Shubham Raut

1. How do you copy a file named "report.pdf" from your home directory to a folder called "documents"?

```
proxim@proxim:~$ touch report.pdf
proxim@proxim:~$ mv report.pdf /home/proxim/Documents
proxim@proxim:~$ ls /home/proxim/Documents
newfolder  report.pdf
```

2. What is the difference between rmdir and rm -rf commands?

```
proxim@proxim:~$ rmdir removes the empty directory, whereas rm -rf removes the directory recursively and forcefully without needing to know what's inside
```

3. How do you move a file named "data.cv" from the "downloads" folder to the "projects" folder?

```
proxim@proxim:~/Downloads$ touch data.csv
proxim@proxim:~/Downloads$ cd ../
proxim@proxim:~$ mkdir projects
proxim@proxim:~$ cd Downloads/
proxim@proxim:~/Downloads$ mv data.csv /home/proxim/projects
proxim@proxim:~/Downloads$ ls
new_folder
proxim@proxim:~/Downloads$ ls /home/proxim/projects
data.csv
```

4. What command shows your current location in the file system?

```
proxim@proxim:~$ pwd
/home/proxim
```

5. How do you create three empty files named "log1.txt", "log2 txt", and "log3, txt" simultaneously?

```
proxim@proxim:~$ ls
1.sh      Desktop   dir2        Downloads  haha.sh  log1.txt  log.txt       newfile.txt  newzip.zip    projects  sort_example.txt  temp.txt
2002      dir1      dir3        file.log   helllo   log2.txt  missile.txt   newname.txt  num_sort.txt  Public    sort_ex.html      Videos
dbda_25   dir11     Documents   fire.sh    linux    log3.txt  Music         newww        Pictures      snap      Templates         without5lines.txt
```

6. How do you change a directory name from "old _project" to "new _project"?

```
proxim@proxim:~$ mkdir oldproject
proxim@proxim:~$ mv oldproject newproject
proxim@proxim:~$ ls
1.sh      Desktop   dir2        Downloads  haha.sh  log1.txt  log.txt       newfile.txt  newww         Pictures  snap              Templates  without5lines.txt
2002      dir1      dir3        file.log   helllo   log2.txt  missile.txt   newname.txt  newzip.zip    projects  sort_example.txt  temp.txt
dbda_25   dir11     Documents   fire.sh    linux    log3.txt  Music         newproject   num_sort.txt  Public    sort_ex.html      Videos
```

7. How do you delete a file named "temp.log" without any confirmation prompt?

```
proxim@proxim:~$ touch temp.log
proxim@proxim:~$ rm -rf temp.log
proxim@proxim:~$ ls
1.sh      Desktop  dir2       Downloads  haha.sh  log1.txt  log.txt      newfile.txt  newww      Pictures  snap             Templates  without5lines.txt
2002      dir1     dir3       file.log   helllo   log2.txt  missile.txt  newname.txt  newzip.zip projects  sort_example.txt temp.txt
dbda_25   dir11    _Documents fire.sh    linux    log3.txt  Music        newproject   num_sort.txt Public   sort_ex.html     Videos
```

8.Display your current directory path using a command.

```
proxim@proxim:~$ pwd
/home/proxim
```

9. Show directory contents with file sizes in human-readable format (KB, MB, GB).

```
proxim@proxim:~$ ls -lh
total 132K
-rw-rw----   1 proxim     proxim        56 Mar 15 07:00 1.sh
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 29  2025 2002
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 dbda_25
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 Desktop
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 29  2025 dir1
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 dir11
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 29  2025 dir2
drwxrwxr-x+ 3 proxim     proxim      4.0K Mar 14 17:00 dir3
drwxrwxr-x+ 3 proxim     proxim      4.0K Mar 15 07:35 Documents
drwxrwxr-x+ 2 proxim     proxim      4.0K Mar 15 07:39 Downloads
-rw-rwx---+ 1 proxim     proxim        33 Mar 14 18:58 file.log
-rw-rwxr--+ 1 proxim     proxim        26 Aug 29  2025 fire.sh
-rw-rwxr--+ 1 proxim     proxim        70 Mar 15 06:49 haha.sh
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 helllo
drwxrwxr-x+ 2 proxim     proxim      4.0K Mar 14 17:00 linux
-rw-rw----   1 proxim     proxim         0 Mar 15 07:41 log1.txt
-rw-rw----   1 proxim     proxim         0 Mar 15 07:41 log2.txt
-rw-rw----   1 proxim     proxim         0 Mar 15 07:41 log3.txt
-rw-rwx---+ 1 proxim     proxim        34 Mar 14 19:01 log.txt
-rwxrwxrwx+ 1 proxim     proxim       314 Mar 14 15:26 missile.txt
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 Music
-rw-rwxr--+ 1 proxim     proxim      3.1K Aug 29  2025 newfile.txt
-rw-rwx---+ 1 proxim     proxim         0 Mar 14 19:05 newname.txt
drwxrwx---  2 proxim     proxim      4.0K Mar 15 07:42 newproject
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 29  2025 newww
-rw-rwxr--+ 1 proxim     proxim      4.5K Aug 29  2025 newzip.zip
-rw-rwxr--+ 1 proxim     proxim        44 Aug 29  2025 num_sort.txt
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 Pictures
drwxrwx---  2 proxim     proxim      4.0K Mar 15 07:39 projects
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 Public
drwxrwx---+ 5 proxim     proxim      4.0K Aug 29  2025 snap
-rwxrwxrwx+ 1 temp_user dbda_2025    39 Aug 29  2025 sort_example.txt
-rw-rwxr--+ 1 proxim     proxim         0 Aug 29  2025 sort_ex.html
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 Templates
-r--r-----+ 1 proxim     dbda_2025    54 Mar 14 19:03 temp.txt
drwxrwxr-x+ 2 proxim     proxim      4.0K Aug 28  2025 Videos
-rw-rwx---+ 1 proxim     proxim      3.1K Mar 14 15:09 without5lines.txt
```

10. Explain the meaning of the first character in file permissions (d, -, l) when using ls -l.

The first character indicates the file type: d for a directory, - for a regular file, and l for a symbolic link.

11. List all files including those starting with a dot (.) in the "/etc" directory.

```
proxim@proxim:~$ ls -a /etc
.                         cron.monthly            glvnd                    ldap                 networkd-dispatcher  rc4.d           sudo_logsrvd.conf
..                        crontab                 gnome                    ld.so.cache          NetworkManager       rc5.d           supercat
adduser.conf              cron.weekly             gnome-remote-desktop     ld.so.conf           networks             rc6.d           sysctl.d
alsa                      cron.yearly             gnutls                   ld.so.conf.d         newt                 rcS.d           sysstat
alternatives              cups                    gprofng.rc               legal                nftables.conf        resolv.conf     systemd
anacrontab                cupshelpers             groff                    libao.conf           nsswitch.conf        .resolv.conf.systemd-resolved.bak  terminfo
apg.conf                  dbus-1                  group                    libaudit.conf        openvpn              rmt             timezone
apm                       dconf                   group-                   libblockdev          opt                  rpc             tmpfiles.d
apparmor                  debconf.conf            grub.d                   libibverbs.d         os-release           rsyslog.conf    ubuntu-advantage
apparmor.d                debian_version          gshadow                  libnl-3              PackageKit           rsyslog.d       ucf.conf
apport                    debuginfod              gshadow-                 locale.alias         pam.conf             rygel.conf      udev
apt                       default                 gss                      locale.conf          pam.d                sane.d          udisks2
avahi                     deluser.conf            gtk-2.0                  locale.gen           paperspecs           security        ufw
bash.bashrc               depmod.d                gtk-3.0                  localtime            passwd               selinux         .updated
bash_completion           dhcp                    hdparm.conf              logcheck             passwd-              sensors3.conf   updatedb.conf
bash_completion.d         dhcpcd.conf             host.conf                login.defs           pcmcia               sensors.d       update-manager
bindresvport.blacklist    dictionaries-common     hostname                 logrotate.conf       perl                 services        update-motd.d
binfmt.d                  dpkg                    hosts                    logrotate.d          pki                  sgml            update-notifier
bluetooth                 e2scrub.conf            hosts.allow              lsb-release          plymouth             shadow          UPower
brlapi.key                emacs                   hosts.deny               machine-id           pm                   shadow-         usb_modeswitch.conf
brltty                    environment             hp                       magic                pnm2ppa.conf         shells          usb_modeswitch.d
brltty.conf               environment.d           ifplugd                  magic.mime           polkit-1             skel            vconsole.conf
ca-certificates           ethertypes              init                     manpath.config       ppp                  snmp            vim
ca-certificates.conf      flash-kernel            init.d                   mime.types           profile              speech-dispatcher  vtrgb
chatscripts               fonts                   initramfs                mke2fs.conf          profile.d            ssh             vulkan
cloud                     fprintd.conf            initramfs-tools          ModemManager         protocols            ssl             wgetrc
colord                    fstab                   inputrc                  modprobe.d           pulse                sssd            wpa_supplicant
console-setup             fuse.conf               insserv.conf.d           modules              .pwd.lock            subgid          X11
cracklib                  fwupd                   ipp-usb                  modules-load.d       python3              subgid-         xattr.conf
credstore                 gai.conf                issue                    mtab                 python3.13           subuid          xdg
credstore.encrypted       gdb                     issue.net                nanorc               rc0.d                subuid-         xml
cron.d                    gdm3                    kdump                    netconfig            rc1.d                sudo.conf       zsh_command_not_found
cron.daily                geoclue                 kernel                   netplan              rc2.d                sudoers
cron.hourly               ghostscript             krb5.conf.d              network              rc3.d                sudoers.d
```

12. . Show only files that start with a dot in your home directory.

```
proxim@proxim:/home$ ls -a
.   ..   proxim   stupid_user   temp_user
```

13. Create a directory structure "workspace/projects/web/frontend" in a single command.

```
proxim@proxim:~$ mkdir -p /home/proxim/workspace/projects/web/frontend
proxim@proxim:~$ tree workspace
workspace
└── projects
    └── web
        └── frontend
```

14. Create the following nested structure in one command:

```
company/
├── departments/
│   ├── hr/
│   ├── finance/
│   └── tech/
└── employees/
    ├── active/
    └── former/
```

```
proxim@proxim:~$ mkdir -p company/{departments/{hr,finance,tech},employees/{active,former}}
proxim@proxim:~$ tree company
company
├── departments
│   ├── finance
│   ├── hr
│   └── tech
└── employees
    ├── active
    └── former
```

15. Create a directory named "test_dir", then remove it and verify it's gone.

```
proxim@proxim:~$ mkdir testdir
proxim@proxim:~$ ls
1.sh      dbda_25  dir11  Documents  find_manual.txt  helllo    log2.txt  missile.txt  newname.txt  newzip.zip  projects  sort_example.txt  temp.txt  without5lines.txt
2002      Desktop  dir2   Downloads  fire.sh          linux     log3.txt  Music        newproject   num_sort.txt  Public    sort_ex.html      testdir   workspace
company   dir1     dir3   file.log   haha.sh          log1.txt  log.txt   newfile.txt  newww        Pictures    snap      Templates         Videos
proxim@proxim:~$ rmdir testdir
proxim@proxim:~$ ls
1.sh      dbda_25  dir11  Documents  find_manual.txt  helllo    log2.txt  missile.txt  newname.txt  newzip.zip  projects  sort_example.txt  temp.txt              workspace
2002      Desktop  dir2   Downloads  fire.sh          linux     log3.txt  Music        newproject   num_sort.txt  Public    sort_ex.html      Videos
company   dir1     dir3   file.log   haha.sh          log1.txt  log.txt   newfile.txt  newww        Pictures    snap      Templates         without5lines.txt
```

16. Save the manual page of the find command to a file named "find _manual.txt".

```
proxim@proxim:~$ man find > find_manual.txt
proxim@proxim:~$ cat find_manual.txt
FIND(1)                                           General Commands Manual                                           FIND(1)

NAME
       find - search for files in a directory hierarchy

SYNOPSIS
       find [-H] [-L] [-P] [-D debugopts] [-Olevel] [starting-point...] [expression]

DESCRIPTION
       This manual page documents the GNU version of find.  GNU find searches the directory tree rooted at each given starting-point by evaluating the given expression from left to right, accord-
       ing  to  the rules of precedence (see section OPERATORS), until the outcome is known (the left hand side is false for and operations, true for or), at which point find moves on to the next
       file name.  If no starting-point is specified, `.' is assumed.
```

17. Display the first 15 lines and last 8 lines of "find _manual.txt".

```
proxim@proxim:~$ head -n 15 "find_manual.txt" && tail -n 8 "find_manual.txt"
FIND(1)                                           General Commands Manual                                           FIND(1)

NAME
       find - search for files in a directory hierarchy

SYNOPSIS
       find [-H] [-L] [-P] [-D debugopts] [-Olevel] [starting-point...] [expression]

DESCRIPTION
       This manual page documents the GNU version of find.  GNU find searches the directory tree rooted at each given starting-point by evaluating the given expression from left to right, accord-
       ing  to  the rules of precedence (see section OPERATORS), until the outcome is known (the left hand side is false for and operations, true for or), at which point find moves on to the next
       file name.  If no starting-point is specified, `.' is assumed.

       If you are using find in an environment where security is important (for example if you are using it to search directories that are writable by other users), you should read the  `Securit
       Considerations' chapter of the findutils documentation, which is called Finding Files and comes with findutils.  That document also includes a lot more detail and discussion than this man

SEE ALSO
       chmod(1), locate(1), ls(1), updatedb(1), xargs(1), lstat(2), stat(2), ctime(3) fnmatch(3), printf(3), strftime(3), locatedb(5), regex(7)

       Full documentation <https://www.gnu.org/software/findutils/find>
       or available locally via: info find
```

18. Copy "find_manual.txt" to a folder named "manuals" and rename the copy to "find_help.txt".

```
proxim@proxim:~$ mkdir -p /home/proxim/manuals
proxim@proxim:~$ cp find_manual.txt /home/proxim/manuals/find_help.txt
proxim@proxim:~$ ls home/proxim/manuals/
ls: cannot access 'home/proxim/manuals/': No such file or directory
proxim@proxim:~$ ls /home/proxim/manuals/
find_help.txt
proxim@proxim:~$
```

19. Count the total lines, words, and characters in "find_manual.txt".

```
proxim@proxim:~$ wc find_manual.txt
 1139 12019 82834 find_manual.txt
```

20. Show your last 15 executed commands.

```
proxim@proxim:~$ history 15
  454  ls home/proxim/manuals/
  455  ls /home/proxim/manuals/
  456  vim 7.sh
  457  bash 7.sh
  458  cat 7.sh
  459  vim 7.sh
  460  bash 7.sh
  461  vim 7.sh
  462  bash 7.sh
  463  vim 7.sh
  464  chmod +x 7.sh
  465  bash 7.sh
  466  bash 7.sh 1 5
  467  wc find_manual.txt
  468  history 15
```

21. Create a tar.gz archive of your home directory's Documents folder.

```
proxim@proxim:~$ tar -czvf documents_archive.tar.gz ~/Documents
tar: Removing leading `/' from member names
/home/proxim/Documents/
/home/proxim/Documents/newfolder/
/home/proxim/Documents/newfolder/copy.txt
/home/proxim/Documents/newfolder/cy.txt
/home/proxim/Documents/report.pdf
proxim@proxim:~$ ls
1.sh  9.sh     Desktop  dir2     documents_archive.tar.gz  find_manual.txt  helllo   log2.txt  manuals      newfile.txt  newww     Pictures  snap            Templates  without5lines.txt
2002  company  dir1     dir3     Downloads                 fire.sh          linux    log3.txt  missile.txt  newname.txt  newzip.zip  projects  sort_example.txt  temp.txt   workspace
7.sh  dbda_25  dir11    Documents  file.log                haha.sh          log1.txt log.txt   Music        newproject   num_sort.txt  Public    sort_ex.html      Videos
```

22. Create a zip archive of your Desktop folder and list its contents without extracting.

```
proxim@proxim:~$ zip -r desktop_archive.zip ~/Desktop
  adding: home/proxim/Desktop/ (stored 0%)
proxim@proxim:~$ unzip -l desktop_archive.zip
Archive:  desktop_archive.zip
  Length      Date    Time    Name
---------  ---------- -----    ----
        0  2025-08-28 17:09    home/proxim/Desktop/
---------                     -------
        0                     1 file
```

23. Set permissions for "script.sh" to be readable, writable, and executable by owner only.

```
proxim@proxim:~$ touch script.sh
proxim@proxim:~$ sudo chmod 777 script.sh
[sudo] password for proxim:
proxim@proxim:~$ ls -l script.sh
-rwxrwxrwx 1 proxim proxim 0 Sep  1 17:30 script.sh
```

24. Change the owner of "database.txt" to user "admin".

```
proxim@proxim:~$ sudo chown admin database.txt
proxim@proxim:~$ ls -l database.txt
-rw-rw-r-- 1 admin proxim 0 Sep  1 17:32 database.txt
```

25. Display currently running processes in your terminal, all system processes, and sort processes by CPU usage.

```
proxim@proxim:~$ ps aux --sort=-%cpu
USER        PID %CPU %MEM    VSZ    RSS TTY      STAT START   TIME COMMAND
proxim     3889  200  0.2  11960   3832 pts/0    R+   17:37   0:00 ps aux --sort=-%cpu
proxim     1977  2.5 25.4 4119740 426712 ?       Ssl  15:44   2:52 /usr/bin/gnome-shell
proxim     1743  0.2  0.9 214664  16168 ?        S<sl 15:44   0:14 /usr/bin/pipewire
proxim     2746  0.1  3.5 719036  59064 ?        Ssl  15:44   0:11 /usr/libexec/gnome-terminal-server
systemd+    296  0.0  0.4  17596   6748 ?        Ss   15:43   0:04 /usr/lib/systemd/systemd-oomd
proxim     2089  0.0  0.5 388924   9132 ?        Ssl  15:44   0:03 /usr/bin/ibus-daemon --panel disable
proxim     1748  0.0  1.0 488736  16836 ?        S<sl 15:44   0:02 /usr/bin/wireplumber
root        798  0.0  1.9 1847700 32264 ?        Ssl  15:43   0:02 /usr/lib/snapd/snapd
```

26. . Show the current date/time and display the calendar for the current month.

```
proxim@proxim:~$ date; cal
Mon Sep  1 05:38:55 PM IST 2025
    September 2025
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
```

27. Set the system date to January 15th, 2025, 2:30 PM.

```
proxim@proxim:~$ sudo date 011514302025
Wed Jan 15 02:30:00 PM IST 2025
```

28. Research and explain these commands: uptime, df, du, free.

- These commands are for monitoring system resources.
    - **uptime** shows how long the system has been running and its load.
    - **df** reports **d**isk **f**ree space across all drives, while **du** checks the **d**isk **u**sage of specific folders.
    - **free** displays available memory (RAM).

29. Create a directory "linux_lab", navigate into it, create "permissions_test.txt", check its

default permissions, modify umask to 022, create "new_permissions_test.txt", and compare their permissions.

```
proxim@proxim:~$ mkdir linux_lab
proxim@proxim:~$ cd linux
proxim@proxim:~/linux$ cd ../
proxim@proxim:~$ cd linux_lab
proxim@proxim:~/linux_lab$ touch permissions_test.txt
proxim@proxim:~/linux_lab$ echo "---Initial Permission---"
---Initial Permission---
proxim@proxim:~/linux_lab$ ls -l
total 0
-rw-rw-r-- 1 proxim proxim 0 Jan 15 16:00 permissions_test.txt
proxim@proxim:~/linux_lab$ umask 022
proxim@proxim:~/linux_lab$ touch new_permissions_test.txt
proxim@proxim:~/linux_lab$ echo "---Comparint All Permissions---"
---Comparint All Permissions---
proxim@proxim:~/linux_lab$ ls -l
total 0
-rw-r--r-- 1 proxim proxim 0 Jan 15 16:01 new_permissions_test.txt
-rw-rw-r-- 1 proxim proxim 0 Jan 15 16:00 permissions_test.txt
proxim@proxim:~/linux_lab$ mkdir linux_lab && cd linux_lab
proxim@proxim:~/linux_lab/linux_lab$ touch permissions_test.txt
ls -l permissions_test.txt
-rw-r--r-- 1 proxim proxim 0 Jan 15 16:02 permissions_test.txt
proxim@proxim:~/linux_lab/linux_lab$ umask 022
proxim@proxim:~/linux_lab/linux_lab$ touch new_permissions_test.txt
ls -l
total 0
-rw-r--r-- 1 proxim proxim 0 Jan 15 16:02 new_permissions_test.txt
-rw-r--r-- 1 proxim proxim 0 Jan 15 16:02 permissions_test.txt
```

30. Create "source.txt" and make a symbolic link named "sym_link.txt" pointing to it.

```
proxim@proxim:~$ echo "This is the original file's content." > original.txt
ln original.txt hard_copy.txt
```

31. Create "source.txt" and make a symbolic link named "sym_link.txt" pointing to it.

```
proxim@proxim:~$ echo "This is the original source file." > source.txt
ln -s source.txt sym_link.txt
proxim@proxim:~$ ln -ls sym_link.txt
ln: invalid option -- 'l'
Try 'ln --help' for more information.
proxim@proxim:~$ ln -l sym_link.txt
ln: invalid option -- 'l'
Try 'ln --help' for more information.
proxim@proxim:~$ ls -l sym_link.txt
lrwxrwxrwx 1 proxim proxim 10 Jan 15 16:20 sym_link.txt -> source.txt
```

32. Copy the entire "projects" directory from a remote server to your local "Downloads"

folder using SCP.

```
proxim@proxim:~$ mkdir -p ~/practice_files/projects && touch ~/practice_files/projects/file.txt
proxim@proxim:~$ scp -r $USER@localhost:~/practice_files/projects ~/Downloads/
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ED25519 key fingerprint is SHA256:E2ySmH3reyU3Qa9+jTl6Lk5pl+mw3yeKaqTLrNqIC8k.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])?
Host key verification failed.
scp: Connection closed
proxim@proxim:~$ scp -r $proxim@localhost:~/practice_files/projects ~/Downloads/
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ED25519 key fingerprint is SHA256:E2ySmH3reyU3Qa9+jTl6Lk5pl+mw3yeKaqTLrNqIC8k.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])?
Host key verification failed.
scp: Connection closed
proxim@proxim:~$ scp -r $USER@localhost:~/practice_files/projects ~/Downloads/
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ED25519 key fingerprint is SHA256:E2ySmH3reyU3Qa9+jTl6Lk5pl+mw3yeKaqTLrNqIC8k.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'localhost' (ED25519) to the list of known hosts.
proxim@localhost's password:
proxim@proxim:~$ ls -l ~/Downloads/
total 8
-rw-rwxr--+ 1 proxim proxim   67 Aug 29 02:29 new_folder
drwxrwxr-x  2 proxim proxim 4096 Sep  1 23:48 projects
```

33. Download files from a public FTP server like ftp.gnu.org using command line FTP client.

```
proxim@proxim:~$ wget https://ftp.debian.org/debian/README
--2025-09-01 23:59:36--  https://ftp.debian.org/debian/README
Resolving ftp.debian.org (ftp.debian.org)... 167.82.58.132, 167.82.62.132, 2a04:4e42:fea::644, ...
Connecting to ftp.debian.org (ftp.debian.org)|167.82.58.132|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1193 (1.2K)
Saving to: 'README'

README                 100%[===================================================================================================================>]   1.17K  --.-KB/s    in 0s

2025-09-01 23:59:36 (20.3 MB/s) - 'README' saved [1193/1193]
```

36. . How do you remove a directory named "old _data" containing files and subdirectories?

```
proxim@proxim:~$ mkdir old_data
proxim@proxim:~$ cd old_data
proxim@proxim:~/old_data$ mkdir file.txt
proxim@proxim:~/old_data$ rmdir file.txt
proxim@proxim:~/old_data$ mkdir files
proxim@proxim:~/old_data$ cd files
proxim@proxim:~/old_data/files$ touch mobile.txt
proxim@proxim:~/old_data/files$ cd ..
proxim@proxim:~/old_data$ cd ../
proxim@proxim:~$ tree old_data
old_data
└── files
    └── mobile.txt

2 directories, 1 file
proxim@proxim:~$  rm -rf old_data
proxim@proxim:~$ cd old_data
bash: cd: old_data: No such file or directory
```

37.List all files in "/var/log" showing detailed information including hidden files.

```
proxim@proxim:~$ ls -la /var/log
total 2472
drwxrwxr-x  16 root            syslog          4096 Sep  1 15:53 .
drwxr-xr-x  14 root            root            4096 Aug 28 17:09 ..
-rw-r--r--   1 root            root               0 Mar 15  2024 alternatives.log
-rw-r--r--   1 root            root           27750 Mar 14  2024 alternatives.log.1
-rw-r-----   1 root            adm                0 Aug 28 17:09 apport.log
drwxr-xr-x   2 root            root            4096 Sep  1 23:45 apt
-rw-r-----   1 syslog          adm            22083 Sep  1 23:59 auth.log
-rw-r-----   1 syslog          adm            60499 Sep  1 15:45 auth.log.1
-rw-r-----   1 syslog          adm            11163 Mar 15  2024 auth.log.2.gz
-rw-------   1 root            root               0 Sep  1 15:53 boot.log
-rw-------   1 root            root           14087 Sep  1 15:53 boot.log.1
-rw-------   1 root            root           38350 Mar 15  2024 boot.log.2
-rw-r--r--   1 root            root          116619 Apr 15 22:50 bootstrap.log
-rw-rw----   1 root            utmp               0 Sep  1 15:53 btmp
-rw-rw----   1 root            utmp            1600 Sep  1 15:44 btmp.1
-rw-r-----   1 syslog          adm           103415 Aug 28 17:10 cloud-init.log
-rw-r-----   1 root            adm             4279 Aug 28 17:10 cloud-init-output.log
drwxr-xr-x   2 root            root            4096 Sep  1 15:53 cups
drwxr-xr-x   2 cups-browsed    lpadmin         4096 Apr 15 23:13 cups-browsed
drwxr-xr-x   2 root            root            4096 Apr  7 21:46 dist-upgrade
-rw-r-----   1 root            adm            46414 Sep  1 15:43 dmesg
-rw-r-----   1 root            adm            43458 Aug 29 15:57 dmesg.0
-rw-r-----   1 root            adm            12716 Aug 28 23:05 dmesg.1.gz
-rw-r-----   1 root            adm            12954 Aug 28 17:09 dmesg.2.gz
-rw-r--r--   1 root            root            2674 Sep  1 23:45 dpkg.log
-rw-r--r--   1 root            root          952838 Mar 14  2024 dpkg.log.1
-rw-r--r--   1 root            root            4706 Apr 15 23:36 fontconfig.log
drwx--x--x   2 root            gdm             4096 Aug 28 17:09 gdm3
drwxr-xr-x   3 root            root            4096 Apr 15 23:09 hp
drwxrwx---   4 root            adm             4096 Aug 28 16:08 installer
drwxr-sr-x+  3 root            systemd-journal 4096 Aug 28 17:09 journal
-rw-r-----   1 syslog          adm              663 Sep  1 23:45 kern.log
-rw-r-----   1 syslog          adm            51272 Sep  1 15:53 kern.log.1
-rw-r-----   1 syslog          adm            37006 Mar 15  2024 kern.log.2.gz
```

38. Create a file named "config.txt" in the path "/opt/myapp/config/" using command line.

```
proxim@proxim:~$ sudo mkdir -p /opt/myapp/config && sudo touch /opt/myapp/config/config.txt
[sudo] password for proxim:
proxim@proxim:~$ ls /opt/myapp/config/
config.txt
```

39. Search for the word "error" in all ".log" files within the current directory and subdirectories.

```
proxim@proxim:~$ grep -r --include="*.log" "error" .
./file.log:error
./file.log:error
./file.log:error
./file.log:error
```

40. Create a directory "myproject" with permissions 755 (rwxr-xr-x).

```
proxim@proxim:~$ rmdir myproject
proxim@proxim:~$ mkdir myproject && chmod 755 myproject
proxim@proxim:~$ ls -l myproject
total 0
proxim@proxim:~$ ls -ld myproject
drwxr-xr-x 2 proxim proxim 4096 Sep  2 00:09 myproject
```

41. . Create a compressed tar archive named "backup.tar.gz" containing all files and subdirectories in "/home/user/documents".

```
proxim@proxim:~$ tar -czvf backup.tar.gz /home/proxim/Documents
tar: Removing leading `/' from member names
/home/proxim/Documents/
/home/proxim/Documents/newfolder/
/home/proxim/Documents/newfolder/copy.txt
/home/proxim/Documents/newfolder/cy.txt
/home/proxim/Documents/report.pdf
```

42. Give read and write permissions to owner and group, but only read permission to others for "shared.txt".

```
proxim@proxim:~$ touch shared.txt
proxim@proxim:~$ sudo chmod 664 shared.txt
proxim@proxim:~$ ls -l shared.txt
-rw-rw-r-- 1 proxim proxim 0 Sep  2 00:14 shared.txt
```

43. Find the size of "video.mp4" and display it in human-readable format (MB/GB).

```
proxim@proxim:~/Downloads$ ls -lh video.mp4
-rw-rw-r-- 1 proxim proxim 7.3M Sep  2 00:17 video.mp4
```

44. Find all files in "/home" and subdirectories that were modified in the last 7 days.

```
proxim@proxim:~/Downloads$ find /home -type f -mtime -7
find: '/home/temp_user': Permission denied
/home/proxim/manuals/find_help.txt
/home/proxim/practice_files/projects/file.txt
/home/proxim/.sudo_as_admin_successful
/home/proxim/.bash_history
/home/proxim/Documents/newfolder/copy.txt
/home/proxim/Documents/newfolder/cy.txt
/home/proxim/newzip.zip
/home/proxim/7.sh
/home/proxim/dir2/dbda_hi.sh
/home/proxim/dir2/dbda_f1.sh
/home/proxim/config.txt
/home/proxim/.config/.gsd-keyboard.settings-ported
/home/proxim/.config/pulse/cookie
/home/proxim/.config/xdg-terminals.list
/home/proxim/.config/ibus/bus/dcf611fb461e49b48e8caa583e77ccfe-unix-0
/home/proxim/.config/ibus/bus/dcf611fb461e49b48e8caa583e77ccfe-unix-wayland-0
/home/proxim/.config/gnome-xdg-terminals.list
/home/proxim/.config/user-dirs.dirs
/home/proxim/.config/user-dirs.locale
/home/proxim/.config/dconf/user
/home/proxim/.config/gnome-initial-setup-done
/home/proxim/.config/ubuntu-xdg-terminals.list
/home/proxim/.config/gtk-3.0/bookmarks
/home/proxim/.config/evolution/sources/system-proxy.source
/home/proxim/database.txt
/home/proxim/linux/f23.txt
```

45. Compare "version1.txt" and "version2.txt" and show only the differences.

```
proxim@proxim:~/Downloads$ diff version1.txt version2.txt
1,4c1,3
< hello this is the version1 text file
< name = Elon Musk
< age = 59
<
---
> hello this is a version2 file
> name = shubham raut
> age = 23
```

46. Synchronize "/home/user/photos" with "/backup/photos" preserving all file attributes.

```
proxim@proxim:~$ rsync -av /home/proxim/photos/ /home/proxim/backup/photos/
sending incremental file list
./

sent 59 bytes   received 19 bytes   156.00 bytes/sec
total size is 0  speedup is 0.00
```

47. . Extract characters 10-25 from each line in "data.txt".

```
proxim@proxim:~$ cut -c 10-25 data.txt
um is simply dum
 Lorem Ipsum has
 since the 1500s
nd scrambled it
not only five ce
ng, remaining es
 with the releas
sages, and more
like Aldus PageM
```

48. Extract only the file "readme.txt" from "archive.tar.gz" without extracting the entire archive.

```
proxim@proxim:~$ tar -czvf archive.tar.gz logs
logs/
logs/log2.txt
logs/readme.txt
logs/log1.txt
logs/archive.tar.gz
proxim@proxim:~$ tar -xzvf archive.tar.gz logs/readme.txt
logs/readme.txt
```

49. Count how many times the word "function" appears in "script.js".

```
proxim@proxim:~$ grep -o -w "function" script.js | wc -l
10
proxim@proxim: $
```

52. . How do you monitor real-time changes to a log file named "application.log"?

```
proxim@proxim:~$ vim application.log
proxim@proxim:~$ tail -F application.log
[2025-09-01 23:30:20] [INFO] POST /api/v1/cart - Response sent with status 201 Created.
[2025-09-01 23:30:22] [INFO] POST /api/v1/login - Request received from 203.0.113.88.
[2025-09-01 23:30:22] [DEBUG] Attempting to authenticate user: charlie.
[2025-09-01 23:30:22] [DEBUG] Database query executed in 48ms: SELECT * FROM users WHERE username='charlie'.
[2025-09-01 23:30:22] [INFO] User 'charlie' authenticated successfully. UserID: 103.
[2025-09-01 23:30:22] [INFO] POST /api/v1/login - Response sent with status 200 OK.
[2025-09-01 23:30:23] [ERROR] Failed to connect to payment gateway: Connection timed out. Service: PayPal.
[2025-09-01 23:30:23] [INFO] POST /api/v1/checkout - Request received from 172.16.0.14.
[2025-09-01 23:30:23] [WARN] Payment gateway service is timing out. Retrying in 5s.
[2025-09-01 23:30:25] [INFO] GET /api/
```

53. How do you find all files larger than 100MB in your entire file system?

```
proxim@proxim:~$ find / -type f -size +100M 2>/dev/null
/swap.img
/snap/gnome-42-2204/201/usr/lib/aarch64-linux-gnu/libLLVM-15.so.1
/snap/firefox/6039/usr/lib/firefox/libxul.so
/snap/firefox/6736/usr/lib/firefox/libxul.so
/proc/kcore
/usr/lib/aarch64-linux-gnu/libLLVM.so.19.1
/usr/lib/aarch64-linux-gnu/libLLVM-18.so.1
/var/lib/snapd/snaps/firefox_6039.snap
/var/lib/snapd/snaps/gnome-42-2204_201.snap
/var/lib/snapd/snaps/firefox_6736.snap
/var/lib/snapd/seed/snaps/firefox_6039.snap
/var/lib/snapd/seed/snaps/gnome-42-2204_201.snap
```

54. How do you create a file with specific content using command line without opening an editor?

```
proxim@proxim:~$     echo "This is the content of the file." > filename.txt
proxim@proxim:~$ cat
^C
proxim@proxim:~$ cat filename.txt
This is the content of the file.
```

55. How do you compress a directory using gzip and preserve the original?

```
proxim@proxim:~$ tar -czvf Documents.tar.gz Documents/
Documents/
Documents/newfolder/
Documents/newfolder/copy.txt
Documents/newfolder/cy.txt
Documents/report.pdf
```

56. How do you find all files owned by user "john" in the "/home" directory?

```
proxim@proxim:~$ sudo find /home -user john -ls
  539493     4 drwxr-x---   4 john     john         4096 Sep  2 00:49 /home/john
  539495     4 -rw-r--r--   1 john     john         3771 Sep  2 00:49 /home/john/.bashrc
  539507     4 drwx------   4 john     john         4096 Sep  2 00:49 /home/john/snap
  539512     4 drwxr-xr-x   4 john     john         4096 Sep  2 00:49 /home/john/snap/prompting-client
  539514     4 drwxr-xr-x   3 john     john         4096 Sep  2 00:49 /home/john/snap/prompting-client/common
  539523     4 drwxrwxr-x   4 john     john         4096 Sep  2 00:49 /home/john/snap/prompting-client/common/.cache
  539585     4 drwxrwxr-x   2 john     john         4096 Sep  2 00:49 /home/john/snap/prompting-client/common/.cache/immodules
```

57. How do you schedule a command to run every day at 9 AM using cron?

```
proxim@proxim:~/linux_lab/linux_lab$ crontab -l
# My daily report job
0 9 * * * /home/proxim/daily_report.sh
```

58. How do you check disk usage of the current directory and sort by size?

```
proxim@proxim:~/linux_lab/linux_lab$ du -h --max-depth=1 | sort -rh
8.0K    .
```

59. How do you find and kill a process by name?

```
proxim@proxim:~/linux_lab/linux_lab$ ps
    PID TTY          TIME CMD
   2753 pts/0    00:00:00 bash
  10191 pts/0    00:00:00 ps
proxim@proxim:~/linux_lab/linux_lab$ kill 10191
bash: kill: (10191) - No such process
proxim@proxim:~/linux_lab/linux_lab$ kill 2753
```

60. How do you create a symbolic link that points to a directory instead of a file?

```
proxim@proxim:~/linux_lab/linux_lab$ ls
hard_copy.txt  new_permissions_test.txt  original.txt  permissions_test.txt  project_files
proxim@proxim:~/linux_lab/linux_lab$ mv hard_copy.txt new_permissions_test.txt project_files/
proxim@proxim:~/linux_lab/linux_lab$ ln -s /home/proxim/project_files current_project
proxim@proxim:~/linux_lab/linux_lab$ ln -la current_project
ln: invalid option -- 'l'
Try 'ln --help' for more information.
proxim@proxim:~/linux_lab/linux_lab$ ls -l current_project
lrwxrwxrwx 1 proxim proxim 26 Sep  2 01:12 current_project -> /home/proxim/project_files
```

61. How do you find all executable files in your PATH?

```
proxim@proxim:~/linux_lab/linux_lab$ cat exec_files.sh
IFS=":"
for dir in $PATH; do
    find "$dir" -maxdepth 1 -type f -executable
done
proxim@proxim:~/linux_lab/linux_lab$ bash exec_files.sh
/usr/sbin/dump.exfat
/usr/sbin/pivot_root
/usr/sbin/pam_namespace_helper
/usr/sbin/resize2fs
/usr/sbin/grub-probe
/usr/sbin/biotop-bpfcc
/usr/sbin/cfdisk
/usr/sbin/alsa-info
/usr/sbin/nfnl_osf
/usr/sbin/groupmod
/usr/sbin/ldattach
/usr/sbin/syncsnoop.bt
/usr/sbin/tcptraceroute.db
/usr/sbin/offwaketime-bpfcc
/usr/sbin/update-fonts-dir
```

62. . How do you merge two sorted files into one sorted file?

```
proxim@proxim:~$ sort -m file1.txt file2.txt > merged_file.txt
proxim@proxim:~$ cat merged_file.txt

this is the file 1 text
this is the file 2 text
```

63. How do you display only unique lines from a file that contains duplicates?

```
proxim@proxim:~$ sort merged_file.txt | uniq

this is the file 1 text
this is the file 2 text
```

64. How do you monitor system resource usage in real-time?

```
proxim@proxim:~$ htop
```

```
  0[||||                                                          3.2%] Tasks: 141, 402 thr, 72 kthr; 1 running
  1[||||                                                          5.2%] Load average: 0.15 0.16 0.11
Mem[|||||||||||||||||||||||||||||||||||||||||||||||||||||||||]  716M/1.60G] Uptime: 05:52:37
Swp[||||||||||||||||||||||||||||||]                             560M/2.00G]

Main  I/O
  PID USER       PRI  NI  VIRT   RES   SHR S CPU%▽MEM%   TIME+  Command
10564 proxim      20   0 11524  4732  2812 R  2.6  0.3  0:00.34 htop
 2010 proxim      20   0 4055M  260M     0 S  2.0 15.9  4:28.69 /usr/bin/gnome-shell
 2011 proxim      20   0 4055M  260M     0 S  2.0 15.9  4:33.57 /usr/bin/gnome-shell
  808 root        20   0 18408  5152  4608 S  0.7  0.3  0:01.45 /usr/lib/systemd/systemd-logind
 1977 proxim      20   0 4045M  260M 57436 S  0.7 15.9  3:22.33 /usr/bin/gnome-shell
 2015 proxim      20   0 4055M  260M     0 S  0.7 15.9  0:06.11 /usr/bin/gnome-shell
 2746 proxim      20   0  720M 56956 41424 S  0.7  3.4  0:54.24 /usr/libexec/gnome-terminal-server
    1 root        20   0 25260  9212  5756 S  0.0  0.5  0:06.37 /sbin/init splash
  284 root        19  -1 67328 13824 13056 S  0.0  0.8  0:02.32 /usr/lib/systemd/systemd-journald
  296 systemd-oo  20   0 17764  2524  2268 S  0.0  0.2  0:13.46 /usr/lib/systemd/systemd-oomd
  341 systemd-re  20   0 23256  4396  3372 S  0.0  0.3  0:01.39 /usr/lib/systemd/systemd-resolved
  342 systemd-ti  20   0 91256  2480  2352 S  0.0  0.1  0:00.66 /usr/lib/systemd/systemd-timesyncd
  350 root        20   0 38696  4172  3276 S  0.0  0.2  0:00.40 /usr/lib/systemd/systemd-udevd
  352 systemd-ti  20   0 91256  2480     0 S  0.0  0.1  0:00.03 /usr/lib/systemd/systemd-timesyncd
  782 avahi       20   0  6568  1800  1544 S  0.0  0.1  0:00.85 avahi-daemon: running [proxim.local]
  783 messagebus  20   0 11900  4020  1844 S  0.0  0.2  0:02.74 @dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation --sy
  788 gnome-remo  20   0  511M  3844  3716 S  0.0  0.2  0:00.00 /usr/libexec/gnome-remote-desktop-daemon --system
```

65. . How do you find files that are exactly 0 bytes (empty files)?

```
proxim@proxim:~$ find . -type f -size 0
./practice_files/projects/file.txt
./.sudo_as_admin_successful
./projects/data.csv
./Documents/report.pdf
./newname.txt
./log3.txt
./dir2/dbda_hi.sh
./config.txt
./.config/.gsd-keyboard.settings-ported
./database.txt
./linux/file1.txt
```

66. How do you change file timestamps without modifying content?

```
proxim@proxim:~$ vim report.txt
proxim@proxim:~$ touch -t 202410261030 report.txt
proxim@proxim:~$ touch -m report.txt
proxim@proxim:~$ touch -a report.txt
```

67. How do you create a file that can only be read by the owner and no one else?

```
proxim@proxim:~$ touch myprivatefile.txt
proxim@proxim:~$ chmod 400 myprivatefile.txt
proxim@proxim:~$ ls -l myprivatefile.txt
-r-------- 1 proxim proxim 0 Sep  2 01:23 myprivatefile.txt
```

68. How do you find broken symbolic links in a directory?

```
proxim@proxim:~$ find . -xtype l
./snap/prompting-client/common/.cache/immodules/im-ibus.so
./snap/prompting-client/common/.cache/immodules/im-ti-er.so
./snap/prompting-client/common/.cache/immodules/im-inuktitut.so
./snap/prompting-client/common/.cache/immodules/im-wayland.so
./snap/prompting-client/common/.cache/immodules/im-ipa.so
./snap/prompting-client/common/.cache/immodules/im-cyrillic-translit.so
./snap/prompting-client/common/.cache/immodules/im-fcitx.so
./snap/prompting-client/common/.cache/immodules/im-am-et.so
./snap/prompting-client/common/.cache/immodules/im-viqr.so
./snap/prompting-client/common/.cache/immodules/im-thai.so
./snap/prompting-client/common/.cache/immodules/im-broadway.so
```

69. How do you copy files while preserving their original timestamps?

```
proxim@proxim:~$ touch newfile.txt
proxim@proxim:~$ cp -p config.txt newfile.txt
proxim@proxim:~$ ls -l config.txt new
ls: cannot access 'new': No such file or directory
-rw-rw-r-- 1 proxim proxim 0 Sep  2 00:04 config.txt
proxim@proxim:~$ ls -l config.txt newfile.txt
-rw-rw-r--  1 proxim proxim 0 Sep  2 00:04 config.txt
-rw-rw-r--+ 1 proxim proxim 0 Sep  2 00:04 newfile.txt
```

70. How do you display the last 50 lines of a log file and continue monitoring new additions?

```
proxim@proxim:~$ vim logfile.txt
proxim@proxim:~$ mv logfile.txt logfile.log
proxim@proxim:~$ tail -n 100 -f logfile.log
2025-09-02 10:00:33 INFO: New user 'jane.smith' registered
2025-09-02 10:00:35 WARNING: API endpoint '/api/legacy' is deprecated and will be removed soon
2025-09-02 10:00:38 INFO: User 'jane.smith' confirmed email address
2025-09-02 10:00:40 DEBUG: Preparing report 'MonthlySales.pdf'
2025-09-02 10:00:43 INFO: Report 'MonthlySales.pdf' generated successfully
2025-09-02 10:00:45 ERROR: File 'config.json' not found in expected directory
2025-09-02 10:00:48 INFO: Scheduled task 'CleanupTempFiles' started
2025-09-02 10:00:50 DEBUG: Deleting 12 files from /temp directory
2025-09-02 10:00:52 INFO: Scheduled task 'CleanupTempFiles' finished
2025-09-02 10:00:55 WARNING: CPU usage is at 95% for the last 30 seconds
2025-09-02 10:00:58 INFO: User 'guest' clicked on advertisement 'Ad_001'
2025-09-02 10:01:01 DEBUG: Sending email to 'jane.smith'
2025-09-02 10:01:03 INFO: Email sent successfully to 'jane.smith'
2025-09-02 10:01:05 INFO: User 'admin' updated product ID 'P-456'
2025-09-02 10:01:08 ERROR: Invalid input for field 'quantity' in order 'ORD-987'
2025-09-02 10:01:10 INFO: Processing payment for order 'ORD-987'
2025-09-02 10:01:12 DEBUG: Connecting to payment gateway 'Stripe'
2025-09-02 10:01:15 INFO: Payment for order 'ORD-987' successful
```