

# **Open Source Computing**

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**Assignment - II**

## **Aim:**

To introduce Linux essential commands and file system concepts, including standard files and the Linux security model, and to understand string processing and techniques for investigating and managing processes in Linux.

## **Theory:**

Linux is a powerful and versatile operating system that offers a range of essential commands and file system concepts, which are fundamental for efficient system management and operation. Understanding these commands is crucial for navigating the Linux environment, managing files, directories, and understanding standard files such as /etc/passwd and /etc/fstab. The Linux security model is robust, emphasizing user permissions, ownership, and access control lists (ACLs) to protect system resources and data. Mastering these basics provides a strong foundation for more advanced Linux administration tasks.

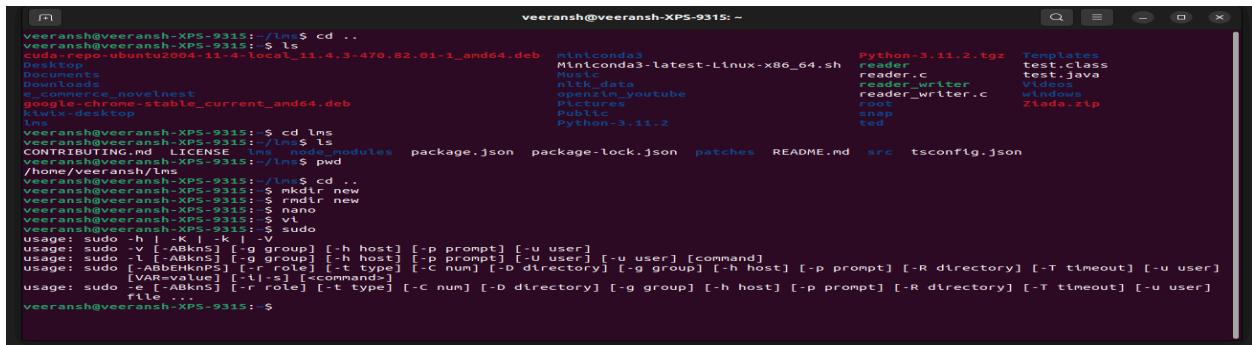
The Vi editor is a powerful text editor available in Linux that allows users to create and modify text files efficiently. Learning Vi is essential for system administrators and developers, as it is often the only editor available in minimal or rescue environments. Partition creation and management are critical skills, enabling the organization and allocation of disk space for different purposes, enhancing system performance and reliability. A solid understanding of the Linux shell, which provides a command-line interface for interacting with the operating system, is also essential for executing commands, writing scripts, and automating tasks.

String processing in Linux involves manipulating text using various commands such as grep, awk, and sed, which are powerful tools for searching, extracting, and transforming

data within files. Investigating and managing processes is another vital aspect of Linux administration, allowing users to monitor system performance, manage running applications, and troubleshoot issues. Commands like ps, top, and kill provide insights into system resource usage and enable effective process control. Together, these skills form a comprehensive toolkit for proficient Linux usage and system administration.

## Code:

1. ls - List directory contents
2. cd - Change current directory
3. pwd - print working directory
4. mkdir - create a new directory



A screenshot of a terminal window titled "veeransh@veeransh-XPS-9315: ~". The terminal displays several Linux commands and their outputs:

```
veeransh@veeransh-XPS-9315:~/lms$ cd ..
veeransh@veeransh-XPS-9315:~$ ls
libreoffice-debian12004=11=4+local_11.4.3-470.82.01-1_amd64.deb  miniconda3-Miniconda3-latest-Linux-x86_64.sh  Python-3.11.2.tgz  Templates
Desktop  Music
Documents  nroff-data
Downloads  openzim_youtube
.SeeAlso  Pictures
.google-chrome-stable_current_amd64.deb  Public
.kde-distro  Python-3.11.2
.kde-kdebase  reader
.kde-kdebase-new  reader.c
.kde-kdebase-new-new  reader_writer
.kde-kdebase-new-new-new  reader_writer.c
.kde-kdebase-new-new-new-new  root
.kde-kdebase-new-new-new-new-new  snap
.kde-kdebase-new-new-new-new-new-new  Zlade.zip
.kde-kdebase-new-new-new-new-new-new-new  ted
veeransh@veeransh-XPS-9315:~$ cd lms
veeransh@veeransh-XPS-9315:~/lms$ ls
CONTRIBUTING.md  LICENSE  node_modules  package.json  package-lock.json  patches  README.md  src  tsconfig.json
veeransh@veeransh-XPS-9315:~/lms$ pwd
/home/veeransh/lms
veeransh@veeransh-XPS-9315:~/lms$ cd ..
veeransh@veeransh-XPS-9315:~$ mkdir new
veeransh@veeransh-XPS-9315:~$ rmdir new
veeransh@veeransh-XPS-9315:~$ nano
veeransh@veeransh-XPS-9315:~$ vi
veeransh@veeransh-XPS-9315:~$ sudo
usage: sudo [-V] [-k]
usage: sudo [-V] [-ABknS] [-g group] [-h host] [-p prompt] [-u user]
usage: sudo [-l] [-ABknS] [-g group] [-h host] [-p prompt] [-U user] [-u user] [command]
usage: sudo [-u] [-ABknS] [-t type] [-t num] [-C num] [-D directory] [-g group] [-h host] [-p prompt] [-R directory] [-T timeout] [-u user]
[VAr=value1] [-i] [-s] [-c command]
usage: sudo [-e] [-ABknS] [-r role] [-t type] [-c num] [-D directory] [-g group] [-h host] [-p prompt] [-R directory] [-T timeout] [-u user]
file ...
veeransh@veeransh-XPS-9315:~$
```

5. rmdir - remove an empty directory
6. rm - remove files
7. cp - copy files
8. mv - move or rename files

```

GNU nano 6.2                                         /etc/sudoers.tmp

# This file MUST be edited with the 'visudo' command as root.
# please consider adding local content in /etc/sudoers.d/ instead of
# directly modifying this file.
# See the man page for details on how to write a sudoers file.
#
Defaults    env_reset
Defaults    mail_bypass
Defaults    secure_path="/usr/local/sbin:/usr/bin:/usr/sbin:/bin:/snap/bin"
Defaults    use_pyt

# This preserves proxy settings from user environments of root
# equivalent users (group sudo)
Defaults:sudo env_keep += "http_proxy https_proxy ftp_proxy all_proxy no_proxy"

# This always runs with arbitrary commands, but so does ALL, and it means
# that any user has the choice of editor respected.
#Defaults:sudo env_keep += "EDITOR"

# Completely harmless preservation of a user preference.
#Defaults:sudo env_keep += "GREP_COLOR"

# While you shouldn't normally run git as root, you need to with etckeeper
#Defaults:sudo env_keep += "GIT_AUTHOR_ GIT_COMMITTER_"

# Per-user preferences; root won't have sensible values for them.
#Defaults:sudo env_keep += "EMAIL DEBEMAIL DEBFULLNAME"

# "sudo scp" or "sudo rsync" should be able to use your SSH agent.
#Defaults:sudo env_keep += "SSH_AGENT_PID SSH_AUTH_SOCK"

# Ditto for GPG agent
#Defaults:sudo env_keep += "GPG_AGENT_INFO"

# Host alias specification
# User alias specification
# Cmd alias specification
# User privilege specification
root    ALL=(ALL:ALL) ALL
# Members of the admin group may gain root privileges
%admin  ALL=(ALL:ALL) ALL
# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL
# See sudoers(5) for more information on "@include" directives:

```

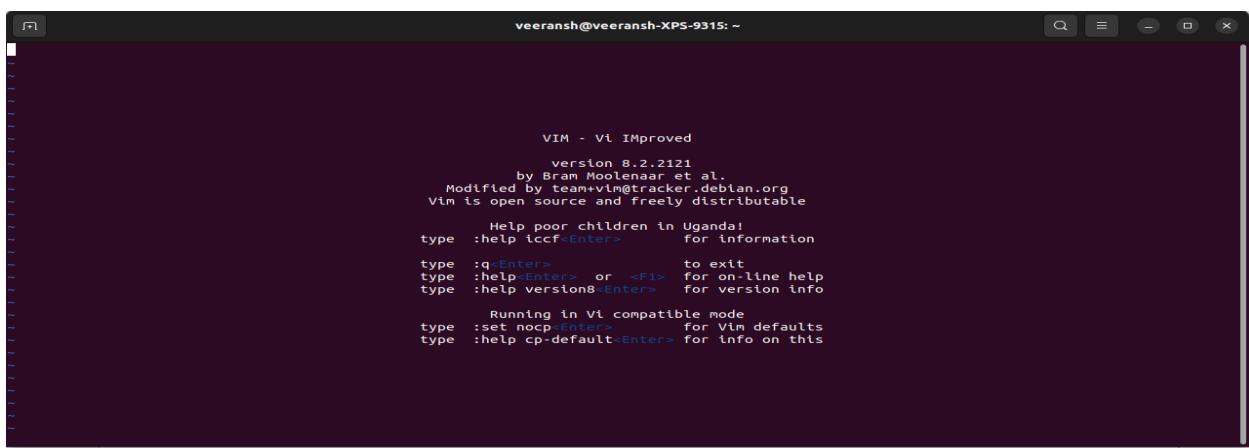
9. touch - create a new empty files

10. cat - concatenate and display file content

11. nano - open the file in Nano text editor



12. vi - open file in Vi text editor



13. sudo - execute command as a superuser

14. apt-get-update - update package list

```

veeransh@veeransh-XPS-9315: ~
veeransh@veeransh-XPS-9315: ~$ sudo apt-get update
[...]
veeransh@veeransh-XPS-9315: ~$ sudo apt-get update
[...]
Get:1 file:/var/cuda-repo-ubuntu2004-11-4-local InRelease
Ign:2 cdrom:/Ubuntu 22.04.3 LTS Jammy Jellyfish - Release amd64 (20230807.2) jammy InRelease
Ign:3 file:/var/cuda-repo-ubuntu2004-11-4-local InRelease
Err:3 cdrom:/Ubuntu 22.04.3 LTS Jammy Jellyfish - Release amd64 (20230807.2) jammy Release
  Please use apt-cdrom to make this CD-ROM recognized by APT. apt-get update cannot be used to add new CD-ROMs
Get:4 file:/var/cuda-repo-ubuntu2004-11-4-local Release [564 B]
Get:5 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:6 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Hit:7 http://archive.ubuntu.com/ubuntu jammy InRelease
Hit:8 http://archive.ubuntu.com/ubuntu jammy InRelease
Hit:9 http://archive.ubuntu.com/ubuntu jammy InRelease
Hit:10 http://archive.ubuntu.com/ubuntu jammy-updates InRelease
Get:11 http://security.ubuntu.com/ubuntu jammy-security InRelease [128 kB]
Hit:12 https://ppa.launchpadcontent.net/deadsnakes/ppa/ubuntu jammy InRelease
Get:13 http://security.ubuntu.com/ubuntu jammy-security InRelease [291 kB]
Get:14 http://security.ubuntu.com/ubuntu jammy-security/main i386 Packages [515 kB]
Hit:15 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:16 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1,085 kB]
Hit:17 http://security.ubuntu.com/ubuntu jammy-security/universe i386 Packages [888 kB]
Get:18 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [888 kB]
Get:19 http://security.ubuntu.com/ubuntu jammy-security/universe i386 Packages [620 kB]
Reading package lists... Done
E: Error, package 'cdrom:/Ubuntu 22.04.3 LTS Jammy Jellyfish - Release amd64 (20230807.2) jammy Release' does not have a Release file.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
W: file '/var/cuda-repo-ubuntu2004-11-4-local/Release.gpg' key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section in apt-key(8) for details.
W: https://mariadb.mirror.liquidtelecom.com/repo/10.6/ubuntu/dists/focal/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section in apt-key(8) for details.
veeransh@veeransh-XPS-9315: ~

```

## 15. apt-get-upgrade - upgrade all installed packages

## 16. apt-get-remove - remove an installed package

```

veeransh@veeransh-XPS-9315: ~$ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages have been kept back:
  linux-headers-generic-hwe-22.04 linux-image-generic-hwe-22.04 python3-update-manager update-manager
update-manager-core
The following packages will be upgraded:
  libcurl3-gnutls libcurl4-openssl-dev libgssapi-krb5-2
  libgssrpc4 libgvco libgvpr2 libk5crypto3 libkadm5clnt-mit12 libkadm5srv-mit12 libkdb5-10 libkrb5-dev libkrb5support0
  libldap-gnutl libldap-2.5-0 libldap-common libpathplan4 wpasupplicant xdg-desktop-portal-gnome
2 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 216 MB/224 MB of archives.
After this operation, 8,234 kB of additional disk space will be used.
Do you want to continue? [Y/n]/y
Get:1 http://security.ubuntu.com/ubuntu jammy-security/main amd64 google-chrome-stable amd64 127.0.6533.99-1 [109 MB]
Get:2 http://security.ubuntu.com/ubuntu jammy-security/main amd64 libk5crypto3 amd64 1.19.2-2ubuntu0.4 [863 kB]
Get:3 https://packages.microsoft.com/code/stable/main amd64 curl amd64 1.92.0-1722473020 [183 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libcurl-2.5-0 amd64 2.5.18+dfsg-0ubuntu0.22.04.2 [183 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libcurl4-openssl-dev amd64 2.5.18+dfsg-0ubuntu0.22.04.2 [183 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 libcurl4-openssl-dev amd64 2.5.18+dfsg-0ubuntu0.22.04.2 [183 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 libcurl4-openssl-dev amd64 2.5.18+dfsg-0ubuntu0.22.04.2 [183 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 libcurl4-openssl-dev amd64 2.5.18+dfsg-0ubuntu0.22.04.2 [183 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 libcurl4-openssl-dev amd64 2.5.18+dfsg-0ubuntu0.22.04.2 [183 kB]
Get:10 http://security.ubuntu.com/ubuntu jammy-security/main amd64 libkrb5-3 amd64 1.19.2-2ubuntu0.4 [356 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 libgvpr2 amd64 2.42.2-2ubuntu0.1 [192 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 libgvpr2 amd64 2.42.2-2ubuntu0.1 [192 kB]
Get:13 http://security.ubuntu.com/ubuntu jammy-security/main amd64 libgssapi-krb5-2 amd64 1.19.2-2ubuntu0.4 [144 kB]
Get:14 http://security.ubuntu.com/ubuntu jammy-security/main amd64 libgssrpc4 amd64 1.19.2-2ubuntu0.4 [58.7 kB]
Get:15 http://security.ubuntu.com/ubuntu jammy-security/main amd64 libkadm5srv-mit12 amd64 1.19.2-2ubuntu0.4 [54.7 kB]
Get:16 http://security.ubuntu.com/ubuntu jammy-security/main amd64 libkadm5clnt-mit12 amd64 1.19.2-2ubuntu0.4 [41.9 kB]

```

## 17. man - display manual page for a command

## 18. echo - display line of text

## 19. df - display disk space usage

## 20. du - display directory space usage

```

xfonts-base:all/jammy 1:1.0.5 uptodate
xfonts-encodings:all/jammy 1:1.0.5-0ubuntu2 uptodate
xfonts-scalable:all/jammy 1:1.0.3-1.2ubuntu1 uptodate
xfonts-utils:amd64/jammy 1:7.7+deb12 uptodate
xterm:amd64/jammy 1:0.98-1 uptodate
xterm:amd64/jammy 1.4.1-0ubuntu4 uptodate
xinput:amd64/jammy 1.6.3-1ubunt2 uptodate
xkb-data:all/jammy 2.33-1 uptodate
xml-core:all/jammy 0.18+nmu1 uptodate
xorg:amd64/jammy 1:7.7+23ubuntu2 uptodate
xorg-docs-core:all/jammy 1:1.7.1-1.2 uptodate
xorg-sgml-actool:jammy 1:1.0.1-1.1 uptodate
xserver-xorg-input-all/jammy-updates 2:21.1.4-2ubuntu1.7-22.04.11 uptodate
xserver-xephyr:amd64/jammy-updates 2:21.1.4-2ubuntu1.7-22.04.11 uptodate
xserver-xephyr:i386 not installed
xserver-xorg:amd64/jammy 1:7.7+23ubuntu2 uptodate
xserver-xorg-core:amd64/jammy-updates 2:21.1.4-2ubuntu1.7-22.04.11 uptodate
xserver-xorg-core:i386 not installed
xserver-xorg-input-joystick:amd64/jammy 1:7.7+23ubuntu2 uptodate
xserver-xorg-input-libinput:jammy 1:1.2.1-1 uptodate
xserver-xorg-input-wacom:amd64/jammy 1:1.0.0-3ubuntu1 uptodate
xserver-xorg-legacy:amd64/jammy-updates 2:21.1.4-2ubuntu1.7-22.04.11 uptodate
xserver-xorg-legacy:i386 not installed
xserver-xorg-video-all:amd64/jammy 1:7.7+23ubuntu2 uptodate
xserver-xorg-video-andgpu:amd64/jammy-updates 22.0.0-1ubuntu0.2 uptodate
xserver-xorg-video-ati:amd64/jammy-updates 1:19.1.0-2ubuntu1 uptodate
xserver-xorg-video-fbdev:amd64/jammy 1:0.5.0-1ubuntu1 uptodate
xserver-xorg-video-intel:amd64/jammy 2:2.6.0-0ubuntu1.19.0.917-2git20200315-1 uptodate
xserver-xorg-video-nouveau:amd64/jammy 1:1.0.17-2ubuntu1 uptodate
xserver-xorg-video-qxl:amd64/jammy 0.1.5+git20200331-3 uptodate
xserver-xorg-video-radeon:amd64/jammy-updates 1:19.1.0-2ubuntu1 uptodate
xserver-xorg-video-vesa:amd64/jammy 1:2.5.0-1ubuntu4 uptodate
xserver-xorg-video-vmware:amd64/jammy 1:13.3.0-3ubuntu1 uptodate
xterm:all/jammy 1:7.0-1ubuntu1 uptodate
xterm:all:i386 not installed
xtrans-dev:all/jammy 1.4.0-1 uptodate
xwayland:amd64/jammy-security 2:22.1.1-1ubuntu0.13 uptodate
xxd:amd64/jammy-updates 2:8.2.3995-1ubuntu2.17 uptodate
xxd:i386 not installed
xz-utils:amd64/jammy 5.2.5-2ubuntu1 uptodate
xz-utils:i386 not installed
yaru-theme-engines-shells:all/jammy-updates 22.04.5 uptodate
yaru-theme-gtk:all/jammy-updates 22.04.5 uptodate
yaru-theme-icon:all/jammy-updates 22.04.5 uptodate
yaru-theme-sounds:all/jammy-updates 22.04.5 uptodate
yasm:amd64/jammy 1.3.0-2.1 uptodate
yasm:i386 not installed
yelp:amd64/jammy 42.1.1 uptodate
yelp:i386 not installed
youtube-dl:all/jammy 2021.12.17-1 uptodate
zenity:amd64/jammy-updates 3.42.1-1ubuntu1 uptodate
zenity-common:all/jammy-updates 3.42.1-1ubuntu1 uptodate
zim:all/jammy 0.74.3-1 uptodate
zip:amd64/jammy 3.0-1ubuntu2 uptodate
zip:i386 not installed
zlib1g:all/jammy-security 1:1.2.11.dfsg-2ubuntu9.2 uptodate
zlib1g:i386 not installed
zlib1g-dev:amd64/jammy-security 1:1.2.11.dfsg-2ubuntu9.2 uptodate
zlib1g-dev:i386 not installed
zstd:amd64/jammy 1.4.8+dfsg-3build1 uptodate
zstd:i386 not installed
veeransh@veeransh-XPS-9315: ~

```

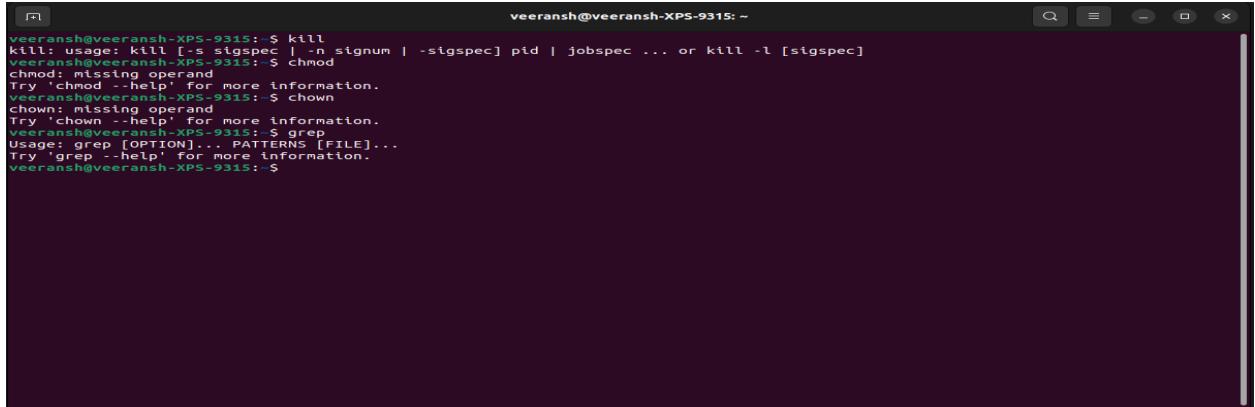
21. free - display memory usage
22. ps - display current running process
23. top - display system tasks and resource usage

```

veeransh@veeransh-XPS-9315: ~ free
              total        used      free    shared   buff/cache  available
Mem:       15982988      7129572     392692   3036764     8406344      5448564
Swap:      2097148      1545336     551812
veeransh@veeransh-XPS-9315: ~ ps
  PID TTY      TIME CMD
 50364 pts/13  00:00:00 bash
 68879 pts/13  00:00:00 ps
veeransh@veeransh-XPS-9315: ~ top

```

24. kill - terminate a process by it's ID
25. chmod - change file permissions
26. chown - change file owner and group
27. grep - search text using patterns



```
veeransh@veeransh-XPS-9315: ~ kill: usage: kill [-s sigspec | -n signum | -stgspec] pid | jobspec ... or kill -l [sigspec]
veeransh@veeransh-XPS-9315: ~ chmod: missing operand
Try 'chmod --help' for more information.
veeransh@veeransh-XPS-9315: ~ chown: missing operand
Try 'chown --help' for more information.
veeransh@veeransh-XPS-9315: ~ grep: usage: grep [OPTION]... PATTERN [FILE]...
Try 'grep --help' for more information.
veeransh@veeransh-XPS-9315: ~
```

28. **find** - search for files in a directories

29. **tar** - archive files and directories

30. **alias** - create an alias for a command

31. **unalias** - remove an alias

32. **uname** - print system information

33. **hostname** - show or set system name

34. **whoami** - display current logged in user

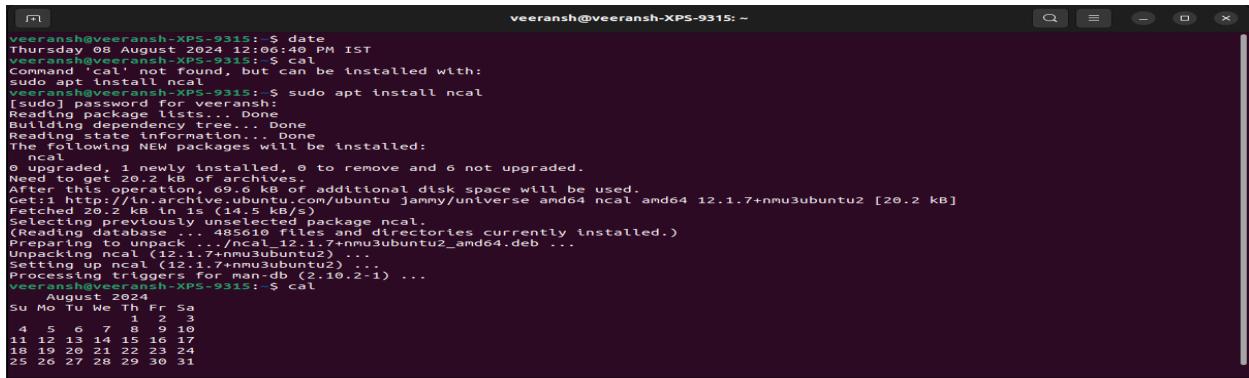


```
veeransh@veeransh-XPS-9315: ~
alias alert='notify-send --urgency=low -i "$( [ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e '\''s/^\\s*[0-9]\\+'\'')"
alias egrep='egrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
veeransh@veeransh-XPS-9315: ~ unalias
unalias: usage: unalias [-a] name [name ...]
veeransh@veeransh-XPS-9315: ~ uname
Linux
veeransh@veeransh-XPS-9315: ~ hostname
veeransh-XPS-9315
veeransh@veeransh-XPS-9315: ~ whoami
veeransh
veeransh@veeransh-XPS-9315: ~
```

35. date - display or set the date and time

36. cal - display calendar

37. uptime - show how long the system has been running



```
veeransh@veeransh-XPS-9315: ~ date
Thursday 08 August 2024 12:00:40 PM IST
veeransh@veeransh-XPS-9315: ~ cal
Command 'cal' not found, but can be installed with:
sudo apt install ncal
[sudo] password for veeransh:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  ncal
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 20.2 kB of archives.
After this operation, 69.6 kB of additional disk space will be used.
Get: http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 ncal amd64 12.1.7+nmu3ubuntuz2 [20.2 kB]
Fetched 20.2 kB in 0s (485010 B/s)
Selecting previously unselected package ncal.
(Reading database ... 485010 files and directories currently installed.)
Preparing to unpack .../ncal_12.1.7+nmu3ubuntuz2_amd64.deb ...
Unpacking ncal (12.1.7+nmu3ubuntuz2) ...
Setting up ncal (12.1.7+nmu3ubuntuz2) ...
Processing triggers for man-db (2.10.2-1) ...
veeransh@veeransh-XPS-9315: ~ cal
August 2024
Su Mo Tu We Th Fr Sa
          1  2  3
4  5  6  7  8  9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31
```

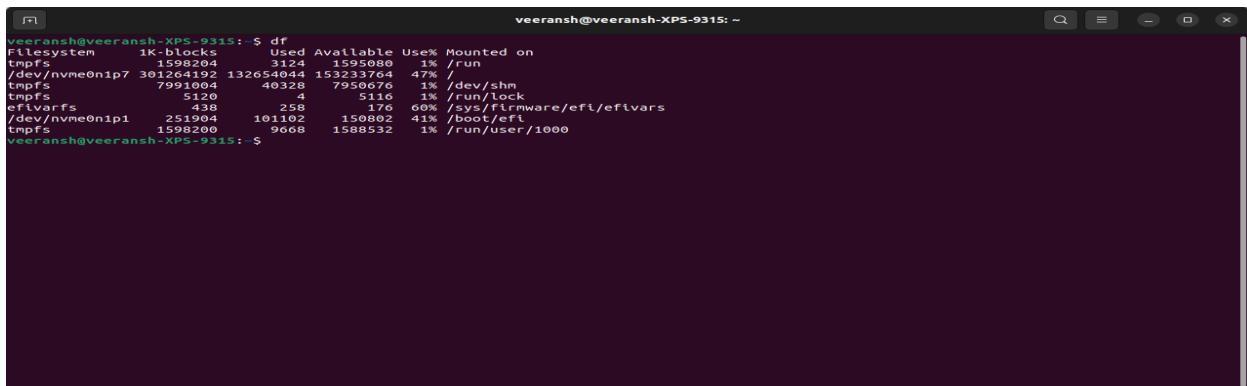
38. history - display command history



```
veeransh@veeransh-XPS-9315: ~
2059 ps
2060 top
2061 clear
2062 clear
2063 kill
2064 chmod
2065 chown
2066 grep
2067 find
2068 clearer
2069 clear
2070 kill
2071 chmod
2072 chown
2073 grep
2074 tar
2075 clear
2076 clear
2077 alias
2078 unalias
2079 unalias
2080 hostname
2081 whoami
2082 clear
2083 date
2084 cal
2085 sudo apt install ncal
2086 cal
2087 clear
2088 uptime
2089 history
veeransh@veeransh-XPS-9315: ~
```

39. clear - clears the terminal screen

40. du - sh - display the total size of a directory in human readable format



```
veeransh@veeransh-XPS-9315: ~ df
Filesystem 1K-blocks Used Available Use% Mounted on
tmpfs 1598204 3124 1595080 1% /run
/dev/nvme0n1p7 301264192 132654044 153233764 47% /
tmpfs 7991094 40328 7950676 1% /dev/shm
tmpfs 512 4 511 1% /run/lock
efivars 512 258 256 60% /sys/firmware/efi/efivars
/dev/nvme0n1p1 251904 101102 150802 41% /boot/efi
tmpfs 1598200 9668 1588532 1% /run/user/1000
veeransh@veeransh-XPS-9315: ~
```

41. df - h - display disk space using human readable format



```
veeransh@veeransh-XPS-9315: ~ df -h
Filesystem Size Used Avail Use% Mounted on
tmpfs 1.6G 3.1M 1.6G 1% /run
/dev/nvme0n1p7 288G 124G 164G 47% /
tmpfs 1.6G 6.6M 1.6G 1% /dev/shm
tmpfs 5.0M 4.0K 5.0M 1% /run/lock
efivars 438K 258K 176K 60% /sys/firmware/efi/efivars
/dev/nvme0n1p1 246M 99M 148M 41% /boot/efi
tmpfs 1.6G 9.5M 1.6G 1% /run/user/1000
veeransh@veeransh-XPS-9315: ~ du -sh
930G
veeransh@veeransh-XPS-9315: ~ ln
ln: missing file operand
Try `ln -h --help' for more information.
veeransh@veeransh-XPS-9315: ~ wget
wget: missing URL
Usage: wget [OPTION]... [URL]...
Try `wget --help' for more options.
veeransh@veeransh-XPS-9315: ~ wget https://chmapbrowse.issdc.gov.in/
2024-08-08 12:25:27 -> https://chmapbrowse.issdc.gov.in/
Resolving chmapbrowse.issdc.gov.in (chmapbrowse.issdc.gov.in)... 64:ff9b::67e6:a5e5, 103.230.165.229
Connecting to chmapbrowse.issdc.gov.in (chmapbrowse.issdc.gov.in)|64:ff9b::67e6:a5e5|:443... connected.
HTTP request sent, awaiting response... 200
Length: 4663 (4.6K) [text/html]
Saving to: 'index.html'

index.html          100%[=====] 4.55K --.-KB/s   in 0s
2024-08-08 12:25:28 (1.02 GB/s) - 'index.html' saved [4663/4663]
veeransh@veeransh-XPS-9315: ~
```

42. ln - create hard and symbolic links

43. wget - download files from the web

44. curl - transfer data to a server

## 45. ping - check a network connection to a host

```
veeransh@veeransh-XPS-9315:~$ curl --help or 'curl --manual' for more information
veeransh@veeransh-XPS-9315:~$ ping
ping: usage error: destination address required
veeransh@veeransh-XPS-9315:~$ ifconfig
docker0: Flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
        ether 0a:0a:0a:0a:0a:0a brd 172.17.255.255 scopeid 0x10<host>
        RX packets 0 bytes 0 (0.0 B)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 0 bytes 0 (0.0 B)
        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
        ether 00:00:00:00:00:00 brd 0x0<host>
        loop txqueuelen 1000 (Local Loopback)
        RX packets 0 bytes 0 (0.0 B)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 0 bytes 0 (0.0 B)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
wlp0s0f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.20.10.8 netmask 255.255.240 broadcast 172.20.10.15
        ether 64:d6:9a:3c:3:fa brd 172.20.10.15
        loop txqueuelen 1000 (Local Loopback)
        RX packets 45327 bytes 4892085 (4.8 MB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 45327 bytes 4892085 (4.8 MB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
veeransh@veeransh-XPS-9315:~$
```

## 46. ifconfig - display network configuration

```
veeransh@veeransh-XPS-9315:~$ ifconfig
docker0: Flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
        ether 0a:0a:0a:0a:0a:0a brd 172.17.255.255 scopeid 0x10<host>
        RX packets 0 bytes 0 (0.0 B)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 0 bytes 0 (0.0 B)
        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
        ether 00:00:00:00:00:00 brd 0x0<host>
        loop txqueuelen 1000 (Local Loopback)
        RX packets 45327 bytes 4892085 (4.8 MB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 45327 bytes 4892085 (4.8 MB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
wlp0s0f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.20.10.8 netmask 255.255.240 broadcast 172.20.10.15
        ether 64:d6:9a:3c:3:fa brd 172.20.10.15
        loop txqueuelen 1000 (Local Loopback)
        RX packets 2873663 bytes 3343981348 (3.3 GB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 1155244 bytes 317739890 (317.7 MB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
veeransh@veeransh-XPS-9315:~$
```

## 47. netsat - print network connections

## 48. ss - display socket statistics

```
veeransh@veeransh-XPS-9315:~$ ss
Netid State      Recv-Q Send-Q          Local Address:Port                               Peer Address:Port
Process
u_seq ESTAB      0      0                           *               176160                         *               176159
u_str ESTAB      0      0                           *               149963                         *               149962
u_str ESTAB      0      6912                         /run/user/1000/bus 100782                         *               96850
u_str ESTAB      0      0                           /run/systemd/journal/stdout 102660                         *               100491
u_str ESTAB      0      0                           /run/systemd/journal/stdout 35402                          *               41453
u_str ESTAB      0      0                           /run/systemd/journal/stdout 314889                         *               41405
u_str ESTAB      0      0                           *               209386                         *               209385
u_str ESTAB      0      0                           *               128931                         *               128932
u_str ESTAB      0      0                           *               155901                         *               155902
u_str ESTAB      0      0                           /run/user/1000/at-spi/bus 85941                         *               104096
u_str ESTAB      0      0                           *               37191                          *               25536
u_str ESTAB      0      0                           /run/dbus/system_bus_socket 26194                         *               33347
u_str ESTAB      0      0                           /run/systemd/journal/stdout 18312                         *               27413
u_str ESTAB      0      0                           *               203615                         *               203614
veeransh@veeransh-XPS-9315:~$
```

## 49. ssh - open a secure shell to remote a machine

```

veeransh@veeransh-XPS-9315: ~
usage: ssh [-468 -fCKMNqstuvwxyz] [-B blind_interface]
           [-bind_address[:port]] [-c cipher_spec] [-D [bind_address:]port]
           [-E log_file] [-e escape_char] [-F configfile] [-I pkcs11]
           [-l identity_file] [-J [user@]host[:port]] [-L address]
           [-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
           [-Q option] [-S socket_address] [-s ctl_path] [-W host:port]
           [-W local_tun[remote_tun]] destination [command [argument ...]]
veeransh@veeransh-XPS-9315: ~
usage: scp [-346ABCOpqRrsTV] [-c cipher] [-D sftp_server_path] [-F ssh_config]
           [-i identity_file] [-J destination] [-l llimit]
           [-o ssh_options] [-P port] [-S program] source ... target
veeransh@veeransh-XPS-9315: ~

```

## 50. scp - secure copy files between host

PID	USER	PR	NI	VIRT	RES	SHR	S	CRUN	TIME	COMMAND
227914	veeransh	20	0	11.4G	427M	73708	S	19.1	2.7	5:15.80 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
197583	veeransh	20	0	11720	342M	6998	S	9.9	2.2	27:52.75 /opt/google/chrome/chrome --type=renderer -crashpad-handler-pid=8038 -enable-crash-reporter=bfbdd40-93a2-4abb-95ea-1d30d890c486, --no-su
8038	veeransh	20	0	33.8G	222M	111M	S	0.6	1.4	19:28.32 /opt/google/chrome/chrome
5367	veeransh	20	0	14.3G	632M	229M	S	5.9	4.1	10:27.25 /snap/firefox/4650/usr/lib/firefox/firefox
183175	veeransh	20	0	11310	7.86M	28756	S	5.9	0.5	1:18.56 /usr/share/code/code --type=utility -utility-sub-type=node_mojo.NodeService -lang=en-GB --service-sandbox-type=none -crashpad-handler-p
229394	veeransh	20	0	11310	7.86M	28756	S	5.9	0.5	1:18.56 /usr/share/code/code --type=utility -utility-sub-type=node_mojo.NodeService -lang=en-GB --service-sandbox-type=none -crashpad-handler-p
5815	veeransh	20	0	3358M	524M	1032	S	2.6	3.4	26:53.25 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 5 -isForBrowser -prefsLen 34631 -prefMapSize 252779 -jsInitLen 234780 -p
8082	veeransh	20	0	33.1G	70432	50196	S	2.6	0.4	6:31.58 /opt/google/chrome/chrome --type=utility -utility-sub-type=network_mojo.NetworkService -lang=en-GB --service-sandbox-type=none -crashpa
18998	veeransh	20	0	11486	280M	61998	S	2.6	0.5	50:58.36 /snap/discord/203/usr/share/discord/Discord --type=renderer -crashpad-handler-pid=18889 -enable-crash-reporter=7bb3f11e-3f87-4e67-89e7-51
8076	veeransh	20	0	33.1G	70432	50196	S	2.0	0.4	8:17.48 /opt/google/chrome/chrome --type=utility -utility-sub-type=network_mojo.NetworkService -lang=en-GB --service-sandbox-type=none -crashpa
20990	veeransh	20	0	11310	7.86M	28756	S	2.0	0.4	10:56.65 /snap/discord/203/usr/share/discord/Discord --type=renderer -crashpad-handler-pid=18889 -enable-crash-reporter=7bb3f11e-3f87-4e67-89e7-51
8064	veeransh	20	0	33.1G	70432	50196	S	1.3	1.4	0:02.96 /opt/google/chrome/chrome
8074	veeransh	20	0	34.0G	98M	56644	S	1.3	0.6	34:18.47 /opt/google/chrome/chrome --type=cpu-process -crashpad-handler-pid=8038 -enable-crash-reporter=bfbdd40-93a2-4abb-95ea-1d30d890c486, --no-su
8141	veeransh	20	0	34.0G	98M	56644	S	1.3	0.6	10:03.83 /opt/google/chrome/chrome --type=cpu-process -crashpad-handler-pid=8038 -enable-crash-reporter=bfbdd40-93a2-4abb-95ea-1d30d890c486, --no-su
183191	veeransh	20	0	11310	7.86M	28756	S	1.3	0.6	10:03.83 /opt/google/chrome/chrome --type=cpu-process -crashpad-handler-pid=8038 -enable-crash-reporter=bfbdd40-93a2-4abb-95ea-1d30d890c486, --no-su
228205	veeransh	20	0	11.4G	427M	73708	S	1.3	2.7	10:55.08 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
229394	veeransh	20	0	11310	7.86M	28756	S	1.3	0.6	10:55.08 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
229394	veeransh	20	0	11310	7.86M	28756	S	1.3	0.6	10:55.08 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
2511	veeransh	20	0	7633M	389M	111M	S	0.7	2.5	10:28:16 /usr/bin/gnome-shell
5462	veeransh	20	0	14.3G	632M	229M	S	0.7	1.4	9:48:16 /snap/firefox/4650/usr/lib/firefox/firefox
5464	veeransh	20	0	14.3G	632M	229M	S	0.7	4.1	4:23:76 /snap/firefox/4650/usr/lib/firefox/firefox
5467	veeransh	20	0	14.3G	632M	229M	S	0.7	4.1	10:21.92 /snap/firefox/4650/usr/lib/firefox/firefox
5507	veeransh	20	0	11310	7.86M	28756	S	0.7	2.5	10:05.25 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
5581	veeransh	20	0	11.4G	427M	73708	S	0.7	1.4	0:43.31 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
8053	veeransh	20	0	33.8G	222M	111M	S	0.7	1.4	1:38.51 /opt/google/chrome/chrome
8054	veeransh	20	0	33.8G	222M	111M	S	0.7	1.4	0:23.78 /opt/google/chrome/chrome
8056	veeransh	20	0	33.8G	222M	111M	S	0.7	1.4	0:08.16 /opt/google/chrome/chrome
8058	veeransh	20	0	33.8G	222M	111M	S	0.7	1.4	3:14.07 /opt/google/chrome/chrome
8329	veeransh	20	0	11310	98M	56644	S	0.7	1.4	10:08.16 /opt/google/chrome/chrome --type=renderer -crashpad-handler-pid=8038 -enable-crash-reporter=bfbdd40-93a2-4abb-95ea-1d30d890c486, --no-su
8348	veeransh	20	0	1156G	179M	60708	S	0.7	1.2	2:31.92 /opt/google/chrome/chrome --type=renderer -crashpad-handler-pid=8038 -enable-crash-reporter=bfbdd40-93a2-4abb-95ea-1d30d890c486, --no-su
8721	veeransh	20	0	550M	40776	28372	S	0.7	0.3	10:16.06 /usr/libexec/gnome-terminal-server
18729	veeransh	20	0	1132G	7794M	37688	S	0.7	0.5	7:55.84 /snap/discord/203/usr/share/discord/Discord --use-tray-icon --no-sandbox -disable-seccomp-filter-sandbox
19278	veeransh	20	0	11486	280M	61998	S	0.7	1.8	13:39.12 /snap/discord/203/usr/share/discord/Discord --type=renderer -crashpad-handler-pid=18889 -enable-crash-reporter=7bb3f11e-3f87-4e67-89e7-51
21063	veeransh	20	0	3358M	526M	77932	S	0.7	3.4	0:44.72 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 37144 -prefMapSize 252779 -jsInitLen 234780 -p
41787	veeransh	20	0	3015M	47M	100M	S	0.7	1.0	9:13.92 /usr/libexec/gnome-terminal-server -channel-id 25753324_b520_4409_a6b6_562372655d5d
183015	veeransh	20	0	33.8G	30120	26688	S	0.7	0.2	0:10.43 /usr/share/code/code --type=utility -utility-sub-network_mojo.NodeService --lang=en-GB --service-sandbox-type=none -crashpad-han
183067	veeransh	20	0	1136G	270M	75076	S	0.7	1.7	2:30.59 /usr/share/code/code --type=renderer -crashpad-handler-pid=182993 -enable-crash-reporter=e408c680-7201-4155-9911-4d9ed804abe_no_channel
183192	veeransh	20	0	11310	7.86M	28756	S	0.7	0.5	0:07.99 /usr/share/code/code --type=renderer -crashpad-handler-pid=182993 -enable-crash-reporter=e408c680-7201-4155-9911-4d9ed804abe_no_channel
183193	veeransh	20	0	11310	7.86M	28756	S	0.7	0.5	0:07.81 /usr/share/code/code --type=utility -utility-sub-type=node_mojo.NodeService -lang=en-GB --service-sandbox-type=none -crashpad-handler-p
187507	veeransh	20	0	11310	342M	53472	S	0.7	0.5	0:07.93 /usr/share/code/code --type=renderer -crashpad-handler-pid=182993 -enable-crash-reporter=e408c680-7201-4155-9911-4d9ed804abe_no_channel
197510	veeransh	20	0	11310	342M	596	S	0.7	2.2	1:10.33 /usr/share/code/code --type=renderer -crashpad-handler-pid=182993 -enable-crash-reporter=e408c680-7201-4155-9911-4d9ed804abe_no_channel
198517	veeransh	20	0	1156G	248M	91926	S	0.7	1.6	4:15.53 /opt/google/chrome/chrome --type=renderer -crashpad-handler-pid=8038 -enable-crash-reporter=bfbdd40-93a2-4abb-95ea-1d30d890c486, --no-su
227919	veeransh	20	0	11.4G	427M	73708	S	0.7	2.7	0:04.00 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
228208	veeransh	20	0	11.4G	427M	73708	S	0.7	2.7	0:04.79 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
228203	veeransh	20	0	11.4G	427M	73708	S	0.7	2.7	0:04.79 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
228204	veeransh	20	0	11.4G	427M	73708	S	0.7	2.7	0:05.20 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
228206	veeransh	20	0	11.4G	427M	73708	S	0.7	2.7	0:04.92 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p
229358	veeransh	20	0	2949M	394M	87176	S	0.7	2.5	0:02.25 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 103 -isForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780 -p

F1 Help F2 Setup F3 Search F4 Filtered F5 Tree F6 SortBy F7 Nice F8 Kill F10 Exit

## 51. neofetch - displays all the system information in an aesthetic, customizable format along with the operating system's logo in the terminal

```

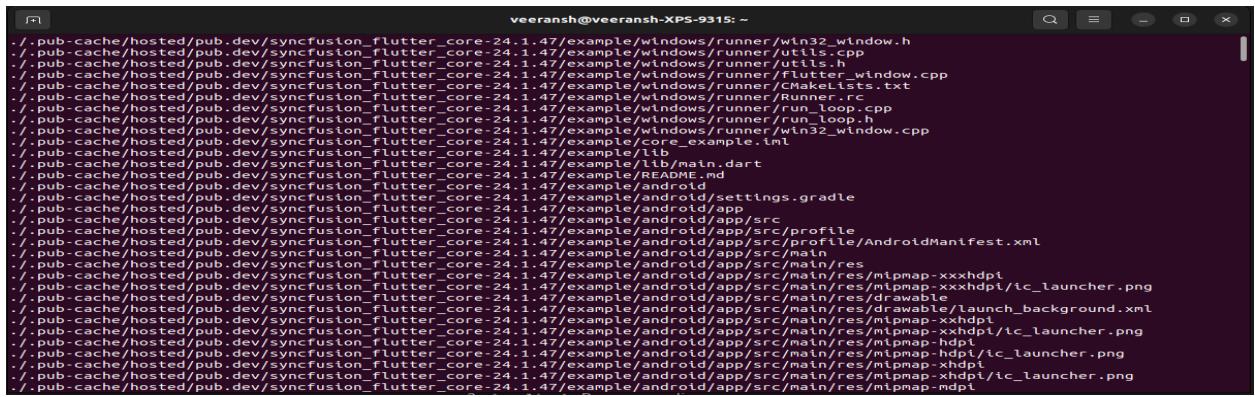
veeransh@veeransh-XPS-9315: $ neofetch
veeransh@veeransh-XPS-9315
-----
OS: Ubuntu 22.04.4 LTS x86_64
Host: XPS 9315
Kernel: 6.5.0-44-generic
Uptime: 5 days, 19 hours, 13 mins
Packages: 2760 (dpkg), 6 (flatpak),
Shell: bash 5.1.16
Resolution: 1920x1200
DE: GNOME 42.9
WM: Mutter
WM Theme: Adwaita
Theme: Yaru-dark [GTK2/3]
Icons: Yaru [GTK2/3]
Terminal: gnome-terminal
CPU: 12th Gen Intel i7-1250U (12)
GPU: Intel Device 46aa
Memory: 12726MiB / 15667MiB
-----
```



```

veeransh@veeransh-XPS-9315: $
```

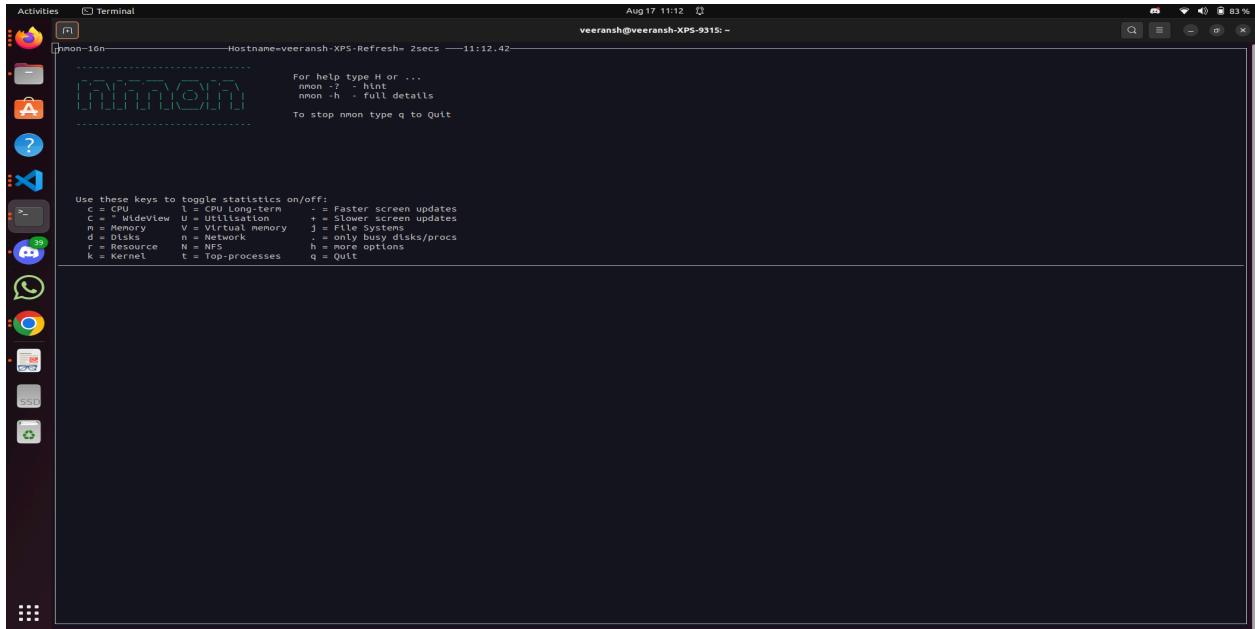
## 52. htop - it is an interactive process viewer



```

veeransh@veeransh-XPS-9315: ~
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/win32_window.h
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/utils.cpp
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/utils.h
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/window.cpp
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/ChakeLists.txt
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/Runner.rc
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/run_loop.cpp
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/run_loop.h
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/windows/runner/wtn32_wtnow.cpp
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/core_example.tml
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/lib
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/main.dart
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/main/main.dart
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/settings.gradle
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/profile
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/AndroidManifest.xml
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/main
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/mipmap-xxxhdpi
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/mipmap-xxxhdpi/lc_launcher.png
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/drawable
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/drawable/launch_background.xml
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/mipmap-xxhdpi
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/mipmap-xxhdpi/lc_launcher.png
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/mipmap-hdpi
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/mipmap-xhdpi
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/mipmap-xhdpi/lc_launcher.png
./pub-cache/hosted/pub.dev/syncfusion_flutter_core-24.1.47/example/android/app/src/main/res/mipmap-mdpi
-----
```

## 53. nmon - it is a performance monitor tool for Linux



```

Activities Terminal Aug 17 11:12 83%
veeransh@veeransh-XPS-9315: ~
nmon-1m Hostname=veeransh-XPS Refresh= 2secs ---11:42-
For help type H or ...
nmon :? - hlist
nmon :h - full details
To stop nmon type q to quit

-----
```

Use these keys to toggle statistics on/off:

- c = CPU
- l = CPU Long-term
- = Faster screen updates
- o = Deviceview
- t = Application
- + = Slower screen updates
- n = Memory
- v = Virtual memory
- j = File System
- d = Disks
- n = Network
- . = only busy disks/procs
- r = Resource
- N = NFS
- h = more options
- k = Kernel
- t = Top-processes
- q = quit

## 54. dstat - it is a versatile resource statistic tool that replaces several other tools

```
veeransh@veeransh-XPS-9315: $ dstat
You did not select any stats, using -cdngy by default.
--total-cpu-usage-- -disk-total- -net/total- --paging-- ...system...
usr sys idl wai ssi| read writ|recv send| in out| int csw
 4 2 94 1 | 12 487 | 0 6204 17 | 573 1275
10 6 83 0 | 24 28 |3340 10 |4096 0 | 37 16
 1 1 97 0 | 0 35 |1711 637 | 0 4777 3627
 2 1 98 0 | 0 1336 |6658 20 | 0 1044 2693
 1 1 98 0 | 0 8192 25 |5526 11 | 0 1107 2858
```

## 55. iostat - it is for CPU and I/O statistics

```
veeransh@veeransh-XPS-9315:~$ iostat
Linux 6.5.0-44-generic (veeransh-XPS-9315)           17/08/24      _x86_64_      (12 CPU)

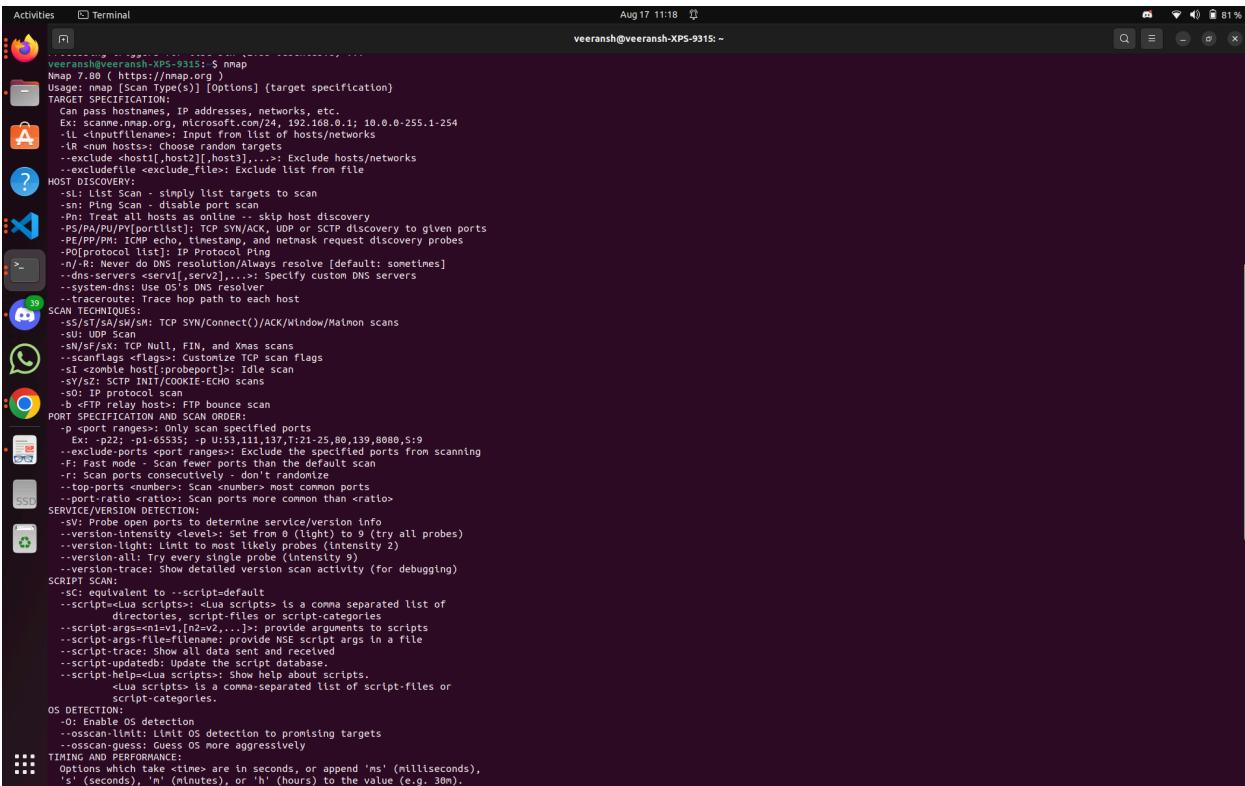
avg-cpu: %user   %nice %system %iowait  %steal   %idle
          3.77    0.01   1.73   0.84    0.00  93.66

Device      tps   kB_read/s   kB_wrtn/s   kB_dscd/s   kB_read   kB_wrtn   kB_dscd
loop0       0.00     0.00     0.00     0.00     17        0        0
loop1       0.00     0.00     0.00     0.00    1072        0        0
loop10      0.00     0.00     0.00     0.00     154        0        0
loop11      0.00     0.00     0.00     0.00    1131        0        0
loop12      0.00     0.00     0.00     0.00    1119        0        0
loop13      0.11     5.23     0.00     0.00  2621142        0        0
loop14      0.00     0.00     0.00     0.00    1080        0        0
loop15      0.00     0.00     0.00     0.00    1085        0        0
loop16      2.10    141.19     0.00     0.00  70812192        0        0
loop17      0.00     0.00     0.00     0.00    1105        0        0
loop18      0.00     0.00     0.00     0.00    1109        0        0
loop19      0.00     0.00     0.00     0.00    371        0        0
loop2       0.00     0.00     0.00     0.00    1717        0        0
loop20      0.00     0.00     0.00     0.00    1128        0        0
loop21      0.23     9.75     0.00     0.00  48882118        0        0
loop22      0.00     0.00     0.00     0.00    1083        0        0
loop23      0.08     3.74     0.00     0.00  1875531        0        0
loop24      0.01     0.45     0.00     0.00  227001        0        0
loop25      0.02     0.08     0.00     0.00    39635        0        0
loop26      0.00     0.00     0.00     0.00    349        0        0
loop27      0.00     0.00     0.00     0.00    361        0        0
loop28      0.00     0.00     0.00     0.00    1097        0        0
loop29      0.00     0.00     0.00     0.00    1129        0        0
loop3       0.00     0.00     0.00     0.00    348        0        0
loop30      0.00     0.00     0.00     0.00    1081        0        0
loop31      0.00     0.00     0.00     0.00    1106        0        0
loop32      0.00     0.00     0.00     0.00    350        0        0
loop33      0.00     0.04     0.00     0.00  18573        0        0
loop34      0.00     0.00     0.00     0.00    348        0        0
loop35      0.00     0.01     0.00     0.00    3077        0        0
loop36      0.00     0.00     0.00     0.00    969        0        0
loop37      0.00     0.00     0.00     0.00    54        0        0
loop38      0.00     0.00     0.00     0.00    1082        0        0
loop39      0.00     0.00     0.00     0.00    1122        0        0
loop4       0.00     0.00     0.00     0.00    370        0        0
loop40      0.00     0.00     0.00     0.00    122        0        0
loop41      0.00     0.00     0.00     0.00    641        0        0
loop42      0.00     0.00     0.00     0.00    1177        0        0
loop43      0.00     0.00     0.00     0.00    1069        0        0
loop44      1.42    88.37     0.00     0.00  44320342        0        0
loop45      0.00     0.00     0.00     0.00    2502        0        0
loop5       0.00     0.00     0.00     0.00    351        0        0
loop6       0.00     0.00     0.00     0.00    373        0        0
loop7       0.00     0.00     0.00     0.00    1088        0        0
loop8       0.09     4.75     0.00     0.00  2381364        0        0
loop9       0.09     4.27     0.00     0.00  2142808        0        0
nvme0n1    100.75   6116.39   243.66   312.46 3067562819 122204173 156708574
```

## 56. vmstat - reports information about processes, memory, paging, block i/o, traps and cpu activity

```
veeransh@veeransh-XPS-9315: $ vmstat
procs -----memory----- swap-- io---- system-- -----cpu-----
r b swpd free buff cache si so bi bo in cs us sy id wa st
1 0 2094344 428904 153892 5424140 3 8 3103 119 29 38 4 2 94 1 0
veeransh@veeransh-XPS-9315: $
```

## 57. nmap - a network exploration tool and security/port scanner



```
Activities Terminal Aug 17 11:18 81%
veeransh@veeransh-XPS-9315: ~
Nmap 7.80 ( https://nmap.org )
Usage: nmap [Scan Type()] [Options] {target specification}
TARGET SPECIFICATION:
  Can specify targets by IP addresses, networks, etc.
    EX: -sC https://nmap.org, microsoft.com/24, 192.168.0.1; 10.0.0-255.1-254
      -iL <inputfilename>; Input from list of hosts/networks
      -iR <num hosts>; Choose random targets
      --exclude <host1>[,<host2>[,<host3>...]]>; Exclude hosts/networks
      --excludedfile <exclude_file>; Exclude list from file
HOST SCANNING:
  -sL: List Scan - simply list targets to scan
  -sN: Ping Scan - disable port scan
  -Pn: Treat all hosts as online -- skip host discovery
  -PS/PU/PY[portlist]: TCP SYN/ACK, UDP or SCTP discovery to given ports
  -PE/PP/PM: ICMP echo, timestamp, and netmask request discovery probes
  -PO[proto list]: IP Protocol discovery
  -A[nalyze]: Perform OS detection/Always resolve [default: sometimes]
  --dns-servers <serv1[,serv2]...>; Specify custom DNS servers
  --system-dns: Use OS's DNS resolver
  --traceroute: Trace hop path to each host
SCAN TECHNIQUES:
  -sT/STFSW/AM: TCP SYN/Connect() /ACK/Window/Hamon scans
  -sU/UDP Scan
  -sV/SF:TCP Null, FIN, and Xmas scans
  -sCANflags <flags>; Customize TCP scan flags
  -sI <zombie host>/probes[probe]: Idle scan
  -sVSz: SCP, INIT/COOKIE-ECHO scans
  -sO: OS probe
  -b <FTP relay host>; FTP bounce scan
PORT SPECIFICATION AND SCAN ORDER:
  -p<port ranges>; Only scan specified ports
    Ex: -p22; -p1-65535; -pU:33,111,137,T:21-25,80,139,8080,S:9
  --exclude-ports <port ranges>; Exclude the specified ports from scanning
  -F: Force a faster order of ports - don't randomize
  -R: Scan ports consecutively (don't randomize)
  --top-ports <nnumber>; Scan <nnumber> most common ports
  --port-ratio <ratio>; Scan ports more common than <ratio>
SERVICE/VERSION DETECTION:
  -sV: Probe open ports to determine service/version info
  --script-args <script>[,<script>...]; Set script args to (try all probes)
  -version-light: Limit to most likely probes (intensity 2)
  -version-all: Try every single probe (intensity 9)
  --version-trace: Show detailed version scan activity (for debugging)
SCRIPT SCAN:
  -sc: equivalent to --script=default
  --script <script>[,<script>...]; A comma-separated list of
    directories, script-files, or script-categories
  --script-args <n>=v1,[n2=v2,...]; provide arguments to scripts
  --script-args-file=<filename>; Provide NSE script args in a file
  --script-trace: Show all data sent and received
  --script-updated: Update the script database
  --script-help=<scripts>; Show help about scripts.
    <scripts> is a comma-separated list of script-files or
    script-categories
OS DETECTION:
  -O: Enable OS detection
  --osscan-limit: Limit OS detection to promising targets
  --osscan-super: Run OS more aggressively
TIMING AND PERFORMANCE:
  Options which take <tme> are in seconds, or append 'ms' (milliseconds),
  's' (seconds), 'm' (minutes), or 'h' (hours) to the value (e.g. 30m).
```

## 58. iftop - it displays bandwidth usage on an interface by host

```
veeransh@veeransh-XPS-9315: ~
interface: wlp0s20f3
IP address is: 172.20.10.8
IPv6 address is: 2402:3a80:4167:1f9a:7e05:6ff4:812e:81fa
MAC address is: 64:d6:9a:c3:fa:41
pcap_open_live(wlp0s20f3): wlp0s20f3: You don't have permission to capture on that device (socket: Operation not permitted)
veeransh@veeransh-XPS-9315: $
```

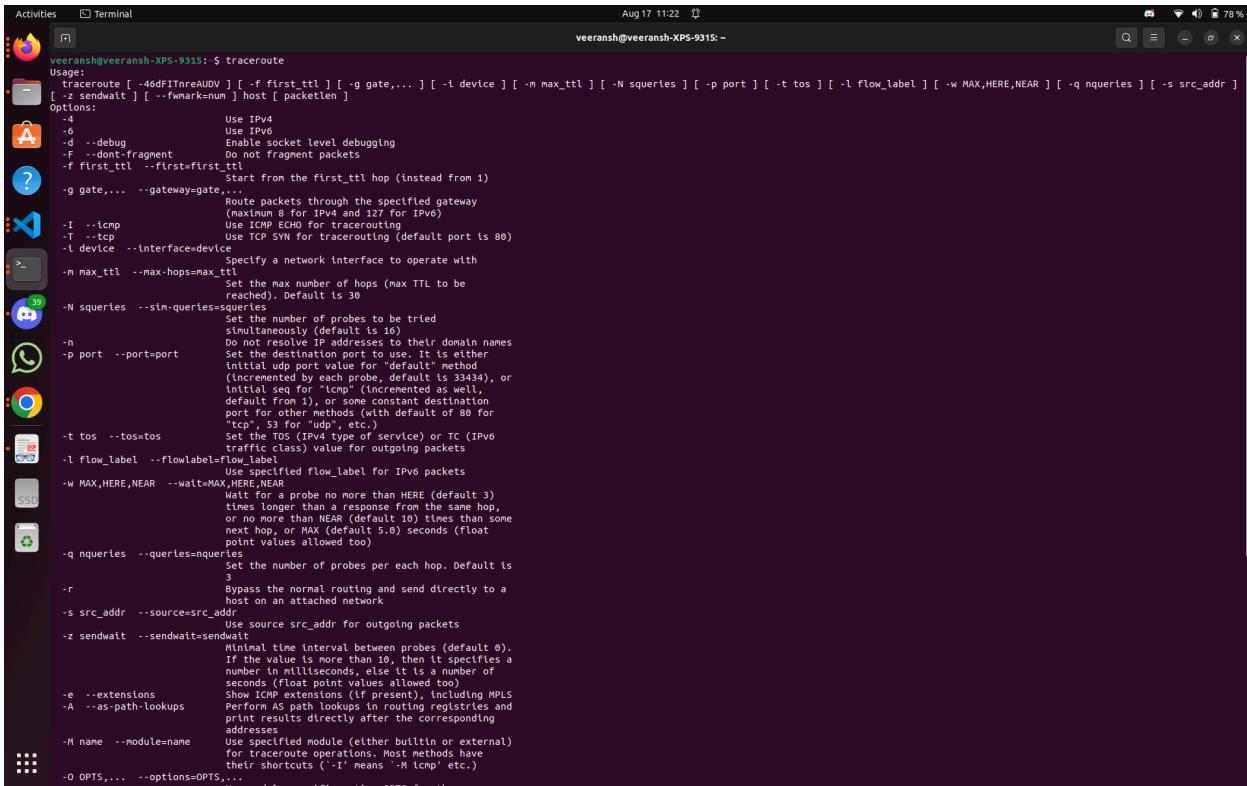
## 59. tcptrack - it tracks the tcp connection on the network interface

```
veeransh@veeransh-XPS-9315: ~
Usage: tcptrack [-dfhvp] [-r <seconds>] -i <interface> [<filter expression>] [-T <pcap file>
veeransh@veeransh-XPS-9315: $
```

## 60. ip addr - view the ip address and network interface details

```
veeransh@veeransh-XPS-9315: $ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: wlp0s20f3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 64:d6:9a:c3:fa:41 brd ff:ff:ff:ff:ff:ff
        inet 172.20.10.8/28 brd 172.20.10.15 scope global dynamic noprefixroute wlp0s20f3
            valid_lft 85630sec preferred_lft 85142sec
        inet6 2402:3a80:4167:1f9a:7e05:6ff4:81fa/64 scope global temporary dynamic
            valid_lft 604032sec preferred_lft 85142sec
        inet6 2402:3a80:4167:1f9a:32a1:a871:60e3:f174/64 scope global mngtmpaddr noprefixroute
            valid_lft forever preferred_lft forever
        inet6 fe80::d130:1b57:447b:ddcb/64 scope link noprefixroute
            valid_lft forever preferred_lft forever
3: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default
    link/ether 02:42:73:fa:c0:f2 brd ff:ff:ff:ff:ff:ff
        inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
            valid_lft forever preferred_lft forever
veeransh@veeransh-XPS-9315: $
```

## 61. traceroute - shows the path packets take to a network host



```
Activities Terminal Aug 17 11:22 veeransh@veeransh-XPS-9315: ~
veeransh@veeransh-XPS-9315: $ traceroute
Usage:
traceroute [ -46FIInreUDV ] [ -f first_ttl ] [ -g gate,... ] [ -i device ] [ -m max_ttl ] [ -N squeries ] [ -p port ] [ -t tos ] [ -l flow_label ] [ -w MAX,HERE,NEAR ] [ -q nqueries ] [ -s src_addr ]
[ -z sendwait ] [ -z fwmknum ] host [ packetlen ]
Options:
-4           Use IPv4
-6           Use IPv6
-d           Enable socket level debugging
-F           --dont-fragment   Do not fragment packets
-f first_ttl -first=first_ttl
-g gate,...  --gateway=gateway
-I           --icmp          Use ICMP ECHO for tracerouting
-T           --tcp           Use TCP SYN for tracerouting (default port is 80)
-l device    --interface=device
-m max_ttl   --max-hops=max_ttl
-N squeries --sim-queries=squeries
-p port      --port=port
-t tos       --tos=tos
-l flow_label --flowlabel=flowlabel
-w MAX,HERE,NEAR --wait=MAX,HERE,NEAR
-q nqueries  --queries=nqueries
-s src_addr  --source=src_addr
-z sendwait  --sendwait=sendwait
-46FIInreUDV
```

## 62. apt-cache - searches for packages

```
veeransh@veeransh-XPS-9315:~$ apt-cache
apt 2.4.12 (amd64)
Usage: apt-cache [options] command
      apt-cache [options] show pkg1 [pkg2 ...]

apt-cache queries and displays available information about installed
and installable packages. It works exclusively on the data acquired
into the local cache via the 'update' command of e.g. apt-get. The
displayed information may therefore be outdated if the last update was
too long ago, but in exchange apt-cache works independently of the
availability of the configured sources (e.g. offline).

Most used commands:
showsrc - Show source records
search - Search the package list for a regex pattern
depends - Show raw dependency information for a package
rdepends - Show reverse dependency information for a package
show - Show a readable record for the package
pkgnames - List the names of all packages in the system
policy - Show policy settings

See apt-cache(8) for more information about the available commands.
Configuration options and syntax is detailed in apt.conf(5).
Information about how to configure sources can be found in sources.list(5).
Package and version choices can be expressed via apt_preferences(5).
Security details are available in apt-secure(8).
veeransh@veeransh-XPS-9315:~$
```

## 63. du -sh - displays the size of files in that particular directory

```
veeransh@veeransh-XPS-9315:~$ du -sh
140G .
veeransh@veeransh-XPS-9315:~$
```

## 64. apt-show-versions - lists available versions of packages

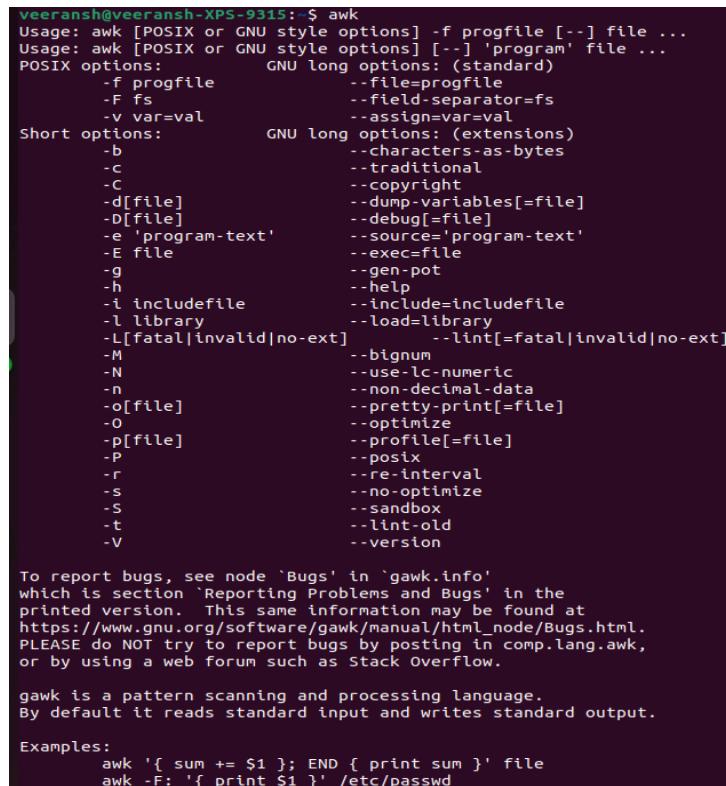
```
veeransh 229641 0.4 0.5 3745452 1051816 ? Sl Aug15 10:41 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 181 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
veeransh 229896 0.0 0.4 2593844 60560 ? Sl 0:08 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 183 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
veeransh 236838 0.0 0.8 2530728 137352 ? Sl Aug15 0:48 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 190 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
veeransh 250389 0.0 1.0 1212402300 1373552 ? Sl Aug16 1:36 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
veeransh 269324 0.0 0.4 819713 73428 ? Sl Aug16 0:03 /usr/bin/nautilus --gapplication-service
veeransh 269361 0.0 0.7 803188 116192 ? Sl Aug16 0:07 evince /home/veeransh/Downloads/lmp_paper_for_lip_reading.pdf
veeransh 269369 0.0 0.0 156793 5504 ? Sl Aug16 0:00 /usr/libexec/evinced
root 266412 0.0 0.0 2381024 15140 ? Sl 0:00 /usr/libexec/evinced
veeransh 266413 0.0 0.0 2381024 15140 ? S=<1 0:15 /usr/libexec/evinced
veeransh 266531 0.0 0.0 0 0 ? I 0:03 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
veeransh 266618 0.0 0.8 2529948 141104 ? Sl 0:05 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
veeransh 266647 0.0 0.0 0 0 ? I=+ 0:45 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
veeransh 266673 0.0 1.2 2643944 204748 ? Sl 0:04 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 217 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
veeransh 266675 0.0 1.2 1188988028 206548 ? Sl 0:04 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 219 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
veeransh 266710 0.0 0.0 1191154816 206528 ? Sl 0:04 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 221 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
veeransh 266896 0.0 0.6 2554468 110288 ? Sl 0:04 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 220 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
root 267235 0.0 0.0 0 0 ? S 11:06 /usr/libexec/evinced
root 267260 0.1 0.0 0 0 ? D 11:06 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 267261 0.1 0.0 0 0 ? I 11:06 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 267269 0.0 0.0 0 0 ? I=+ 11:06 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
veeransh 267270 0.0 0.0 327525 66993 ? Sl 11:06 /usr/share/gnome-shell/extensions/ding@rastersoft.com/ding.js -E -P /usr/share/gnome-shell/extensions/ding@rastersoft.com -M 0 -O 0:0
veeransh 267270 0.0 0.0 145746 84848 pts/10 S 11:06 /usr/share/gnome-shell/extensions/ding@rastersoft.com/ding.js -E -P /usr/share/gnome-shell/extensions/ding@rastersoft.com -M 0 -O 0:0
root 269072 0.0 0.0 0 0 ? I 11:11 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
veeransh 269073 1.7 3.1 2957428 508628 ? Sl 11:11 0:33 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 226 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
veeransh 269396 0.0 0.4 2398752 73728 ? Sl 11:13 0:00 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 228 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
root 269688 0.1 0.0 0 0 ? I 11:15 0:02 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 270169 0.0 0.0 0 0 ? I 11:16 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 270855 0.0 0.0 0 0 ? I 11:17 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 271205 0.0 0.0 0 0 ? I 11:21 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 271229 0.0 0.0 0 0 ? I 11:24 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
veeransh 271298 0.0 0.4 2398752 73216 ? Sl 11:24 0:00 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 229 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
root 271438 0.0 0.0 0 0 ? I 11:25 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
veeransh 271478 0.0 0.4 2398756 73216 ? Sl 11:26 0:00 /snap/firefox/4650/usr/lib/firefox/firefox -contentproc -childID 230 -lsForBrowser -prefsLen 35084 -prefMapSize 252779 -jsInitLen 234780
root 271539 0.0 0.0 0 0 ? I 11:26 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 271573 0.0 0.0 0 0 ? I 11:26 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 271676 0.0 0.0 0 0 ? I 11:27 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272188 0.0 0.0 0 0 ? I 11:31 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272189 0.0 0.0 0 0 ? I 11:31 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272235 0.0 0.0 0 0 ? I 11:32 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272323 0.0 0.0 0 0 ? I 11:33 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272325 0.0 0.0 0 0 ? I< 11:33 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272323 0.0 0.0 0 0 ? I 11:33 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272473 0.0 0.0 0 0 ? I 11:35 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272489 0.0 0.0 0 0 ? I 11:35 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272494 0.0 0.0 0 0 ? I 11:35 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272526 0.0 0.0 0 0 ? I 11:35 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272536 0.0 0.0 0 0 ? I 11:35 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272544 0.0 0.0 0 0 ? I 11:36 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272826 0.0 0.0 0 0 ? I 11:40 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
root 272827 0.0 0.0 0 0 ? I 11:41 0:00 /opt/google/chrome/chrome --type=renderer --crashpad-handler-pid=8038 -enable-crash-reporter=bfb0dd40-93a2-4abb-95ea-1d30d890c486, --no-
```

## 65. dpkg --get-selections - list all installed packages



```
veeransh@veeransh-XPS-9315: ~
xbitmaps          install
xbrlapi           install
xcas              install
xcolor-themes     install
xcryst            install
xdgibus-proxy     install
xdg-desktop-portal install
xdg-desktop-portal-gnome install
xdg-desktop-portal-gtk install
xdg-basedirs      install
xdg-basedirs-gtk install
xdg-utils          install
xfonts-base       install
xfonts-encodings  install
xfonts-scalable   install
xfonts-utils      install
xinit              install
xkb-common        install
xkb-data          install
xml-core          install
xorg               install
xorg-docs-core    install
xorg-sgml-doctools install
xserver-common    install
xserver-xephyr    install
xserver-xinerama   install
xserver-xorg-core  install
xserver-xorg-input-all install
xserver-xorg-input-libinput install
xserver-xorg-input-wacom install
xserver-xorg-legacy install
xserver-xorg-video-all install
xserver-xorg-video-dri4pu install
xserver-xorg-video-ati install
xserver-xorg-video-fbdev install
xserver-xorg-video-intel install
xserver-xorg-video-nouveau install
xserver-xorg-video-qxl install
xserver-xorg-video-radeon install
xserver-xorg-video-vesa install
xserver-xorg-video-vnware install
xterm               install
xtrans-dev         install
xwayland          install
xxd                install
xz-utils          install
yaru-theme-gnome-shell install
yaru-theme-gtk    install
yaru-theme-icon   install
yaru-theme-sound  install
yasm               install
yelp               install
yelp-xsl          install
youtube-dl        install
zenty              install
zetty-common      install
zim               install
zip                install
zlibbig:amd64     install
zlibbig-dev:amd64 install
zstd               install
veeransh@veeransh-XPS-9315: $
```

## 66. awk - pattern scanning and processing language



```
veeransh@veeransh-XPS-9315: ~ awk
Usage: awk [POSIX or GNU style options] -f progfile [...] file ...
Usage: awk [POSIX or GNU style options] [...] 'program' file ...
POSIX options:           GNU long options: (standard)
  -f progfile           --file=progfile
  -F fs                 --field-separator=fs
  -v var=val            --assign=var=val
Short options:           GNU long options: (extensions)
  -b                   --characters-as-bytes
  -c                   --traditional
  -C                   --copyright
  -d[file]             --dump-variables[=file]
  -D[file]             --debug[=file]
  -e 'program-text'   --source='program-text'
  -E file              --exec=file
  -g                   --gen-pot
  -h                   --help
  -i includefile       --include=includefile
  -l library           --load=library
  -L[fatal|invalid|no-ext] --lint[=fatal|invalid|no-ext]
  -M                   --bignum
  -N                   --use-lc-numeric
  -n                   --non-decimal-data
  -o[file]             --pretty-print[=file]
  -O                   --optimize
  -p[file]             --profile[=file]
  -P                   --posix
  -r                   --re-interval
  -s                   --no-optimize
  -S                   --sandbox
  -t                   --lint-old
  -V                   --version

To report bugs, see node 'Bugs' in `gawk.info'
which is section 'Reporting Problems and Bugs' in the
printed version. This same information may be found at
https://www.gnu.org/software/gawk/manual/html\_node/Bugs.html.
PLEASE do NOT try to report bugs by posting in comp.lang.awk,
or by using a web forum such as Stack Overflow.

gawk is a pattern scanning and processing language.
By default it reads standard input and writes standard output.

Examples:
  awk '{ sum += $1 }; END { print sum }' file
  awk -F: '{ print $1 }' /etc/passwd
```

## 67. sed - stream editor for filtering and transforming text

```
veeransh@veeransh-XPS-9315:~$ sed
Usage: sed [OPTION]... {script-only-if-no-other-script} [input-file]...

-n, --quiet, --silent
    suppress automatic printing of pattern space
--debug
    annotate program execution
-e script, --expression=script
    add the script to the commands to be executed
-f script-file, --file=script-file
    add the contents of script-file to the commands to be executed
--follow-symlinks
    follow symlinks when processing in place
-i[SUFFIX], --in-place[=SUFFIX]
    edit files in place (makes backup if SUFFIX supplied)
-l N, --line-length=N
    specify the desired line-wrap length for the 'l' command
--posix
    disable all GNU extensions.
-E, -r, --regexp-extended
    use extended regular expressions in the script
    (for portability use POSIX -E).
-s, --separate
    consider files as separate rather than as a single,
    continuous long stream.
--sandbox
    operate in sandbox mode (disable e/r/w commands).
-u, --unbuffered
    load minimal amounts of data from the input files and flush
    the output buffers more often
-z, --null-data
    separate lines by NUL characters
--help
    display this help and exit
--version
    output version information and exit
```

If no -e, --expression, -f, or --file option is given, then the first non-option argument is taken as the sed script to interpret. All remaining arguments are names of input files; if no input files are specified, then the standard input is read.

GNU sed home page: <<https://www.gnu.org/software/sed/>>.  
General help using GNU software: <<https://www.gnu.org/gethelp/>>.  
veeransh@veeransh-XPS-9315:~\$

## 68. cut -d':' -f1 /etc/passwd - extracts specific fields from files

```
veeransh@veeransh-XPS-9315:~$ cut -d':' -f1 /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
messagebus
systemd-timesync
syslog
_apt
tss
uidd
systemd-oom
tcpdump
avahi-autoipd
usbmux
dnsmasq
kernoops
avahi
cups-pk-helper
rtkit
whoopsie
sssd
speech-dispatcher
fwupd-refresh
nm-openvpn
saned
colord
geoclue
gnome-initial-setup
hplip
gdm
veeransh
_flatpak
mysql
lightdm
pulse
veeransh@veeransh-XPS-9315:~$
```

## 69. lscpu - displays detailed information about the CPU architecture.

```
Veeransh@veeransh-XPS-9315: ~ lscpu
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Address sizes:         39 bits physical, 48 bits virtual
Byte Order:            Little Endian
CPU(s):                12
On-line CPU(s) list:  0-11
Vendor ID:             GenuineIntel
Model name:            12th Gen Intel(R) Core(TM) i7-1250U
CPU Family:            6
Model:                 154
Thread(s) per core:   2
Core(s) per socket:  10
Socket(s):            1
Stepping:              4
CPU max MHz:          4700,0000
CPU min MHz:          400,0000
BogoMIPS:              3763,20
Flags:    fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_cpt cpuid aperfmperf tsc_known_freq nrepn pclmulqdq dtes64 monitor ds_cpl vnx snx est tm2 ssse3 sdbg fma cx16 xtrp pdcm sse4_1 sse4_2 x2apic movbe popcnt tsc deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ept epb ssbd lbrs lpbb sttbp lbrs_enhanced tpr_shadow flexpriority ept_vpid ept_ad tsg sbse4 _adjust_bmi2 avx2 smp bmi2 erts invpcid rdseed adx snap clflushopt clwb intel_pt sha_ni xsaveopt xsavec xgetbv1 xsaves split_lock_detect avx_vnni dtherm idaa arat pln pts hwp hwp_notify hwp_act_window hwp_epp hwp_pkg_req hfi vmtt unk pku ospe wnlkntqdf qfnid novdrl rd4b fsrn md_clear serialize arch_lbr lbt flush_lid arch_capabilities
Virtualization features:
Virtualization:        VT-x
Caches (sum of all):
L1d:                  352 Kib (10 instances)
L1i:                  576 Kib (10 instances)
L2:                   6.5 MiB (4 instances)
L3:                   12 MiB (1 instance)
NUMA:
NUMA node(s):          1
NUMA node0 CPU(s):    0-11
Vulnerabilities:
    Border data sampling: Not affected
    I海棠 multihit:     Not affected
    L1fif:                Not affected
    Mds:                  Not affected
    Meltdown:             Not affected
    Mitigations for stale data: Not affected
    Retbleed:              Not affected
    Speculative store overflow: Mitigation disabled via prctl
    Spectre v1:            Mitigation: usercopy/swaps barriers and _user pointer sanitization
    Spectre v2:            Mitigation: Enhanced / Automatic IBRS; IBPB conditional; RSB filling; PBRSB-eIBRS SW sequence; BHI BHI_DIS_S
    Srbds:                Not affected
    Tsx async abort:      Not affected
veeransh@veeransh-XPS-9315: ~
```

## 70. chmod +x filename - makes the file executable

```
Veeransh@veeransh-XPS-9315: ~/Downloads$ chmod u+x LM_Studio-0.2.27.AppImage
veeransh@veeransh-XPS-9315: ~/Downloads $ ./LM_Studio-0.2.27.AppImage
22:58:17.550 > App starting...
libava error: vaGetDriverNameByIndex() failed with unknown libava error, driver name = (null)
22:58:18.191 > Backend 'opencl_llama.cpp' requires gpu acceleration, but GPU survey on hardware was unsuccessful with message 'Error trying to query OpenCL gpus: No OpenCL platforms found!'
[backEndPrefs] Initializing FileData
[backEndPrefs] FileData read from file
[backEndPrefs] File content is the same as last written, skipping read
22:58:18.261 > Downloads folder from settings.json: /home/veeransh/.cache/lm-studio/models/
22:58:18.282 > Current downloads folder: /home/veeransh/.cache/lm-studio/models
[SettingsProvider][SettingsFile] Initializing FileData
Logger created with filePath /tmp/lmstudio-server-log.txt
Client with id 'httpServer' registered.
[ConversationProvider] Creating Conversation index for path /home/veeransh/.cache/lm-studio/conversations
[LLEExternalAPIProvider] Creating HTTP server extender
[LLEExternalAPIProvider] Registering IPC server
[PlatformExternalAPIProvider] Creating HTTP server extender
[PlatformExternalAPIProvider] Registering IPC server
[SystemExternalAPIProvider] Creating HTTP server extender
[SystemExternalAPIProvider] Registering IPC server
[DiagnosticExternalAPIProvider] Creating HTTP server extender
[DiagnosticExternalAPIProvider] Registering IPC server
[NotePadInthusiastExternalAPIProvider] Registering IPC server
[DeepLinkHandlingExternalAPIProvider] Registering IPC server
[AppSettingsInternalAPIProvider] Registering IPC server
[ModelErrorInternalAPIProvider] Registering IPC server
[PresetsEditorInternalAPIProvider] Registering IPC server
[ContextMenuMenuItemInternalAPIProvider] Registering IPC server
[ContentContextMenuInternalAPIProvider] Registering IPC server
22:58:19.059 > [AppUpdater] Checking for updates... (current state: idle)
22:58:19.059 > AppUpdater state changed to checking-for-updates-periodic
22:58:19.127 > First model catalog download.
[LMSAuthenticator] Fetching version info from https://versions.lmstudio.al
22:58:19.127 > First model catalog download.
[LMSAuthenticator][Client==3FK3FS18N2yvtv7EPXXXXd3] Client created.
[LMSAuthenticator][Client==3FK3FS18N2yvtv7EPXXXXd3] Holder created, references: 1
[LMSAuthenticator][Client==3FK3FS18N2yvtv7EPXXXXd3] Holder created, references: 3
[LMSAuthenticator][Client==3FK3FS18N2yvtv7EPXXXXd3] Holder created, references: 4
[LMSAuthenticator][Client==3FK3FS18N2yvtv7EPXXXXd3] Holder created, references: 5
[LMSAuthenticator][Client==3FK3FS18N2yvtv7EPXXXXd3] Holder created, references: 6
[LMSAuthenticator][Client==3FK3FS18N2yvtv7EPXXXXd3] Holder created, references: 7
setConfiguration called but the number of loaded models is not 1.
[readJsonFromFile] Error reading file /home/veeransh/.cache/lm-studio/config-presets/config.map.json: SyntaxError: Unexpected end of JSON input
Error reading file /home/veeransh/.cache/lm-studio/config-presets/config.map.json: SyntaxError: Unexpected end of JSON input
22:58:19.177 > Current downloads folder: /home/veeransh/.cache/lm-studio/models
[LMSAuthenticator][Client=L Studio][LMContext[(cp=handle_tsChannel)] Handling deep link
```

71. `sudo visudo` - edits the sudoers file for user permissions.

72. ps aux - lists process matching matching a specific name

```
veeransh@veeransh-XPS-9315: ~
```

```
20 ./Downloads/cmake-3.29.0/Tests/ObjectLibrary/B
24 ./Downloads/cmake-3.29.0/Tests/ObjectLibrary/ExportLanguages/ExportLanguagesTest
28 ./Downloads/cmake-3.29.0/Tests/ObjectLibrary/ExportLanguages
20B ./Downloads/cmake-3.29.0/Tests/objectLibrary
12 ./Downloads/cmake-3.29.0/Tests/FindGLEW/Test
16 ./Downloads/cmake-3.29.0/Tests/FindGIF/Test
16 ./Downloads/cmake-3.29.0/Tests/FindTIFF/Test
24 ./Downloads/cmake-3.29.0/Tests/FindTIFF
20 ./Downloads/cmake-3.29.0/Tests/FindVTK/include
12 ./Downloads/cmake-3.29.0/Tests/FindSQLite3/Test
20 ./Downloads/cmake-3.29.0/Tests/FindSQLite3
22 ./Downloads/cmake-3.29.0/Tests/FindGLUT/Test
20 ./Downloads/cmake-3.29.0/Tests/FindGLUT
20 ./Downloads/cmake-3.29.0/Tests/SwiftMLx
28 ./Downloads/cmake-3.29.0/Tests/FindTigraCes
2 ./Downloads/cmake-3.29.0/Tests/InstallModules
12 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/Install-RUNTIME_DEPENDENCY_SET
8 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/linkB
16 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/sublib
8 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/Interface/headeronly
8 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/Interface/sharedlib
8 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/pch
48 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/interface
8 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/suite
8 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/include/abs/ib
8 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/include/abs/ia
24 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/include/abs
20 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/include/testinterfaceIncludeUser
36 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/include
12 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/sublinkA
20 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export/rename
420 ./Downloads/cmake-3.29.0/Tests/ExportImport/Export
```

73. nohup command & - runs a command immune to hangups, with output to a non-terminal.

```
veeransh@veeransh-XPS-9315:~$ nohup command &
[1] 273156
```

74. `watch -n 1 command` - runs a command repeatedly, displaying its output in real-time.

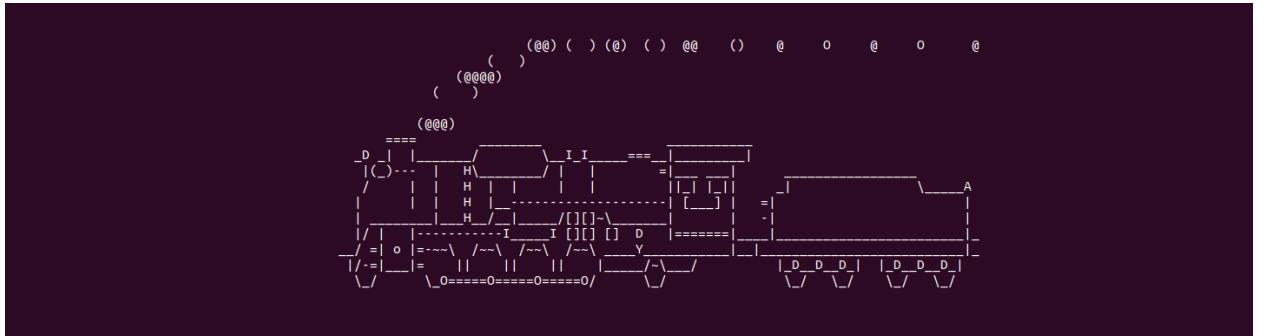
75. **inxi** - provides detailed information about the system

```
veeransh@veeransh-XPS-9315: ~ $ inxi  
CPU: 10-core (2.80 GHz) 12th Gen Intel Core i7-1250U (-MST AMCP)  
speed/mHz: max: 515/400/470/400/3500 MHz Kernel: 6.5.0-44-generic x86_64  
Up: 5d 16h 59m User: 137008/156074 MB (87.8%)  
Storage: 476.94 GB (36.58% used) Procs: 495 Shell: Bash (inxi) 3.3.13
```

76. screenfetch - displays system information with an ASCII art logo

```
veeransh@veeransh-XPS-9315:~$ screencfetch
              .+o+.
veeransh@veeransh-XPS-9315
      yyyyv - _yyyyyy+
  05: Ubuntu 22.04. jammy
  ://|||||----yyyyyy+
Kernel: x86_64 Linux 6.5.0-44-generic
  .+++: .+++++++-+sss+
Uptime: 5d 20h 2m
  .:+o: /+++++++-|-:-
  Packages: 2772
  o:+o+:+: .++. .+o+o+o+/
Shell: bash 5.1.16
  .:+o:+: .+sssoo+/ Resolution: 1920x1200
  .++:+o+o+o: /sssooo. DE: GNOME 41.7
  /+++/++: .+o+o /-----: WM: Mutter
\+o+o+++: .+o+o +//|||. WM Theme: Adwaiata
  .+++.o+o+++: .+o+o /ddhhh+. GTK Theme: Yaru-dark [GTK2/3]
  .+o+o++: .+o+o .+ddhhh+. Icon Theme: Yaru
  .+o+o++: .+o+o .+ddhhh+. Font: Ubuntu 11
  .+o+o++: .+o+o .+ddhhh+. Disk: 175G / 288G (64%)
  .+o+o++: .+o+o .+ddhhh+. CPU: i2th Gen Intel Core i7-1250U @ 12x 4.7GHz [62.0°C]
  .+o+o++: .+o+o .+ddhhh+. GPU: Mesa Intel(R) Graphics (ADL GT2)
  .+o+o++: .+o+o .+ddhhh+. RAM: 13769MB / 15607MB
  .+o+o++: .+o+o .+ddhhh+. veeransh@veeransh-XPS-9315:~$ 
```

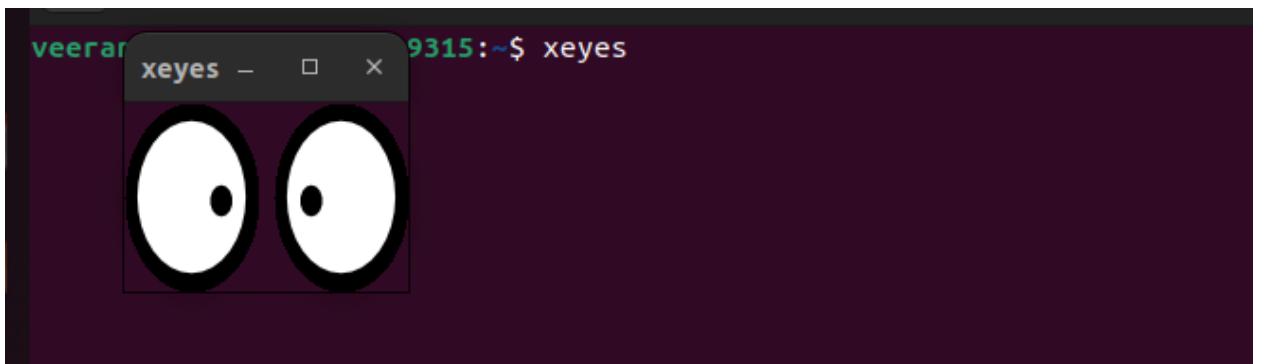
77. sl - Displays an animated steam locomotive across your terminal as a fun "typo" response for ls.



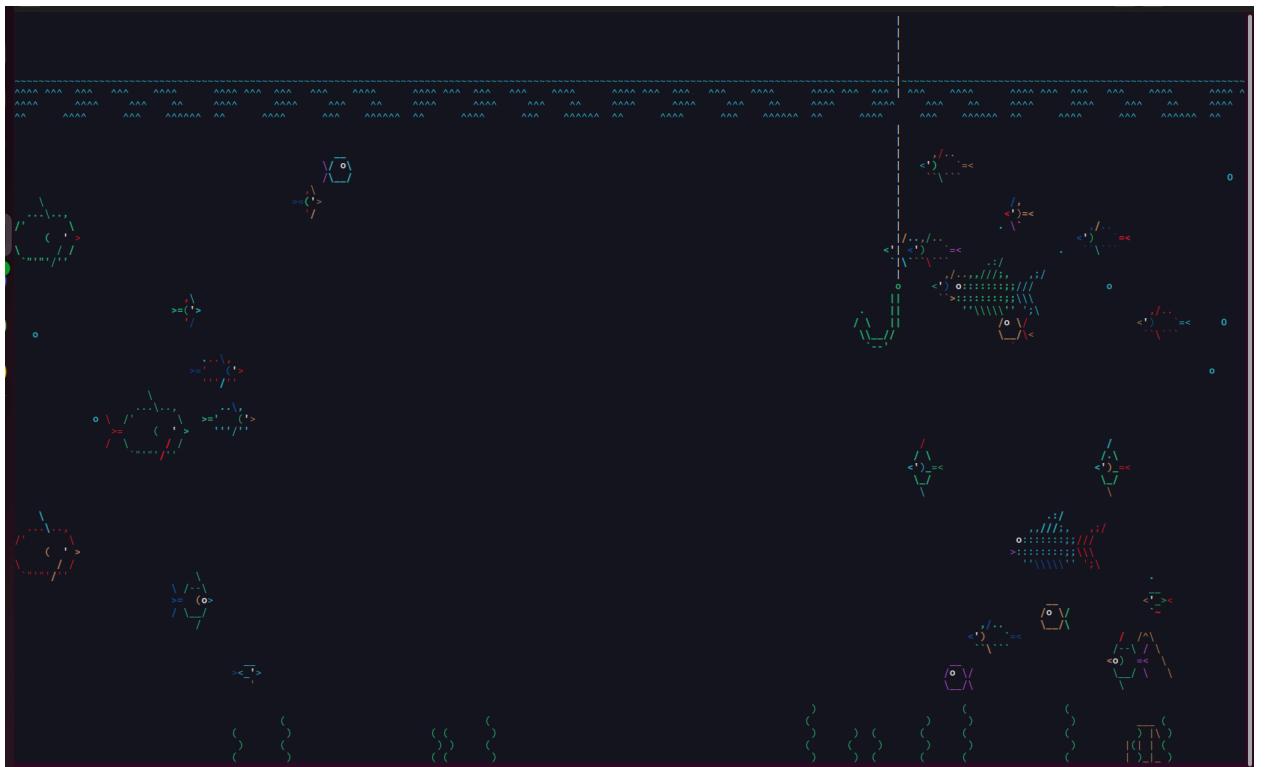
78. toilet --gay "Veeransh" - gives the inputted text in a colorful presentation

```
veeransh@veeransh-XPS-9315:~$ toilet --gay "Hello!"  
  
M M      ""#  ""#  M  
# # MM#  # # MM# #  
#MM# # "#  # # "# #  
# # #MM#  # # # # "  
# # "#MM"  "MM" "MM" "#MM"  
  
veeransh@veeransh-XPS-9315:~$ toilet --gay "Veeransh"  
  
M M      "#  
"M" MM#  MM#  MM#  MM#  MM#  MM#  MM#  "# MM  
# # "# # "# # "# " "# "# "# "# "# "# "# "# "# "#  
"MM" "#MM" "#MM" "# MM" "# MM" "# MM" "# MM" "# MM" "# MM"  
## "#MM" "#MM" "# MM" "# MM" "# MM" "# MM" "# MM" "# MM"  
  
veeransh@veeransh-XPS-9315:~$
```

79. xeyes - creates animated eyes where the eyeballs will turn according to how the cursor moves



## 80. asciiquarium - gives animation of a fish game



## **Conclusion:**

Mastering a wide range of complex Linux commands not only enhances one's ability to efficiently navigate and manage the Linux environment but also empowers users to leverage the full potential of the system. These commands form the backbone of automation, system administration, and troubleshooting, making them indispensable tools for anyone looking to excel in the world of computing. Furthermore, successfully dual-booting a system with Windows and Ubuntu demonstrates a deep understanding of operating system architecture, partition management, and bootloader configuration. It enables users to harness the strengths of both operating systems on a single machine, optimizing workflows and ensuring flexibility in software development, testing, and everyday use. This combination of skills underscores a well-rounded technical proficiency, positioning one to tackle diverse challenges in the ever-evolving field of technology.