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# Practical 1

Getting acquaintance with basic UNIX commands and filters

## 1. who

**Description :** The who command is used to get information about currently logged in user on to system.

The who command displays the following information for each user currently logged in to the system if no option is provided :

1. Login name of the users
2. Terminal line numbers
3. Login time of the users in to system
4. Remote host name of the user

```
aayush@aayushs-Ubuntu:/$ who
aayush      :0              2021-01-29 18:29 (:0)
```

## 2. cp

**Description :** *cp* which stands for *copy*, 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 in which the first one is source-file and the second one is destination-file.

```
aayush@aayushs-Ubuntu:~/Documents$ ls
sample.txt
aayush@aayushs-Ubuntu:~/Documents$ cp sample.txt sample_copy.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
sample_copy.txt  sample.txt
```

### 3. ln

**Description :** This command is used to create links between files.

Creating Hard link :

```
aayush@aayushs-Ubuntu:~/Documents$ ls
sample.txt
aayush@aayushs-Ubuntu:~/Documents$ cat < sample.txt
This is sample text.
aayush@aayushs-Ubuntu:~/Documents$ ln sample.txt sample_link.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
sample_link.txt  sample.txt
aayush@aayushs-Ubuntu:~/Documents$ cat < sample_link.txt
This is sample text.
```

Creating Soft link :

```
aayush@aayushs-Ubuntu:~/Documents$ ln -s sample.txt sample_soft_link.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
sample_link.txt  sample_soft_link.txt  sample.txt
aayush@aayushs-Ubuntu:~/Documents$ cat < sample_soft_link.txt
This is sample text.
```

Listing with links :

```
aayush@aayushs-Ubuntu:~/Documents$ ls -l
total 8
-rw-rw-r-- 2 aayush aayush 21 Jan 30 11:22 sample_link.txt
lrwxrwxrwx 1 aayush aayush 10 Jan 30 11:33 sample_soft_link.txt -> sample.txt
-rw-rw-r-- 2 aayush aayush 21 Jan 30 11:22 sample.txt
```

### 4. mkdir

**Description :** This command in Linux allows the user to create directories.

```
aayush@aayushs-Ubuntu:~/Documents$ ls
sample.txt
aayush@aayushs-Ubuntu:~/Documents$ mkdir demo_dir
aayush@aayushs-Ubuntu:~/Documents$ ls
demo_dir  sample.txt
aayush@aayushs-Ubuntu:~/Documents$ ls demo_dir
aayush@aayushs-Ubuntu:~/Documents$ █
```

## 5. bc -l

**Description :** *bc* command is used for command line calculator.

In which *-l*, {*- -mathlib*} : Defines the standard math library.

```
aayush@aayushs-Ubuntu:~/Documents$ bc -l
bc 1.07.1
Copyright 1991-1994, 1997, 1998, 2000, 2004, 2006, 2008, 2012-2017 Free Software
Foundation, Inc.
This is free software with ABSOLUTELY NO WARRANTY.
For details type `warranty'.
1+3
4
5*2
10
quit
aayush@aayushs-Ubuntu:~/Documents$
```

## 6. uname

**Description :** This command displays the information about the system.

In which *-a* , 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*.

```
aayush@aayushs-Ubuntu:~/Documents$ uname
Linux
aayush@aayushs-Ubuntu:~/Documents$ uname -a
Linux aayushs-Ubuntu 5.8.0-38-generic #43~20.04.1-Ubuntu SMP Tue Jan 12 16:39:47
UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
```

## 7. du

**Description :** *du* stands for *disk usage*, which is used to estimate file space usage.

In which,

*-h, -human-readable* : print sizes in human readable format.

*-a, -all* : write count of all files, not just directories.

```
aayush@aayushs-Ubuntu:~/Documents$ ls
demo_dir sample.txt
aayush@aayushs-Ubuntu:~/Documents$ du
4      ./demo_dir
12     .
aayush@aayushs-Ubuntu:~/Documents$ du -a
4      ./sample.txt
4      ./demo_dir
12     .
aayush@aayushs-Ubuntu:~/Documents$ du -h
4.0K   ./demo_dir
12K    .
aayush@aayushs-Ubuntu:~/Documents$ du -a -h
4.0K   ./sample.txt
4.0K   ./demo_dir
12K    .
```

## 8. sort

**Description :** This command is used to sort a file, arranging the records in a particular order. By default, the sort command sorts file assuming the contents are ASCII.

In which, -r reverses the order of sorting.

*This command does not actually change the input file, i.e. sample.txt.*

```
aayush@aayushs-Ubuntu:~/Documents$ cat< sample.txt
Preet
Shivam
Zack
Ansh
Bob
Aayush
aayush@aayushs-Ubuntu:~/Documents$ sort sample.txt
Aayush
Ansh
Bob
Preet
Shivam
Zack
aayush@aayushs-Ubuntu:~/Documents$ sort -r sample.txt
Zack
Shivam
Preet
Bob
Ansh
Aayush
```

## 9. pipe

**Description :** This command is used to combine two or more commands, and in this, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on.

Like, If we want to display first three names [alphabetically] of a text file in which names are not sorted.

Then we can do the following using | (pipe) command :

```
aayush@aayushs-Ubuntu:~/Documents$ cat sample.txt
Preet
Shivam
Zack
Ansh
Bob
Aayush
aayush@aayushs-Ubuntu:~/Documents$ cat < sample.txt | sort | head -3
Aayush
Ansh
Bob
```

## 10.nice

**Description :** This *nice* command helps in execution of a program/process with modified scheduling priority. It launches a process with a user-defined scheduling priority.

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

```
aayush@aayushs-Ubuntu:~/Documents$ nice
0
aayush@aayushs-Ubuntu:~/Documents$ nice --help
Usage: nice [OPTION] [COMMAND [ARG]...]
Run COMMAND with an adjusted niceness, which affects process scheduling.
With no COMMAND, print the current niceness. Niceness values range from
-20 (most favorable to the process) to 19 (least favorable to the process).

Mandatory arguments to long options are mandatory for short options too.
  -n, --adjustment=N    add integer N to the niceness (default 10)
            --help      display this help and exit
            --version   output version information and exit

NOTE: your shell may have its own version of nice, which usually supersedes
the version described here. Please refer to your shell's documentation
for details about the options it supports.

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

## 11. whoami

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

```
aayush@aayushs-Ubuntu:~/Documents$ whoami
aayush
```

## 12.rm

**Description :** this command is used to remove objects such as files, directories, symbolic links and so on from the file system like UNIX.

```
aayush@aayushs-Ubuntu:~/Documents$ ls
demo_dir  sample.txt  state.txt
aayush@aayushs-Ubuntu:~/Documents$ rm state.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
demo_dir  sample.txt
```

## 13.head

**Description :** As the name implies, This command print the top N number of data of the given input. By default, it prints the first 10 lines of the specified files.

```
aayush@aayushs-Ubuntu:~/Documents$ cat state.txt
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chhattisgarh
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu and Kashmir
Jharkhand
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Manipur
Meghalaya
Mizoram
Nagaland
Odisha
Punjab
Rajasthan
Sikkim
Tamil Nadu
Telangana
Tripura
Uttar Pradesh
Uttarakhand
West Bengal
aayush@aayushs-Ubuntu:~/Documents$ head state.txt
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chhattisgarh
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu and Kashmir
aayush@aayushs-Ubuntu:~/Documents$ █
```

## 14.chmod

**Description :** This command is used to change the access mode of a file.

```
aayush@aayushs-Ubuntu:~/Documents$ ls -l sample.txt
-rw-rw-r-- 1 aayush aayush 34 Jan 30 11:59 sample.txt
aayush@aayushs-Ubuntu:~/Documents$ chmod u=r sample.txt
aayush@aayushs-Ubuntu:~/Documents$ ls -l sample.txt
-r--r--r-- 1 aayush aayush 34 Jan 30 11:59 sample.txt
```

## 15.rmdir

**Description :** This command is used remove empty directories from the filesystem 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.

```
aayush@aayushs-Ubuntu:~/Documents$ ls
demo_dir  sample.txt
aayush@aayushs-Ubuntu:~/Documents$ rmdir demo_dir
aayush@aayushs-Ubuntu:~/Documents$ ls
sample.txt
```

## 16.expr

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

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

```
aayush@aayushs-Ubuntu:~/Documents$ expr 12 + 4 \* 3
24
```

## 17.tty

**Description :** This command displays information related to *terminal*. This command of terminal basically prints the file name of the terminal connected to standard input.

```
aayush@aayushs-Ubuntu:~/Documents$ tty --help
Usage: tty [OPTION]...
Print the file name of the terminal connected to standard input.

-s, --silent, --quiet    print nothing, only return an exit status
--help      display this help and exit
--version   output version information and exit

GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
Full documentation at: <https://www.gnu.org/software/coreutils/tty>
or available locally via: info '(coreutils) tty invocation'
aayush@aayushs-Ubuntu:~/Documents$ tty --version
tty (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 David MacKenzie.
aayush@aayushs-Ubuntu:~/Documents$ tty --s
aayush@aayushs-Ubuntu:~/Documents$ tty
/dev/pts/3
```

## 18.cut

**Description :** This 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*. Basically, the cut command slices a line and extracts the text.

```
aayush@aayushs-Ubuntu:~/Documents$ cat sample.txt
Preet
Shivam
Zack
Ansh
Bob
Aayush
aayush@aayushs-Ubuntu:~/Documents$ cut -b 1,2,3 sample.txt
Pre
Shi
Zac
Ans
Bob
Aay
aayush@aayushs-Ubuntu:~/Documents$ cut -c 1-4 sample.txt
Pree
Shiv
Zack
Ansh
Bob
Aayu
```

## 19.ulimit

**Description :** This command sets limits on system resources or displays information about limits on system resources that have been set. This command is used to set upper limits on system resources that are specified by option specifications, as well as to output to the standard output limits that have been set.

1. To display maximum users process or for showing maximum user process limit for the logged-in user.
2. For showing the maximum file size a user can have.
3. For showing maximum memory size for the current user.
4. For showing maximum memory size limit.

```
aayush@aayushs-Ubuntu:~/Documents$ ulimit
unlimited
aayush@aayushs-Ubuntu:~/Documents$ 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) 11741
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) 11741
virtual memory             (kbytes, -v) unlimited
file locks                  (-x) unlimited
aayush@aayushs-Ubuntu:~/Documents$ ulimit -u
11741
aayush@aayushs-Ubuntu:~/Documents$ ulimit -f
unlimited
aayush@aayushs-Ubuntu:~/Documents$ ulimit -m
unlimited
aayush@aayushs-Ubuntu:~/Documents$ ulimit -v
unlimited
```

## 20.pg

**Description :** This command allows us to view text files page-by-page. The pg command has 12 options and the argument is the text file to view, and because pg is a separate program it has its own internal commands, and there are about 15 of those. To return to the command prompt, hit ‘q’.

pg command is not working on my pc.

```
aayush@aayushs-Ubuntu:~/Documents$ pg sample.txt
pg: command not found
aayush@aayushs-Ubuntu:~/Documents$ pg -n sample.txt
pg: command not found
aayush@aayushs-Ubuntu:~/Documents$ pg -s sample.txt
pg: command not found
```

## 21.tee

**Description :** This 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

```
aayush@aayushs-Ubuntu:~/Documents$ date | tee demo_write.txt
Saturday 30 January 2021 09:47:05 PM IST
aayush@aayushs-Ubuntu:~/Documents$ ls
demo_write.txt  sample.txt
aayush@aayushs-Ubuntu:~/Documents$ cat demo_write.txt
Saturday 30 January 2021 09:47:05 PM IST
```

## 22.read

**Description :** This 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. Zero indicates the end of the file. If some errors found then it returns -1.

```
aayush@aayushs-Ubuntu:~/Documents$ echo "what is your name..?";read name;echo "hello $name"
what is your name..?
Aayush
hello Aayush
```

## 23.touch

**Description :** This command is a standard command used in UNIX/Linux operating system which is used to create, change and modify timestamps of a file

- 1)touch -a: This command is used to change access time only.
- 2)touch -c : This command is used to check whether a file is created or not.
- 3)touch -c-d : This is used to update access and modification time.

```
aayush@aayushs-Ubuntu:~/Documents$ touch demo_touch.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
demo_touch.txt demo_write.txt sample.txt
aayush@aayushs-Ubuntu:~/Documents$ touch demo1.txt demo2.txt demo3.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
demo1.txt demo2.txt demo3.txt demo_touch.txt demo_write.txt sample.txt
aayush@aayushs-Ubuntu:~/Documents$ touch -a demo1.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
demo1.txt demo2.txt demo3.txt demo_touch.txt demo_write.txt sample.txt
aayush@aayushs-Ubuntu:~/Documents$ touch -c demo1.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
demo1.txt demo2.txt demo3.txt demo_touch.txt demo_write.txt sample.txt
```

## 24.mv

**Description :** mv stands for move. mv is used to move one or more files or directories from one place to another in file system. We can also rename files using mv.

```
aayush@aayushs-Ubuntu:~/Documents$ ls
sample.txt
aayush@aayushs-Ubuntu:~/Documents$ mv sample.txt moved.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
moved.txt
```

## 25.umask

**Description :** Umask which stands for user file-creation mode, is a Linux command that is used to assign the default file permission sets for newly created folders and files.

```
aayush@aayushs-Ubuntu:~/Documents$ umask
0002
aayush@aayushs-Ubuntu:~/Documents$ umask -S
U=rwx,g=rwx,o=rx
```

## 26.cd

**Description :** The cd (“change directory”) command is used to change the current working directory in Linux.

```
aayush@aayushs-Ubuntu:~$ pwd
/home/aayush
aayush@aayushs-Ubuntu:~$ cd Documents
aayush@aayushs-Ubuntu:~/Documents$ pwd
/home/aayush/Documents
```

## 27.factor

**Description :** The factor command in Linux is used to print the prime factors of the given numbers, either given from command line or read from standard input.

```
aayush@aayushs-Ubuntu:~/Documents$ factor 44
44: 2 2 11
aayush@aayushs-Ubuntu:~/Documents$ factor --help
Usage: factor [NUMBER]...
      or: factor OPTION
Print the prime factors of each specified integer NUMBER. If none
are specified on the command line, read them from standard input.

      --help      display this help and exit
      --version   output version information and exit

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

## 28.date

**Description :** date command is used to display the system date and time. date command is also used to set date and time of the system.

1)date -u : Displays the time in GMT(Greenwich Mean Time)/UTC(Coordinated Universal Time )time zone.

2)date -d Option: Displays the given date string in the format of date.

```
aayush@aayushs-Ubuntu:~/Documents$ date
Saturday 30 January 2021 10:13:28 PM IST
aayush@aayushs-Ubuntu:~/Documents$ date -u
Saturday 30 January 2021 04:43:31 PM UTC
```

## 29.cal

**Description :** cal command shows current month calendar as output.

```
aayush@aayushs-Ubuntu:~/Documents$ cal
      January 2021
Su Mo Tu We Th Fr Sa
                    1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
```

## 30.grep

**Description :** The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern.

- 1)grep -c : This prints only a count of the lines that match a pattern
- 2)grep -h : Display the matched lines, but do not display the filenames.
- 3)grep -i : Ignores, case for matching
- 4)grep -l : Displays list of a filenames only.
- 5)grep -n : Display the matched lines and their line numbers.
- 6)grep -v : This prints out all the lines that do not matches the pattern
- 7)grep -e exp : Specifies expression with this option. Can use multiple times.
- 8)grep -f file : Takes patterns from file, one per line.
- 9)grep -E : Treats pattern as an extended regular expression (ERE)
- 10)grep -w : Match whole word
- 11)grep -o : Print only the matched parts of a matching line

```
aayush@aayushs-Ubuntu:~/Documents$ cat sample.txt
Preet
Shivam
Zack
Ansh
Bob
Aayush
aayush@aayushs-Ubuntu:~/Documents$ grep -i "aayu" sample.txt
Aayush
aayush@aayushs-Ubuntu:~/Documents$ grep -c "sh" sample.txt
2
```

```
aayush@aayushs-Ubuntu:~/Documents$ grep -l "Aayush" *
sample.txt
aayush@aayushs-Ubuntu:~/Documents$ grep -w "Za" sample.txt
aayush@aayushs-Ubuntu:~/Documents$ grep -w "Zack" sample.txt
Zack
aayush@aayushs-Ubuntu:~/Documents$ grep "^A" sample.txt
Ansh
Aayush
```

## 31.more

**Description :** more command is used to view the text files in the command prompt.

- 1)more -d : to help the user to navigate
- 2)more -f : This option does not wrap the long lines and displays them as such
- 3)more -p : This option clears the screen and then displays the text
- 4)more -s : This option squeezes multiple blank lines into one single blank line
- 5)more -u : This option omits the underlines

```
aayush@aayushs-Ubuntu:~/Documents$ more sample.txt
Preet
Shivam
Zack
Ansh
Bob
Aayush
aayush@aayushs-Ubuntu:~/Documents$ more -d sample.txt
Preet
Shivam
Zack
Ansh
Bob
Aayush
aayush@aayushs-Ubuntu:~/Documents$ more -u sample.txt
Preet
Shivam
Zack
Ansh
Bob
Aayush
```

After writing -p command :

```
Preet
Shivam
Zack
Ansh
Bob
Aayush
aayush@aayushs-Ubuntu:~/Documents$
```

## 32.ps

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

```
aayush@aayushs-Ubuntu:~/Documents$ ps
  PID TTY      TIME CMD
 22796 pts/0    00:00:00 bash
 23003 pts/0    00:00:00 ps
```

## 33.echo

**Description :** This command in linux is used to display line of text/string that are passed as an argument .

```
aayush@aayushs-Ubuntu:~/Documents$ echo "Hello Aayush!"
Hello Aayush!
```

## 34.cat

**Description :** This command is used to read data from the file and displays its content as the output. It also helps to view, create and concatenate files.

Options :

- a. To view files -> \$cat file1 file2 file3
- b. To create file -> \$cat > new\_filename
- c. Copy files content -> \$cat source\_filename > destination\_filename.

```
aayush@aayushs-Ubuntu:~/Documents$ ls
aayush@aayushs-Ubuntu:~/Documents$ cat > sample.txt
Hello !
I am Aayush
My roll number is 19BCE245
Thank you.aayush@aayushs-Ubuntu:~/Documents$ cat < sample.txt
Hello !
I am Aayush
My roll number is 19BCE245
Thank you.aayush@aayushs-Ubuntu:~/Documents$
```

## 35.ls

**Description :** This command is used to list the files or directories.

```
aayush@aayushs-Ubuntu:~$ ls
afiedt.buf  Documents          oradiag_aayush  sample.txt
DBMS        Downloads           OS              snap
Desktop     Music              Pictures        Templates
Disk1       oracle-xe-11.2.0-1.0.x86_64.rpm.zip Public        Videos
```

## 36.pwd

**Description :** This command outputs the path of the working directory, starting from the root. This command has two flags :

- a. pwd -L -> outputs the symbolic path
- b. pwd -P -> outputs the actual path

```
aayush@aayushs-Ubuntu:~/Documents$ pwd
/home/aayush/Documents
aayush@aayushs-Ubuntu:~/Documents$ pwd -L
/home/aayush/Documents
aayush@aayushs-Ubuntu:~/Documents$ pwd -P
/home/aayush/Documents
```

## 37.bc

**Description :** This command is used for command line calculator. This command supports arithmetic, increment/decrement, assignment, comparison relational, logical/boolean operators.

```
aayush@aayushs-Ubuntu:~/Documents$ bc
bc 1.07.1
Copyright 1991-1994, 1997, 1998, 2000, 2004, 2006, 2008, 2012-2017 Free Software
Foundation, Inc.
This is free software with ABSOLUTELY NO WARRANTY.
For details type `warranty'.
1+3
4
4/2
2
```

## 38.logname

**Description :** This command outputs the login name of the current user.

```
aayush@aayushs-Ubuntu:~/Documents$ logname
aayush
```

## 39.df

**Description :** This command outputs the information related to file systems about the total space and available space

Options :

- df -a -> If you want to display all the file system, use -a option
- df -h -> Use -h option to display size in power of 1024
- df -H -> Use -H option to display sizes in power of 1000
- df --total -> To get complete grand total, use -total option.

```
aayush@aayushs-Ubuntu:~/Documents$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev            1502916      0   1502916   0% /dev
tmpfs           306420       1488   304932   1% /run
/dev/sda5        14897128  9595460  4525220  68% /
tmpfs           1532084     624032   908052  41% /dev/shm
tmpfs            5120         4     5116   1% /run/lock
tmpfs           1532084      0   1532084   0% /sys/fs/cgroup
/dev/loop0        56320       56320      0  100% /snap/core18/1880
/dev/loop2        261760      261760      0  100% /snap/gnome-3-34-1804/36
/dev/loop1        56832       56832      0  100% /snap/core18/1944
/dev/loop3        224256      224256      0  100% /snap/gnome-3-34-1804/66
/dev/loop4        63616       63616      0  100% /snap/gtk-common-themes/1506
/dev/loop6        66432       66432      0  100% /snap/gtk-common-themes/1514
/dev/loop5        51072       51072      0  100% /snap/snap-store/467
/dev/loop7        52352       52352      0  100% /snap/snap-store/518
/dev/loop8        30720       30720      0  100% /snap/snapd/8542
/dev/loop9        31872       31872      0  100% /snap/snapd/10707
/dev/sda1        523248       4     523244   1% /boot/efi
tmpfs           306416       4     306412   1% /run/user/1001
Operating_System 244810132 226165376 18644756  93% /media/sf_Operating_System
tmpfs           306416      40     306376   1% /run/user/1000
```

```
aayush@aayushs-Ubuntu:~/Documents$ df -H
Filesystem      Size  Used Avail Use% Mounted on
udev            1.6G   0    1.6G   0% /dev
tmpfs           314M  1.6M  313M   1% /run
/dev/sda5        16G  9.9G  4.7G  68% /
tmpfs           1.6G  640M  930M  41% /dev/shm
tmpfs            5.3M  4.1k  5.3M   1% /run/lock
tmpfs           1.6G   0    1.6G   0% /sys/fs/cgroup
/dev/loop0        58M   58M   0  100% /snap/core18/1880
/dev/loop2        269M  269M   0  100% /snap/gnome-3-34-1804/36
```

```
/dev/loop1      59M   59M    0 100% /snap/core18/1944
/dev/loop3     230M  230M    0 100% /snap/gnome-3-34-1804/66
/dev/loop4      66M   66M    0 100% /snap/gtk-common-themes/1506
/dev/loop6      69M   69M    0 100% /snap/gtk-common-themes/1514
/dev/loop5      53M   53M    0 100% /snap/snap-store/467
/dev/loop7      54M   54M    0 100% /snap/snap-store/518
/dev/loop8      32M   32M    0 100% /snap/snapd/8542
/dev/loop9      33M   33M    0 100% /snap/snapd/10707
/dev/sda1     536M  4.1k   536M    1% /boot/efi
tmpfs        314M  4.1k   314M    1% /run/user/1001
Operating_System 251G  232G   20G  93% /media/sf_Operating_System
tmpfs        314M  41k    314M    1% /run/user/1000
aayush@aayushs-Ubuntu:~/Documents$ df --total
Filesystem      1K-blocks      Used Available Use% Mounted on
udev            1502916         0  1502916   0% /dev
tmpfs           306420       1488  304932   1% /run
/dev/sda5     14897128  9595460  4525220  68% /
tmpfs           1532084      624032  908052  41% /dev/shm
tmpfs            5120          4    5116   1% /run/lock
tmpfs           1532084         0  1532084   0% /sys/fs/cgroup
/dev/loop0      56320        56320         0 100% /snap/core18/1880
/dev/loop2     261760       261760         0 100% /snap/gnome-3-34-1804/36
/dev/loop1      56832        56832         0 100% /snap/core18/1944
/dev/loop3     224256       224256         0 100% /snap/gnome-3-34-1804/66
/dev/loop4      63616        63616         0 100% /snap/gtk-common-themes/1506
/dev/loop6      66432        66432         0 100% /snap/gtk-common-themes/1514
/dev/loop5      51072        51072         0 100% /snap/snap-store/467
/dev/loop7      52352        52352         0 100% /snap/snap-store/518
/dev/loop8      30720        30720         0 100% /snap/snapd/8542
/dev/loop9      31872        31872         0 100% /snap/snapd/10707
/dev/sda1     523248         4   523244   1% /boot/efi
tmpfs           306416         4   306412   1% /run/user/1001
Operating_System 244810132 226168148 18641984  93% /media/sf_Operating_System
tmpfs           306416        40   306376   1% /run/user/1000
total        266617196  237284412 28556336  90% -
```

## 40.wc

**Description :** This command is used to output the number of lines, word count, byte and characters count of the file specified in the argument. The 1st column shows the no. of lines, 2nd column shows no. of words, 3rd column shows no. of characters, 4th column shows the filename.

Options :

- a. wc -l filename -> prints the number of lines present in a file
- b. wc -w filename -> prints the number of words present in a file
- c. wc -c filename -> displays count of bytes present in a file.

```
aayush@aayushs-Ubuntu:~/Documents$ cat sample.txt
Hello !
I am Aayush
My roll number is 19BCE245
Thank you.
aayush@aayushs-Ubuntu:~/Documents$ wc sample.txt
 4 12 60 sample.txt
aayush@aayushs-Ubuntu:~/Documents$ wc -l sample.txt
4 sample.txt
```

```
aayush@aayushs-Ubuntu:~/Documents$ wc -w sample.txt
12 sample.txt
aayush@aayushs-Ubuntu:~/Documents$ wc -c sample.txt
60 sample.txt
```

## 41.awk

**Description :** 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 performs the associated actions.

1. awk '{print}' sample.txt : By default Awk prints every line of data from the specified file
2. awk '/sh/{print}' sample.txt : Print the lines which matches with the given pattern.

```
aayush@aayushs-Ubuntu:~/Documents$ cat sample.txt
Hello !
I am Aayush
My roll number is 19BCE245
Thank you.
aayush@aayushs-Ubuntu:~/Documents$ awk '{print}' sample.txt
Hello !
I am Aayush
My roll number is 19BCE245
Thank you.
aayush@aayushs-Ubuntu:~/Documents$ awk '/ayus/{print}' sample.txt
I am Aayush
```

## 42.tail

**Description :** This command outputs the last N ( by default 10 if not mentioned ) number os data of the given input.

Options :

- a. tail -n filename -> outputs the last n lines of the file
- b. tail +n filename -> outputs the last n lines of the file, but starts from the start instead of the end of file.
- c. tail -c filename -> outputs the last n bytes of the file

```
aayush@aayushs-Ubuntu:~/Documents$ cat sample.txt
Hello !
I am Aayush
My roll number is 19BCE245
Thank you.
```

```
aayush@aayushs-Ubuntu:~/Documents$ tail -2 sample.txt
My roll number is 19BCE245
Thank you.
aayush@aayushs-Ubuntu:~/Documents$ tail +2 sample.txt
I am Aayush
My roll number is 19BCE245
Thank you.
aayush@aayushs-Ubuntu:~/Documents$ tail -c 5 sample.txt
you.
```

## 43.kill

**Description :** This command is used to terminate the processes manually. This command sends a signal to a process which terminates the process. If the user doesn't specify the signal, then default TERM signal is sent. Signals are specified by 3 ways :

- a. By number
- b. With SIG prefix
- c. Without SIG prefix

```
aayush@aayushs-Ubuntu:~/Documents$ kill
kill: usage: kill [-s sigspec | -n signum | -sigspec] pid | jobspec ... or kill -l [sigspec]
aayush@aayushs-Ubuntu:~/Documents$ kill -l
 1) SIGHUP      2) SIGINT      3) SIGQUIT      4) SIGILL      5) SIGTRAP
 6) SIGABRT     7) SIGBUS      8) SIGFPE       9) SIGKILL     10) SIGUSR1
11) SIGSEGV     12) SIGUSR2     13) SIGPIPE     14) SIGALRM     15) SIGTERM
16) SIGSTKFLT   17) SIGCHLD     18) SIGCONT     19) SIGSTOP     20) SIGTSTP
21) SIGTTIN     22) SIGTTOU     23) SIGURG      24) SIGXCPU     25) SIGXFSZ
26) SIGVTALRM   27) SIGPROF     28) SIGWINCH    29) SIGIO       30) SIGPWR
31) SIGSYS      34) SIGRTMIN    35) SIGRTMIN+1  36) SIGRTMIN+2  37) SIGRTMIN+3
38) SIGRTMIN+4  39) SIGRTMIN+5  40) SIGRTMIN+6  41) SIGRTMIN+7  42) SIGRTMIN+8
43) SIGRTMIN+9  44) SIGRTMIN+10 45) SIGRTMIN+11 46) SIGRTMIN+12 47) SIGRTMIN+13
48) SIGRTMIN+14 49) SIGRTMIN+15 50) SIGRTMAX-14 51) SIGRTMAX-13 52) SIGRTMAX-12
53) SIGRTMAX-11 54) SIGRTMAX-10 55) SIGRTMAX-9  56) SIGRTMAX-8  57) SIGRTMAX-7
58) SIGRTMAX-6  59) SIGRTMAX-5  60) SIGRTMAX-4  61) SIGRTMAX-3  62) SIGRTMAX-2
63) SIGRTMAX-1  64) SIGRTMAX
```

## 44.I/O redirection

**Description :** This command allows us to change the standard input output devices.

- o pgm > file: Output of pgm is redirected to file (previous file will be lost)
- o pgm < file: Program pgm reads its input from file o pgm >> file: Output of pgm is appended to file

```
aayush@aayushs-Ubuntu:~/Documents$ cat > sample2.txt
This is demo text.
aayush@aayushs-Ubuntu:~/Documents$ ls
sample2.txt sample.txt
aayush@aayushs-Ubuntu:~/Documents$ wc -l sample.txt >> sample2.txt
aayush@aayushs-Ubuntu:~/Documents$ ls
sample2.txt sample.txt
aayush@aayushs-Ubuntu:~/Documents$ cat sample2.txt
This is demo text.
4 sample.txt
```