypervisor detected: VMware
[ 0.000000] vmware: TSC freq read from hypervisor : 2595.038 MHz
[ 0.000000] vmware: Host bus clock speed read from hypervisor : 66000000 Hz
[ 0.000000] vmware: using clock offset of 69499682543 ns
[ 0.000067] tsc: Detected 2595.038 MHz processor
[ 0.003727] e820: update [mem 0x00000000-0x00000fff] usable ==> reserved
[ 0.003739] e820: remove [mem 0x000a0000-0x000fffff] usable
[ 0.003753] last_pfn = 0x1c4000 max_arch_pfn = 0x400000000
[ 0.003942] x86/PAT: Configuration [0-7]: WB WC UC- UC WB WP UC- WT
[ 0.003977] total RAM covered: 130048M
[ 0.004992] Found optimal setting for mtrr clean up
[ 0.004995]   gran_size: 64K chunk_size: 64K      num_reg: 7      lose cover RAM: 0G
[ 0.005187] e820: update [mem 0xc0000000-0xfffffff] usable ==> reserved
[ 0.005217] last_pfn = 0xc0000 max_arch_pfn = 0x400000000
[ 0.009577] found SMP MP-table at [mem 0x000f6a70-0x000f6a7f]
```

----- **tee Command** -----

tee command reads the standard input and writes it to both the standard output and one or more files. The command is named after the T-splitter used in plumbing. It basically breaks the output of a program so that it can be both displayed and saved in a file. It does both the tasks simultaneously, copies the result into the specified files or variables and also display the result.

SYNTAX = tee [OPTION]... [FILE]...

OPTIONS =

1. **-a** = It basically do not overwrite the file but append to the given file.

```
ankit-jain@ubuntu:~/Downloads$ man tee
ankit-jain@ubuntu:~/Downloads$ cat file.txt
good morning
have a nice day
My name is Ankit Jain
2020btcse004
ankit-jain@ubuntu:~/Downloads$ cat file1.txt
good morning
have a nice day
My name is Ankit Jain
2020btcse004
ankit-jain@ubuntu:~/Downloads$ wc -l file.txt | tee -a file1.txt
4 file.txt
4 file.txt
ankit-jain@ubuntu:~/Downloads$ cat file1.txt
good morning
have a nice day
My name is Ankit Jain
2020btcse004
4 file.txt
ankit-jain@ubuntu:~/Downloads$ df -h | tee diskusage.txt
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
tmpfs           3.0G   0    3.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup
/dev/loop0       56M   56M   0  100% /snap/core18/2128
/dev/loop1      128K  128K   0  100% /snap/bare/5
/dev/loop2       56M   56M   0  100% /snap/core18/2284
/dev/loop3      219M  219M   0  100% /snap/gnome-3-34-1804/72
/dev/loop4       62M   62M   0  100% /snap/core20/1328
/dev/loop5      219M  219M   0  100% /snap/gnome-3-34-1804/77
/dev/loop6       66M   66M   0  100% /snap/gtk-common-themes/1515
/dev/loop7       66M   66M   0  100% /snap/gtk-common-themes/1519
/dev/loop8       55M   55M   0  100% /snap/snap-store/558
/dev/loop9       51M   51M   0  100% /snap/snap-store/547
/dev/loop10      44M   44M   0  100% /snap/snapd/14549
/dev/loop11      33M   33M   0  100% /snap/snapd/12704
/dev/sda1      511M  4.0K  511M  1% /boot/efi
tmpfs           597M  72K  597M  1% /run/user/1001
tmpfs           597M  36K  597M  1% /run/user/1000
ankit-jain@ubuntu:~/Downloads$
```

ankit-jain@ubuntu: ~/Downloads

Search Minimize Close

```
ankit-jain@ubuntu:~/Downloads$ cat diskusage.txt
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
tmpfs           3.0G   0    3.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup
/dev/loop0       56M   56M   0 100% /snap/core18/2128
/dev/loop1      128K  128K   0 100% /snap/bare/5
/dev/loop2       56M   56M   0 100% /snap/core18/2284
/dev/loop3      219M  219M   0 100% /snap/gnome-3-34-1804/72
/dev/loop4       62M   62M   0 100% /snap/core20/1328
/dev/loop5      219M  219M   0 100% /snap/gnome-3-34-1804/77
/dev/loop6       66M   66M   0 100% /snap/gtk-common-themes/1515
/dev/loop7       66M   66M   0 100% /snap/gtk-common-themes/1519
/dev/loop8       55M   55M   0 100% /snap/snap-store/558
/dev/loop9       51M   51M   0 100% /snap/snap-store/547
/dev/loop10      44M   44M   0 100% /snap/snapd/14549
/dev/loop11      33M   33M   0 100% /snap/snapd/12704
/dev/sda1       511M  4.0K  511M  1% /boot/efi
tmpfs           597M  72K  597M  1% /run/user/1001
tmpfs           597M  36K  597M  1% /run/user/1000
ankit-jain@ubuntu:~/Downloads$
```

ankit-jain@ubuntu: ~/Downloads

Search Minimize Close

----- echo Command -----

echo command in linux is used to display line of text/string that are passed as an argument . This is a built in command that is mostly used in shell scripts and batch files to output status text to the screen or a file.

SYNTAX = echo [option] [string]

```
ankit-jain@ubuntu:~$ man echo
ankit-jain@ubuntu:~$ echo "hy"
hy
ankit-jain@ubuntu:~$ echo -e "hello \bhow \bare \byou"
hellohowareyou
ankit-jain@ubuntu:~$ echo "heelo\nhy"
heelo\nhy
ankit-jain@ubuntu:~$ echo -e "hello \nhy"
hello
hy
ankit-jain@ubuntu:~$ 
```

----- **init Command** -----

init is parent of all Linux processes with PID or process ID of 1. It is the first process to start when a computer boots up and runs until the system shuts down. init stands for initialization. In simple words the role of init is to create processes from script stored in the file /etc/inittab which is a configuration file which is to be used by initialization system. It is the last step of the kernel boot sequence.

SYNTAX = init [OPTIONS...] {COMMAND}

```
ankit-jain@ubuntu:~$ man init  
ankit-jain@ubuntu:~$ init --help  
init [OPTIONS...] COMMAND
```

Send control commands to the init daemon.

Commands:

0	Power-off the machine
6	Reboot the machine
2, 3, 4, 5	Start runlevelX.target unit
1, s, S	Enter rescue mode
q, Q	Reload init daemon configuration
u, U	Reexecutes init daemon

Options:

--help	Show this help
--no-wall	Don't send wall message before halt/power-off/reboot

See the [telinit\(8\).man page](#) for details.

```
ankit-jain@ubuntu:~$
```

----- **env Command** -----

env is used to either print environment variables. It is also used to run a utility or command in a custom environment

It is often used by shell scripts to launch the correct interpreter. In this usage, the environment is typically not changed.

```
ankit-jain@ubuntu:~$ man env
ankit-jain@ubuntu:~$ env
SHELL=/bin/bash
SESSION_MANAGER=local/ubuntu:@/tmp/.ICE-unix/1644,unix/ubuntu:/tmp/.ICE-unix/1644
QT_ACCESSIBILITY=1
COLORTERM=truecolor
XDG_CONFIG_DIRS=/etc/xdg/xdg-ubuntu:/etc/xdg
XDG_MENU_PREFIX=gnome-
GNOME_DESKTOP_SESSION_ID=this-is-deprecated
GNOME_SHELL_SESSION_MODE=ubuntu
SSH_AUTH_SOCK=/run/user/1000/keyring/ssh
XMODIFIERS=@im=ibus
DESKTOP_SESSION=ubuntu
SSH_AGENT_PID=1607
GTK_MODULES=gail:atk-bridge
PWD=/home/ankit-jain
LOGNAME=ankit-jain
XDG_SESSION_DESKTOP=ubuntu
XDG_SESSION_TYPE=x11
GPG_AGENT_INFO=/run/user/1000/gnupg/S.gpg-agent:0:1
XAUTHORITY=/run/user/1000/gdm/Xauthority
GJS_DEBUG_TOPICS=JS ERROR;JS LOG
WINDOWPATH=2
HOME=/home/ankit-jain
USERNAME=ankit-jain
IM_CONFIG_PHASE=1
LANG=en_US.UTF-8
LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33:01:cd=40;33:01:or=40;31:01:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01
;31:*.arj=01;31:*.taz=01;31:*.lha=01;31:*.lz4=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=01;31:*.tzo=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*.lz=01;31:*.lzo=01;31
:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01;31:*.tz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=01;31
:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;31:*.dwm=01;31:*.esd=01;31:*.jpg=01;35:*.jpeg=01;35:*.mjpg=01;35:*.mjpeg=01;35:*.gif=01;35:*.bmp=01;35:*.pbm=01;35:*.pgm=0
1;35:*.ppm=01;35:*.tga=01;35:*.xbm=01;35:*.xpm=01;35:*.tif=01;35:*.tiff=01;35:*.png=01;35:*.svg=01;35:*.svgz=01;35:*.mng=01;35:*.pcx=01;35:*.mov=01;35:*.mpg=01;35:*.mpeg=01;35:*.m2v=01;35:*.mkv=01;35:*.w
ebm=01;35:*.ogm=01;35:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vob=01;35:*.nuv=01;35:*.wmv=01;35:*.ASF=01;35:*.rm=01;35:*.rmvb=01;35:*.flc=01;35:*.avi=01;35:*.fli=01;35:*.flv=01;35:*.gl=01;35:*
dl=01;35:*.xcf=01;35:*.xdw=01;35:*.yuv=01;35:*.cgm=01;35:*.emf=01;35:*.ogx=01;35:*.aac=00;36:*.au=00;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.mka=00;36:*.mp3=00;36:*.mpc=00;36:*
.ogg=00;36:*.ra=00;36:*.wav=00;36:*.oga=00;36:*.opus=00;36:*.spx=00;36:*.xspf=00;36:
XDG_CURRENT_DESKTOP=ubuntu:GNOME
VTE_VERSION=6003
GNOME_TERMINAL_SCREEN=/org/gnome/Terminal/screen/7bf06dc2_5ee4_4b2f_ab4c_980ca1abedf2
INVOCATION_ID=b8851d9f29b144418767d4783bdc0fe5
MANAGERPID=1425
GJS_DEBUG_OUTPUT=stderr
LESSCLOSE=/usr/bin/lesspipe %s %s
XDG_SESSION_CLASS=user
TERM=xterm-256color
LESSOPEN=| /usr/bin/lesspipe %s
USER=ankit-jain
GNOME_TERMINAL_SERVICE=:1.115
DISPLAY=:0
SHLVL=1
```

ankit-jain@ubuntu:~

Q E - x

----- set Command -----

Linux set command is used to set and unset certain flags or settings within the shell environment. These flags and settings determine the behavior of a defined script and help in executing the tasks without facing any issue. The values of shell attributes and parameters can be changed or displayed by using the set command.

SYNTAX = set [options]

----- ed Command -----

ed command in Linux is used for launching the ed text editor which is a line-based text editor with a minimal interface which makes it less complex for working on text files i.e creating, editing, displaying and manipulating files. It is the oldest editor built in the Unix. It is succeeded by *vi* and *emacs* text editor.

SYNTAX = `ed [options] [file]`

Activities Terminal ▾

Feb 10 21:27

2 0 0

```
ankit-jain@ubuntu:~$ man ed  
ankit-jain@ubuntu:~$ ed
```

```
a  
hello  
goog morning  
how are you?
```

```
.
```

```
,p  
hello  
goog morning  
how are you?
```

```
f textfile.txt
```

```
textfile.txt
```

```
w
```

```
32
```

```
Q
```

```
ankit-jain@ubuntu:~$ cat textfile.txt  
hello  
goog morning  
how are you?  
ankit-jain@ubuntu:~$
```

ankit-jain@ubuntu: ~

Q E - x

----- useradd Command -----

useradd is a command in Linux that is used to add user accounts to your system. It is just a symbolic link to adduser command in Linux and the difference between both of them is that useradd is a native binary compiled with system whereas adduser is a Perl script which uses useradd binary in the background.

SYNTAX = useradd [options] name_of_the_user.

```
ankit-jain@ubuntu:~$ man useradd
ankit-jain@ubuntu:~$ sudo useradd newuser
ankit-jain@ubuntu:~$ cat /etc/passwd | grep newuser
newuser:x:1001:1001::/home/newuser:/bin/sh
ankit-jain@ubuntu:~$ id newuser
uid=1001(newuser) gid=1001(newuser) groups=1001(newuser)
ankit-jain@ubuntu:~$ 
```

----- dd Command -----

dd is a command-line utility for Unix and Unix-like operating systems whose primary purpose is to convert and copy files.

- On Unix, device drivers for hardware (such as hard disk drives) and special device files (such as /dev/zero and /dev/random) appear in the file system just like normal files.
- dd can also read and/or write from/to these files, provided that function is implemented in their respective drivers
- As a result, dd can be used for tasks such as backing up the boot sector of a hard drive, and obtaining a fixed amount of random data.

```
ankit-jain@ubuntu:~$ man dd
ankit-jain@ubuntu:~$ dd --help
Usage: dd [OPERAND]...
      or: dd OPTION
Copy a file, converting and formatting according to the operands.

bs=BYTES      read and write up to BYTES bytes at a time (default: 512);
               overrides ibs and obs
cbs=BYTES      convert BYTES bytes at a time
conv=CONVS     convert the file as per the comma separated symbol list
count=N        copy only N input blocks
ibs=BYTES      read up to BYTES bytes at a time (default: 512)
if=FILE        read from FILE instead of stdin
iflag=FLAGS    read as per the comma separated symbol list
obs=BYTES      write BYTES bytes at a time (default: 512)
of=FILE        write to FILE instead of stdout
oflag=FLAGS    write as per the comma separated symbol list
seek=N         skip N obs-sized blocks at start of output
skip=N         skip N ibs-sized blocks at start of input
status=LEVEL   The LEVEL of information to print to stderr;
               'none' suppresses everything but error messages,
               'noxfer' suppresses the final transfer statistics,
               'progress' shows periodic transfer statistics
```

N and BYTES may be followed by the following multiplicative suffixes:
c =1, w =2, b =512, kB =1000, K =1024, MB =1000*1000, M =1024*1024, xM =M,
GB =1000*1000*1000, G =1024*1024*1024, and so on for T, P, E, Z, Y.

Each CONV symbol may be:

```
ascii      from EBCDIC to ASCII
ebcdic    from ASCII to EBCDIC
ibm       from ASCII to alternate EBCDIC
block     pad newline-terminated records with spaces to cbs-size
unblock   replace trailing spaces in cbs-size records with newline
lcase     change upper case to lower case
ucase     change lower case to upper case
sparse    try to seek rather than write the output for NUL input blocks
swab      swap every pair of input bytes
sync      pad every input block with NULs to ibs-size; when used
           with block or unblock, pad with spaces rather than NULs
excl      fail if the output file already exists
nocreat   do not create the output file
notrunc   do not truncate the output file
noerror   continue after read errors
fdatasync physically write output file data before finishing
fsync     likewise, but also write metadata
```

Each FLAG symbol may be:

----- crontab Command -----

The crontab is a list of commands that you want to run on a regular schedule, and also the name of the command used to manage that list. Crontab stands for “cron table,” because it uses the job scheduler *cron* to execute tasks.

Each cron command entry in the crontab file has five time and date fields followed by a command.

```
ankit-jain@ubuntu:~$ man crontab
ankit-jain@ubuntu:~$ crontab -l
8 21 * * * /home/ankit-jain/script/file1.sh
8 21 * * * /home/ankit-jain/script/file2.sh

# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command
ankit-jain@ubuntu:~$ crontab -r
ankit-jain@ubuntu:~$ crontab -l
no crontab for ankit-jain
ankit-jain@ubuntu:~$ 
```



```
11 17 * * * /home/ankit-jain/script/sample1.sh
```

ankit-jain@ubuntu: ~/script

```
# Edit this file to introduce tasks to be run by cron.  
#  
# Each task to run has to be defined through a single line  
# indicating with different fields when the task will be run  
# and what command to run for the task  
#  
# To define the time you can provide concrete values for  
# minute (m), hour (h), day of month (dom), month (mon),  
# and day of week (dow) or use '*' in these fields (for 'any').  
#  
# Notice that tasks will be started based on the cron's system  
# daemon's notion of time and timezones.  
#  
# Output of the crontab jobs (including errors) is sent through  
# email to the user the crontab file belongs to (unless redirected).  
#  
# For example, you can run a backup of all your user accounts  
# at 5 a.m every week with:  
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/  
#  
# For more information see the manual pages of crontab(5) and cron(8)  
#  
# m h dom mon dow command
```

-

-

-

-

-

-

-

-

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-

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-

:wq

```
ankit-jain@ubuntu:~/script$ cat sample1.sh  
#!/bin/bash
```

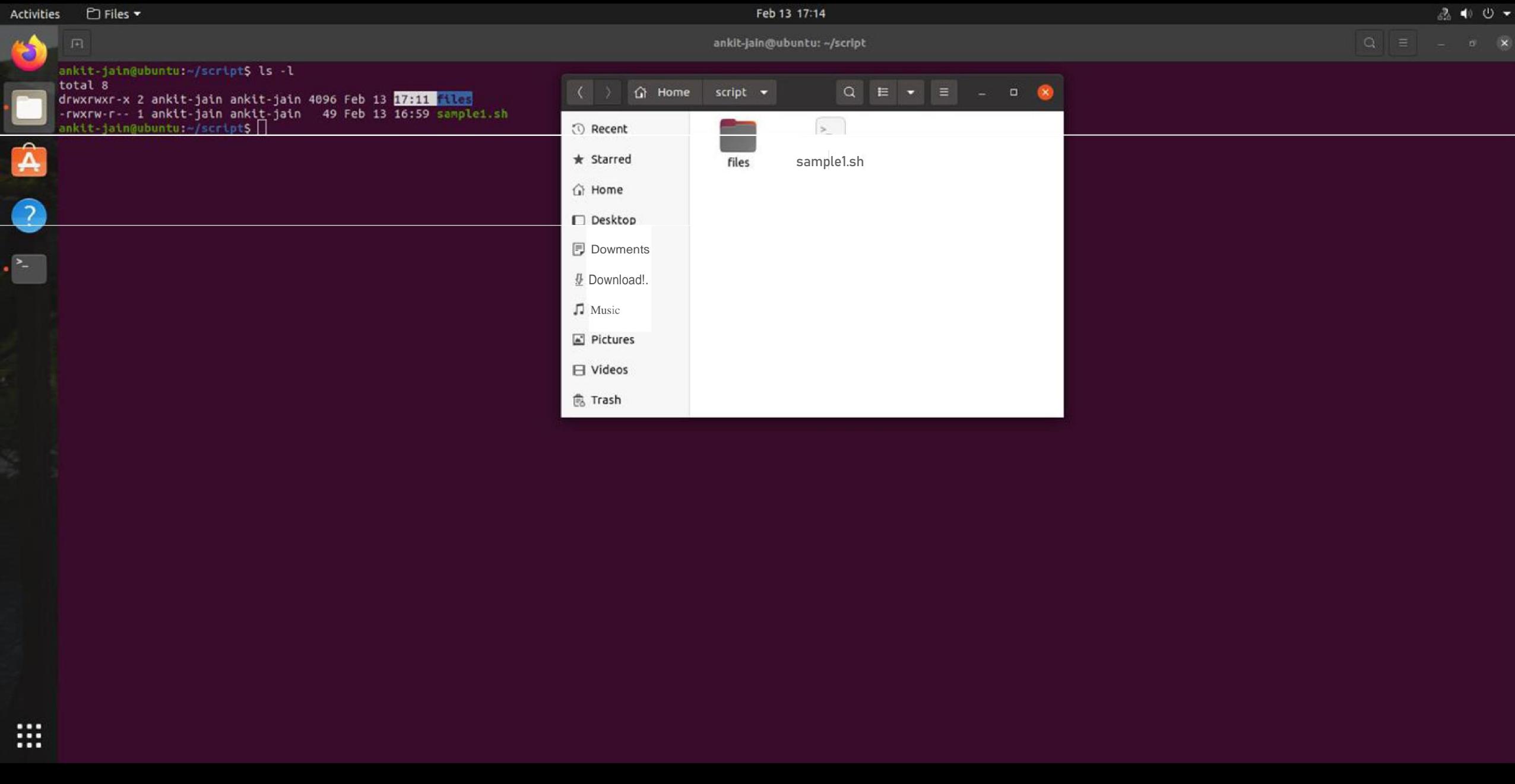
```
mkdir /home/ankit-jain/script/files  
ankit-jain@ubuntu:~/script$ crontab -e
```

```
crontab: installing new crontab  
ankit-jain@ubuntu:~/script$ crontab -l  
11 17 * * * /home/ankit-jain/script/sample1.sh
```

```
# Edit this file to introduce tasks to be run by cron.  
#  
# Each task to run has to be defined through a single line  
# indicating with different fields when the task will be run  
# and what command to run for the task  
#  
# To define the time you can provide concrete values for  
# minute (m), hour (h), day of month (dom), month (mon),  
# and day of week (dow) or use '*' in these fields (for 'any').  
#  
# Notice that tasks will be started based on the cron's system  
# daemon's notion of time and timezones.  
#  
# Output of the crontab jobs (including errors) is sent through  
# email to the user the crontab file belongs to (unless redirected).  
#  
# For example, you can run a backup of all your user accounts  
# at 5 a.m every week with:  
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/  
#  
# For more information see the manual pages of crontab(5) and cron(8)  
#  
# m h dom mon dow   command  
ankit-jain@ubuntu:~/script$ 
```

ankit-jain@ubuntu: ~/script





----- alias Command -----

alias command instructs the shell to replace one string with another string while executing the commands.

When we often have to use a single big command multiple times, in those cases, we create something called as alias for that command. *Alias* is like a shortcut command which will have same functionality as if we are writing the whole command.

SYNTAX = alias [-p] [name[=value] ...]

OPTION =

1. -p = This option prints all the defined aliases in reusable format.

Activities Terminal ▾

Feb 13 17:41

2 0 0

ankit-jain@ubuntu: ~/script

```
ankit-jain@ubuntu:~$ alias college="CENTRAL UNIVERSITY OF RAJASTHAN"
ankit-jain@ubuntu:~$ alias -p
alias alert='notify-send --urgency=low -i "$([ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e '\''s/^\\s*[0-9]\\+\\s*//;s/[;&]\\s*alert$/'\\''")"
alias college='CENTRAL UNIVERSITY OF RAJASTHAN'
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
ankit-jain@ubuntu:~$ alias w="cd /home/ankit-jain/script"
ankit-jain@ubuntu:~$ w
ankit-jain@ubuntu:~/script$ 
```

```
ankit-jain@ubuntu:~$ alias -p
alias alert='notify-send --urgency=low -i "$([ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e "'\''s/^\\s*[0-9]\\+\\s*//;s/[;&]\\s*alert$/'\\''")'"
alias college='CENTRAL UNIVERSITY OF RAJASTHAN'
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
alias w='cd /home/ankit-jain/script'
ankit-jain@ubuntu:~$ unalias college
ankit-jain@ubuntu:~$ unalias w
ankit-jain@ubuntu:~$ alias -p
alias alert='notify-send --urgency=low -i "$([ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e "'\''s/^\\s*[0-9]\\+\\s*//;s/[;&]\\s*alert$/'\\''")'"
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
ankit-jain@ubuntu:~$ 
```

----- expr Command -----

The expr command in Unix evaluates a given expression and displays its corresponding output. It is used for:

- Basic operations like addition, subtraction, multiplication, division, and modulus on integers.
- Evaluating regular expressions, string operations like substring, length of strings etc.

SYNTAX = expr expression

```
ankit-jain@ubuntu:~$ man expr
ankit-jain@ubuntu:~$ expr 40 + 5
45
ankit-jain@ubuntu:~$ expr 30 \* 3
90
ankit-jain@ubuntu:~$ expr 30 / 4
7
ankit-jain@ubuntu:~$ expr 30 == 40
0
ankit-jain@ubuntu:~$ expr 30 == 30
1
ankit-jain@ubuntu:~$ 
```

----- sed Command -----

SED command in UNIX stands for stream editor and it can perform lots of functions on file like searching, find and replace, insertion or deletion. Though most common use of SED command in UNIX is for substitution or for find and replace. By using SED you can edit files even without opening them, which is much quicker way to find and replace something in file, than first opening that file in VI Editor and then changing it.

SYNTAX = sed OPTIONS... [SCRIPT] [INPUTFILE...]

```
ankit-jain@ubuntu:~$ man sed
ankit-jain@ubuntu:~$ cat hello.txt
My name is Rahul Jain
2020btcse004
assignment 1 OS
Unix command
jaipur
ajjmer
jaipur
udaipur
jaipur
up
rajasthan
jaipur
ankit-jain@ubuntu:~$ sed 's/jaipur/bhiwara/' hello.txt
My name is Rahul Jain
2020btcse004
assignment 1 OS
Unix command
bhiwara
ajjmer
bhiwara
udaipur
bhiwara
up
rajasthan
bhiwara
ankit-jain@ubuntu:~$
```

ankit-jain@ubuntu: ~



----- awk Command -----

Awk is a utility that enables a programmer to write tiny but effective programs in the form of statements that define text patterns that are to be searched for in each line of a document and the action that is to be taken when a match is found within a line. Awk is mostly used for pattern scanning and processing. It searches one or more files to see if they contain lines that matches with the specified patterns and then perform the associated actions.

SYNTAX = awk options 'selection _criteria {action }' input-file > output-fil

```
ankit-jain@ubuntu:~$ man awk
ankit-jain@ubuntu:~$ cat hello.txt
My name is ankit Jain
2020btcse004
assignment 1 OS
Unix command
jaipur
ajjmer
jaipur
udaipur
jaipur
up
rajasthan
jaipur
ankit-jain@ubuntu:~$ awk '{print}' hello.txt
My name is ankit Jain
2020btcse004
assignment 1 OS
Unix command
jaipur
ajjmer
jaipur
udaipur
jaipur
up
rajasthan
jaipur
ankit-jain@ubuntu:~$ awk '/jaipur/ {print}' hello.txt
jaipur
jaipur
jaipur
jaipur
jaipur
ankit-jain@ubuntu:~$ awk '/name/ {print}' hello.txt
My name is ankit Jain
ankit-jain@ubuntu:~$ awk '{print $1}' hello.txt
My
2020btcse004
assignment
Unix
jaipur
ajjmer
jaipur
udaipur
jaipur
up
rajasthan
jaipur
ankit-jain@ubuntu:~$
```

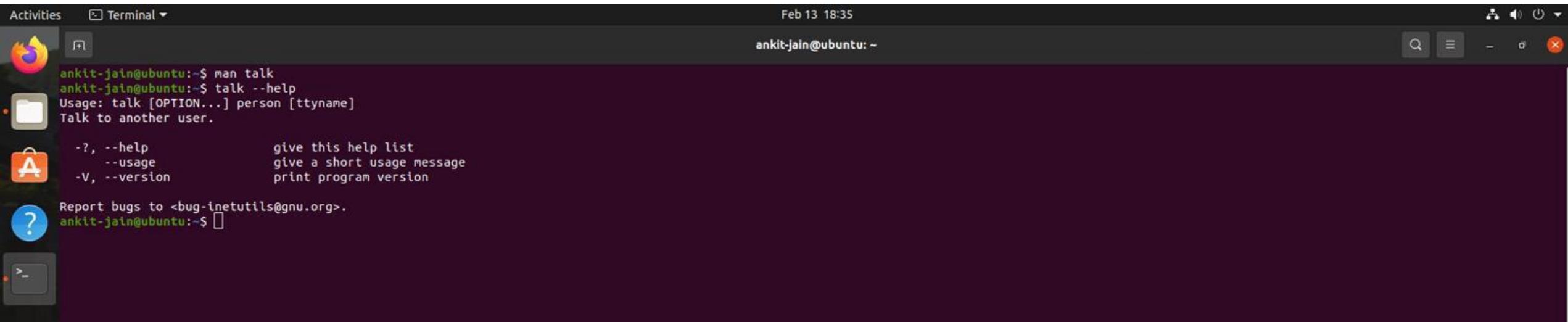
ankit-jain@ubuntu: ~

Q E - o x

----- talk Command -----

The talk command provides a text chat interface which lets you communicate in real time with other logged-in users

Talk is a visual communication program which copies lines from your terminal to that of another user, much like an instant messenger service. When first called, talk contacts the talk daemon on the other user's machine, which sends the message below



A screenshot of an Ubuntu desktop environment. The terminal window shows the following output:

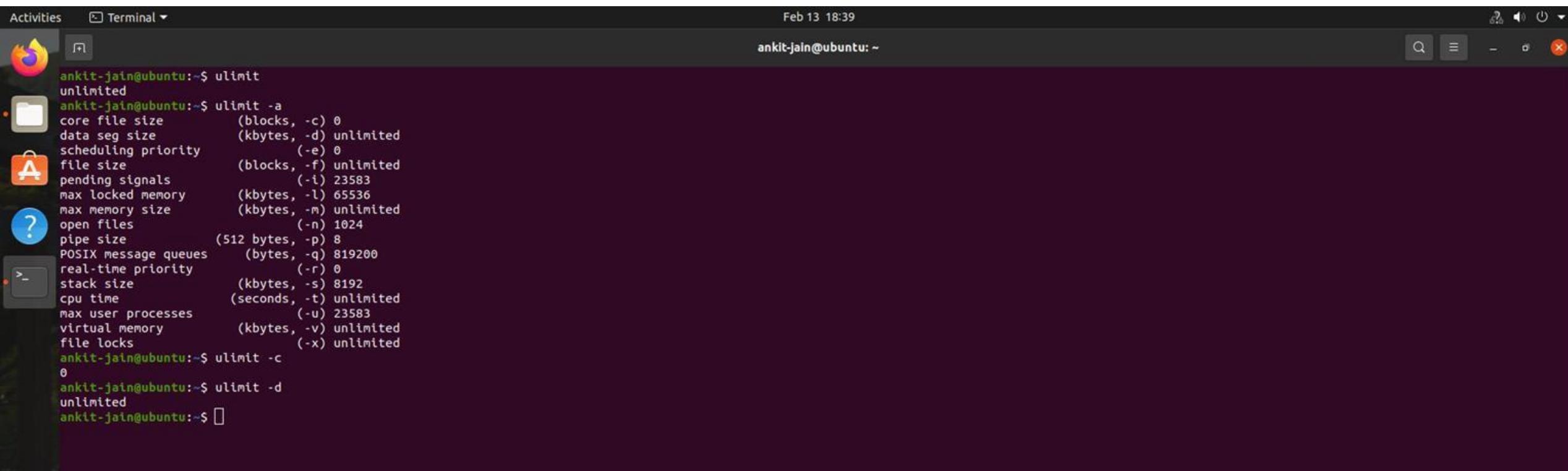
```
ankit-jain@ubuntu:~$ man talk
ankit-jain@ubuntu:~$ talk --help
Usage: talk [OPTION...] person [ttyname]
Talk to another user.

-?, --help          give this help list
--usage            give a short usage message
-V, --version      print program version

Report bugs to <bug-inetutils@gnu.org>.
ankit-jain@ubuntu:~$
```

----- ulimit Command -----

ulimit is admin access required Linux shell command which is used to see, set, or limit the resource usage of the current user. It is used to return the number of open file descriptors for each process. It is also used to set restrictions on the resources used by a process



The image shows a screenshot of a Ubuntu desktop environment. A terminal window is open in the center, displaying the output of the 'ulimit' command. The terminal title is 'Terminal' and the date and time are 'Feb 13 18:39'. The user is 'ankit-jain@ubuntu'. The terminal window shows the following text:

```
ankit-jain@ubuntu:~$ ulimit
unlimited
ankit-jain@ubuntu:~$ ulimit -a
core file size          (blocks, -c) 0
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals         (-i) 23583
max locked memory       (kbytes, -l) 65536
max memory size         (kbytes, -m) unlimited
open files              (-n) 1024
pipe size               (512 bytes, -p) 8
POSIX message queues   (bytes, -q) 819200
real-time priority      (-r) 0
stack size              (kbytes, -s) 8192
cpu time                (seconds, -t) unlimited
max user processes      (-u) 23583
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
ankit-jain@ubuntu:~$ ulimit -c
0
ankit-jain@ubuntu:~$ ulimit -d
unlimited
ankit-jain@ubuntu:~$ 
```

----- uname Command -----

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

SYNTAX = `uname [OPTION]`

OPTION =

1. `-s` = It prints the kernel name.
2. `-a` = It prints all the system information in the following order: *Kernel name, network node hostname, kernel release date, kernel version, machine hardware name, hardware platform, operating system*

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2 0 0



```
ankit-jain@ubuntu:~$ man uname
ankit-jain@ubuntu:~$ uname
Linux
ankit-jain@ubuntu:~$ uname -a
Linux ubuntu 5.13.0-28-generic #31~20.04.1-Ubuntu SMP Wed Jan 19 14:08:10 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
ankit-jain@ubuntu:~$ uname -s
Linux
ankit-jain@ubuntu:~$ uname -n
ubuntu
ankit-jain@ubuntu:~$ uname -r
5.13.0-28-generic
ankit-jain@ubuntu:~$ uname -m
x86_64
ankit-jain@ubuntu:~$ uname -p
x86_64
ankit-jain@ubuntu:~$ 
```



----- unlink Command -----

unlink is a command-line utility for removing a single file

SYNTAX = unlink filename

```
ankit-jain@ubuntu:~/Downloads$ man unlink
ankit-jain@ubuntu:~/Downloads$ ls
cde.html diskusage.txt file1.txt file.txt pqr.html sample1.txt
ankit-jain@ubuntu:~/Downloads$ unlink file.txt
ankit-jain@ubuntu:~/Downloads$ ls
cde.html diskusage.txt file1.txt pqr.html sample1.txt
ankit-jain@ubuntu:~/Downloads$ unlink file1.txt
ankit-jain@ubuntu:~/Downloads$ ls
cde.html diskusage.txt pqr.html sample1.txt
ankit-jain@ubuntu:~/Downloads$ 
```

----- sort Command -----

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

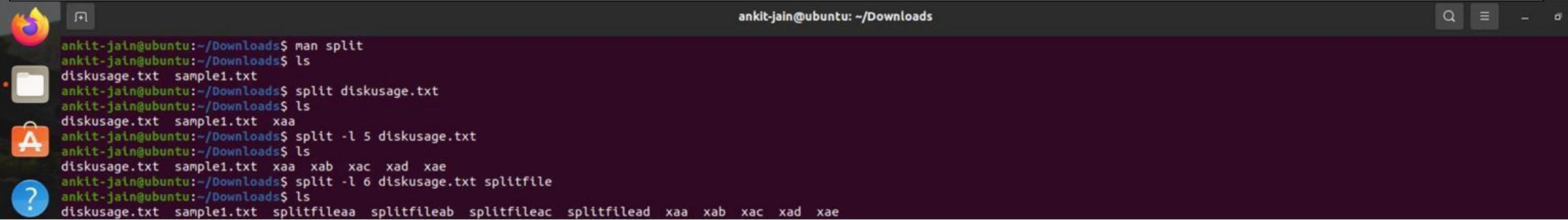
- SORT command sorts the contents of a text file, line by line.
- sort is a standard command-line program that prints the lines of its input or concatenation of all files listed in its argument list in sorted order.
- The sort command is a command-line utility for sorting lines of text files. It supports sorting alphabetically, in reverse order, by number, by month, and can also remove duplicates.
- The sort command can also sort by items not at the beginning of the line, ignore case sensitivity, and return whether a file is sorted or not. Sorting is done based on one or more sort keys extracted from each line of input.

```
* ankit-jain@ubuntu:~$ sort -o output.txt hello.txt
ankit-jain@ubuntu:~$ cat output.txt
2020btcse004
ajjmer
assignment 1 OS
jaipur
jaipur
jaipur
jaipur
My name is ankit Jain
rajasthan
udaipur
Unix command
up
ankit-jain@ubuntu:~$ sort -r -o outputinverse.txt hello.txt
ankit-jain@ubuntu:~$ cat outputinverse.txt
up
Unix command
udaipur
rajasthan
My name is ankit Jain
jaipur
jaipur
jaipur
jaipur
assignment 1 OS
ajjmer
2020btcse004
ankit-jain@ubuntu:~$ 
```

----- split Command -----

Split command in Linux is used to split large files into smaller files. It splits the files into 1000 lines per file(by default) and even allows users to change the number of lines as per requirement.

SYNTAX = split [options] name_of_file prefix_for_new_files



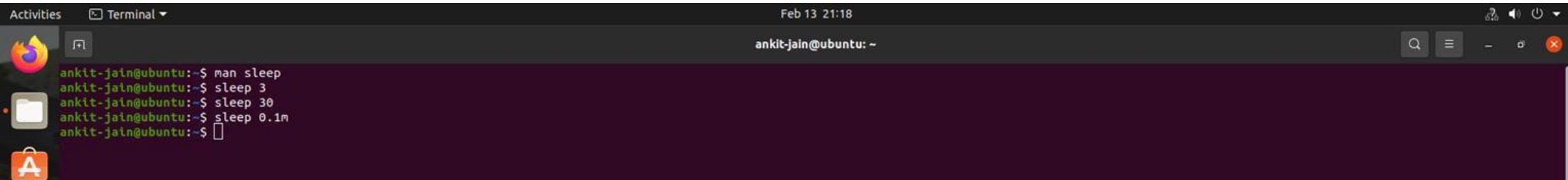
The image shows a screenshot of a Ubuntu desktop environment. A terminal window is open with the following command history:

```
ankit-jain@ubuntu:~/Downloads$ man split
ankit-jain@ubuntu:~/Downloads$ ls
diskusage.txt sample1.txt
ankit-jain@ubuntu:~/Downloads$ split diskusage.txt
ankit-jain@ubuntu:~/Downloads$ ls
diskusage.txt sample1.txt xaa
ankit-jain@ubuntu:~/Downloads$ split -l 5 diskusage.txt
ankit-jain@ubuntu:~/Downloads$ ls
diskusage.txt sample1.txt xaa xab xac xad xae
ankit-jain@ubuntu:~/Downloads$ split -l 6 diskusage.txt splitfile
ankit-jain@ubuntu:~/Downloads$ ls
diskusage.txt sample1.txt splitfileaa splitfileab splitfileac splitfilead xaa xab xac xad xae
```

----- sleep Command -----

sleep command is used to create a dummy job. A dummy job helps in delaying the execution. It takes time in seconds by default but a small suffix(s, m, h, d) can be added at the end to convert it into any other format. This command pauses the execution for an amount of time which is defined by *NUMBER*.

SYNTAX = sleep NUMBER[SUFFIX]...

A screenshot of an Ubuntu desktop environment. At the bottom is a dark dock bar with icons for the Dash, Home, and other applications. To the left of the dock is a vertical docked panel containing icons for the Dash, Home, and several system settings. On the right side of the dock is a system tray with icons for battery, signal strength, and volume. The main area of the screen shows a terminal window titled "Terminal". The terminal window has a dark background and contains the following text:

```
Activities Terminal ▾ Feb 13 21:18
ankit-jain@ubuntu:~$ man sleep
ankit-jain@ubuntu:~$ sleep 3
ankit-jain@ubuntu:~$ sleep 30
ankit-jain@ubuntu:~$ sleep 0.1m
ankit-jain@ubuntu:~$ 
```

The terminal window is active and shows the user's command history.

----- sh Command -----

The sh command invokes the default shell and uses its syntax and flags. The shell linked to the /usr/bin/sh path is the default shell. The standard configuration of the operating system links the /usr/bin/sh path to the Korn shell.

```
ankit-jain@ubuntu:~/script$ man sh
ankit-jain@ubuntu:~/script$ cat sample1.sh
#!/bin/bash

mkdir /home/ankit-jain/script/files
ankit-jain@ubuntu:~/script$ sh sample1.sh
ankit-jain@ubuntu:~/script$ ls
files  sample1.sh
ankit-jain@ubuntu:~/script$ 
```

----- read Command -----

read command in Linux system is used to read from a file descriptor. Basically, this command read up the total number of bytes from the specified file descriptor into the buffer. If the number or count is zero then this command may detect the errors. But on success, it returns the number of bytes read.

```
ankit-jain@ubuntu:~$ read
hello
ankit-jain@ubuntu:~$ echo $REPLY
hello
ankit-jain@ubuntu:~$ echo "what is your enrollment no";read rollno;echo "hy Ankit, your roll no is $rollno"
what is your enrollment no
2020btcse004
hy Ankit, your roll no is 2020btcse004
ankit-jain@ubuntu:~$ read a b c
Udaipur is city of lake.
ankit-jain@ubuntu:~$ ^C
ankit-jain@ubuntu:~$ echo "$a"
Udaipur
ankit-jain@ubuntu:~$ echo "$b"
is
ankit-jain@ubuntu:~$ echo "$c"
city of lake.
ankit-jain@ubuntu:~$ echo "[\$a] [\$b] [\$c]"
[Udaipur] [is] [city of lake.]
ankit-jain@ubuntu:~$ read -n 6
abcdefankit-jain@ubuntu:~$ read -s -p "enter password"
enter passwordankit-jain@ubuntu:~$ echo $REPLY
home
ankit-jain@ubuntu:~$ 
```

----- more Command -----

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 (For example log files). The more command also allows the user do scroll up and down through the page

When the output is large, we can use more command to see output one by one.

```
ankit-jain@ubuntu:~/Downloads$ man more
ankit-jain@ubuntu:~/Downloads$ ls
diskusage.txt
ankit-jain@ubuntu:~/Downloads$ more -d diskusage.txt
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
tmpfs           3.0G   0    3.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup
/dev/loop0       56M   56M   0 100% /snap/core18/2128
/dev/loop1       128K  128K   0 100% /snap/bare/5
/dev/loop2       56M   56M   0 100% /snap/core18/2284
/dev/loop3       219M  219M   0 100% /snap/gnome-3-34-1804/72
/dev/loop4       62M   62M   0 100% /snap/core20/1328
/dev/loop5       219M  219M   0 100% /snap/gnome-3-34-1804/77
/dev/loop6       66M   66M   0 100% /snap/gtk-common-themes/1515
/dev/loop7       66M   66M   0 100% /snap/gtk-common-themes/1519
/dev/loop8       55M   55M   0 100% /snap/snap-store/558
/dev/loop9       51M   51M   0 100% /snap/snap-store/547
/dev/loop10      44M   44M   0 100% /snap/snapd/14549
/dev/loop11      33M   33M   0 100% /snap/snapd/12704
/dev/sda1        511M  4.0K  511M  1% /boot/efi
tmpfs           597M  72K  597M  1% /run/user/1001
tmpfs           597M  36K  597M  1% /run/user/1000
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
tmpfs           3.0G   0    3.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup
/dev/loop0       56M   56M   0 100% /snap/core18/2128
/dev/loop1       128K  128K   0 100% /snap/bare/5
/dev/loop2       56M   56M   0 100% /snap/core18/2284
/dev/loop3       219M  219M   0 100% /snap/gnome-3-34-1804/72
/dev/loop4       62M   62M   0 100% /snap/core20/1328
/dev/loop5       219M  219M   0 100% /snap/gnome-3-34-1804/77
/dev/loop6       66M   66M   0 100% /snap/gtk-common-themes/1515
/dev/loop7       66M   66M   0 100% /snap/gtk-common-themes/1519
/dev/loop8       55M   55M   0 100% /snap/snap-store/558
/dev/loop9       51M   51M   0 100% /snap/snap-store/547
/dev/loop10      44M   44M   0 100% /snap/snapd/14549
/dev/loop11      33M   33M   0 100% /snap/snapd/12704
/dev/sda1        511M  4.0K  511M  1% /boot/efi
tmpfs           597M  72K  597M  1% /run/user/1000
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
```

ankit-jain@ubuntu: ~/Downloads



ankit-jain@ubuntu: ~/Downloads

```
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
tmpfs           3.0G   0    3.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup
/dev/loop0       56M   56M   0 100% /snap/core18/2128
/dev/loop1      128K  128K   0 100% /snap/bare/5
/dev/loop2       56M   56M   0 100% /snap/core18/2284
/dev/loop3      219M  219M   0 100% /snap/gnome-3-34-1804/72
/dev/loop4       62M   62M   0 100% /snap/core20/1328
/dev/loop5      219M  219M   0 100% /snap/gnome-3-34-1804/77
/dev/loop6       66M   66M   0 100% /snap/gtk-common-themes/1515
/dev/loop7       66M   66M   0 100% /snap/gtk-common-themes/1519
/dev/loop8       55M   55M   0 100% /snap/snap-store/558
/dev/loop9       51M   51M   0 100% /snap/snap-store/547
/dev/loop10      44M   44M   0 100% /snap/snapd/14549
/dev/loop11      33M   33M   0 100% /snap/snapd/12704
/dev/sda1        511M  4.0K  511M  1% /boot/efi
tmpfs           597M  72K  597M  1% /run/user/1001
tmpfs           597M  36K  597M  1% /run/user/1000
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
tmpfs           3.0G   0    3.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup
/dev/loop0       56M   56M   0 100% /snap/core18/2128
/dev/loop1      128K  128K   0 100% /snap/bare/5
/dev/loop2       56M   56M   0 100% /snap/core18/2284
/dev/loop3      219M  219M   0 100% /snap/gnome-3-34-1804/72
/dev/loop4       62M   62M   0 100% /snap/core20/1328
/dev/loop5      219M  219M   0 100% /snap/gnome-3-34-1804/77
/dev/loop6       66M   66M   0 100% /snap/gtk-common-themes/1515
/dev/loop7       66M   66M   0 100% /snap/gtk-common-themes/1519
/dev/loop8       55M   55M   0 100% /snap/snap-store/558
/dev/loop9       51M   51M   0 100% /snap/snap-store/547
/dev/loop10      44M   44M   0 100% /snap/snapd/14549
/dev/loop11      33M   33M   0 100% /snap/snapd/12704
/dev/sda1        511M  4.0K  511M  1% /boot/efi
tmpfs           597M  72K  597M  1% /run/user/1000
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
-More--(72%) [Press space to continue, 'q' to quit.]
```

ankit-jain@ubuntu: ~/Downloads

```
ankit-jain@ubuntu:~/Downloads$ more -s diskusage.txt
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
tmpfs           3.0G   0    3.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup
/dev/loop0       56M   56M   0 100% /snap/core18/2128
/dev/loop1       128K  128K   0 100% /snap/bare/5
/dev/loop2       56M   56M   0 100% /snap/core18/2284
/dev/loop3       219M  219M   0 100% /snap/gnome-3-34-1804/72
/dev/loop4       62M   62M   0 100% /snap/core20/1328
/dev/loop5       219M  219M   0 100% /snap/gnome-3-34-1804/77
/dev/loop6       66M   66M   0 100% /snap/gtk-common-themes/1515
/dev/loop7       66M   66M   0 100% /snap/gtk-common-themes/1519
/dev/loop8       55M   55M   0 100% /snap/snap-store/558
/dev/loop9       51M   51M   0 100% /snap/snap-store/547
/dev/loop10      44M   44M   0 100% /snap/snapd/14549
/dev/loop11      33M   33M   0 100% /snap/snapd/12704
/dev/sda1        511M  4.0K  511M  1% /boot/efi
tmpfs           597M  72K  597M  1% /run/user/1001
tmpfs           597M  36K  597M  1% /run/user/1000
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
tmpfs           597M  2.1M  595M  1% /run
/dev/sda5        59G  8.3G  48G  15% /
tmpfs           3.0G   0    3.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           3.0G   0    3.0G  0% /sys/fs/cgroup
/dev/loop0       56M   56M   0 100% /snap/core18/2128
/dev/loop1       128K  128K   0 100% /snap/bare/5
/dev/loop2       56M   56M   0 100% /snap/core18/2284
/dev/loop3       219M  219M   0 100% /snap/gnome-3-34-1804/72
/dev/loop4       62M   62M   0 100% /snap/core20/1328
/dev/loop5       219M  219M   0 100% /snap/gnome-3-34-1804/77
/dev/loop6       66M   66M   0 100% /snap/gtk-common-themes/1515
/dev/loop7       66M   66M   0 100% /snap/gtk-common-themes/1519
/dev/loop8       55M   55M   0 100% /snap/snap-store/558
/dev/loop9       51M   51M   0 100% /snap/snap-store/547
/dev/loop10      44M   44M   0 100% /snap/snapd/14549
/dev/loop11      33M   33M   0 100% /snap/snapd/12704
/dev/sda1        511M  4.0K  511M  1% /boot/efi
tmpfs           597M  72K  597M  1% /run/user/1001
Filesystem      Size  Used Avail Use% Mounted on
udev            2.9G   0    2.9G  0% /dev
-More--(69%)
```

----- less Command -----

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. It has faster access because if file is large it doesn't access the complete file, but accesses it page by page.

For example, if it's a large file and you are reading it using any text editor, then the complete file will be loaded to main memory. The less command doesn't load the entire file, but loads it part by part which makes it faster.

SYNTAX = less filename

ankit-jain@ubuntu:~/Downloads\$ less diskusage.txt

Filesystem	Size	Used	Avail	Use%	Mounted on
udev	2.9G	0	2.9G	0%	/dev
tmpfs	597M	2.1M	595M	1%	/run
/dev/sda5	59G	8.3G	48G	15%	/
tmpfs	3.0G	0	3.0G	0%	/dev/shm
tmpfs	5.0M	4.0K	5.0M	1%	/run/lock
tmpfs	3.0G	0	3.0G	0%	/sys/fs/cgroup
/dev/loop0	56M	56M	0	100%	/snap/core18/2128
/dev/loop1	128K	128K	0	100%	/snap/bare/5
/dev/loop2	56M	56M	0	100%	/snap/core18/2284
/dev/loop3	219M	219M	0	100%	/snap/gnome-3-34-1804/72
/dev/loop4	62M	62M	0	100%	/snap/core20/1328
/dev/loop5	219M	219M	0	100%	/snap/gnome-3-34-1804/77
/dev/loop6	66M	66M	0	100%	/snap/gtk-common-themes/1515
/dev/loop7	66M	66M	0	100%	/snap/gtk-common-themes/1519
/dev/loop8	55M	55M	0	100%	/snap/snap-store/558
/dev/loop9	51M	51M	0	100%	/snap/snap-store/547
/dev/loop10	44M	44M	0	100%	/snap/snapd/14549
/dev/loop11	33M	33M	0	100%	/snap/snapd/12704
/dev/sda1	511M	4.0K	511M	1%	/boot/efi
tmpfs	597M	72K	597M	1%	/run/user/1001
tmpfs	597M	36K	597M	1%	/run/user/1000
Filesystem	Size	Used	Avail	Use%	Mounted on
udev	2.9G	0	2.9G	0%	/dev
tmpfs	597M	2.1M	595M	1%	/run
/dev/sda5	59G	8.3G	48G	15%	/
tmpfs	3.0G	0	3.0G	0%	/dev/shm
tmpfs	5.0M	4.0K	5.0M	1%	/run/lock
tmpfs	3.0G	0	3.0G	0%	/sys/fs/cgroup
/dev/loop0	56M	56M	0	100%	/snap/core18/2128
/dev/loop1	128K	128K	0	100%	/snap/bare/5
/dev/loop2	56M	56M	0	100%	/snap/core18/2284
/dev/loop3	219M	219M	0	100%	/snap/gnome-3-34-1804/72
/dev/loop4	62M	62M	0	100%	/snap/core20/1328
/dev/loop5	219M	219M	0	100%	/snap/gnome-3-34-1804/77
/dev/loop6	66M	66M	0	100%	/snap/gtk-common-themes/1515
/dev/loop7	66M	66M	0	100%	/snap/gtk-common-themes/1519
/dev/loop8	55M	55M	0	100%	/snap/snap-store/558
/dev/loop9	51M	51M	0	100%	/snap/snap-store/547

diskusage.txt

ankit-jain@ubuntu:~/Downloads\$ dmesg | less

```
[ 0.00000] Linux version 5.13.0-28-generic (buildd@lgw01-amd64-035) (gcc (Ubuntu 9.3.0-17ubuntu1-20.04) 9.3.0, GNU ld (GNU Binutils for Ubuntu) 2.34) #31~20.04.1-Ubuntu SMP Wed Jan 19 14:08:10 UTC 2022 (Ubuntu 5.13.0-28.31-20.04.1-generic 5.13.19)
[ 0.00000] Command line: BOOT_IMAGE=/boot/vmlinuz-5.13.0-28-generic root=UUID=3561732a-62e2-41ac-88be-f3e8f4c4f661 ro find_preseed=/preseed.cfg auto noprompt priority=critical locale=en_US quiet
[ 0.00000] KERNEL supported cpus:
[ 0.00000]   Intel GenuineIntel
[ 0.00000]   AMD AuthenticAMD
[ 0.00000]   Hygon HygonGenuine
[ 0.00000]   Centaur CentaurHauls
[ 0.00000]   zhaixin Shanghai
[ 0.00000] [Firmware Bug]: TSC doesn't count with P0 frequency!
[ 0.00000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point registers'
[ 0.00000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
[ 0.00000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
[ 0.00000] x86/fpu: xstate_offset[2]: 576, xstate_sizes[2]: 256
[ 0.00000] x86/fpu: Enabled xstate features 0x7, context size is 832 bytes, using 'compacted' format.
[ 0.00000] BIOS-provided physical RAM map:
[ 0.00000] BIOS-e820: [mem 0x0000000000000000-0x000000000000e7ff] usable
[ 0.00000] BIOS-e820: [mem 0x0000000000000e800-0x000000000000ffff] reserved
[ 0.00000] BIOS-e820: [mem 0x00000000000dc000-0x000000000000ffff] reserved
[ 0.00000] BIOS-e820: [mem 0x00000000000100000-0x00000000bfecffff] usable
[ 0.00000] BIOS-e820: [mem 0x000000000bfed0000-0x00000000bfefefff] ACPI data
[ 0.00000] BIOS-e820: [mem 0x000000000bfefff000-0x000000000bfefffff] ACPI NVS
[ 0.00000] BIOS-e820: [mem 0x000000000bff00000-0x000000000bffffff] usable
[ 0.00000] BIOS-e820: [mem 0x000000000f0000000-0x000000000f7fffff] reserved
[ 0.00000] BIOS-e820: [mem 0x000000000fec00000-0x000000000fec0ffff] reserved
[ 0.00000] BIOS-e820: [mem 0x000000000fee00000-0x000000000fee00ff] reserved
[ 0.00000] BIOS-e820: [mem 0x000000000fffe0000-0x000000000fffffff] reserved
[ 0.00000] BIOS-e820: [mem 0x00000000100000000-0x000000001c3fffff] usable
[ 0.00000] NX (Execute Disable) protection: active
[ 0.00000] SMBIOS 2.7 present.
[ 0.00000] DMI: VMware, Inc. VMware Virtual Platform/440BX Desktop Reference Platform, BIOS 6.00 11/12/2020
[ 0.00000] vmware: hypercall mode: 0x01
[ 0.00000] Hypervisor detected: VMware
[ 0.00000] vmware: TSC freq read from hypervisor : 2595.038 MHz
[ 0.00000] vmware: Host bus clock speed read from hypervisor : 66000000 Hz
[ 0.00000] vmware: using clock offset of 67256764056 ns
[ 0.000048] tsc: Detected 2595.038 MHz processor
[ 0.002537] e820: update [mem 0x00000000-0x00000fff] usable ==> reserved
[ 0.002544] e820: remove [mem 0x000a0000-0x000fffff] usable
[ 0.002552] last_pfn = 0x1c4000 max_arch_pfn = 0x40000000
[ 0.002708] x86/PAT: Configuration [0-7]: WB WC UC- UC WB WP UC- WT
[ 0.002736] total RAM covered: 130048M
[ 0.003339] Found optimal setting for mtrr clean up
[ 0.003340] gran_size: 64K chunk_size: 64K num_reg: 7 lose cover RAM: 0G
[ 0.003453] e820: update [mem 0xc0000000-0xffffffff] usable ==> reserved
[ 0.003481] last_pfn = 0xc0000 max_arch_pfn = 0x40000000
[ 0.007416] found SMP MP-table at [mem 0x000f6a70-0x000f6a7f]
```

ankit-jain@ubuntu:~/Downloads\$ dmesg | less -p KERNEL

```
[ 0.00000] KERNEL supported cpus:
[ 0.00000]   Intel GenuineIntel
[ 0.00000]   AMD AuthenticAMD
[ 0.00000]   Hygon HygonGenuine
[ 0.00000]   Centaur CentaurHauls
[ 0.00000]   zhaixin Shanghai
[ 0.00000] [Firmware Bug]: TSC doesn't count with P0 frequency!
[ 0.00000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point registers'
[ 0.00000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
[ 0.00000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
[ 0.00000] x86/fpu: xstate_offset[2]: 576, xstate_sizes[2]: 256
[ 0.00000] x86/fpu: Enabled xstate features 0x7, context size is 832 bytes, using 'compacted' format.
[ 0.00000] BIOS-provided physical RAM map:
[ 0.00000] BIOS-e820: [mem 0x0000000000000000-0x000000000009e7ff] usable
[ 0.00000] BIOS-e820: [mem 0x000000000009e800-0x000000000009ffff] reserved
[ 0.00000] BIOS-e820: [mem 0x0000000000dc000-0x00000000000fffff] reserved
[ 0.00000] BIOS-e820: [mem 0x0000000000100000-0x000000000bfecffff] usable
[ 0.00000] BIOS-e820: [mem 0x000000000bfed0000-0x000000000bfefefff] ACPI data
[ 0.00000] BIOS-e820: [mem 0x000000000bfef0000-0x000000000bfefffff] ACPI NVS
[ 0.00000] BIOS-e820: [mem 0x000000000bfef0000-0x000000000bfefffff] usable
[ 0.00000] BIOS-e820: [mem 0x000000000f000000-0x000000000f7fffff] reserved
[ 0.00000] BIOS-e820: [mem 0x000000000fec0000-0x000000000fec0ffff] reserved
[ 0.00000] BIOS-e820: [mem 0x000000000fee00000-0x000000000fee00fff] reserved
[ 0.00000] BIOS-e820: [mem 0x000000000fffe0000-0x000000000fffeffff] reserved
[ 0.00000] BIOS-e820: [mem 0x0000000100000000-0x00000001c3fffff] usable
[ 0.00000] NX (Execute Disable) protection: active
[ 0.00000] SMBIOS 2.7 present.
[ 0.00000] DMI: VMware, Inc. VMware Virtual Platform/440BX Desktop Reference Platform, BIOS 6.00 11/12/2020
[ 0.00000] vmware: hypercall mode: 0x01
[ 0.00000] Hypervisor detected: VMware
[ 0.00000] vmware: TSC freq read from hypervisor : 2595.038 MHz
[ 0.00000] vmware: Host bus clock speed read from hypervisor : 66000000 Hz
[ 0.00000] vmware: using clock offset of 67256764056 ns
[ 0.00048] tsc: Detected 2595.038 MHz processor
[ 0.002537] e820: update [mem 0x00000000-0x00000fff] usable ==> reserved
[ 0.002544] e820: remove [mem 0x000a0000-0x000fffff] usable
[ 0.002552] last_pfn = 0x1c4000 max_arch_pfn = 0x40000000
[ 0.002708] x86/PAT: Configuration [0-7]: WB WC UC- UC WB WP UC- WT
[ 0.002736] total RAM covered: 130048M
[ 0.003339] Found optimal setting for mtrr clean up
[ 0.003340]   gran_size: 64K   chunk_size: 64K   num_reg: 7   lose cover RAM: 0G
[ 0.003453] e820: update [mem 0xc0000000-0xfffffff] usable ==> reserved
[ 0.003481] last_pfn = 0xc0000 max_arch_pfn = 0x40000000
[ 0.007416] Found SMP MP-table at [mem 0x000f6a70-0x000f6a7f]
[ 0.007452] Using GB pages for direct mapping
[ 0.007745] RAMDISK: [mem 0x30e57000-0x34722fff]
[ 0.007760] ACPI: Early table checksum verification disabled
```

----- wc Command -----

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

- It is used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.
- By default it displays four-columnar output.
- First column shows number of lines present in a file specified, second column shows number of words present in the file, third column shows number of characters present in file and fourth column itself is the file name which are given as argument.

SYNTAX = wc [OPTION]... [FILE]...

```
ankit-jain@ubuntu:~$ cat hello.txt
My name is ankit Jain
2020btcse004
assignment 1 OS
Unix command
jaipur
ajjmer
jaipur
udaipur
jaipur
up
rajasthan
jaipur
ankit-jain@ubuntu:~$ wc hello.txt
12 19 120 hello.txt
ankit-jain@ubuntu:~$ wc hello.txt newfile.txt
12 19 120 hello.txt
4 12 58 newfile.txt
16 31 178 total
ankit-jain@ubuntu:~$ wc -l hello.txt
12 hello.txt
ankit-jain@ubuntu:~$ wc -w hello.txt newfile.txt
19 hello.txt
12 newfile.txt
31 total
ankit-jain@ubuntu:~$ wc -c hello.txt newfile.txt
120 hello.txt
58 newfile.txt
178 total
ankit-jain@ubuntu:~$ wc -m hello.txt newfile.txt
120 hello.txt
58 newfile.txt
178 total
ankit-jain@ubuntu:~$ 
```

----- Ip Command -----

Ip submits files for printing, or alters a pending print job. Use a file name of "-" to specify printing from the standard input.

```
ankit-jain@ubuntu:~$ lp --help
Usage: lp [options] [--] [file(s)]
      lp [options] -i id
Options:
  -c           Make a copy of the print file(s)
  -d destination        Specify the destination
  -E           Encrypt the connection to the server
  -h server[:port]      Connect to the named server and port
  -H HH:MM      Hold the job until the specified UTC time
  -H hold       Hold the job until released/resumed
  -H immediate   Print the job as soon as possible
  -H restart     Reprint the job
  -H resume      Resume a held job
  -i id         Specify an existing job ID to modify
  -m           Send an email notification when the job completes
  -n num-copies  Specify the number of copies to print
  -o option[=value]  Specify a printer-specific option
  -o job-sheets=standard Print a banner page with the job
  -o media=size    Specify the media size to use
  -o number-up=N   Specify that input pages should be printed N-up (1, 2, 4, 6, 9, and 16 are supported)
  -o orientation-requested=N
                  Specify portrait (3) or landscape (4) orientation
  -o print-quality=N  Specify the print quality - draft (3), normal (4), or best (5)
  -o sides=one-sided  Specify 1-sided printing
  -o sides=two-sided-long-edge
                  Specify 2-sided portrait printing
  -o sides=two-sided-short-edge
                  Specify 2-sided landscape printing
  -P page-list    Specify a list of pages to print
  -q priority     Specify the priority from low (1) to high (100)
  -s           Be silent
  -t title        Specify the job title
  -U username     Specify the username to use for authentication
ankit-jain@ubuntu:~$ 
```

----- fuser Command -----

On Unix-like operating systems, the fuser command identifies processes that are currently using files or sockets on the system.

fuser displays the PIDs of processes using the specified files or file systems

```
ankit-jain@ubuntu:~$ man fuser  
ankit-jain@ubuntu:~$ fuser .
```

```
/home/ankit-jain: 1420c 1422c 1430c 1435c 1453c 1456c 1461c 1464c 1469c 1475c 1479c 1483c 1490c 1521c 1609c 1615c 1619c 1626c 1639c 1657c 1661c 1662c 1664c 1666c 1679c 1688c  
1694c 1700c 1708c 1712c 1722c 1742c 1755c 1759c 1761c 1765c 1766c 1770c 1773c 1776c 1777c 1780c 1785c 1793c 1795c 1806c 1809c 1810c 1812c 1819c 1826c 1829c 1844c 1899c  
1951c 1998c 2001c 2146c 3200c
```

```
ankit-jain@ubuntu:~$ fuser -v .  
USER PID ACCESS COMMAND  
/home/ankit-jain: ankit-jain 1420 ...c.. tracker-miner-f  
ankit-jain 1422 ...c.. dbus-daemon  
ankit-jain 1430 ...c.. gvfsd  
ankit-jain 1435 ...c.. gvfsd-fuse  
ankit-jain 1453 ...c.. gvfs-udisks2-vo  
ankit-jain 1456 ...c.. gdm-x-session  
ankit-jain 1461 ...c.. Xorg  
ankit-jain 1464 ...c.. gvfs-ftp-volume  
ankit-jain 1469 ...c.. gvfs-afc-volume  
ankit-jain 1475 ...c.. gvfs-gphoto2-vo  
ankit-jain 1479 ...c.. gvfs-goa-volume  
ankit-jain 1483 ...c.. goa-daemon  
ankit-jain 1490 ...c.. goa-identity-se  
ankit-jain 1521 ...c.. gnome-session-b  
ankit-jain 1609 ...c.. at-spi-bus-laun  
ankit-jain 1615 ...c.. dbus-daemon  
ankit-jain 1619 ...c.. gnome-session-c  
ankit-jain 1626 ...c.. gnome-session-b  
ankit-jain 1639 ...c.. gnome-shell  
ankit-jain 1657 ...c.. ibus-daemon  
ankit-jain 1661 ...c.. ibus-memconf  
ankit-jain 1662 ...c.. ibus-extension  
ankit-jain 1664 ...c.. ibus-x11  
ankit-jain 1666 ...c.. ibus-portal  
ankit-jain 1679 ...c.. at-spi2-registr  
ankit-jain 1688 ...c.. xdg-permission  
ankit-jain 1694 ...c.. gnome-shell-cal  
ankit-jain 1700 ...c.. evolution-sourc  
ankit-jain 1708 ...c.. evolution-calen  
ankit-jain 1719 ...c.. dconf-service  
ankit-jain 1722 ...c.. evolution-addre  
ankit-jain 1742 ...c.. gvfsd-trash  
ankit-jain 1748 ...c.. gjs  
ankit-jain 1755 ...c.. gsd-a11y-settin  
ankit-jain 1759 ...c.. gsd-color  
ankit-jain 1761 ...c.. gsd-datetime  
ankit-jain 1765 ...c.. gsd-housekeepin  
ankit-jain 1766 ...c.. gsd-keyboard  
ankit-jain 1770 ...c.. gsd-media-keys  
ankit-jain 1773 ...c.. gsd-power  
ankit-jain 1776 ...c.. gsd-print-notif  
ankit-jain 1777 ...c.. gsd-rfkill
```

----- comm Command -----

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

SYNTAX = comm [OPTION]... FILE1 FILE2

OPTIONS =

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).

Activities Terminal ▾

Feb 13 23:52

52 0 0

ankit-jain@ubuntu:~

```
ankit-jain@ubuntu:~$ man comm
ankit-jain@ubuntu:~$ cat sort1.txt
ankit
bhavesh
chetan
dhanraj
gajanand
ankit-jain@ubuntu:~$ cat sort2.txt
ankit
chetan
ram
sita
ankit-jain@ubuntu:~$ comm sort1.txt sort2.txt
      ankit
bhavesh      chetan
dhanraj
gajanand
      ram
      sita
ankit-jain@ubuntu:~$ comm -1 sort1.txt sort2.txt
      ankit
      chetan
      ram
      sita
ankit-jain@ubuntu:~$ comm -2 sort1.txt sort2.txt
      ankit
bhavesh
      chetan
dhanraj
gajanand
ankit-jain@ubuntu:~$ comm -12 sort1.txt sort2.txt
ankit
chetan
ankit-jain@ubuntu:~$
```

QUESTION 2

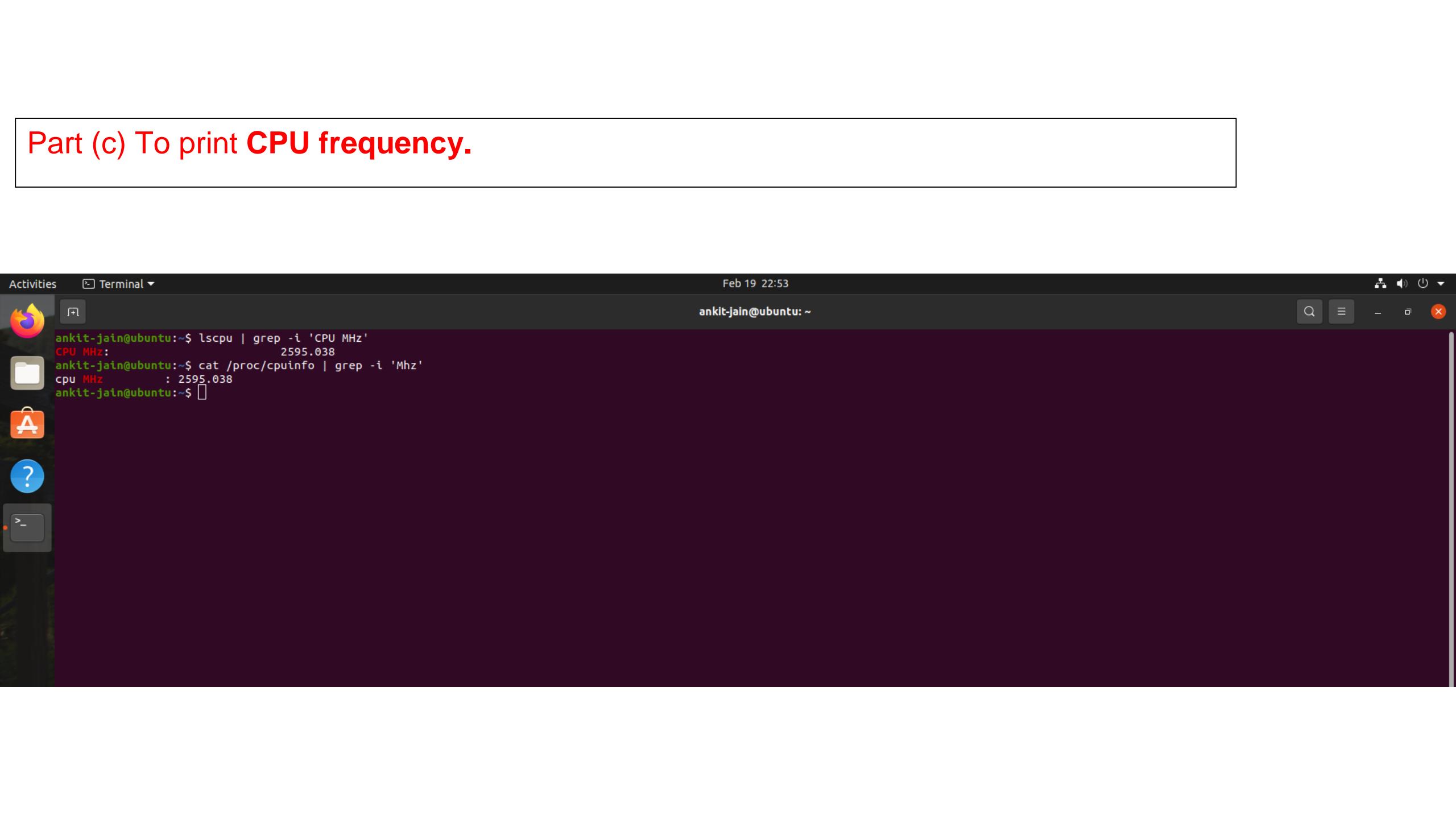
Part (a) To print processor type

```
ankit-jain@ubuntu:~$ uname -p  
x86_64  
ankit-jain@ubuntu:~$ □
```

Part (b) To print no of processor

```
ankit-jain@ubuntu:~$ cat /proc/cpuinfo | grep 'cpu cores'  
cpu cores      : 1  
ankit-jain@ubuntu:~$ lscpu | grep 'Core(s)'  
Core(s) per socket:          1  
ankit-jain@ubuntu:~$ 
```

Part (c) To print CPU frequency.



The image shows a screenshot of a Ubuntu desktop environment. On the left, there is a dock with several icons: a red Firefox icon, a grey folder icon, an orange application icon, a blue question mark icon, and a grey terminal icon. The main area features a dark-themed terminal window. The terminal window has a title bar with "Activities" and "Terminal". The status bar at the top right shows the date and time as "Feb 19 22:53" and the user as "ankit-jain@ubuntu: ~". The terminal itself contains the following command-line session:

```
ankit-jain@ubuntu:~$ lscpu | grep -i 'CPU MHz'  
CPU MHz: 2595.038  
ankit-jain@ubuntu:~$ cat /proc/cpuinfo | grep -i 'Mhz'  
cpu MHz : 2595.038  
ankit-jain@ubuntu:~$
```

Part (d) To print OS name

```
ankit-jain@ubuntu:~$ cat /etc/os-release | egrep '^NAME=|VERSION='
NAME="Ubuntu"
VERSION="20.04.3 LTS (Focal Fossa)"
ankit-jain@ubuntu:~$ 
```

Part (e) To print **kernel version**

```
ankit-jain@ubuntu:~$ uname -r  
5.13.0-28-generic  
ankit-jain@ubuntu:~$ cat /proc/version  
Linux version 5.13.0-28-generic (buildd@lgw01-amd64-035) (gcc (Ubuntu 9.3.0-17ubuntu1~20.04) 9.3.0, GNU ld (GNU Binutils for Ubuntu) 2.34) #31~20.04.1-Ubuntu SMP Wed Jan 19 14:08:10 UTC 2022  
ankit-jain@ubuntu:~$ █
```

Part (f) To print ram size(Total and free memory in mb),Disk size

```
ankit-jain@ubuntu:~$ free -m | egrep 'Mem|total|free'
      total        used       free      shared  buff/cache   available
Mem:      5961         915       4185          2        860       4789
ankit-jain@ubuntu:~$ df -m
Filesystem  1M-blocks  Used Available Use% Mounted on
udev            2948     0     2948   0% /dev
tmpfs           597     2     595   1% /run
/dev/sda5      59713    8447    48205  15% /
tmpfs           2981     0     2981   0% /dev/shm
tmpfs             5     1       5   1% /run/lock
tmpfs           2981     0     2981   0% /sys/fs/cgroup
/dev/loop0          1     1       0  100% /snap/bare/5
/dev/loop1          56    56       0  100% /snap/core18/2284
/dev/loop2          56    56       0  100% /snap/core18/2128
/dev/loop3          62    62       0  100% /snap/core20/1328
/dev/loop4          219   219       0  100% /snap/gnome-3-34-1804/72
/dev/loop5          219   219       0  100% /snap/gnome-3-34-1804/77
/dev/loop6          66    66       0  100% /snap/gtk-common-themes/1515
/dev/loop7          66    66       0  100% /snap/gtk-common-themes/1519
/dev/loop8          55    55       0  100% /snap/snap-store/558
/dev/loop9          44    44       0  100% /snap/snapd/14978
/dev/loop10         51    51       0  100% /snap/snap-store/547
/dev/sda1           511    1     511   1% /boot/efi
tmpfs             597     1     597   1% /run/user/1000
ankit-jain@ubuntu:~$ 
```

Part (g) To print **Total no of processes running**

```
ankit-jain@ubuntu:~$ ps aux | wc -l  
280  
ankit-jain@ubuntu:~$ 
```

Part (h) To print No of different users available on machine and their name

```
ankit-jain@ubuntu:~$ awk -F':' '{print $1}' /etc/passwd
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
systemd-network
systemd-resolve
systemd-timesync
messagebus
syslog
_apt
tss
uuid
tcpdump
avahi-autoipd
usbmux
rtkit
dnsmasq
cups-pk-helper
speech-dispatcher
avahi
kernoops
saned
nm-openvpn
hplip
whoopsie
colord
geoclue
pulse
gnome-initial-setup
gdm
sssd
ankit-jain
systemd-coredump
newuser
```

Part (i) To print No of times this system has been booted / rebooted

```
ankit-jain@ubuntu:~$ last reboot | wc -l  
21  
ankit-jain@ubuntu:~$ □
```

