

Linux Commands Practice Questions -2

File and Directory Operations

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

```
user@cdacDBDAA:~$ mkdir documents
user@cdacDBDAA:~$ cd documents
user@cdacDBDAA:~/documents$ cd ..
user@cdacDBDAA:~$ cp report.pdf /home/user/documents
user@cdacDBDAA:~$ cd documents
user@cdacDBDAA:~/documents$ ls
report.pdf
user@cdacDBDAA:~/documents$
```

2. What is the difference between `rmdir` and `rm -rf` commands?
`rmdir` is used to remove empty directories, while `rm -rf` forcefully and recursively deletes non-empty directories and their contents.

```
report.pdf
user@cdacDBDAA:~/documents$ mkdir emptydir
user@cdacDBDAA:~/documents$ ls
emptydir  report.pdf
user@cdacDBDAA:~/documents$ mkdir contentdir
user@cdacDBDAA:~/documents$ cd contentdir
user@cdacDBDAA:~/documents/contentdir$ touch 1.py
user@cdacDBDAA:~/documents/contentdir$ cd ..
user@cdacDBDAA:~/documents$ ls
contentdir  emptydir  report.pdf
user@cdacDBDAA:~/documents$ rmdir emptydir
user@cdacDBDAA:~/documents$ ls
contentdir  report.pdf
user@cdacDBDAA:~/documents$ rm -rf contentdir
user@cdacDBDAA:~/documents$ ls
report.pdf
user@cdacDBDAA:~/documents$
```

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

```
user@cdacDBDAA:~$ mkdir projects
user@cdacDBDAA:~$ cd documents
user@cdacDBDAA:~/documents$ touch data.csv
user@cdacDBDAA:~/documents$ cd ..
user@cdacDBDAA:~$ mv /home/user/documents/data.csv /home/user/projects
user@cdacDBDAA:~$ cd projects
user@cdacDBDAA:~/projects$ ls
data.csv
user@cdacDBDAA:~/projects$
```

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

```
user@cdacDBDAA:~/projects$ pwd
/home/user/projects
user@cdacDBDAA:~/projects$
```

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

```
user@cdacDBDAA:~/projects$ touch log1.txt log2.txt log3.txt
user@cdacDBDAA:~/projects$ ls
data.csv log1.txt log2.txt log3.txt
user@cdacDBDAA:~/projects$
```

6. How do you change a directory name from "old_project" to "new_project"?

```
user@cdacDBDAA:~/projects$ mkdir old_project
user@cdacDBDAA:~/projects$ ls
data.csv log1.txt log2.txt log3.txt old_project
user@cdacDBDAA:~/projects$ mv old_project new_project
user@cdacDBDAA:~/projects$ ls
data.csv log1.txt log2.txt log3.txt new_project
```

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

```
user@cdacDBDAA:~$ rm -r temp.log
```

8. Display your current directory path using a command

```
user@cdacDBDAA:~/projects$ pwd
/home/user/projects
user@cdacDBDAA:~/projects$
```

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

```
user@cdacDBDAA:~$ ls -lh
total 324K
-rw-rw-r-- 1 user user 467 Sep  1 14:21 101.txt
-rw-rw-r-- 1 user user 272 Sep  1 18:21 10.sh
-rw-rw-r-- 1 user user 110 Sep  1 18:29 11.sh
-rw-rw-r-- 1 user user   0 Aug 29 14:45 11.txt
-rw-rw-r-- 1 user user 135 Sep  1 18:45 12.sh
-rw-rw-r-- 1 user user 144 Sep  1 18:49 13.sh
-rw-rw-r-- 1 root root 6.2K Aug 31 20:35 13.txt
-rw-rw-r-- 1 user user 169 Sep  1 18:54 14.sh
-rw-rw-r-- 1 user user  89 Sep  1 19:07 15.sh
-rw-rw-r-- 1 user user 158 Sep  1 19:17 16.sh
-rwxrwxrwx 1 user user   0 Aug 29 14:45 1.java
-rw-rw-r-- 1 root root   0 Aug 29 14:45 1.py
-rw-rw-r-- 1 user user  48 Sep  1 13:13 1.sh
-rwxrwxrwx 1 user user 836 Aug 31 20:52 1.txt
-rw-rw-r-- 1 root root   0 Aug 29 14:45 2.py
-rw-rw-r-- 1 user user  25 Sep  1 13:16 2.sh
-rwxrwxrwx 1 user user 704 Aug 30 12:55 2.txt
-rw-rw-r-- 1 user user  41 Sep  1 13:18 3.sh
-rw-rw-r-- 1 user user 145 Sep  1 17:41 4.sh
-rw-rw-r-- 1 user user 148 Sep  1 17:49 5.sh
-rw-rw-r-- 1 user user  92 Sep  1 17:53 6.sh
-rw-rw-r-- 1 user user  49 Sep  1 18:00 7.sh
-rw-rw-r-- 1 user user  57 Sep  1 18:02 8.sh
-rw-rw-r-- 1 user user  85 Sep  1 18:07 9.sh
-rw-rw-r-- 1 user user 10K Aug 29 17:20 archive.tar
drwxrwxr-x 2 user user 4.0K Aug 29 15:13 hackun
```

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

```
user@cdacDBDAA:~/First_Dir$ ls -l
total 36
-rw-rw-r-- 1 user user 18 Aug 28 18:00 abc.java
-rw-rw-r-- 1 user user 6 Aug 29 10:53 cp.txt
drwxrwxr-x 2 user user 4096 Aug 29 12:33 dir11
drwxrwxr-x 2 user user 4096 Aug 29 11:15 dir11copy
-rw-rw-r-- 1 user user 0 Aug 29 10:21 ex1.java
-rw-rw-r-- 1 user user 0 Aug 29 10:21 ex1.py
-rw-rw-r-- 1 user user 0 Aug 29 10:20 ex1.sh
drwxrwxr-x 2 user user 4096 Aug 29 13:03 example
-rw-rw-r-- 1 user user 0 Aug 28 17:44 f1.cpp
-rw-rw-r-- 1 user user 4 Aug 28 17:53 f1.java
-rw-rw-r-- 1 user user 0 Aug 28 17:44 f1.py
-rw-rw-r-- 1 user user 0 Aug 28 17:44 f1.sh
-rw-rw-r-- 1 user user 19 Aug 28 17:52 f1.txt
-rw-rw-r-- 1 user user 6 Aug 29 10:51 og.txt
-rw-rw-r-- 1 user user 68 Aug 28 18:05 xyz.java
user@cdacDBDAA:~/First_Dir$
```

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

```
user@cdacDBDAA:/etc$ ls .*
.pwd.lock .resolv.conf systemd-resolved.bak .updated
user@cdacDBDAA:/etc$
```

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

```
user@cdacDBDAA:~$ ls .*
.bash_history  .bash_logout  .bashrc       .lessht       .pam_environment  .profile      .sudo_as_admin_successful

.cache:
event-sound-cache.tdb.d595f9de05464c47903609c151caf2e1.x86_64-pc-linux-gnu  ibus-table          ubuntu-report
evolution          mesa_shader_cache    mesa_shader_cache_db  update-manager-core
gstreamer-1.0      tracker3

.config:
dconf      gnome-initial-setup-done  gtk-3.0  nautilus  tiling-assistant  user-dirs.dirs
enchant    GNOME-xdg-terminals.list  htop     procps    ubuntu-xdg-terminals.list  user-dirs.locale
evolution  goa-1.0                   ibus     pulse     update-notifier      xdg-terminals.list

.gnupg:
pubring.kbx  trustdb.gpg

.local:
share  state

.ssh:
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ mkdir -p workspace/projects/web/frontend
user@cdacDBDAA:~$ tree workspace
workspace
├── projects
│   └── web
│       └── frontend
4 directories, 0 files
```

14. Create the following nested structure in one command:

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

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

8 directories, 0 files
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~/projects$ mkdir old_project
user@cdacDBDAA:~/projects$ ls
data.csv  log1.txt  log2.txt  log3.txt  old_project
user@cdacDBDAA:~/projects$ mv old_project new_project
user@cdacDBDAA:~/projects$ ls
data.csv  log1.txt  log2.txt  log3.txt  new_project
```

File Content and Text Processing

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

```
user@cdacDBDAA:~$ man find> find_manual
user@cdacDBDAA:~$ cat find_manual
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, according 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 'Security 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 manual page, so you may find it a more useful source of information.

OPTIONS
    The -H, -L and -P options control the treatment of symbolic links. Command-line arguments following these are taken to be names of files or directories to be examined, up to the first argument that begins with '.', or the argument '(' or '!'. That argument and any following arguments are taken to be the expression describing what is to be searched for. If no paths are given, the current directory is used. If no expression is given, the expression -print is used (but you should probably consider using -print0 instead, anyway).

    This manual page talks about 'options' within the expression list. These options control the behaviour of find, but are specified immediately after the last path name. The five 'real' options -H, -L, -P, -D and -O
```

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

```
1.sh 4.sh diricopy file2.txt hardlink.txt num_sort.txt Second_Dir temp.txt
user@cdacDBDAA:~$ cat find_manual | head -n 15
FIND(1)                                General Commands Manual                                FIND(1)

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    If you are using find in an environment where security is important (for example if you are using it to search
user@cdacDBDAA:~$ cat find_manual | tail -n 8
SEE ALSO
    chmod(1), locate(1), ls(1), updatedb(1), xargs(1), lstat(2), stat(2), ctime(3) fnmatch(3), printf(3), strf-
time(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".

```
user@cdacDBDAA:~$ touch find_manual.txt
user@cdacDBDAA:~$ cp -a find_manual.txt manuals
user@cdacDBDAA:~$ cd manuals
user@cdacDBDAA:~/manuals$ ls
find_manual.txt
user@cdacDBDAA:~/manuals$ mv find_manual.txt find_help.txt
user@cdacDBDAA:~/manuals$ ls
find_help.txt
user@cdacDBDAA:~/manuals$
```

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

```
user@cdacDBDAA:~$ wc find_manual.txt
0 0 0 find_manual.txt
```

20. Show your last 15 executed commands.

```
user@cdacDBDAA:~$ history 15
1015*
1016 mv find_help.txt find_manual.txt
1017 ls
1018 wc find_manual
1019 wc find_manual.txt
1020 cd ..
1021 wc find_manuals.txt
1022 wc find_manual.txt
1023 cat find_manual | head -n 15
1024 ls
1025 cat find_manual.txt | head -n 15
1026 man find> find_manual
1027 cat find_manual.txt | head -n 15
1028 history
1029 history 15
user@cdacDBDAA:~$
```


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

```
user@cdacDBDAA:~$ tar -czvf documents_archi.tar.gz Documents
Documents/
Documents/myfile.txt
user@cdacDBDAA:~$ ls
101.txt  16.sh  4.sh      company      emp          hardlink1.txt
10.sh    1.java  5.sh      copydir11    f11.cpp      hardlink.txt
11.sh    1.py   6.sh      Desktop      file1.txt     linux
11.txt   1.sh   7.sh      Dir101       file2.txt     manuals
12.sh    1.txt  8.sh      dir11copy    find_manual   Music
13.sh    2.py   9.sh      documents    find_manual.txt mydir
13.txt   2.sh   archive.tar Documents     First_Dir     Newone
14.sh    2.txt  backup    documents_archi.tar.gz Forth_Dir     newzip.zip
15.sh    3.sh   com       Downloads    hardfile1.txt num_sort.txt
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ tar -czvf desktop_archi.tar Desktop
Desktop/
user@cdacDBDAA:~$ ls
101.txt  16.sh  4.sh      company      Downloads
10.sh    1.java  5.sh      copydir11    emp
11.sh    1.py   6.sh      Desktop      f11.cpp
11.txt   1.sh   7.sh      desktop_archi.tar file1.txt
12.sh    1.txt  8.sh      Dir101       file2.txt
13.sh    2.py   9.sh      dir11copy    find_manual
13.txt   2.sh   archive.tar documents     find_manual.txt
14.sh    2.txt  backup    Documents    First_Dir
15.sh    3.sh   com       documents_archi.tar.gz Forth_Dir
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ touch script.sh
user@cdacDBDAA:~$ chmod 700 script.sh
user@cdacDBDAA:~$ ls -l script.sh
-rwx----- 1 user user 0 Sep  1 21:00 script.sh
user@cdacDBDAA:~$ getfacl script.sh
# file: script.sh
# owner: user
# group: user
user::rwx
group::---
other::---

user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ touch database.txt
user@cdacDBDAA:~$ getfacl database.txt
# file: database.txt
# owner: user
# group: user
user::rw-
group::rw-
other::r--

user@cdacDBDAA:~$ sudo chown admin database.txt
user@cdacDBDAA:~$ getfacl database.txt
# file: database.txt
# owner: admin
# group: user
user::rw-
group::rw-
other::r--

user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ ps -aux --sort=-%cpu
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
user      24246 100  0.2  23776  5540 pts/0    R+   21:13   0:00 ps -aux --sort=-%cpu
user      3309  2.0  16.1 4033040 326392 ?        Ssl  14:12   8:27 /usr/bin/gnome-shell
user      3950  0.2  2.3 572192 47904 ?        Ssl  14:13   1:12 /usr/libexec/gnome-terminal-server
user      5187  0.2  16.2 3302972 328380 ?        Sl   14:19   0:57 /snap/firefox/6738/usr/lib/firefox/firefox
root      24245  0.2  0.0      0      0 ?        I    21:12   0:00 [kworker/u10:1-events_unbound]
root      24131  0.1  0.0      0      0 ?        I    21:07   0:00 [kworker/u10:2-events_power_efficient]
user      3441  0.1  0.5 397336 11864 ?        Ssl  14:13   0:28 /usr/bin/ibus-daemon --panel disable
root      23709  0.1  0.0      0      0 ?        I    20:55   0:01 [kworker/u10:0-events_power_efficient]
user      5353  0.0  3.8 2489724 78520 ?        Sl   14:19   0:21 /snap/firefox/6738/usr/lib/firefox/firefox -contentpr
root      23040  0.0  0.0      0      0 ?        I    20:40   0:01 [kworker/u10:3-events_power_efficient]
root      20019  0.0  0.0      0      0 ?        I    19:52   0:03 [kworker/0:2-events]
systemd+  382  0.0  0.3 17728  6540 ?        Ss   14:12   0:11 /usr/lib/systemd/systemd-oomd
root      18  0.0  0.0      0      0 ?        I    14:12   0:11 [rcu_preempt]
user      3745  0.0  0.3 245564  7476 ?        Sl   14:13   0:10 /usr/libexec/ibus-engine-simple
pcp      1201  0.0  0.3 15612  6644 ?        Ssl  14:12   0:09 /usr/lib/pcp/bin/pmpoxy -F -A
root      2738  0.0  0.5 327316 10920 ?        Ssl  14:12   0:09 /usr/libexec/upowerd
user      5897  0.0  6.6 2587856 133740 ?        Sl   14:19   0:06 /snap/firefox/6738/usr/lib/firefox/firefox -contentpr
avahi     824  0.0  0.2  8800  4448 ?        Ss   14:12   0:05 avahi-daemon: running [cdacDBDAA.local]
root      1  0.0  0.6 23352 12876 ?        Rs   14:12   0:05 /sbin/init splash
root      847  0.0  0.9 1849508 19188 ?        Ssl  14:12   0:05 /usr/lib/snapd/snapd
user      3093  0.0  0.6 125292 13864 ?        Ssl  14:12   0:05 /usr/bin/pipewire
```

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

```
user@cdacDBDAA:~$ date
Mon Sep  1 09:14:57 PM IST 2025
user@cdacDBDAA:~$ cal
      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

user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ sudo date 0115143025
Wed Jan 15 02:30:00 PM IST 2025
user@cdacDBDAA:~$
```

System Information Commands

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

```
user@cdacDBDAA:~$ uptime
 14:31:24 up  7:05,  1 user,  load average: 0.07, 0.10, 0.08
user@cdacDBDAA:~$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
tmpfs            201560      1636    199924   1% /run
/dev/sda2       51287520 6971456   41678396  15% /
tmpfs           1007792        0   1007792   0% /dev/shm
tmpfs            5120         8      5112   1% /run/lock
tmpfs           201556      120    201436   1% /run/user/1000
/dev/sr0        6191494 6191494        0 100% /media/user/Ubuntu 24.04.3 LTS amd64
user@cdacDBDAA:~$ free
              total        used        free      shared  buff/cache   available
Mem:           2015584    1427172      83276        55256       675488       588412
Swap:              0           0            0
user@cdacDBDAA:~$ du
4      ./emp/act,for
4      ./emp/ac
4      ./emp/for
16     ./emp
4      ./linux
4      ./backup
4      ./root_dir/a2/b2/c2
8      ./root_dir/a2/b2
12     ./root_dir/a2
4      ./root_dir/a1/b1/c1
8      ./root_dir/a1/b1
12     ./root_dir/a1
36     ./root_dir
4      ./Desktop
```

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.

```
user@cdacDBDAA:~/linux_lab$ umask
0002
user@cdacDBDAA:~/linux_lab$ umask 022
user@cdacDBDAA:~/linux_lab$ umask
0022
user@cdacDBDAA:~/linux_lab$ touch new_permissions_test.txt
user@cdacDBDAA:~/linux_lab$ umask
0022
user@cdacDBDAA:~/linux_lab$ getfacl permissions_test.txt
# file: permissions_test.txt
# owner: user
# group: user
user::rw-
group::rw-
other::r--

user@cdacDBDAA:~/linux_lab$ getfacl new_permissions_test.txt
# file: new_permissions_test.txt
# owner: user
# group: user
user::rw-
group::r--
other::r--
```

30. Create "original.txt" and make a hard link named "hard_copy.txt" pointing to it.

```
user@cdacDBDAA:~/linux$ touch original.txt
user@cdacDBDAA:~/linux$ ln original.txt hard_copy.txt
user@cdacDBDAA:~/linux$ ls
hard_copy.txt  newtestperms.txt  original.txt  testperms.txt
user@cdacDBDAA:~/linux$
```

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

```
user@cdacDBDAA:~/linux$ touch source.txt
user@cdacDBDAA:~/linux$ ln -s original.txt sym_link.txt
user@cdacDBDAA:~/linux$ ls
hard_copy.txt  newtestperms.txt  original.txt  source.txt  sym_link.txt  testperms.txt
user@cdacDBDAA:~/linux$
```

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

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

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

```
user@cdacDBDAA:~$ mkdir -p old_data/subdir/dir1/dir2
user@cdacDBDAA:~$ tree old_data
old_data
├── subdir
│   ├── dir1
│   │   └── dir2
└──
```

4 directories, 0 files

```
user@cdacDBDAA:~$ rm -r old_data
user@cdacDBDAA:~$ cd old_data
bash: cd: old_data: No such file or directory
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ ls -al /var/log
total 8800
drwxrwxr-x 17 root          syslog      4096 Sep  1  2025 .
drwxr-xr-x 14 root          root         4096 Aug 25  2025 ..
-rw-r--r--  1 root          root        25453 Aug 30  2025 alternatives.log
-rw-r-----  1 root          adm           376 Aug 30  2025 apport.log
drwxr-xr-x  2 root          root         4096 Sep  1  2025 apt
-rw-r-----  1 syslog       adm       208915 Jan 15 15:25 auth.log
-rw-r-----  1 root         root      110038 Sep  1  2025 boot.log
-rw-r-----  1 root         root     130033 Aug 30  2025 boot.log.1
-rw-r--r--  1 root         root     118497 Aug  5  2025 bootstrap.log
-rw-rw----  1 root         utmp         1152 Sep  1  2025 btmp
drwxr-xr-x  2 root          root         4096 Aug 30  2025 cups
drwxr-xr-x  2 cups-browsed  lpadmin    4096 Aug  5  2025 cups-browsed
drwxr-xr-x  2 root          root         4096 Jul 25  2025 dist-upgrade
-rw-r-----  1 root         adm      48302 Sep  1  2025 dmesg
-rw-r-----  1 root         adm     47804 Sep  1  2025 dmesg.0
-rw-r-----  1 root         adm     14796 Sep  1  2025 dmesg.1.gz
-rw-r-----  1 root         adm     15257 Sep  1  2025 dmesg.2.gz
-rw-r-----  1 root         adm     14798 Aug 31  2025 dmesg.3.gz
-rw-r-----  1 root         adm           0 Aug 31  2025 dmesg.4.gz
-rw-r--r--  1 root         root    974688 Sep  1  2025 dpkg.log
-rw-r--r--  1 root         root           0 Aug  5  2025 faillog
-rw-r--r--  1 root         root         4706 Aug  5  2025 fontconfig.log
drwx--x--x  2 root          gdm         4096 Aug 25  2025 gdm3
-rw-r-----  1 root         root     1300 Sep  1  2025 gpu-manager.log
```

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

```
user@cdacDBDAA:~$ sudo mkdir -p /home/user/opt/myapp/config/config.txt
user@cdacDBDAA:~$ tree opt
opt [error opening dir]

0 directories, 1 file
```

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

```
user@cdacDBDAA:~$ grep -n "error" .log
2:error is a deviation from correctness, an unexpected event, or a malfunction in a system. The process of anticipating, detecting, and responding to these errors to ensure an application runs smoothly and to prevent crashes. Key strategies include using try-catch blocks to gracefully handle exceptions, retry mechanisms for transient issues, logging errors for debugging, and providing meaningful feedback to users instead of failing silently
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ chmod 755 myproject
user@cdacDBDAA:~$ getfacl myproject
# file: myproject
# owner: user
# group: user
user::rwx
group::r-x
other::r-x

user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ tar -czvf backup.tar.gz documents
documents/
documents/report.pdf
user@cdacDBDAA:~$
```

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


```

user@cdacDBDAA:~$ touch shared.txt
user@cdacDBDAA:~$ getfacl shared.txt
# file: shared.txt
# owner: user
# group: user
user::rw-
group::r--
other::r--

user@cdacDBDAA:~$ chmod 664 shared.txt
user@cdacDBDAA:~$ getfacl shared.txt
# file: shared.txt
# owner: user
# group: user
user::rw-
group::rw-
other::r--

user@cdacDBDAA:~$

```

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

```

-rw-r--r-- 1 user user 0G Jan 15 2025 video.mp4
user@cdacDBDAA:~$ ls -l --b=M video.mp4
-rw-r--r-- 1 user user 0M Jan 15 2025 video.mp4
user@cdacDBDAA:~$ ls -l --b=G video.mp4
-rw-r--r-- 1 user user 0G Jan 15 2025 video.mp4
user@cdacDBDAA:~$

```

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

```
user@cdacDBDAA:~$ find /home -type f -mtime -7
find: '/home/gpuser2': Permission denied
find: '/home/dbda999': Permission denied
find: '/home/gpuser1': Permission denied
/home/user/hardlink1.txt
/home/user/backup/file.txt
/home/user/root_dir/newtemp.txt
/home/user/2.py
/home/user/.config/ibus/bus/d595f9de05464c47903609c151caf2e1-unix-0
/home/user/.config/ibus/bus/d595f9de05464c47903609c151caf2e1-unix-wayland-0
/home/user/.config/enchant/en_US.exc
/home/user/.config/enchant/en_US.dic
/home/user/.config/gtk-3.0/bookmarks
/home/user/report.pdf
/home/user/tar.gz
/home/user/First_Dir/cp.txt
/home/user/First_Dir/ex1.py
/home/user/First_Dir/f1.py
/home/user/First_Dir/abc.java
/home/user/First_Dir/ex1.java
/home/user/First_Dir/dir11/attri.txt
/home/user/First_Dir/dir11/bc.txt
/home/user/First_Dir/dir11/ab.txt
/home/user/First_Dir/f1.sh
/home/user/First_Dir/f1.txt
/home/user/First_Dir/f1.cpp
/home/user/First_Dir/ex1.sh
/home/user/First_Dir/dir11copy/bc.txt
/home/user/First_Dir/dir11copy/ab.txt
/home/user/First_Dir/f1.java
/home/user/First_Dir/example/dbda1.sh
/home/user/First_Dir/example/dbda2.sh
/home/user/First_Dir/example/dbda3.sh
```

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

```
user@cdacDBDAA:~$ diff -u version1.txt version2.txt
--- version1.txt      2025-01-15 16:16:53.184692483 +0530
+++ version2.txt      2025-09-02 18:44:49.506784076 +0530
@@ -1,5 +1,4 @@
 echo "cdac
-is
-one of
-the best
-place for learning"
+DBDA
+linux
+Module"
user@cdacDBDAA:~$ diff -y version1.txt version2.txt
echo "cdac
is
one of
the best
place for learning"
user@cdacDBDAA:~$
```

```
echo "cdac
| DBDA
| linux
| Module"
<
```

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

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

sent 74 bytes  received 20 bytes  188.00 bytes/sec
total size is 0  speedup is 0.00
user@cdacDBDAA:~$ cd backup
user@cdacDBDAA:~/backup$ ls
file.txt  photos
user@cdacDBDAA:~/backup$
```

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

```
user@cdacDBDAA:~$ nano data.txt
user@cdacDBDAA:~$ bash data.txt
Technology is the creation, modification, and use of tools, techniques, systems, and
ieve goals, making our lives easier and more efficient. It encompasses both tangible
er, and the intangible knowledge required to design and use them, including scientifi
s roots in ancient Greek and describes the application of scientific knowledge to pra

user@cdacDBDAA:~$ cut -c 10-25 data.txt
hnology is the c
```

48. Extract only the file "readme.txt" from "archive.tar.gz" without extracting the entire archive.
49. Count how many times the word "function" appears in "script.js".

```
code organization, modularity, and reusability, which are crucial for writing efficient and maintainable programs
user@cdacDBDAA:~$ grep -n -i "function" script.js
1:echo "In JavaScript, a function is a block of reusable code designed to perform a specific task. Functions allow for c
ode organization, modularity, and reusability, which are crucial for writing efficient and maintainable programs"
user@cdacDBDAA:~$
```

Advanced Questions

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

```
user@cdacDBDAA:~$ tail -f application.log
echo "Authentication is the process of verifying the identity of a user, system, or device by comparing their provided c
redentials against a trusted source to prove they are who they claim to be, thereby preventing unauthorized access to sy
stems and resources. It typically uses factors like something you know (password), something you have (a token), or some
thing you are (biometrics)."
^C
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ sudo find -type f -size +11M
./snap/firefox/common/.mozilla/firefox/usz8a5dq.default/storage/permanent/chrome/idb/3870112724rsegmnoittet-es.sqlite
./snap/firefox/common/.cache/mozilla/firefox/usz8a5dq.default/startupCache/scriptCache-current.bin
```

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

```
user@cdacDBDAA:~$ touch 112.txt
user@cdacDBDAA:~$ echo "CDAC DBDA MUMBAI, INDIA">> 112.txt
user@cdacDBDAA:~$ cat 112.txt
CDAC DBDA MUMBAI, INDIA
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ tar -czvf archive.tar.gz emp
emp/
emp/act,for/
emp/ac/
emp/for/
```

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

```
user@cdacDBDAA:~$ find -user john
./112.txt
./1.txt
./13.txt
./101.txt
user@cdacDBDAA:~$
```

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

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

```
user@cdacDBDAA:~$ ps -aux --sort=-%cpu
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
user      6883  100  0.2  23776  5484 pts/0    R+   14:14   0:00 ps -aux --sort=-%cpu
user      4224   7.5  14.5 4013288 293824 ?        Ssl  14:06   0:37 /usr/bin/gnome-shell
user      5854   5.2  19.7 3148840 398836 ?        Sl   14:08   0:19 /snap/firefox/6738/usr/lib/firefox/firefox
user      6571   1.6  10.7 2596632 216256 ?        Sl   14:08   0:05 /snap/firefox/6738/usr/lib/firefox/firefox -contentpr
user      4875   0.9   2.4 563952 48932 ?        Ssl  14:06   0:04 /usr/libexec/gnome-terminal-server
user      6031   0.7   6.8 2485132 137484 ?        Sl   14:08   0:02 /snap/firefox/6738/usr/lib/firefox/firefox -contentpr
user      4520   0.4   1.1 429616 23728 ?        Sl   14:06   0:02 /usr/libexec/ibus-extension-gtk3
root      861    0.4   1.9 1849380 38396 ?        Ssl  14:05   0:02 /usr/lib/snapd/snapd
root       1    0.3   0.7  23348 14288 ?        Ss   14:05   0:01 /sbin/init splash
user     4354   0.3   0.5 397516 12076 ?        Ssl  14:06   0:01 /usr/bin/ibus-daemon --panel disable
root     559   0.2   0.0     0     0 ?        I    14:05   0:01 [kworker/u10:6-flush-8:0]
user     6078   0.2   0.6 1691828 12404 ?        Sl   14:08   0:00 /usr/bin/snapd userd
user     4015   0.2   0.5  39136 11744 ?        Ss   14:06   0:01 /snap/snapd-desktop-integration/315/usr/bin/snapd-des
user     6382   0.1   4.7 2456576 94796 ?        Sl   14:08   0:00 /snap/firefox/6738/usr/lib/firefox/firefox -contentpr
avahi     800    0.1   0.2   8856  4432 ?        Ss   14:05   0:00 avahi-daemon: running [cdacDBDAA.local]
root      62    0.1   0.0     0     0 ?        I    14:05   0:00 [kworker/u10:3-events_unbound]
polkitd   831    0.1   0.5 399432 11960 ?        Ssl  14:05   0:00 /usr/lib/polkit-1/polkitd --no-debug
user     4761   0.1   2.2 2814424 44956 ?        Sl   14:06   0:00 gjs /usr/share/gnome-shell/extensions/ding@rastersoft
message+  802    0.1   0.3  12200  7348 ?        Ss   14:05   0:00 @dbus-daemon --system --address=systemd: --nofork --n
user     3991   0.1   0.6  21148 12528 ?        Ss   14:06   0:00 /usr/lib/systemd/systemd --user
root      55    0.1   0.0     0     0 ?        I    14:05   0:00 [kworker/u10:1-kvfree_rcu_reclaim]
root      18    0.1   0.0     0     0 ?        I    14:05   0:00 [rcu_preempt]
root      916   0.1   0.8 345000 17948 ?        Ssl  14:05   0:00 /usr/sbin/NetworkManager --no-daemon
user     4674   0.1   0.3 245436  7296 ?        Sl   14:06   0:00 /usr/libexec/ibus-engine-simple
user     4026   0.1   0.3  10672  6460 ?        Ss   14:06   0:00 /usr/bin/dbus-daemon --session --address=systemd: --n
root      250   0.1   0.8  50836 16196 ?        S<s  14:05   0:00 /usr/lib/systemd/systemd-journald
root      28    0.1   0.0     0     0 ?        I    14:05   0:00 [kworker/1:0-events]
user     4334   0.0   1.8 675132 37484 ?        Ssl  14:06   0:00 /usr/libexec/evolution-source-registry
user     4446   0.0   2.5  83352 50704 ?        Sl   14:06   0:00 /usr/libexec/evolution-data-server/evolution-data-ser
```

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

```
user@cdacDBDAA:~$ ps
  PID TTY          TIME CMD
 8909 pts/1        00:00:00 bash
 9114 pts/1        00:00:00 ps
user@cdacDBDAA:~$ kill -9 9114
bash: kill: (9114) - No such process
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~/mydir$ ln -s symm symboliclink
user@cdacDBDAA:~/mydir$ ls
symboliclink symm
```

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

```
user@cdacDBDAA:~$ find -type f -executable -print
./linux/newtestperms.txt
./linux/testperms.txt
./1.java
./script.sh
./1.txt
./testperms.txt
./hardlink.txt
./temp.txt
./snap/firefox/common/.mozilla/firefox/usz8a5dq.default/times.json
./snap/firefox/common/.mozilla/firefox/usz8a5dq.default/gmp-gmpopenh264/2.6.0/libgmpopenh
./snap/firefox/common/.mozilla/firefox/usz8a5dq.default/gmp-gmpopenh264/2.6.0/gmpopenh264
./2.txt
./f11.cpp
user@cdacDBDAA:~$
```

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

```

user@cdacDBDAA:~$ sort -m -o file1.txt file2.txt
user@cdacDBDAA:~$ cat file1.txt
Merging file2

```

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

```

user@cdacDBDAA:~$ uniq -d file1.txt
cold coffee
collllldd
teaa
user@cdacDBDAA:~$

```

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

```

user@cdacDBDAA:~$ top
top - 20:57:28 up 38 min, 1 user, load average: 0.06, 0.14, 0.11
Tasks: 207 total, 1 running, 206 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.5 us, 0.5 sy, 0.0 ni, 98.5 id, 0.0 wa, 0.0 hi, 0.5 si, 0.0 st
MiB Mem : 1968.3 total, 284.8 free, 940.8 used, 925.1 buff/cache
MiB Swap: 0.0 total, 0.0 free, 0.0 used. 1027.5 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM    TIME+  COMMAND
 4213 user        20   0 4002540 389900 144788 S   2.0   19.3   0:50.12 gnome-shell
 6725 user        20   0  23184   5684   3636 R   0.7    0.3   0:00.08 top
 4878 user        20   0 564196  54380  43388 S   0.3    2.7   0:05.87 gnome-terminal-
 6724 root         20   0      0      0      0 I   0.3    0.0   0:00.08 kworker/u10:2-events_unbound
    1 root         20   0  23212  14124   9260 S   0.0    0.7   0:02.20 systemd
    2 root         20   0      0      0      0 S   0.0    0.0   0:00.02 kthreadd
    3 root         20   0      0      0      0 S   0.0    0.0   0:00.00 pool_workqueue_release
    4 root         0 -20      0      0      0 I   0.0    0.0   0:00.00 kworker/R-rcu_gp
    5 root         0 -20      0      0      0 I   0.0    0.0   0:00.00 kworker/R-sync_wq
    6 root         0 -20      0      0      0 I   0.0    0.0   0:00.00 kworker/R-kvfree_rcu_reclaim
    7 root         0 -20      0      0      0 I   0.0    0.0   0:00.00 kworker/R-slub_flushwq
    8 root         0 -20      0      0      0 I   0.0    0.0   0:00.00 kworker/R-netns
   11 root         0 -20      0      0      0 I   0.0    0.0   0:00.00 kworker/0:0H-events_highpri
   12 root        20   0      0      0      0 I   0.0    0.0   0:00.00 kworker/u8:0-ipv6_addrconf
   13 root         0 -20      0      0      0 I   0.0    0.0   0:00.00 kworker/R-mm_percpu_wq
   14 root        20   0      0      0      0 I   0.0    0.0   0:00.00 rcu_tasks_kthread
   15 root        20   0      0      0      0 I   0.0    0.0   0:00.00 rcu_tasks_rude_kthread
   16 root        20   0      0      0      0 I   0.0    0.0   0:00.00 rcu_tasks_trace_kthread
   17 root        20   0      0      0      0 S   0.0    0.0   0:01.15 ksoftirqd/0
   18 root        20   0      0      0      0 I   0.0    0.0   0:04.17 rcu_preempt
   19 root        20   0      0      0      0 S   0.0    0.0   0:00.00 rcu_exp_par_gp_kthread_worker/0
   20 root        20   0      0      0      0 S   0.0    0.0   0:00.01 rcu_exp_gp_kthread_worker

```

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

```
user@cdacDBDAA:~$ find . -type f -empty
./linux/hard_copy.txt
./linux/newtestperms.txt
./linux/testperms.txt
./linux/original.txt
./linux/source.txt
./backup/file.txt
./2.py
./config/.gsd-keyboard.settings-ported
./config/enchant/en_US.exc
./config/enchant/en_US.dic
./report.pdf
./First_Dir/ex1.py
./First_Dir/f1.py
./First_Dir/ex1.java
./First_Dir/dir11/bc.txt
./First_Dir/dir11/ab.txt
./First_Dir/f1.sh
./First_Dir/f1.cpp
./First_Dir/ex1.sh
./First_Dir/dir11copy/bc.txt
./First_Dir/dir11copy/ab.txt
./First_Dir/example/dbda1.sh
./First_Dir/example/dbda2.sh
./First_Dir/example/dbda3.sh
./First_Dir/example/.3.txt
./documents/report.pdf
```

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

```
Birth: 2025-09-03 21:14:04.479098835 +0530
user@cdacDBDAA:~$ faketime "2009-09-09 09:09:09" touch aa.txt
user@cdacDBDAA:~$ stat aa.txt
  File: aa.txt
  Size: 0
  Blocks: 0
    IO Block: 4096   regular empty file
Device: 8,2    Inode: 395319    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/   user)   Gid: ( 1000/   user)
Access: 2009-09-09 09:09:09.852809773 +0530
Modify: 2009-09-09 09:09:09.852809773 +0530
Change: 2025-09-03 21:17:22.852104810 +0530
 Birth: 2025-09-03 21:14:04.479098835 +0530
user@cdacDBDAA:~$
```


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

```
user@cdacDBDAA:~$ touch myfile
user@cdacDBDAA:~$ touch myfile.txt
user@cdacDBDAA:~$ chmod 400 myfile.txt
user@cdacDBDAA:~$ getfacl myfile.txt
# file: myfile.txt
# owner: user
# group: user
user::r--
group::---
other::---
```

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

```
user@cdacDBDAA:~$ find /home/user -xtype l
/home/user/softlink.txt
/home/user/snap/firmware-updater/common/.cache/immodules/im-cyrillic-translit.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-ti-et.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-am-et.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-multipress.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-thai.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-xim.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-fcitx.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-ibus.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-inuktitut.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-ipa.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-broadway.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-viqr.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-waylandgtk.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-wayland.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-ti-et.so
/home/user/snap/firmware-updater/common/.cache/immodules/im-cedilla.so
/home/user/snap/firmware-updater/common/.cache/gio-modules/libgiognomeproxy.so
/home/user/snap/firmware-updater/common/.cache/gio-modules/libdconfsettings.so
/home/user/snap/firmware-updater/common/.cache/gio-modules/libgiognutls.so
/home/user/snap/firmware-updater/common/.cache/gio-modules/libgiolibproxy.so
/home/user/snap/firmware-updater/common/.cache/gio-modules/libgioenvironmentproxy.so
/home/user/snap/firmware-updater/167/.config/gtk-2.0/gtkfilechooser.ini
/home/user/snap/firmware-updater/167/.config/gtk-3.0/gtk.css
/home/user/snap/firmware-updater/167/.config/gtk-3.0/settings.ini
/home/user/snap/firmware-updater/167/.local/share/themes
/home/user/snap/firmware-updater/167/.themes
/home/user/snap/firefox/common/.mozilla/firefox/usz8a5dn.default/lock
```

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

```
Birth: 2025-09-03 21:14:04.479098835 +0530
user@cdacDBDAA:~$ cp -p aa.txt Newone
user@cdacDBDAA:~$ stat aa.txt
  File: aa.txt
  Size: 0                Blocks: 0                IO Block: 4096   regular empty file
Device: 8,2      Inode: 395319      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/   user)   Gid: ( 1000/   user)
Access: 2025-09-03 21:19:55.011109394 +0530
Modify: 2009-09-09 09:09:09.852809773 +0530
Change: 2025-09-03 21:17:22.852104810 +0530
 Birth: 2025-09-03 21:14:04.479098835 +0530
user@cdacDBDAA:~$ stat Newone
  File: Newone
  Size: 4096              Blocks: 8                IO Block: 4096   directory
Device: 8,2      Inode: 393660      Links: 2
Access: (0775/drwxrwxr-x)  Uid: ( 1000/   user)   Gid: ( 1000/   user)
Access: 2025-09-03 18:31:24.636819809 +0530
Modify: 2025-09-03 21:19:55.011109394 +0530
Change: 2025-09-03 21:19:55.011109394 +0530
 Birth: 2025-08-29 14:54:01.890931597 +0530
user@cdacDBDAA:~$
```

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

```
user@cdacDBDAA:~$ bash new.log
Bhim Rao Ambedkar's story is that of a Dalit-born scholar and social reformer who, despite facing severe discrimination,
became the chief architect of India's Constitution, the first Law Minister, and a leading voice for the rights of the u
ntouchables and women. Born in 1891, his life was dedicated to fighting caste-based injustice, leading to his role in dr
afting the Constitution, founding the Dalit Buddhist Movement, and advocating for the rights of marginalized communities
.
user@cdacDBDAA:~$ tail -n 50 -f new.log
echo "Bhim Rao Ambedkar's story is that of a Dalit-born scholar and social reformer who, despite facing severe discrimin
ation, became the chief architect of India's Constitution, the first Law Minister, and a leading voice for the rights of
the untouchables and women. Born in 1891, his life was dedicated to fighting caste-based injustice, leading to his role
in drafting the Constitution, founding the Dalit Buddhist Movement, and advocating for the rights of marginalized commu
nities."
hhh
kkhh
bdjshvdjhjd
^C
user@cdacDBDAA:~$
```