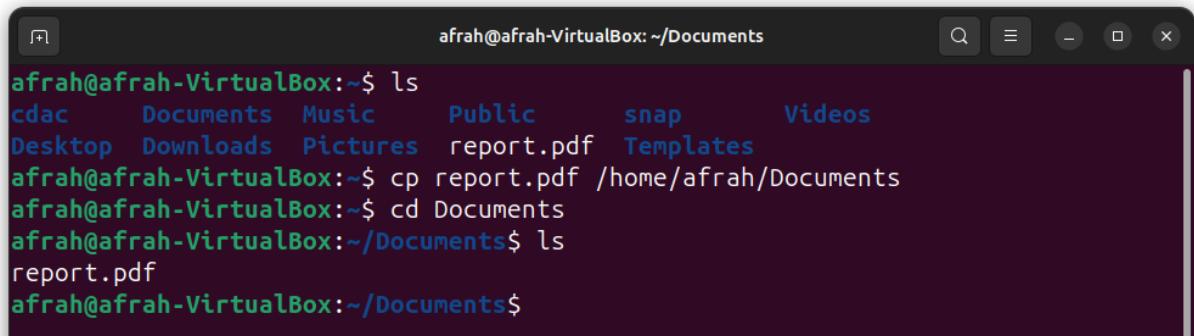


Linux Commands Practice Questions -2

File and Directory Operations

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



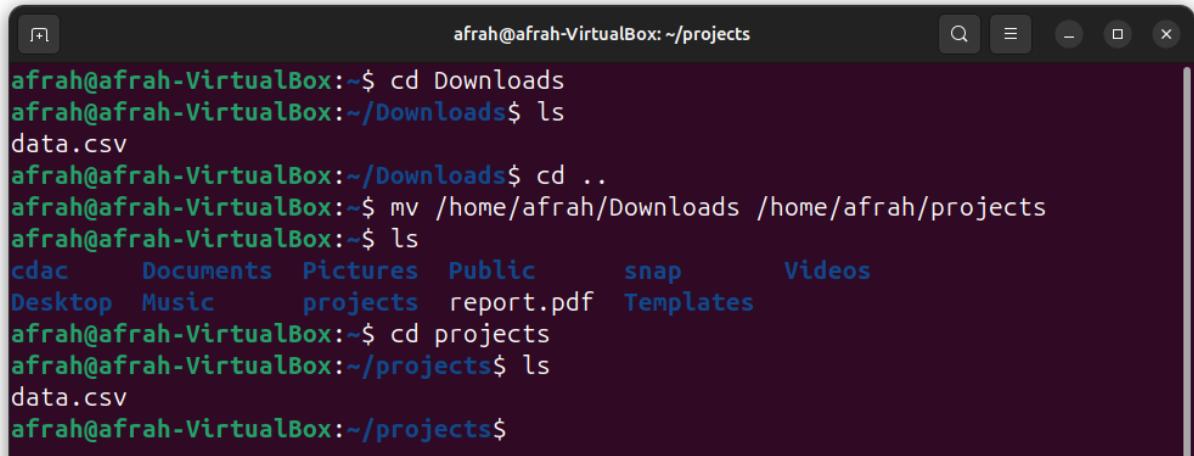
```
afrah@afrah-VirtualBox:~$ ls
cdac  Documents  Music  Public  snap  Videos
Desktop  Downloads  Pictures  report.pdf  Templates
afrah@afrah-VirtualBox:~$ cp report.pdf /home/afrah/Documents
afrah@afrah-VirtualBox:~$ cd Documents
afrah@afrah-VirtualBox:~/Documents$ ls
report.pdf
afrah@afrah-VirtualBox:~/Documents$
```

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

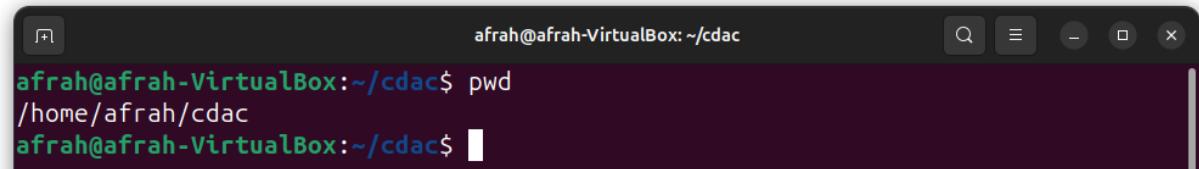
rmdir removes empty directories only

rm -rf removes everything (files and sub-directories) recursively and forcefully

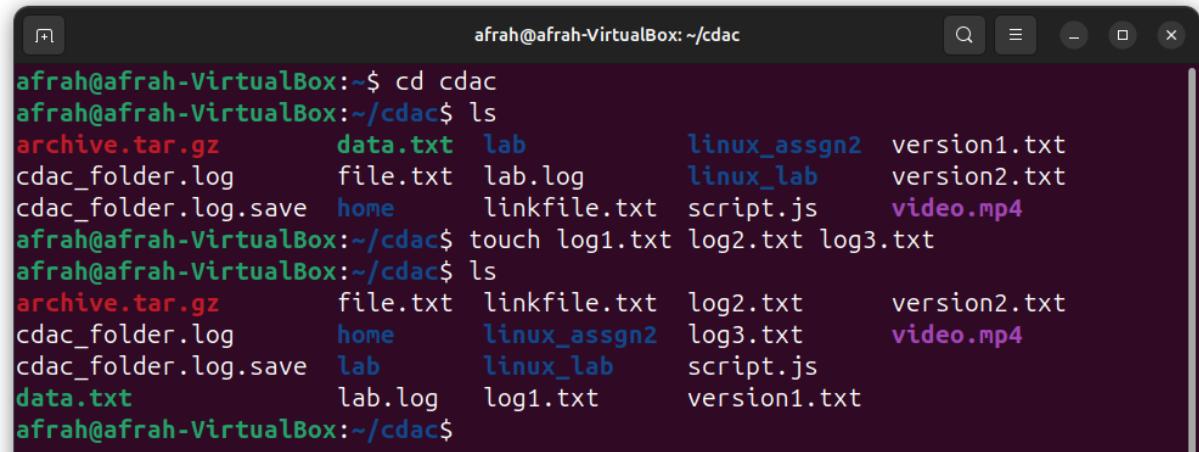
3. How do you move a file named "data.csv" from the "downloads" folder to the "projects" folder?



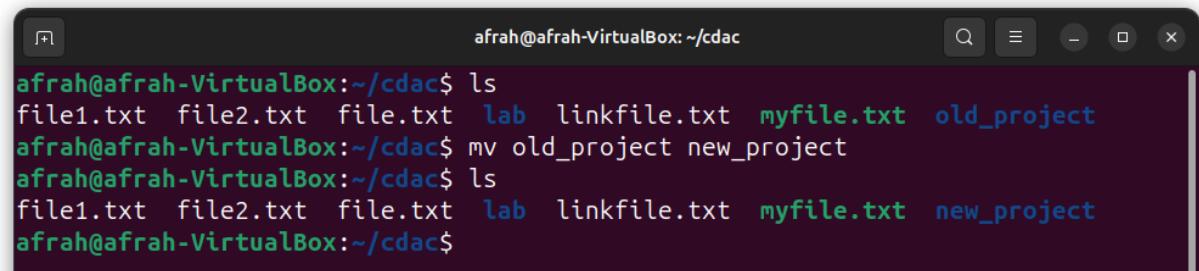
```
afrah@afrah-VirtualBox:~$ cd Downloads
afrah@afrah-VirtualBox:~/Downloads$ ls
data.csv
afrah@afrah-VirtualBox:~/Downloads$ cd ..
afrah@afrah-VirtualBox:~$ mv /home/afrah/Downloads /home/afrah/projects
afrah@afrah-VirtualBox:~$ ls
cdac  Documents  Pictures  Public  snap  Videos
Desktop  Music  projects  report.pdf  Templates
afrah@afrah-VirtualBox:~$ cd projects
afrah@afrah-VirtualBox:~/projects$ ls
data.csv
afrah@afrah-VirtualBox:~/projects$
```

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

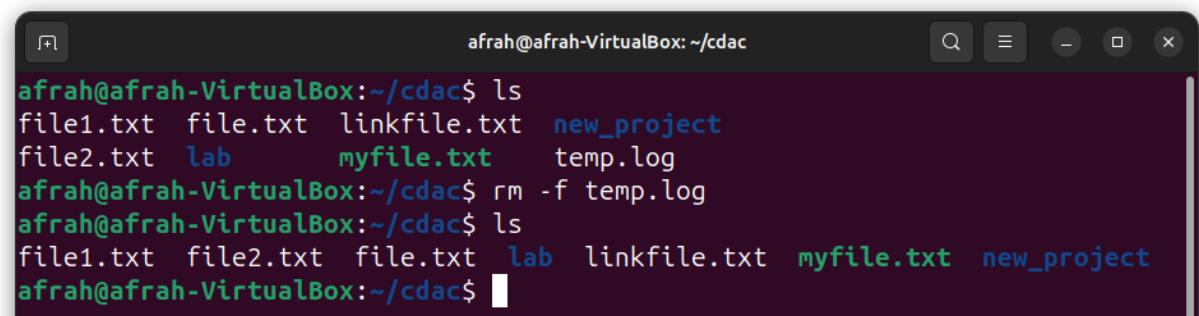
```
afrah@afrah-VirtualBox:~/cdac$ pwd
/home/afrah/cdac
afrah@afrah-VirtualBox:~/cdac$
```

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

```
afrah@afrah-VirtualBox:~$ cd cdac
afrah@afrah-VirtualBox:~/cdac$ ls
archive.tar.gz      data.txt  lab          linux_assgn2  version1.txt
cdac_folder.log     file.txt  lab.log       linux_lab    version2.txt
cdac_folder.log.save home    linkfile.txt  script.js   video.mp4
afrah@afrah-VirtualBox:~/cdac$ touch log1.txt log2.txt log3.txt
afrah@afrah-VirtualBox:~/cdac$ ls
archive.tar.gz      file.txt  linkfile.txt  log2.txt      version2.txt
cdac_folder.log     home    linux_assgn2  log3.txt      video.mp4
cdac_folder.log.save lab    linux_lab    script.js   version1.txt
data.txt            lab.log  log1.txt     version1.txt
afrah@afrah-VirtualBox:~/cdac$
```

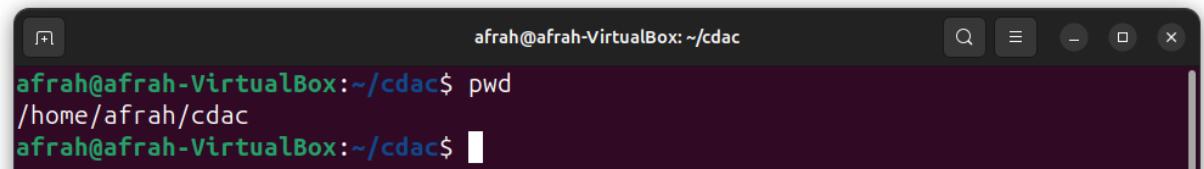
6. How do you change a directory name from "old_project" to "new_project"?

```
afrah@afrah-VirtualBox:~/cdac$ ls
file1.txt  file2.txt  file.txt  lab  linkfile.txt  myfile.txt  old_project
afrah@afrah-VirtualBox:~/cdac$ mv old_project new_project
afrah@afrah-VirtualBox:~/cdac$ ls
file1.txt  file2.txt  file.txt  lab  linkfile.txt  myfile.txt  new_project
afrah@afrah-VirtualBox:~/cdac$
```

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

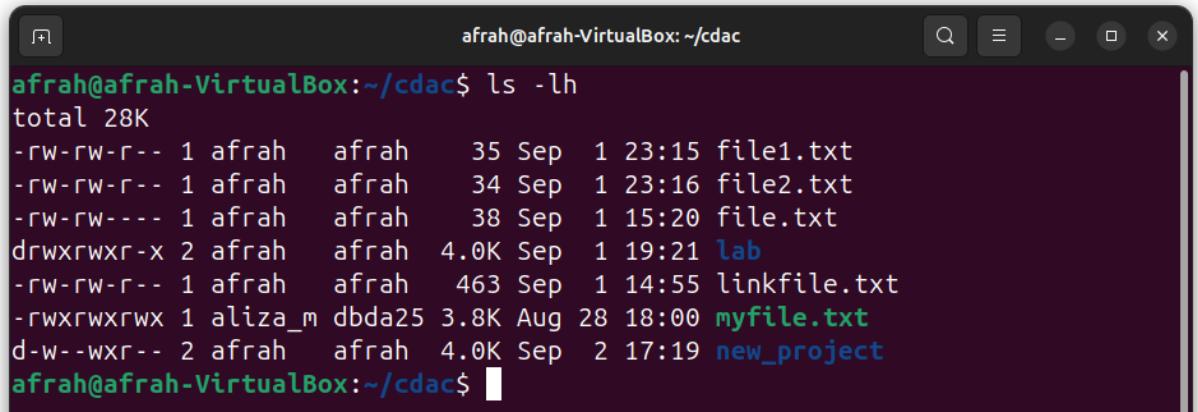
```
afrah@afrah-VirtualBox:~/cdac$ ls
file1.txt  file.txt  linkfile.txt  new_project
file2.txt  lab      myfile.txt   temp.log
afrah@afrah-VirtualBox:~/cdac$ rm -f temp.log
afrah@afrah-VirtualBox:~/cdac$ ls
file1.txt  file2.txt  file.txt  lab  linkfile.txt  myfile.txt  new_project
afrah@afrah-VirtualBox:~/cdac$
```

8. Display your current directory path using a command.



```
afrah@afrah-VirtualBox:~/cdac$ pwd
/home/afrah/cdac
afrah@afrah-VirtualBox:~/cdac$
```

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

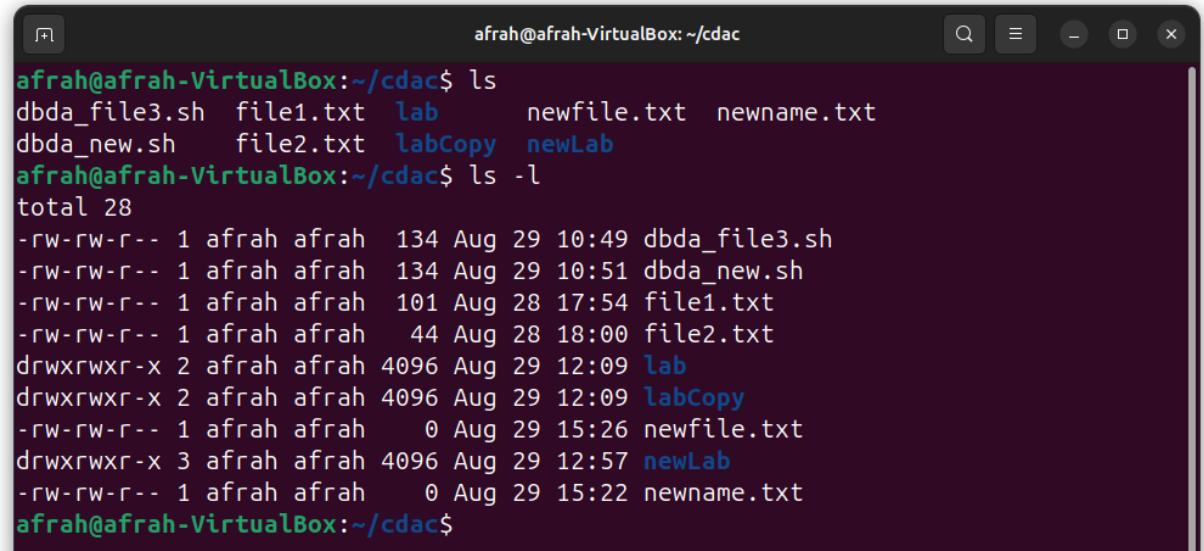


```
afrah@afrah-VirtualBox:~/cdac$ ls -lh
total 28K
-rw-rw-r-- 1 afrah    afrah    35 Sep  1 23:15 file1.txt
-rw-rw-r-- 1 afrah    afrah    34 Sep  1 23:16 file2.txt
-rw-rw---- 1 afrah    afrah    38 Sep  1 15:20 file.txt
drwxrwxr-x 2 afrah    afrah   4.0K Sep  1 19:21 lab
-rw-rw-r-- 1 afrah    afrah   463 Sep  1 14:55 linkfile.txt
-rwxrwxrwx 1 aliza_m dbda25 3.8K Aug 28 18:00 myfile.txt
d-w--wxr-- 2 afrah    afrah   4.0K Sep  2 17:19 new_project
afrah@afrah-VirtualBox:~/cdac$
```

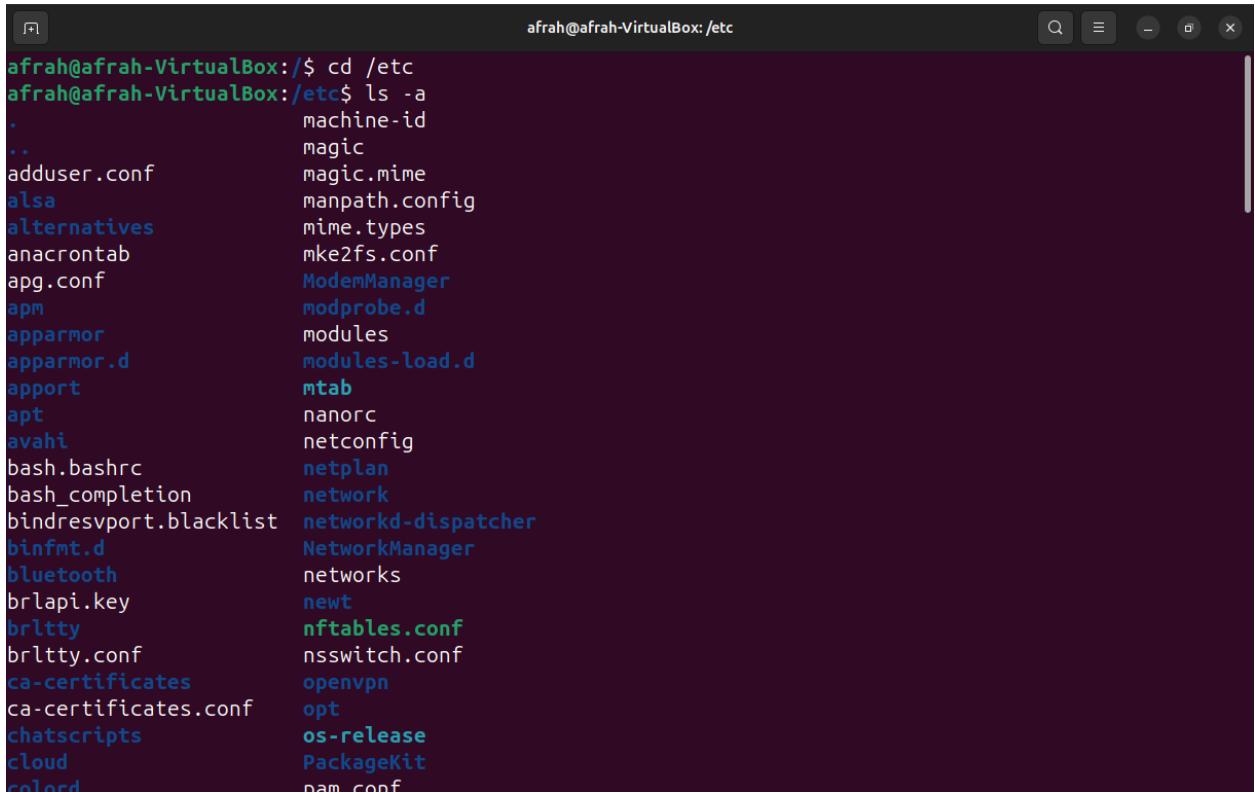
10. Explain the meaning of the first character in file permissions (d, -, l) when using `ls -l`.

The first character in file permissions stands for –

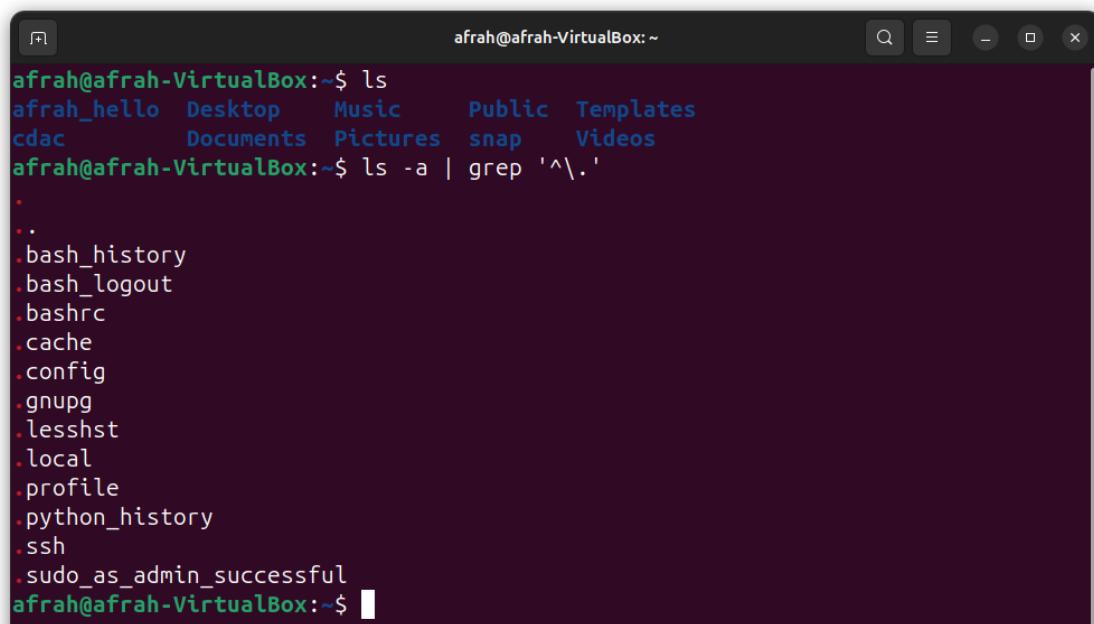
I stands for links, d stands for directories and - stands for files



```
afrah@afrah-VirtualBox:~/cdac$ ls
dbda_file3.sh  file1.txt  lab      newfile.txt  newname.txt
dbda_new.sh    file2.txt  labCopy  newLab
afrah@afrah-VirtualBox:~/cdac$ ls -l
total 28
-rw-rw-r-- 1 afrah afrah  134 Aug 29 10:49 dbda_file3.sh
-rw-rw-r-- 1 afrah afrah  134 Aug 29 10:51 dbda_new.sh
-rw-rw-r-- 1 afrah afrah  101 Aug 28 17:54 file1.txt
-rw-rw-r-- 1 afrah afrah   44 Aug 28 18:00 file2.txt
drwxrwxr-x 2 afrah afrah 4096 Aug 29 12:09 lab
drwxrwxr-x 2 afrah afrah 4096 Aug 29 12:09 labCopy
-rw-rw-r-- 1 afrah afrah     0 Aug 29 15:26 newfile.txt
drwxrwxr-x 3 afrah afrah 4096 Aug 29 12:57 newLab
-rw-rw-r-- 1 afrah afrah     0 Aug 29 15:22 newname.txt
afrah@afrah-VirtualBox:~/cdac$
```

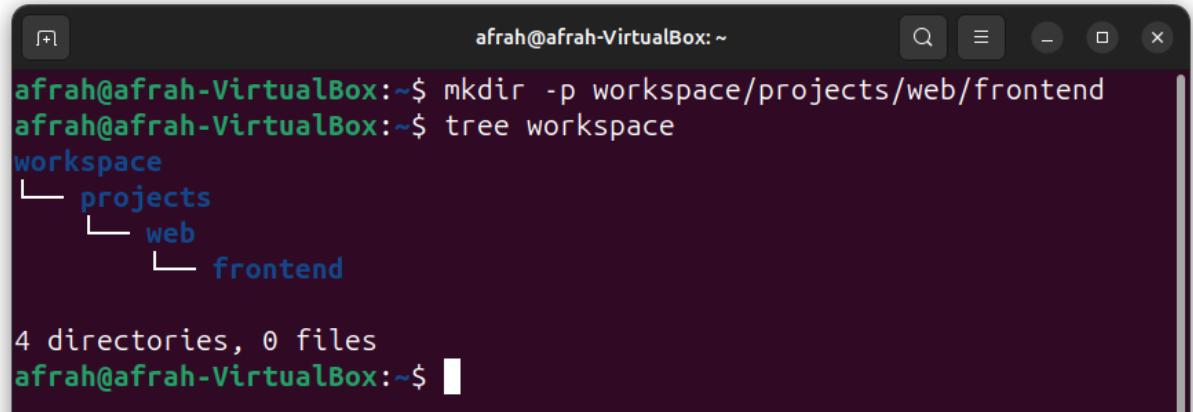
11. List all files including those starting with a dot (.) in the "/etc" directory.

```
afrah@afrah-VirtualBox:~$ cd /etc
afrah@afrah-VirtualBox:/etc$ ls -a
.
..
adduser.conf
alsa
alternatives
anacrontab
apg.conf
apm
apparmor
apparmor.d
apport
apt
avahi
bash.bashrc
bash_completion
bindresvport.blacklist
binfmt.d
bluetooth
brlapi.key
brltty
brltty.conf
ca-certificates
ca-certificates.conf
chatscripts
cloud
colord
.
..
machine-id
magic
magic.mime
manpath.config
mime.types
mke2fs.conf
ModemManager
modprobe.d
modules
modules-load.d
mtab
nanorc
netconfig
netplan
network
networkd-dispatcher
NetworkManager
networks
newt
nftables.conf
nsswitch.conf
openvpn
opt
os-release
PackageKit
nam.conf
```

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

```
afrah@afrah-VirtualBox:~$ ls
afrah_hello  Desktop   Music    Public  Templates
cdac        Documents  Pictures  snap    Videos
afrah@afrah-VirtualBox:~$ ls -a | grep '^\.\'"
.
..
.bash_history
.bash_logout
.bashrc
.cache
.config
.gnupg
.lessht
.local
.profile
.python_history
.ssh
.sudo_as_admin_successful
afrah@afrah-VirtualBox:~$
```

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



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

4 directories, 0 files
afrah@afrah-VirtualBox:~$
```

Create the following nested structure in one command:

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

- 14.



```
afrah@afrah-VirtualBox:~$ mkdir -p company/departments/hr company/departments/finance company/departments/tech company/employees/active company/employees/former
afrah@afrah-VirtualBox:~$ tree company
company
├── departments
│   ├── finance
│   ├── hr
│   └── tech
└── employees
    ├── active
    └── former

8 directories, 0 files
afrah@afrah-VirtualBox:~$
```

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

```
afrah@afrah-VirtualBox:~$ ls
afrah_hello company Documents Pictures snap Videos
cdac Desktop Music Public Templates workspace
afrah@afrah-VirtualBox:~$ mkdir test_dir
afrah@afrah-VirtualBox:~$ ls
afrah_hello company Documents Pictures snap test_dir workspace
cdac Desktop Music Public Templates Videos
afrah@afrah-VirtualBox:~$ rmdir test_dir
afrah@afrah-VirtualBox:~$ ls
afrah_hello company Documents Pictures snap Videos
cdac Desktop Music Public Templates workspace
afrah@afrah-VirtualBox:~$
```

File Content and Text Processing

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

```
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ man find > find_manual.txt
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ ls
find_manual.txt
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ head -n 15 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...] [ex-
      pression]

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),
      or the limit of 1000000000 recursions is reached.
```

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

```
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ head -n 15 find_manual.txt
FIND(1)           General Commands Manual           FIND(1)

NAME
    find - search for files in a directory hierarchy

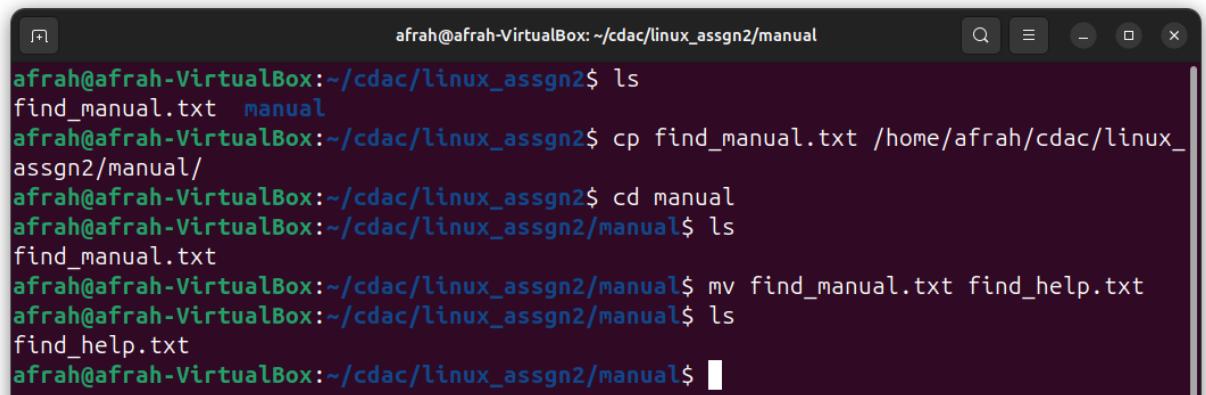
SYNOPSIS
    find [-H] [-L] [-P] [-D debugopts] [-Olevel] [starting-point...] [ex-
        pression]

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),
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ tail -n 8 find_manual.txt
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

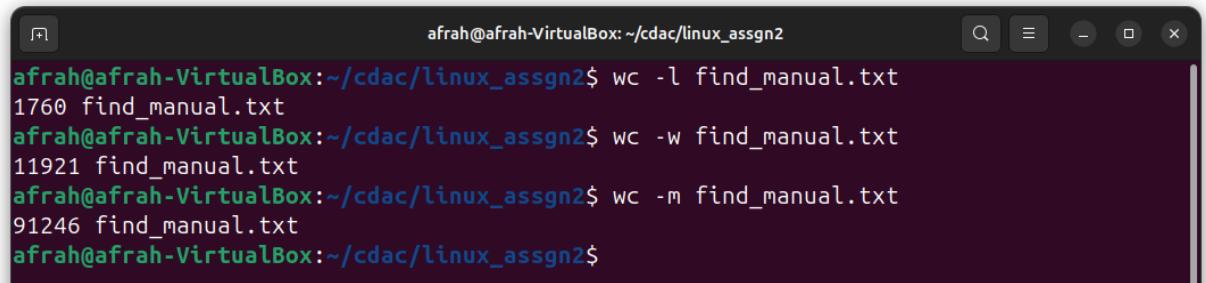
                                            FIND(1)
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$
```

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

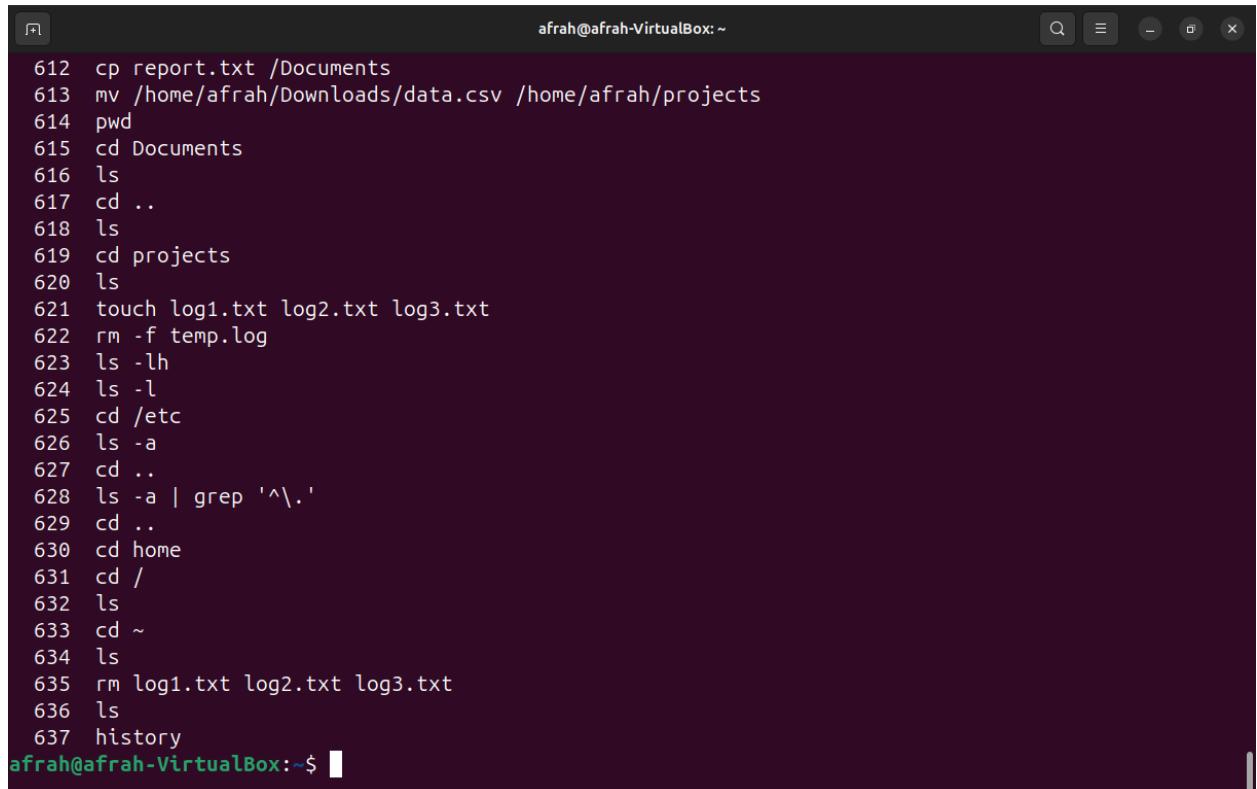


```
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ ls
find_manual.txt  manual
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ cp find_manual.txt /home/afrah/cdac/linux_
assgn2/manual/
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ cd manual
afrah@afrah-VirtualBox:~/cdac/linux_assgn2/manual$ ls
find_manual.txt
afrah@afrah-VirtualBox:~/cdac/linux_assgn2/manual$ mv find_manual.txt find_help.txt
afrah@afrah-VirtualBox:~/cdac/linux_assgn2/manual$ ls
find_help.txt
afrah@afrah-VirtualBox:~/cdac/linux_assgn2/manual$
```

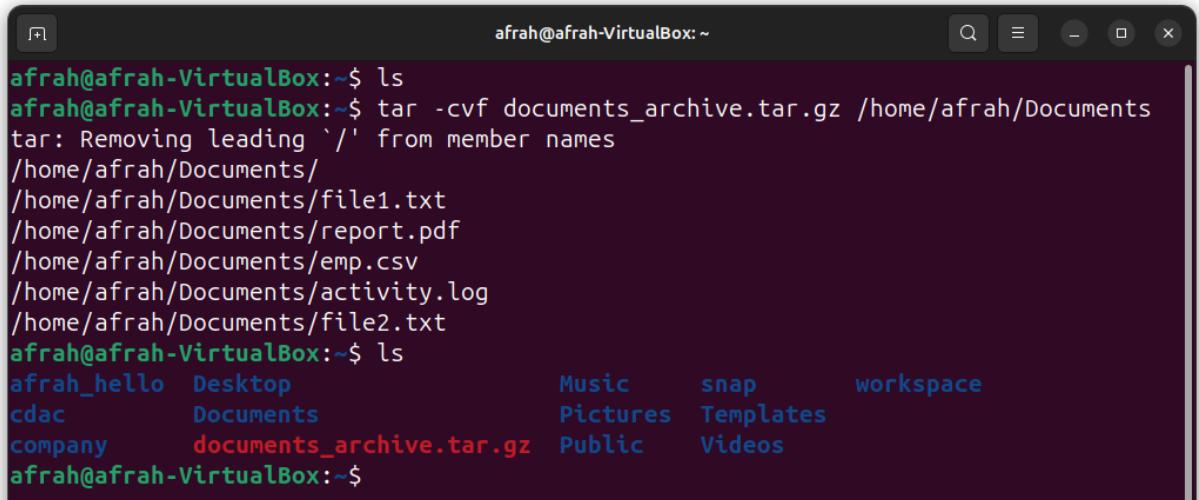
- 19. Count the total lines, words, and characters in "find_manual.txt".**



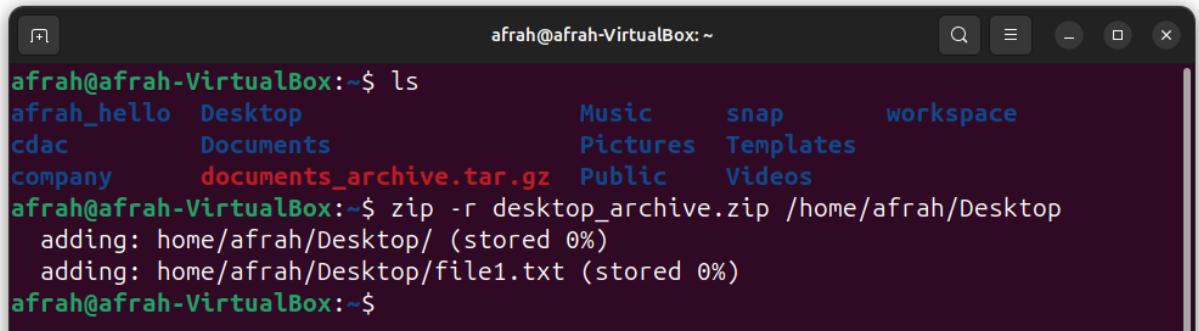
```
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ wc -l find_manual.txt
1760 find_manual.txt
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ wc -w find_manual.txt
11921 find_manual.txt
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$ wc -m find_manual.txt
91246 find_manual.txt
afrah@afrah-VirtualBox:~/cdac/linux_assgn2$
```

20. Show your last 15 executed commands.

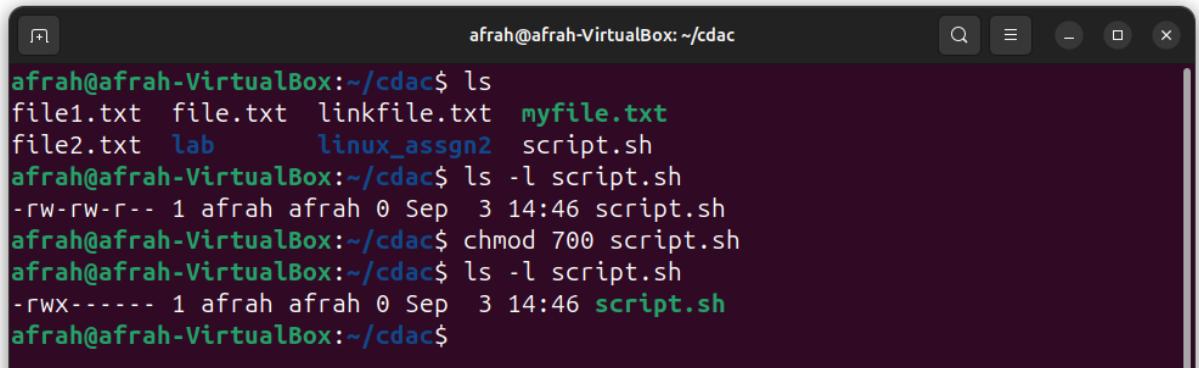
```
afrah@afrah-VirtualBox:~$ ls
afrah@afrah-VirtualBox:~$ cp report.txt /Documents
afrah@afrah-VirtualBox:~$ mv /home/afrah/Downloads/data.csv /home/afrah/projects
afrah@afrah-VirtualBox:~$ pwd
afrah@afrah-VirtualBox:~/Documents$ cd Documents
afrah@afrah-VirtualBox:~/Documents$ ls
afrah@afrah-VirtualBox:~/Documents$ cd ..
afrah@afrah-VirtualBox:~$ ls
afrah@afrah-VirtualBox:~$ cd projects
afrah@afrah-VirtualBox:~/projects$ ls
afrah@afrah-VirtualBox:~/projects$ touch log1.txt log2.txt log3.txt
afrah@afrah-VirtualBox:~/projects$ rm -f temp.log
afrah@afrah-VirtualBox:~/projects$ ls -lh
afrah@afrah-VirtualBox:~/projects$ ls -l
afrah@afrah-VirtualBox:~/projects$ cd /etc
afrah@afrah-VirtualBox:/etc$ ls -a
afrah@afrah-VirtualBox:/etc$ cd ..
afrah@afrah-VirtualBox:/etc$ ls -a | grep '^\.'
afrah@afrah-VirtualBox:/etc$ cd ..
afrah@afrah-VirtualBox:~$ cd home
afrah@afrah-VirtualBox:~/home$ cd /
afrah@afrah-VirtualBox:/$ ls
afrah@afrah-VirtualBox:/$ cd ~
afrah@afrah-VirtualBox:~$ ls
afrah@afrah-VirtualBox:~$ rm log1.txt log2.txt log3.txt
afrah@afrah-VirtualBox:~$ ls
afrah@afrah-VirtualBox:~$ history
afrah@afrah-VirtualBox:~$
```

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

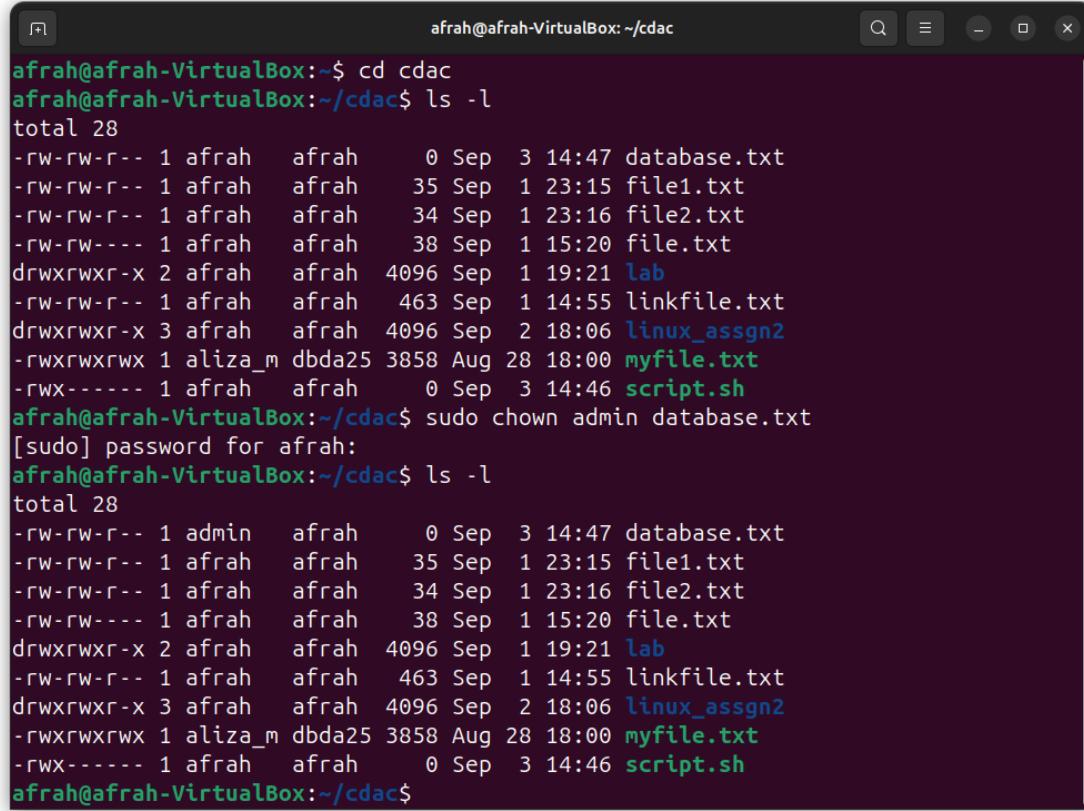
```
afrah@afrah-VirtualBox:~$ ls
afrah@afrah-VirtualBox:~$ tar -cvf documents_archive.tar.gz /home/afrah/Documents
tar: Removing leading '/' from member names
/home/afrah/Documents/
/home/afrah/Documents/file1.txt
/home/afrah/Documents/report.pdf
/home/afrah/Documents/emp.csv
/home/afrah/Documents/activity.log
/home/afrah/Documents/file2.txt
afrah@afrah-VirtualBox:~$ ls
afrah_hello  Desktop          Music      snap      workspace
cdac        Documents        Pictures    Templates
company     documents_archive.tar.gz Public    Videos
afrah@afrah-VirtualBox:~$
```

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

```
afrah@afrah-VirtualBox:~$ ls
afrah_hello  Desktop          Music      snap      workspace
cdac        Documents         Pictures   Templates
company     documents_archive.tar.gz  Public    Videos
afrah@afrah-VirtualBox:~$ zip -r desktop_archive.zip /home/afrah/Desktop
adding: home/afrah/Desktop/ (stored 0%)
adding: home/afrah/Desktop/file1.txt (stored 0%)
afrah@afrah-VirtualBox:~$
```

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

```
afrah@afrah-VirtualBox:~/cdac$ ls
file1.txt  file.txt  linkfile.txt  myfile.txt
file2.txt  lab       linux_assgn2  script.sh
afrah@afrah-VirtualBox:~/cdac$ ls -l script.sh
-rw-rw-r-- 1 afrah afrah 0 Sep  3 14:46 script.sh
afrah@afrah-VirtualBox:~/cdac$ chmod 700 script.sh
afrah@afrah-VirtualBox:~/cdac$ ls -l script.sh
-rwx----- 1 afrah afrah 0 Sep  3 14:46 script.sh
afrah@afrah-VirtualBox:~/cdac$
```

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

The screenshot shows a terminal window titled 'afrah@afrah-VirtualBox:~/cdac\$'. The user first lists files in the current directory ('ls -l') and then uses 'sudo chown admin database.txt' to change the owner of 'database.txt' to 'admin'. A password prompt is shown, followed by another 'ls -l' command to verify the ownership change.

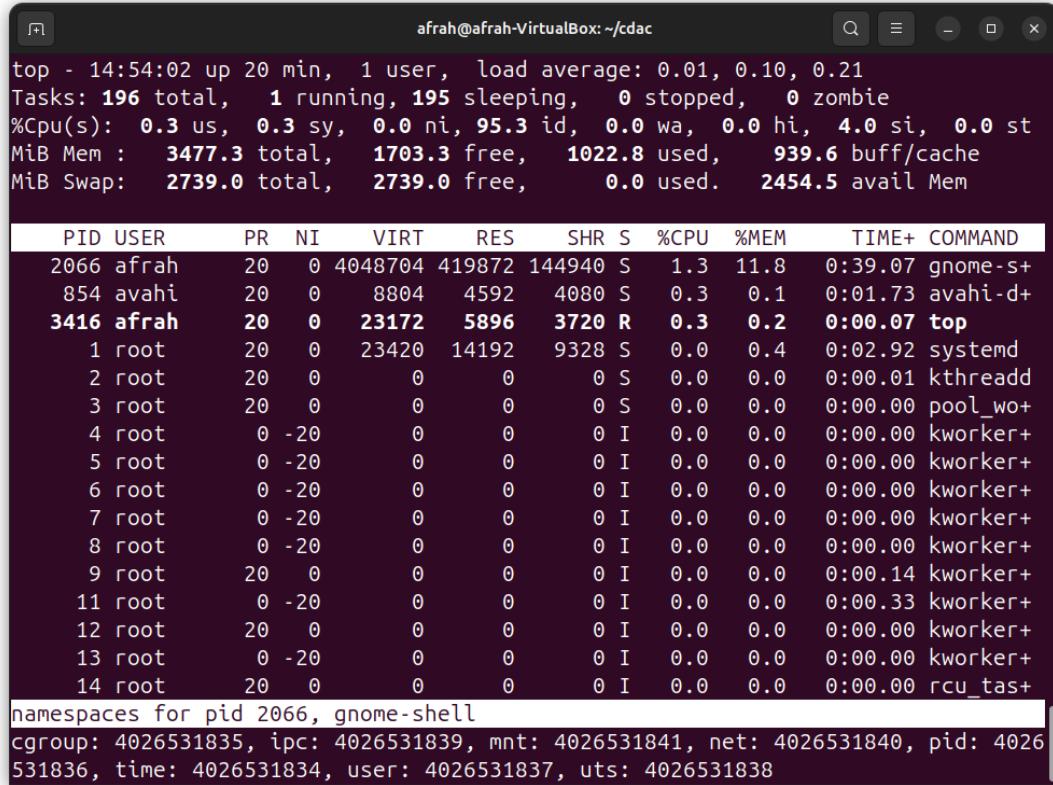
```
afrah@afrah-VirtualBox:~$ cd cdac
afrah@afrah-VirtualBox:~/cdac$ ls -l
total 28
-rw-rw-r-- 1 afrah    afrah     0 Sep  3 14:47 database.txt
-rw-rw-r-- 1 afrah    afrah    35 Sep  1 23:15 file1.txt
-rw-rw-r-- 1 afrah    afrah    34 Sep  1 23:16 file2.txt
-rw-rw--- 1 afrah    afrah    38 Sep  1 15:20 file.txt
drwxrwxr-x 2 afrah    afrah   4096 Sep  1 19:21 lab
-rw-rw-r-- 1 afrah    afrah    463 Sep  1 14:55 linkfile.txt
drwxrwxr-x 3 afrah    afrah   4096 Sep  2 18:06 linux_assgn2
-rwxrwxrwx 1 aliza_m dbda25 3858 Aug 28 18:00 myfile.txt
-rwx----- 1 afrah    afrah     0 Sep  3 14:46 script.sh
afrah@afrah-VirtualBox:~/cdac$ sudo chown admin database.txt
[sudo] password for afrah:
afrah@afrah-VirtualBox:~/cdac$ ls -l
total 28
-rw-rw-r-- 1 admin    afrah     0 Sep  3 14:47 database.txt
-rw-rw-r-- 1 afrah    afrah    35 Sep  1 23:15 file1.txt
-rw-rw-r-- 1 afrah    afrah    34 Sep  1 23:16 file2.txt
-rw-rw--- 1 afrah    afrah    38 Sep  1 15:20 file.txt
drwxrwxr-x 2 afrah    afrah   4096 Sep  1 19:21 lab
-rw-rw-r-- 1 afrah    afrah    463 Sep  1 14:55 linkfile.txt
drwxrwxr-x 3 afrah    afrah   4096 Sep  2 18:06 linux_assgn2
-rwxrwxrwx 1 aliza_m dbda25 3858 Aug 28 18:00 myfile.txt
-rwx----- 1 afrah    afrah     0 Sep  3 14:46 script.sh
afrah@afrah-VirtualBox:~/cdac$
```

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

```
afrah@afrah-VirtualBox:~/cdac$ ps
  PID TTY      TIME CMD
 3390 pts/0    00:00:00 bash
 3412 pts/0    00:00:00 ps
afrah@afrah-VirtualBox:~/cdac$ ps -e
  PID TTY      TIME CMD
    1 ?        00:00:02 systemd
    2 ?        00:00:00 kthreadd
    3 ?        00:00:00 pool_workqueue_release
    4 ?        00:00:00 kworker/R-rcu_gp
    5 ?        00:00:00 kworker/R-sync_wq
    6 ?        00:00:00 kworker/R-kvfree_rcu_reclaim
    7 ?        00:00:00 kworker/R-slab_flushwq
    8 ?        00:00:00 kworker/R-netns
    9 ?        00:00:00 kworker/0:0-events
   11 ?        00:00:00 kworker/0:0H-kblockd
   12 ?        00:00:00 kworker/u8:0-ipv6_addrconf
   13 ?        00:00:00 kworker/R-mm_percpu_wq
   14 ?        00:00:00 rcu_tasks_kthread
   15 ?        00:00:00 rcu_tasks_rude_kthread
   16 ?        00:00:00 rcu_tasks_trace_kthread
   17 ?        00:00:00 ksoftirqd/0
   18 ?        00:00:01 rcu_preempt
   19 ?        00:00:00 rcu_exp_par_gp_kthread_worker/0
   20 ?        00:00:00 rcu_exp_gp_kthread_worker
   21 ?        00:00:00 migration/0
```

```
top - 14:53:35 up 20 min,  1 user,  load average: 0.01, 0.11, 0.22
Tasks: 196 total,  1 running, 195 sleeping,  0 stopped,  0 zombie
%CPU(s): 0.2 us, 0.7 sy, 0.0 ni, 93.6 id, 0.0 wa, 0.0 hi, 5.5 si, 0.0 st
MiB Mem : 3477.3 total, 1705.0 free, 1022.2 used, 937.7 buff/cache
MiB Swap: 2739.0 total, 2739.0 free, 0.0 used. 2455.2 avail Mem

          PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM     TIME+ COMMAND
 2066 afrah    20   0 4048704 419928 144940 S  2.0 11.8  0:38.30 gnome-s+
  854 avahi    20   0    8804   4592   4080 S  0.3  0.1  0:01.70 avahi-d+
 3300 root     20   0      0      0      0 I  0.3  0.0  0:00.18 kworker+
 3383 afrah    20   0 707580 56488  44748 S  0.3  1.6  0:01.20 gnome-t+
    1 root     20   0 23420 14192   9328 S  0.0  0.4  0:02.92 systemd
    2 root     20   0      0      0      0 S  0.0  0.0  0:00.01 kthreadd
    3 root     20   0      0      0      0 S  0.0  0.0  0:00.00 pool_wo+
    4 root     0 -20      0      0      0 I  0.0  0.0  0:00.00 kworker+
    5 root     0 -20      0      0      0 I  0.0  0.0  0:00.00 kworker+
    6 root     0 -20      0      0      0 I  0.0  0.0  0:00.00 kworker+
    7 root     0 -20      0      0      0 I  0.0  0.0  0:00.00 kworker+
    8 root     0 -20      0      0      0 I  0.0  0.0  0:00.00 kworker+
    9 root     20   0      0      0      0 I  0.0  0.0  0:00.14 kworker+
   11 root     0 -20      0      0      0 I  0.0  0.0  0:00.33 kworker+
   12 root     20   0      0      0      0 I  0.0  0.0  0:00.00 kworker+
   13 root     0 -20      0      0      0 I  0.0  0.0  0:00.00 kworker+
   14 root     20   0      0      0      0 I  0.0  0.0  0:00.00 rcu_tas+
   15 root     20   0      0      0      0 I  0.0  0.0  0:00.00 rcu_tas+
   16 root     20   0      0      0      0 I  0.0  0.0  0:00.00 rcu_tas+
```



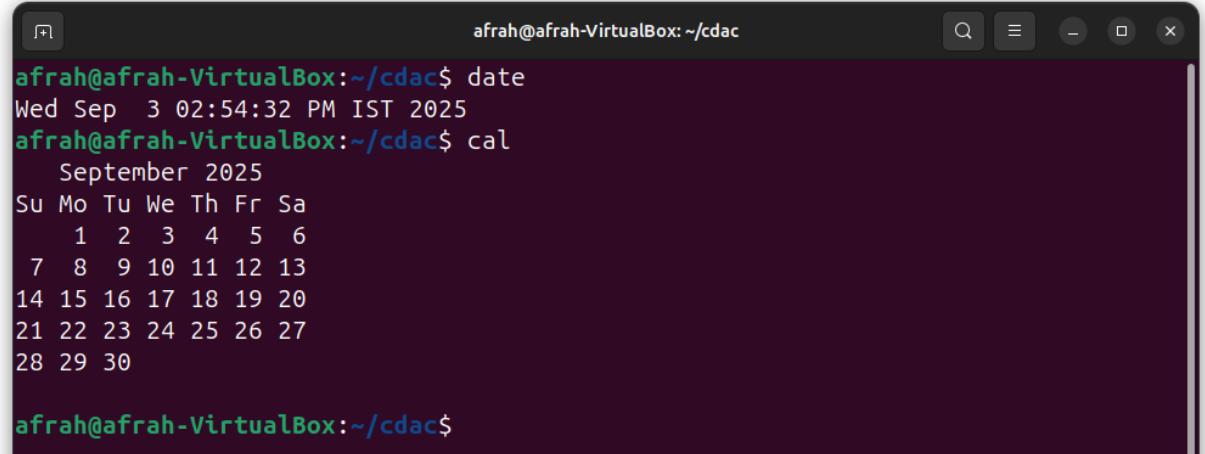
```

afrah@afrah-VirtualBox: ~/cdac
top - 14:54:02 up 20 min, 1 user, load average: 0.01, 0.10, 0.21
Tasks: 196 total, 1 running, 195 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.3 us, 0.3 sy, 0.0 ni, 95.3 id, 0.0 wa, 0.0 hi, 4.0 si, 0.0 st
MiB Mem : 3477.3 total, 1703.3 free, 1022.8 used, 939.6 buff/cache
MiB Swap: 2739.0 total, 2739.0 free, 0.0 used. 2454.5 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
2066 afrah 20 0 4048704 419872 144940 S 1.3 11.8 0:39.07 gnome-s+
854 avahi 20 0 8804 4592 4080 S 0.3 0.1 0:01.73 avahi-d+
3416 afrah 20 0 23172 5896 3720 R 0.3 0.2 0:00.07 top
  1 root 20 0 23420 14192 9328 S 0.0 0.4 0:02.92 systemd
  2 root 20 0 0 0 0 S 0.0 0.0 0:00.01 kthreadd
  3 root 20 0 0 0 0 S 0.0 0.0 0:00.00 pool_wo+
  4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker+
  5 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker+
  6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker+
  7 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker+
  8 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker+
  9 root 20 0 0 0 0 I 0.0 0.0 0:00.14 kworker+
  11 root 0 -20 0 0 0 I 0.0 0.0 0:00.33 kworker+
  12 root 20 0 0 0 0 I 0.0 0.0 0:00.00 kworker+
  13 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker+
  14 root 20 0 0 0 0 I 0.0 0.0 0:00.00 rcu_tas+
namespaces for pid 2066, gnome-shell
cgroup: 4026531835, ipc: 4026531839, mnt: 4026531841, net: 4026531840, pid: 4026531836, time: 4026531834, user: 4026531837, uts: 4026531838

```

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



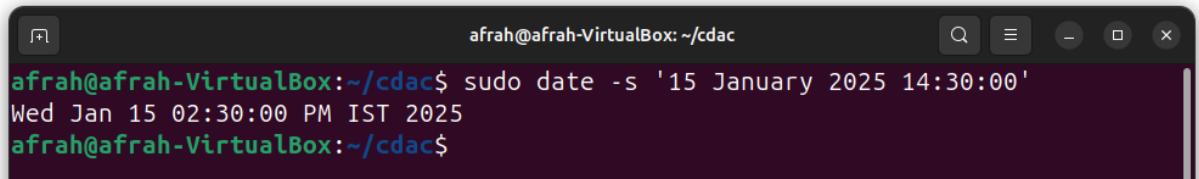
```

afrah@afrah-VirtualBox:~/cdac$ date
Wed Sep 3 02:54:32 PM IST 2025
afrah@afrah-VirtualBox:~/cdac$ 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

afrah@afrah-VirtualBox:~/cdac$ 

```

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



```
afrah@afrah-VirtualBox:~/cdac$ sudo date -s '15 January 2025 14:30:00'
Wed Jan 15 02:30:00 PM IST 2025
afrah@afrah-VirtualBox:~/cdac$
```

System Information Commands

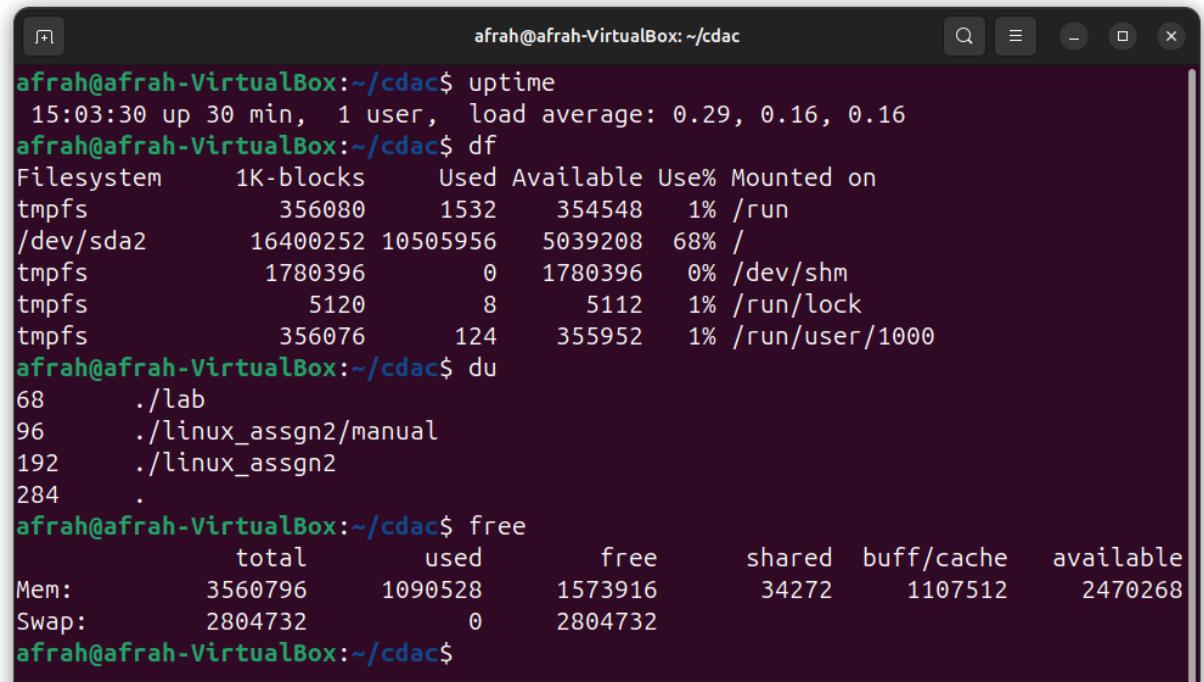
28. Research and explain these commands: **uptime**, **df**, **du**, **free**.

uptime: Displays how long the system has been running, the current time, number of logged-in users, and average system load

df: Shows disk space usage for mounted filesystems — including total, used, available space, and usage percentage

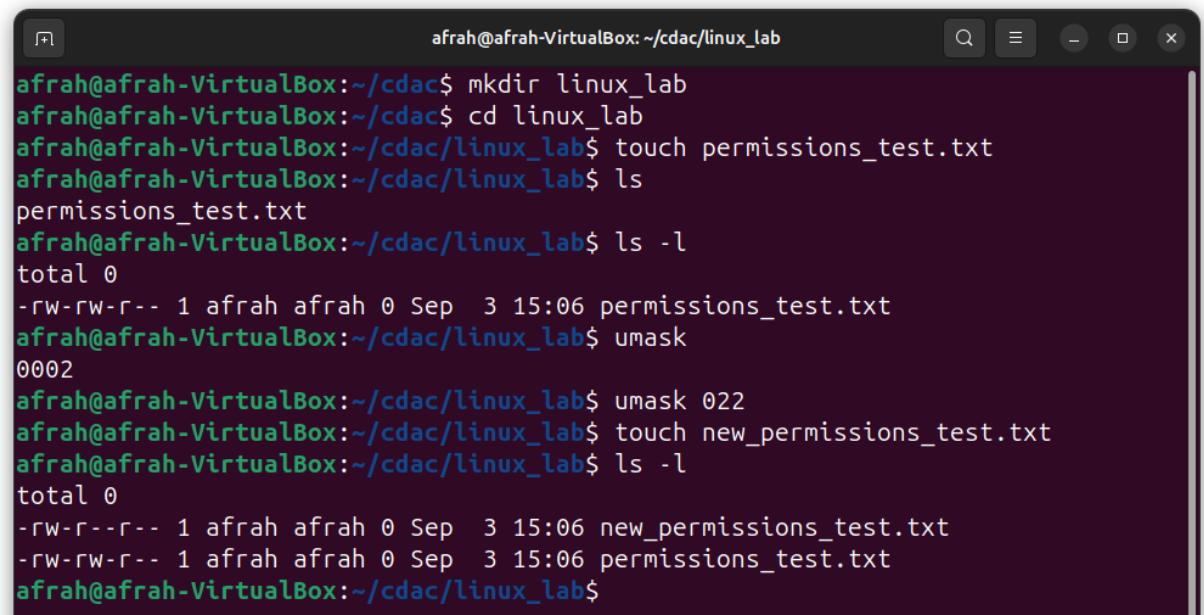
du: Reports the disk space used by files and directories

free: Displays memory usage including total, used, free, shared, buffer/cache, and available RAM



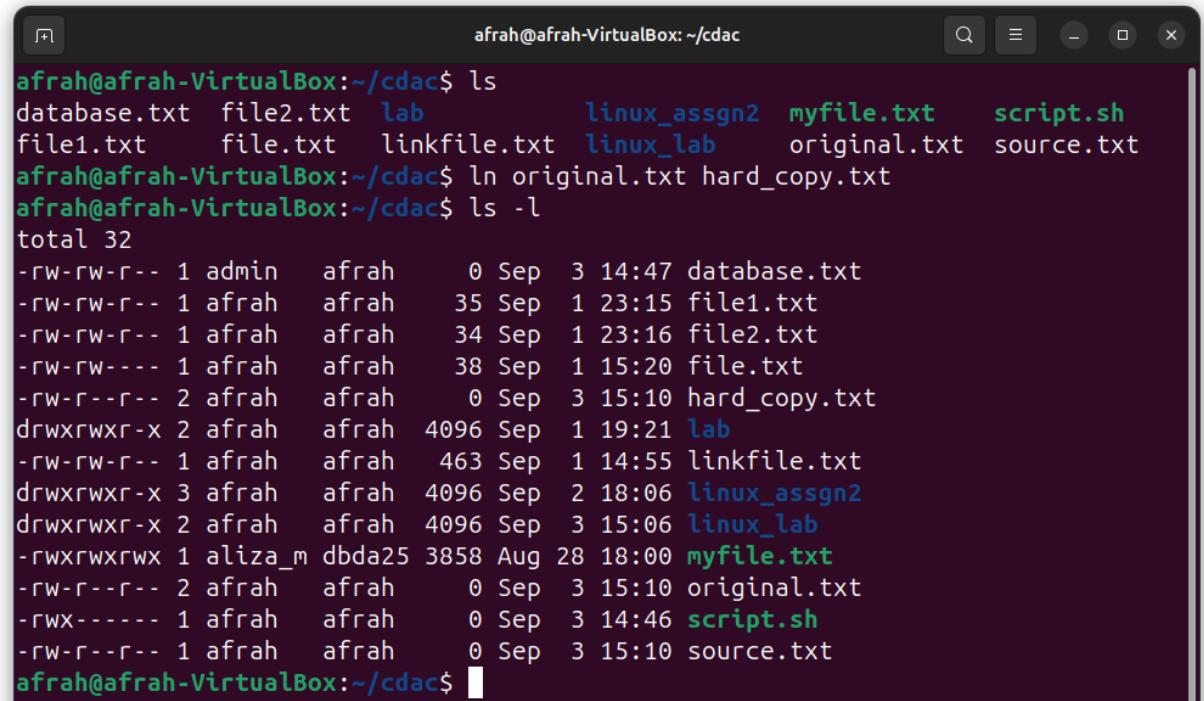
```
afrah@afrah-VirtualBox:~/cdac$ uptime
15:03:30 up 30 min, 1 user, load average: 0.29, 0.16, 0.16
afrah@afrah-VirtualBox:~/cdac$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
tmpfs            356080     1532   354548   1% /run
/dev/sda2        16400252 10505956   5039208  68% /
tmpfs            1780396       0   1780396   0% /dev/shm
tmpfs              5120       8     5112   1% /run/lock
tmpfs            356076     124   355952   1% /run/user/1000
afrah@afrah-VirtualBox:~/cdac$ du
68      ./lab
96      ./linux_assgn2/manual
192      ./linux_assgn2
284      .
afrah@afrah-VirtualBox:~/cdac$ free
              total        used         free      shared  buff/cache   available
Mem:       3560796     1090528     1573916          0     34272     1107512     2470268
Swap:      2804732           0     2804732
afrah@afrah-VirtualBox:~/cdac$
```

- 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.**



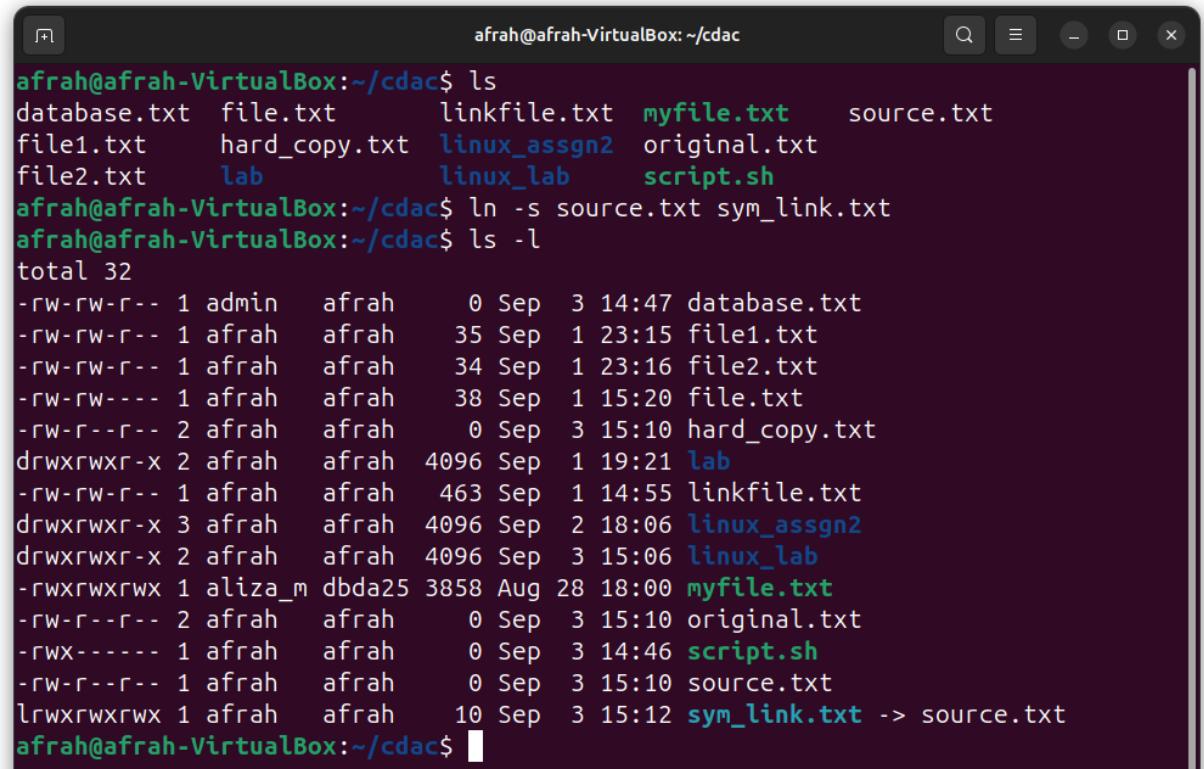
```
afrah@afrah-VirtualBox:~/cdac$ mkdir linux_lab
afrah@afrah-VirtualBox:~/cdac$ cd linux_lab
afrah@afrah-VirtualBox:~/cdac/linux_lab$ touch permissions_test.txt
afrah@afrah-VirtualBox:~/cdac/linux_lab$ ls
permissions_test.txt
afrah@afrah-VirtualBox:~/cdac/linux_lab$ ls -l
total 0
-rw-rw-r-- 1 afrah afrah 0 Sep  3 15:06 permissions_test.txt
afrah@afrah-VirtualBox:~/cdac/linux_lab$ umask
0002
afrah@afrah-VirtualBox:~/cdac/linux_lab$ umask 022
afrah@afrah-VirtualBox:~/cdac/linux_lab$ touch new_permissions_test.txt
afrah@afrah-VirtualBox:~/cdac/linux_lab$ ls -l
total 0
-rw-r--r-- 1 afrah afrah 0 Sep  3 15:06 new_permissions_test.txt
-rw-rw-r-- 1 afrah afrah 0 Sep  3 15:06 permissions_test.txt
afrah@afrah-VirtualBox:~/cdac/linux_lab$
```

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



```
afrah@afrah-VirtualBox:~/cdac$ ls
database.txt  file2.txt  lab          linux_assgn2  myfile.txt  script.sh
file1.txt      file.txt   linkfile.txt  linux_lab    original.txt  source.txt
afrah@afrah-VirtualBox:~/cdac$ ln original.txt hard_copy.txt
afrah@afrah-VirtualBox:~/cdac$ ls -l
total 32
-rw-rw-r--  1 admin    afrah     0 Sep  3 14:47 database.txt
-rw-rw-r--  1 afrah   afrah    35 Sep  1 23:15 file1.txt
-rw-rw-r--  1 afrah   afrah    34 Sep  1 23:16 file2.txt
-rw-rw----  1 afrah   afrah    38 Sep  1 15:20 file.txt
-rw-r--r--  2 afrah   afrah     0 Sep  3 15:10 hard_copy.txt
drwxrwxr-x  2 afrah   afrah   4096 Sep  1 19:21 lab
-rw-rw-r--  1 afrah   afrah    463 Sep  1 14:55 linkfile.txt
drwxrwxr-x  3 afrah   afrah   4096 Sep  2 18:06 linux_assgn2
drwxrwxr-x  2 afrah   afrah   4096 Sep  3 15:06 linux_lab
-rwxrwxrwx  1 aliza_m dbda25 3858 Aug 28 18:00 myfile.txt
-rw-r--r--  2 afrah   afrah     0 Sep  3 15:10 original.txt
-rwx-----  1 afrah   afrah     0 Sep  3 14:46 script.sh
-rw-r--r--  1 afrah   afrah     0 Sep  3 15:10 source.txt
afrah@afrah-VirtualBox:~/cdac$
```

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



```

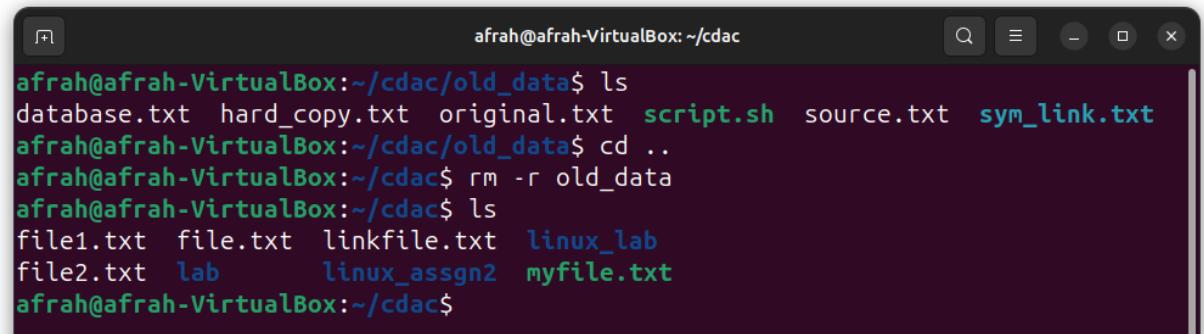
afrah@afrah-VirtualBox:~/cdac$ ls
database.txt  file.txt      linkfile.txt  myfile.txt   source.txt
file1.txt     hard_copy.txt  linux_assgn2 original.txt
file2.txt     lab           linux_lab    script.sh
afrah@afrah-VirtualBox:~/cdac$ ln -s source.txt sym_link.txt
afrah@afrah-VirtualBox:~/cdac$ ls -l
total 32
-rw-rw-r-- 1 admin    afrah      0 Sep  3 14:47 database.txt
-rw-rw-r-- 1 afrah   afrah     35 Sep  1 23:15 file1.txt
-rw-rw-r-- 1 afrah   afrah     34 Sep  1 23:16 file2.txt
-rw-rw---- 1 afrah   afrah     38 Sep  1 15:20 file.txt
-rw-r--r-- 2 afrah   afrah      0 Sep  3 15:10 hard_copy.txt
drwxrwxr-x 2 afrah   afrah    4096 Sep  1 19:21 lab
-rw-rw-r-- 1 afrah   afrah    463 Sep  1 14:55 linkfile.txt
drwxrwxr-x 3 afrah   afrah    4096 Sep  2 18:06 linux_assgn2
drwxrwxr-x 2 afrah   afrah    4096 Sep  3 15:06 linux_lab
-rwxrwxrwx 1 aliza_m dbda25 3858 Aug 28 18:00 myfile.txt
-rw-r--r-- 2 afrah   afrah      0 Sep  3 15:10 original.txt
-rwx----- 1 afrah   afrah      0 Sep  3 14:46 script.sh
-rw-r--r-- 1 afrah   afrah      0 Sep  3 15:10 source.txt
lrwxrwxrwx 1 afrah   afrah     10 Sep  3 15:12 sym_link.txt -> source.txt
afrah@afrah-VirtualBox:~/cdac$ 

```

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.

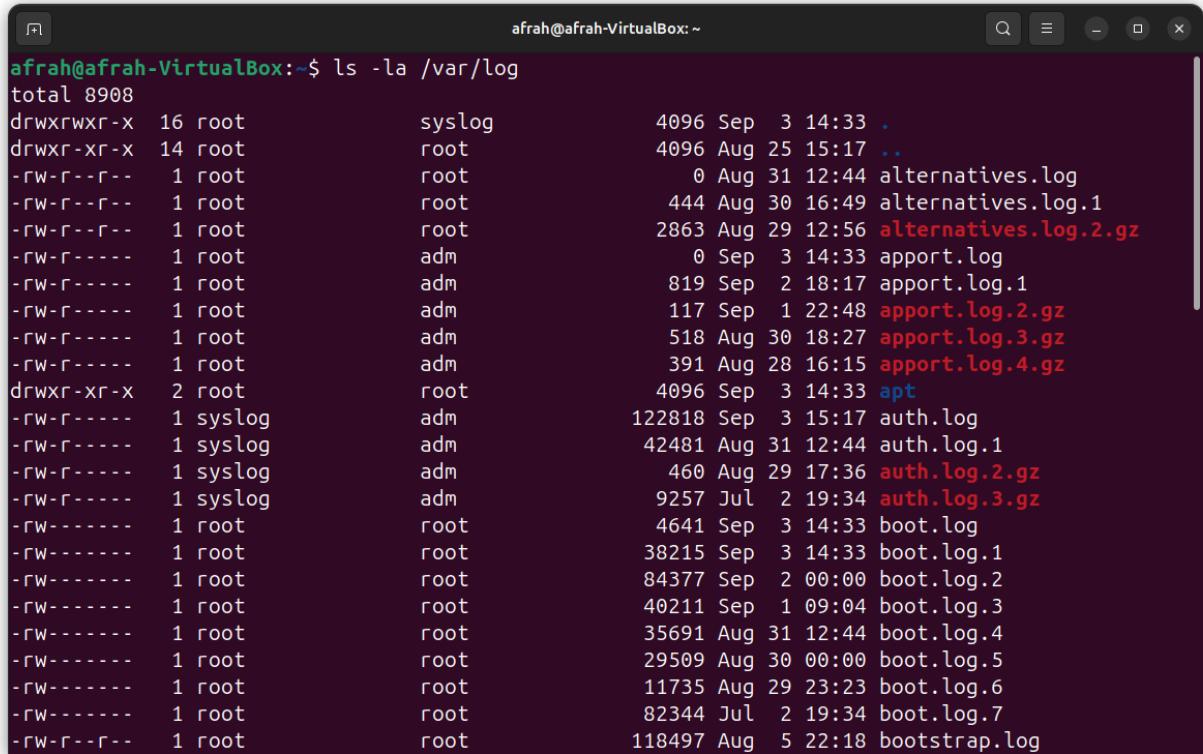
36. How do you remove a directory named "old_data" containing files and subdirectories?



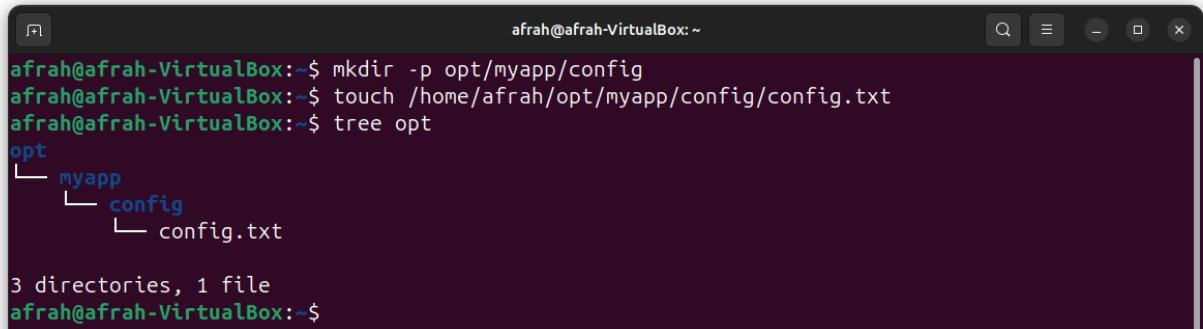
```

afrah@afrah-VirtualBox:~/cdac/old_data$ ls
database.txt  hard_copy.txt  original.txt  script.sh  source.txt  sym_link.txt
afrah@afrah-VirtualBox:~/cdac/old_data$ cd ..
afrah@afrah-VirtualBox:~/cdac$ rm -r old_data
afrah@afrah-VirtualBox:~/cdac$ ls
file1.txt  file.txt  linkfile.txt  linux_lab
file2.txt  lab      linux_assgn2  myfile.txt
afrah@afrah-VirtualBox:~/cdac$ 

```

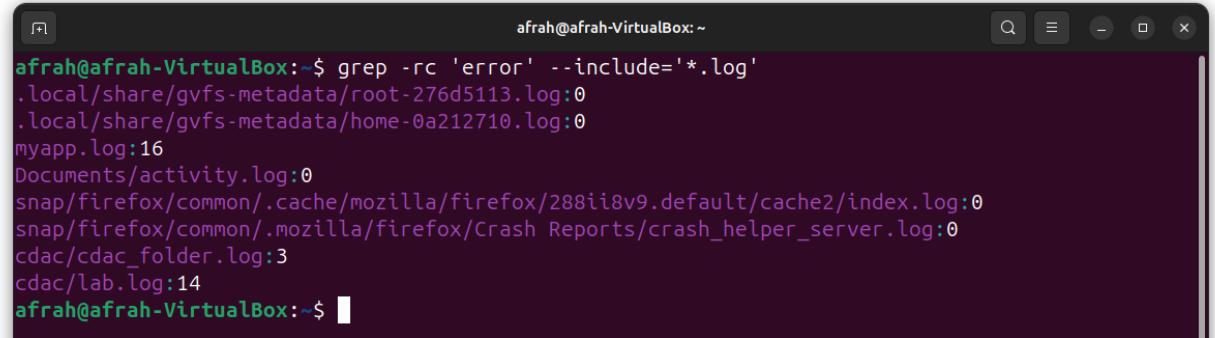
37. List all files in "/var/log" showing detailed information including hidden files.

```
afrah@afrah-VirtualBox:~$ ls -la /var/log
total 8908
drwxrwxr-x  16 root          syslog      4096 Sep  3 14:33 .
drwxr-xr-x  14 root          root        4096 Aug 25 15:17 ..
-rw-r--r--  1 root          root        0 Aug 31 12:44 alternatives.log
-rw-r--r--  1 root          root      444 Aug 30 16:49 alternatives.log.1
-rw-r--r--  1 root          root    2863 Aug 29 12:56 alternatives.log.2.gz
-rw-r----- 1 root          adm       0 Sep  3 14:33 apport.log
-rw-r----- 1 root          adm     819 Sep  2 18:17 apport.log.1
-rw-r----- 1 root          adm   117 Sep  1 22:48 apport.log.2.gz
-rw-r----- 1 root          adm   518 Aug 30 18:27 apport.log.3.gz
-rw-r----- 1 root          adm   391 Aug 28 16:15 apport.log.4.gz
drwxr-xr-x  2 root          root      4096 Sep  3 14:33 apt
-rw-r----- 1 syslog         adm  122818 Sep  3 15:17 auth.log
-rw-r----- 1 syslog         adm  42481 Aug 31 12:44 auth.log.1
-rw-r----- 1 syslog         adm   460 Aug 29 17:36 auth.log.2.gz
-rw-r----- 1 syslog         adm  9257 Jul  2 19:34 auth.log.3.gz
-rw----- 1 root           root   4641 Sep  3 14:33 boot.log
-rw----- 1 root           root  38215 Sep  3 14:33 boot.log.1
-rw----- 1 root           root  84377 Sep  2 00:00 boot.log.2
-rw----- 1 root           root  40211 Sep  1 09:04 boot.log.3
-rw----- 1 root           root  35691 Aug 31 12:44 boot.log.4
-rw----- 1 root           root  29509 Aug 30 00:00 boot.log.5
-rw----- 1 root           root  11735 Aug 29 23:23 boot.log.6
-rw----- 1 root           root  82344 Jul  2 19:34 boot.log.7
-rw-r--r--  1 root           root 118497 Aug  5 22:18 bootstrap.log
```

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

```
afrah@afrah-VirtualBox:~$ mkdir -p opt/myapp/config
afrah@afrah-VirtualBox:~$ touch /home/afrah/opt/myapp/config/config.txt
afrah@afrah-VirtualBox:~$ tree opt
opt
└── myapp
    └── config
        └── config.txt

3 directories, 1 file
afrah@afrah-VirtualBox:~$
```

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

```
afrah@afrah-VirtualBox:~$ grep -rc 'error' --include='*.log'
.local/share/gvfs-metadata/root-276d5113.log:0
.local/share/gvfs-metadata/home-0a212710.log:0
myapp.log:16
Documents/activity.log:0
snap/firefox/common/.cache/mozilla/firefox/288i18v9.default/cache2/index.log:0
snap/firefox/common/.mozilla/firefox/Crash Reports/crash_helper_server.log:0
cdac/cdac_folder.log:3
cdac/lab.log:14
afrah@afrah-VirtualBox:~$
```

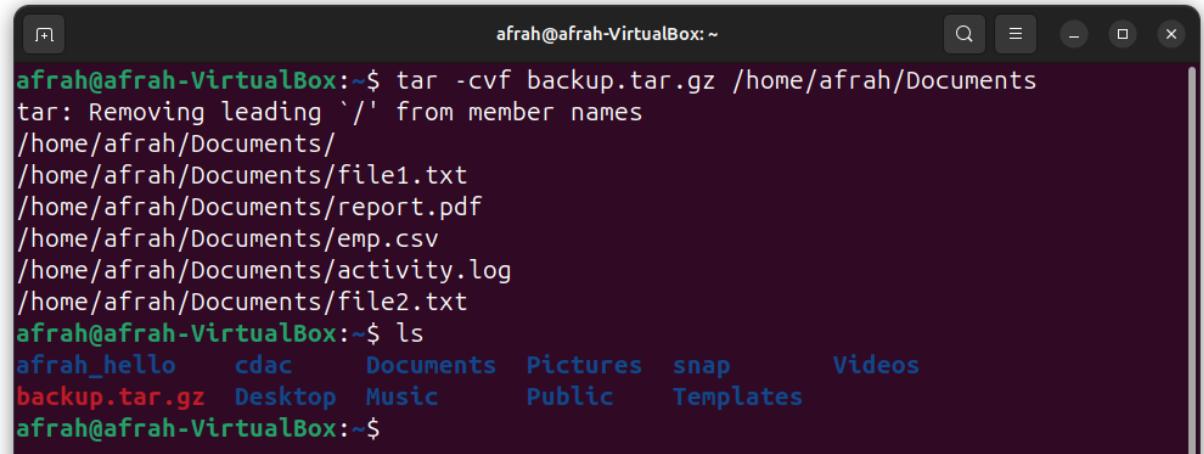
40. Create a directory "myproject" with permissions 755 (rwxr-xr-x).

```
afrah@afrah-VirtualBox:~$ mkdir myproject
afrah@afrah-VirtualBox:~$ getfacl myproject
# file: myproject
# owner: afrah
# group: afrah
user::rwx
group::rwx
other::r-x

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

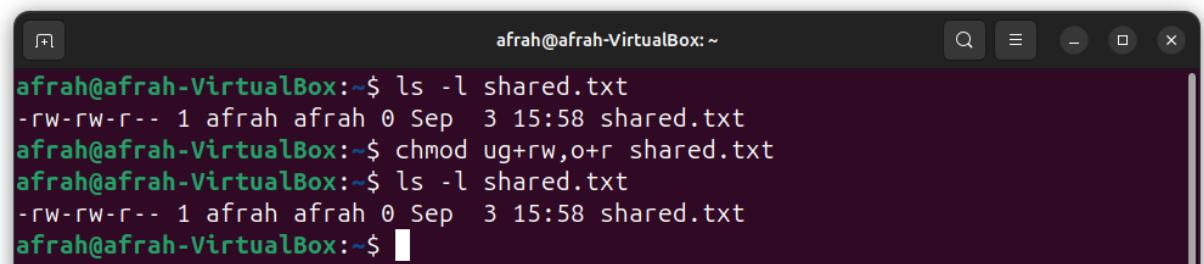
afrah@afrah-VirtualBox:~$
```

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



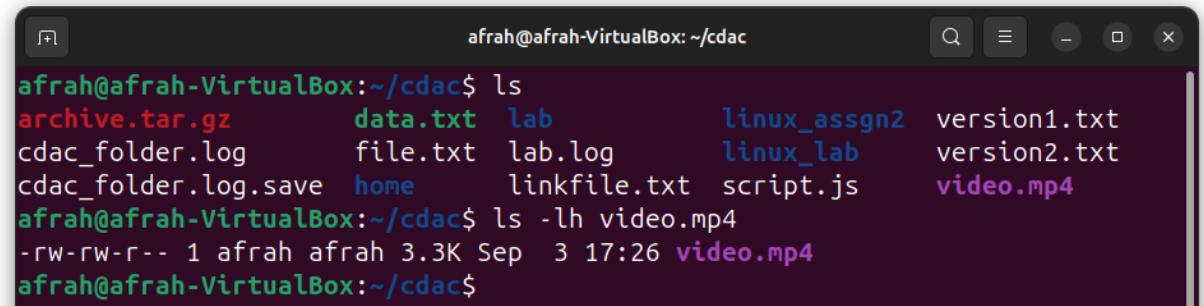
```
afrah@afrah-VirtualBox:~$ tar -cvf backup.tar.gz /home/afrah/Documents
tar: Removing leading '/' from member names
/home/afrah/Documents/
/home/afrah/Documents/file1.txt
/home/afrah/Documents/report.pdf
/home/afrah/Documents/emp.csv
/home/afrah/Documents/activity.log
/home/afrah/Documents/file2.txt
afrah@afrah-VirtualBox:~$ ls
afrah_hello cdac Documents Pictures snap Videos
backup.tar.gz Desktop Music Public Templates
afrah@afrah-VirtualBox:~$
```

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



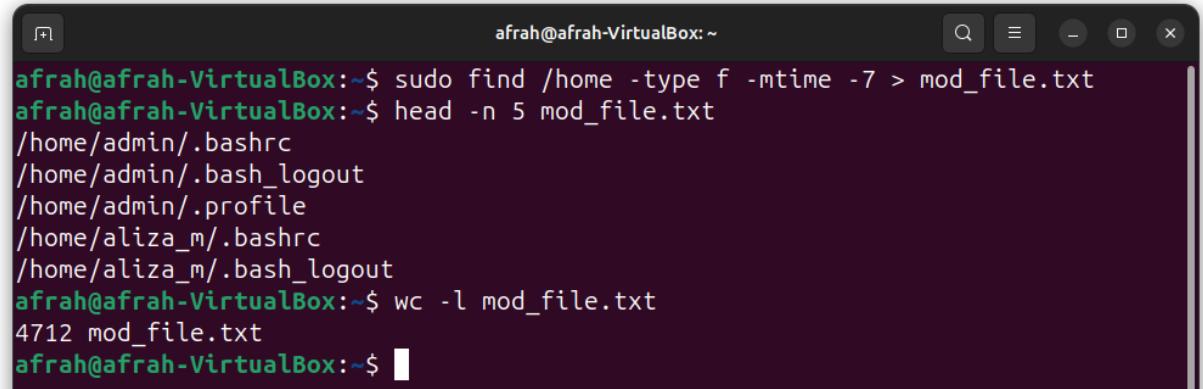
```
afrah@afrah-VirtualBox:~$ ls -l shared.txt
-rw-rw-r-- 1 afrah afrah 0 Sep  3 15:58 shared.txt
afrah@afrah-VirtualBox:~$ chmod ug+rw,o+r shared.txt
afrah@afrah-VirtualBox:~$ ls -l shared.txt
-rw-rw-r-- 1 afrah afrah 0 Sep  3 15:58 shared.txt
afrah@afrah-VirtualBox:~$
```

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



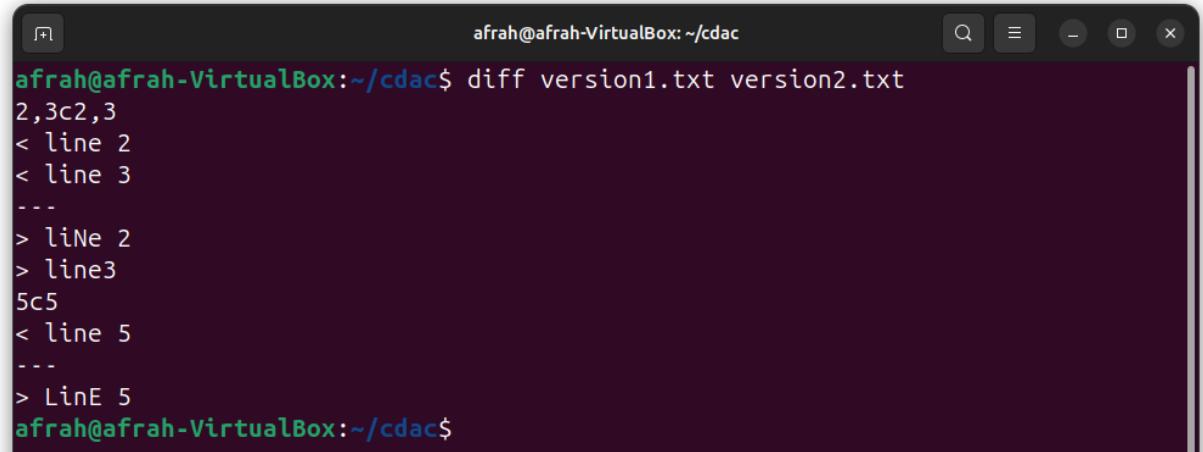
```
afrah@afrah-VirtualBox:~/cdac$ ls
archive.tar.gz      data.txt  lab          linux_assgn2  version1.txt
cdac_folder.log     file.txt  lab.log      linux_lab    version2.txt
cdac_folder.log.save home     linkfile.txt script.js   video.mp4
afrah@afrah-VirtualBox:~/cdac$ ls -lh video.mp4
-rw-rw-r-- 1 afrah afrah 3.3K Sep  3 17:26 video.mp4
afrah@afrah-VirtualBox:~/cdac$
```

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



```
afrah@afrah-VirtualBox:~$ sudo find /home -type f -mtime -7 > mod_file.txt
afrah@afrah-VirtualBox:~$ head -n 5 mod_file.txt
/home/admin/.bashrc
/home/admin/.bash_logout
/home/admin/.profile
/home/aliza_m/.bashrc
/home/aliza_m/.bash_logout
afrah@afrah-VirtualBox:~$ wc -l mod_file.txt
4712 mod_file.txt
afrah@afrah-VirtualBox:~$
```

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



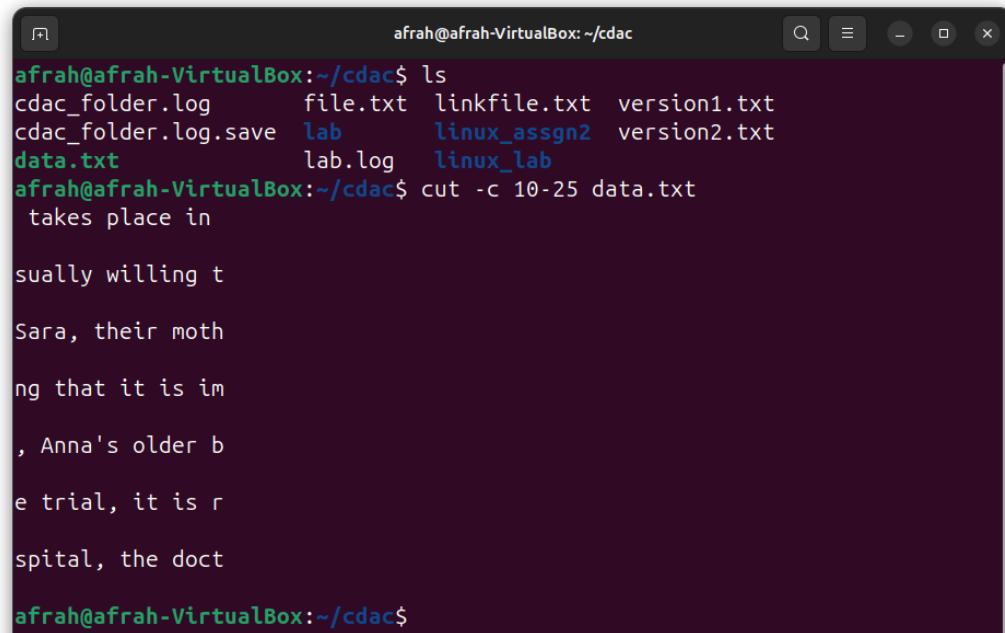
```
afrah@afrah-VirtualBox:~/cdac$ diff version1.txt version2.txt
2,3c2,3
< line 2
< line 3
---
> liNe 2
> line3
5c5
< line 5
---
> LinE 5
afrah@afrah-VirtualBox:~/cdac$
```

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

```
afrah@afrah-VirtualBox:~$ ls
afrah_hello cdac Documents photos Public Templates
backup Desktop Music Pictures snap Videos
afrah@afrah-VirtualBox:~$ rsync -av /home/afrah/photos/ /home/afrah/backup/
photos/
sending incremental file list
created directory /home/afrah/backup/photos
./
Screenshot from 2025-01-15 14-30-09.png
Screenshot from 2025-09-01 16-48-45.png
Screenshot from 2025-09-01 16-55-46.png
Screenshot from 2025-09-01 22-55-45.png
Screenshot from 2025-09-01 22-59-28.png
Screenshot from 2025-09-01 23-07-40.png
Screenshot from 2025-09-01 23-14-27.png
Screenshot from 2025-09-01 23-16-53.png
Screenshot from 2025-09-01 23-21-57.png
Screenshot from 2025-09-01 23-24-20.png
Screenshot from 2025-09-01 23-40-09.png
Screenshot from 2025-09-02 14-48-56.png
Screenshot from 2025-09-02 15-05-38.png
Screenshot from 2025-09-02 15-05-44.png
Screenshot from 2025-09-02 15-07-54.png
Screenshot from 2025-09-02 15-08-24.png
```

```
afrah@afrah-VirtualBox:~$ tree backup
backup
└── photos
    ├── Screenshot from 2025-01-15 14-30-09.png
    ├── Screenshot from 2025-09-01 16-48-45.png
    ├── Screenshot from 2025-09-01 16-55-46.png
    ├── Screenshot from 2025-09-01 22-55-45.png
    ├── Screenshot from 2025-09-01 22-59-28.png
    ├── Screenshot from 2025-09-01 23-07-40.png
    ├── Screenshot from 2025-09-01 23-14-27.png
    ├── Screenshot from 2025-09-01 23-16-53.png
    ├── Screenshot from 2025-09-01 23-21-57.png
    ├── Screenshot from 2025-09-01 23-24-20.png
    ├── Screenshot from 2025-09-01 23-40-09.png
    ├── Screenshot from 2025-09-02 14-48-56.png
    ├── Screenshot from 2025-09-02 15-05-38.png
    ├── Screenshot from 2025-09-02 15-05-44.png
    ├── Screenshot from 2025-09-02 15-07-54.png
    ├── Screenshot from 2025-09-02 15-08-24.png
    ├── Screenshot from 2025-09-02 15-10-44.png
    ├── Screenshot from 2025-09-02 15-10-57.png
    ├── Screenshot from 2025-09-02 15-16-15.png
    ├── Screenshot from 2025-09-02 15-55-40.png
    └── Screenshot from 2025-09-02 16-59-48.png
```

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



The screenshot shows a terminal window with the following session:

```
afrah@afrah-VirtualBox:~/cdac$ ls
cdac_folder.log      file.txt  linkfile.txt  version1.txt
cdac_folder.log.save  lab       linux_assgn2  version2.txt
data.txt              lab.log   linux_lab
afrah@afrah-VirtualBox:~/cdac$ cut -c 10-25 data.txt
takes place in

usually willing t

Sara, their moth

ng that it is im

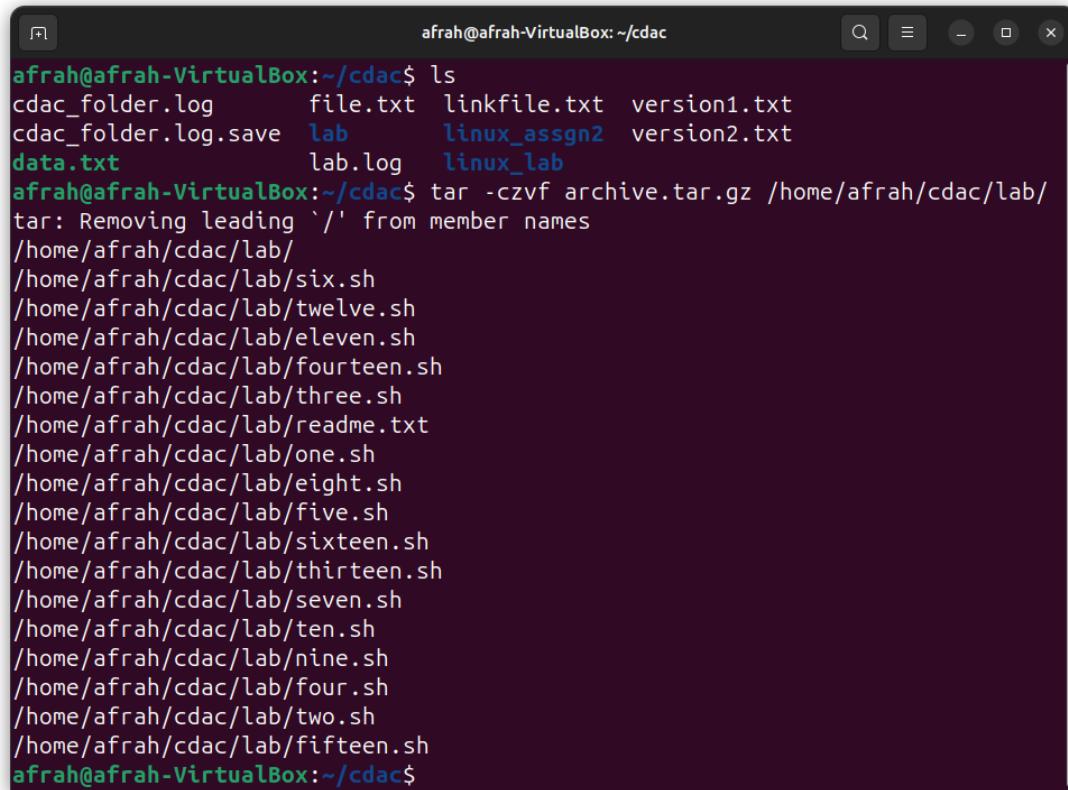
, Anna's older b

e trial, it is r

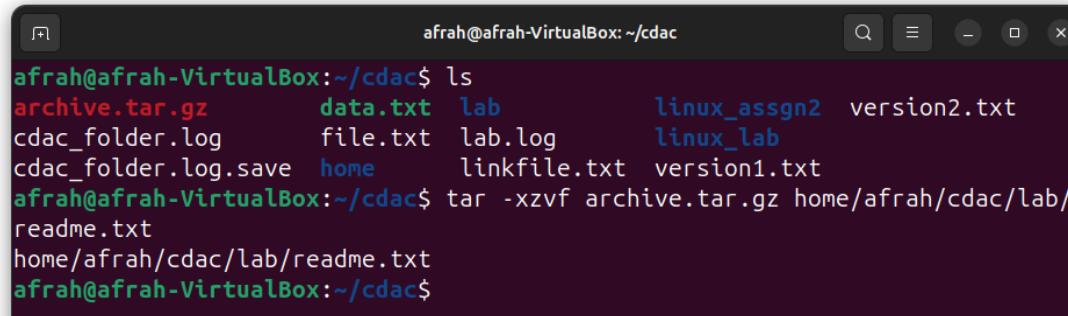
spital, the doct

afrah@afrah-VirtualBox:~/cdac$
```

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



```
afrah@afrah-VirtualBox:~/cdac$ ls
cdac_folder.log      file.txt  linkfile.txt  version1.txt
cdac_folder.log.save  lab       linux_assgn2  version2.txt
data.txt              lab.log   linux_lab
afrah@afrah-VirtualBox:~/cdac$ tar -czvf archive.tar.gz /home/afrah/cdac/lab/
tar: Removing leading '/' from member names
/home/afrah/cdac/lab/
/home/afrah/cdac/lab/six.sh
/home/afrah/cdac/lab/twelve.sh
/home/afrah/cdac/lab/eleven.sh
/home/afrah/cdac/lab/fourteen.sh
/home/afrah/cdac/lab/three.sh
/home/afrah/cdac/lab/readme.txt
/home/afrah/cdac/lab/one.sh
/home/afrah/cdac/lab/eight.sh
/home/afrah/cdac/lab/five.sh
/home/afrah/cdac/lab/sixteen.sh
/home/afrah/cdac/lab/thirteen.sh
/home/afrah/cdac/lab/seven.sh
/home/afrah/cdac/lab/ten.sh
/home/afrah/cdac/lab/nine.sh
/home/afrah/cdac/lab/four.sh
/home/afrah/cdac/lab/two.sh
/home/afrah/cdac/lab/fifteen.sh
afrah@afrah-VirtualBox:~/cdac$
```



```
afrah@afrah-VirtualBox:~/cdac$ ls
archive.tar.gz        data.txt  lab           linux_assgn2  version2.txt
cdac_folder.log       file.txt  lab.log       linux_lab
cdac_folder.log.save  home     linkfile.txt  version1.txt
afrah@afrah-VirtualBox:~/cdac$ tar -xzvf archive.tar.gz home/afrah/cdac/lab/
readme.txt
home/afrah/cdac/lab/readme.txt
afrah@afrah-VirtualBox:~/cdac$
```

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

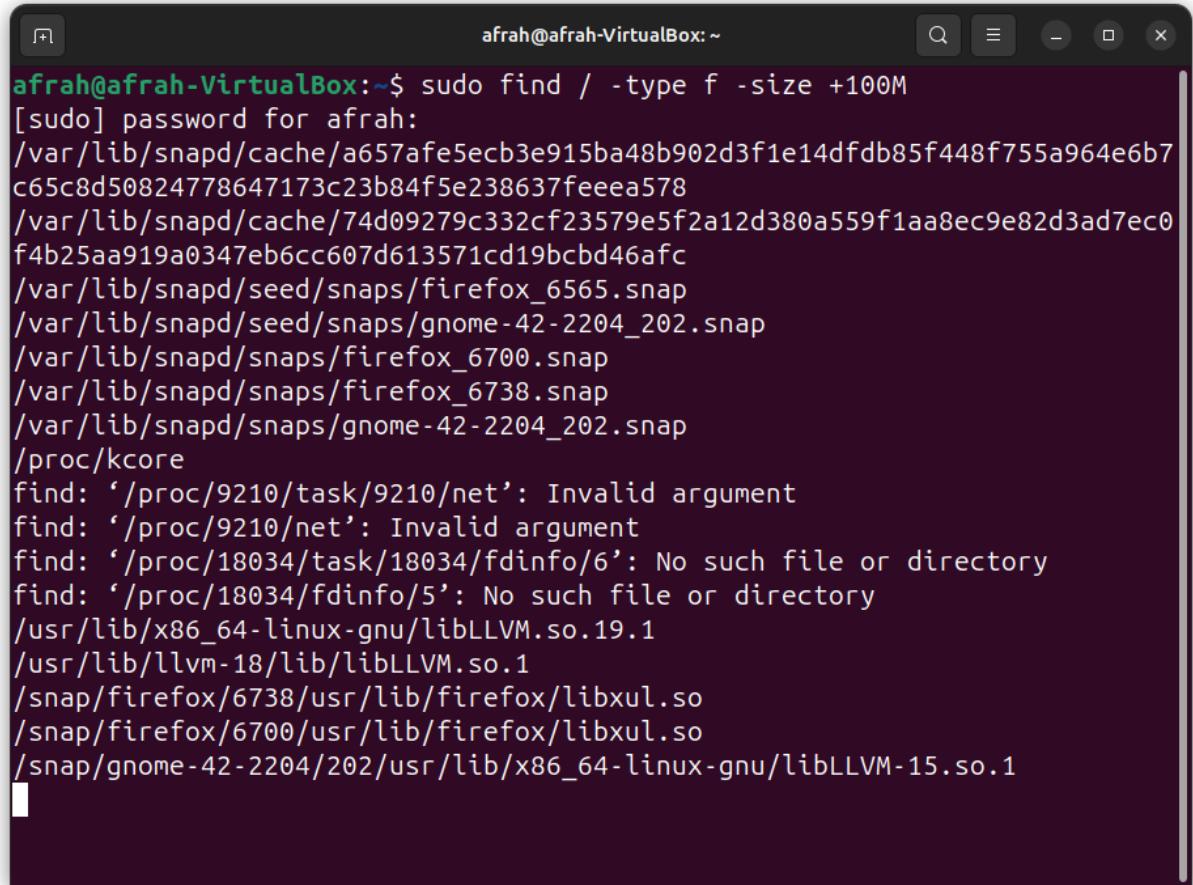
```
afrah@afrah-VirtualBox:~/cdac$ ls
archive.tar.gz      data.txt  lab          linux_assgn2  version1.txt
cdac_folder.log     file.txt  lab.log      linux_lab    version2.txt
cdac_folder.log.save home     linkfile.txt script.js
afrah@afrah-VirtualBox:~/cdac$ grep -i 'function' script.js | wc -l
2
afrah@afrah-VirtualBox:~/cdac$ cat script.js
function outerFun(a) {
    function innerFun(b) {
        return a + b;
    }
    return innerFun;
}

const addTen = outerFun(10);
console.log(addTen(5));
afrah@afrah-VirtualBox:~/cdac$
```

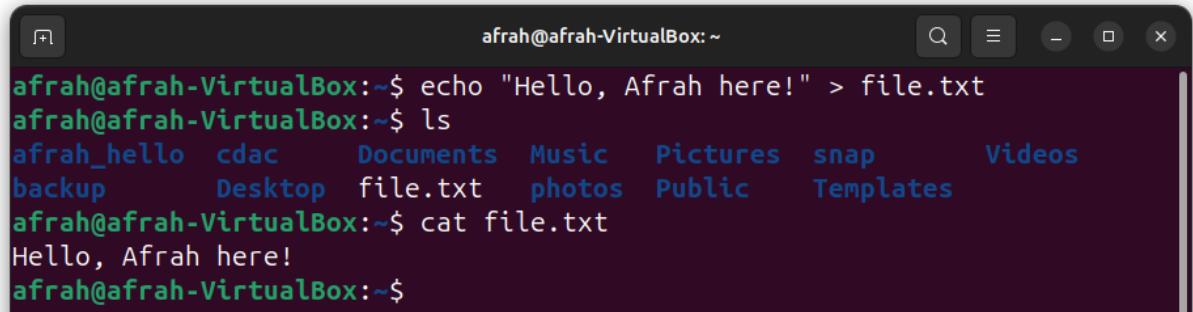
Advanced Questions

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

```
afrah@afrah-VirtualBox:~/cdac$ ls
application.log  cdac_folder.log.save  home      linkfile.txt  log1.txt  log_script.sh  version2.txt
archive.tar.gz    data.txt            lab       linux_assgn2  log2.txt  script.js    video.mp4
cdac_folder.log   file.txt           lab.log   linux_lab    log3.txt  version1.txt
afrah@afrah-VirtualBox:~/cdac$ tail -f application.log
New entry at
New entry at
New entry at
New entry at
```

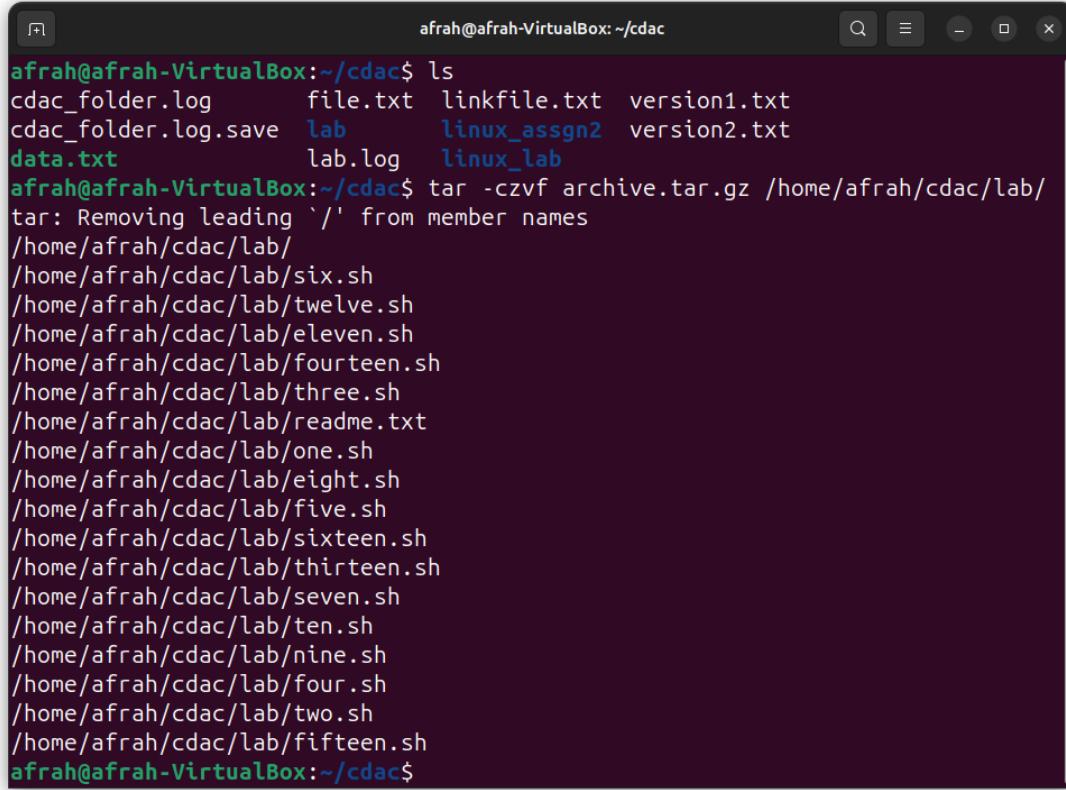
53. How do you find all files larger than 100MB in your entire file system?

```
afrah@afrah-VirtualBox:~$ sudo find / -type f -size +100M
[sudo] password for afrah:
/var/lib/snapd/cache/a657afe5ecb3e915ba48b902d3f1e14dfdb85f448f755a964e6b7
c65c8d50824778647173c23b84f5e238637feeaa578
/var/lib/snapd/cache/74d09279c332cf23579e5f2a12d380a559f1aa8ec9e82d3ad7ec0
f4b25aa919a0347eb6cc607d613571cd19bcd46afc
/var/lib/snapd/seed/snaps/firefox_6565.snap
/var/lib/snapd/seed/snaps/gnome-42-2204_202.snap
/var/lib/snapd/snaps/firefox_6700.snap
/var/lib/snapd/snaps/firefox_6738.snap
/var/lib/snapd/snaps/gnome-42-2204_202.snap
/proc/kcore
find: '/proc/9210/task/9210/net': Invalid argument
find: '/proc/9210/net': Invalid argument
find: '/proc/18034/task/18034/fdinfo/6': No such file or directory
find: '/proc/18034/fdinfo/5': No such file or directory
/usr/lib/x86_64-linux-gnu/libLLVM.so.19.1
/usr/lib/llvm-18/lib/libLLVM.so.1
/snap/firefox/6738/usr/lib/firefox/libxul.so
/snap/firefox/6700/usr/lib/firefox/libxul.so
/snap/gnome-42-2204/202/usr/lib/x86_64-linux-gnu/libLLVM-15.so.1
```

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

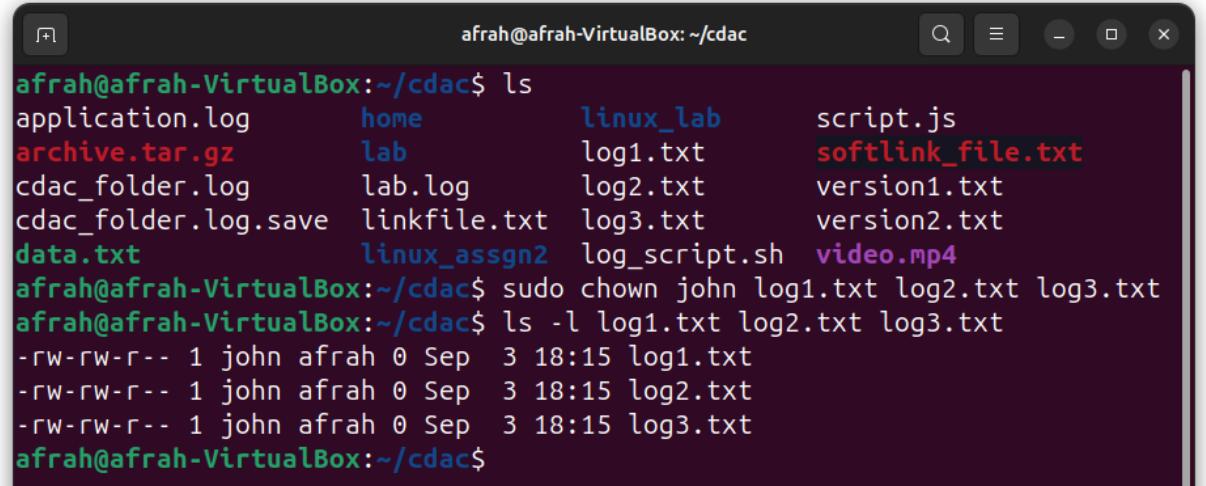
```
afrah@afrah-VirtualBox:~$ echo "Hello, Afrah here!" > file.txt
afrah@afrah-VirtualBox:~$ ls
afrah_hello  cdac  Documents  Music  Pictures  snap      Videos
backup      Desktop  file.txt  photos  Public    Templates
afrah@afrah-VirtualBox:~$ cat file.txt
Hello, Afrah here!
afrah@afrah-VirtualBox:~$
```

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



```
afrah@afrah-VirtualBox:~/cdac$ ls
cdac_folder.log      file.txt  linkfile.txt  version1.txt
cdac_folder.log.save  lab       linux_assgn2  version2.txt
data.txt              lab.log   linux_lab
afrah@afrah-VirtualBox:~/cdac$ tar -czvf archive.tar.gz /home/afrah/cdac/lab/
tar: Removing leading `/' from member names
/home/afrah/cdac/lab/
/home/afrah/cdac/lab/six.sh
/home/afrah/cdac/lab/twelve.sh
/home/afrah/cdac/lab/eleven.sh
/home/afrah/cdac/lab/fourteen.sh
/home/afrah/cdac/lab/three.sh
/home/afrah/cdac/lab/readme.txt
/home/afrah/cdac/lab/one.sh
/home/afrah/cdac/lab/eight.sh
/home/afrah/cdac/lab/five.sh
/home/afrah/cdac/lab/sixteen.sh
/home/afrah/cdac/lab/thirteen.sh
/home/afrah/cdac/lab/seven.sh
/home/afrah/cdac/lab/ten.sh
/home/afrah/cdac/lab/nine.sh
/home/afrah/cdac/lab/four.sh
/home/afrah/cdac/lab/two.sh
/home/afrah/cdac/lab/fifteen.sh
afrah@afrah-VirtualBox:~/cdac$
```

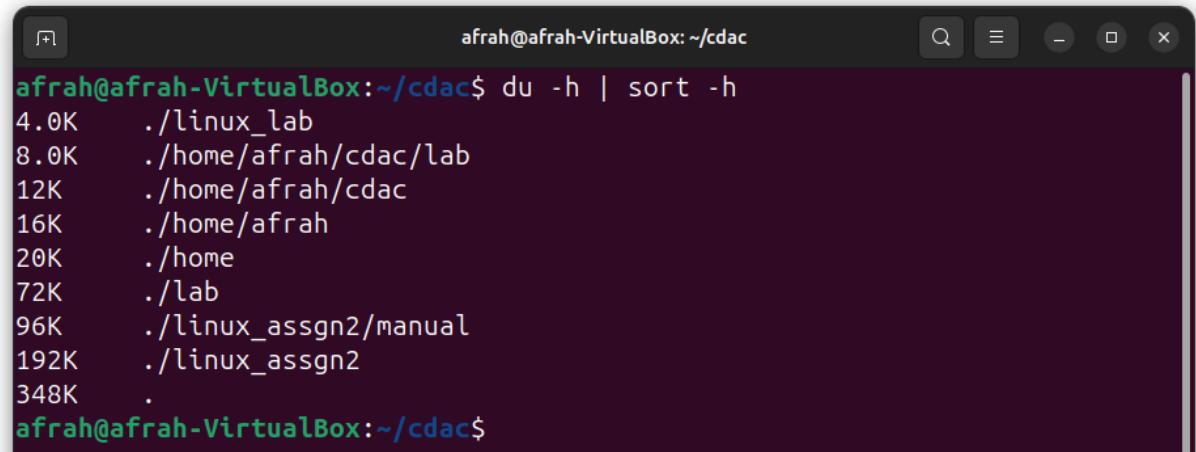
56. How do you find all files owned by user "john" in the "/home" directory?



```
afrah@afrah-VirtualBox:~/cdac$ ls
application.log      home        linux_lab      script.js
archive.tar.gz        lab         log1.txt      softlink_file.txt
cdac_folder.log       lab.log    log2.txt      version1.txt
cdac_folder.log.save  linkfile.txt  log3.txt      version2.txt
data.txt              linux_assgn2 log_script.sh video.mp4
afrah@afrah-VirtualBox:~/cdac$ sudo chown john log1.txt log2.txt log3.txt
afrah@afrah-VirtualBox:~/cdac$ ls -l log1.txt log2.txt log3.txt
-rw-rw-r-- 1 john afrah 0 Sep  3 18:15 log1.txt
-rw-rw-r-- 1 john afrah 0 Sep  3 18:15 log2.txt
-rw-rw-r-- 1 john afrah 0 Sep  3 18:15 log3.txt
afrah@afrah-VirtualBox:~/cdac$
```

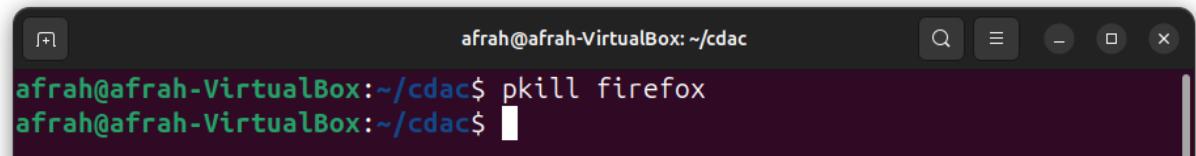
57. How do you schedule a command to run every day at 9 AM using cron?

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



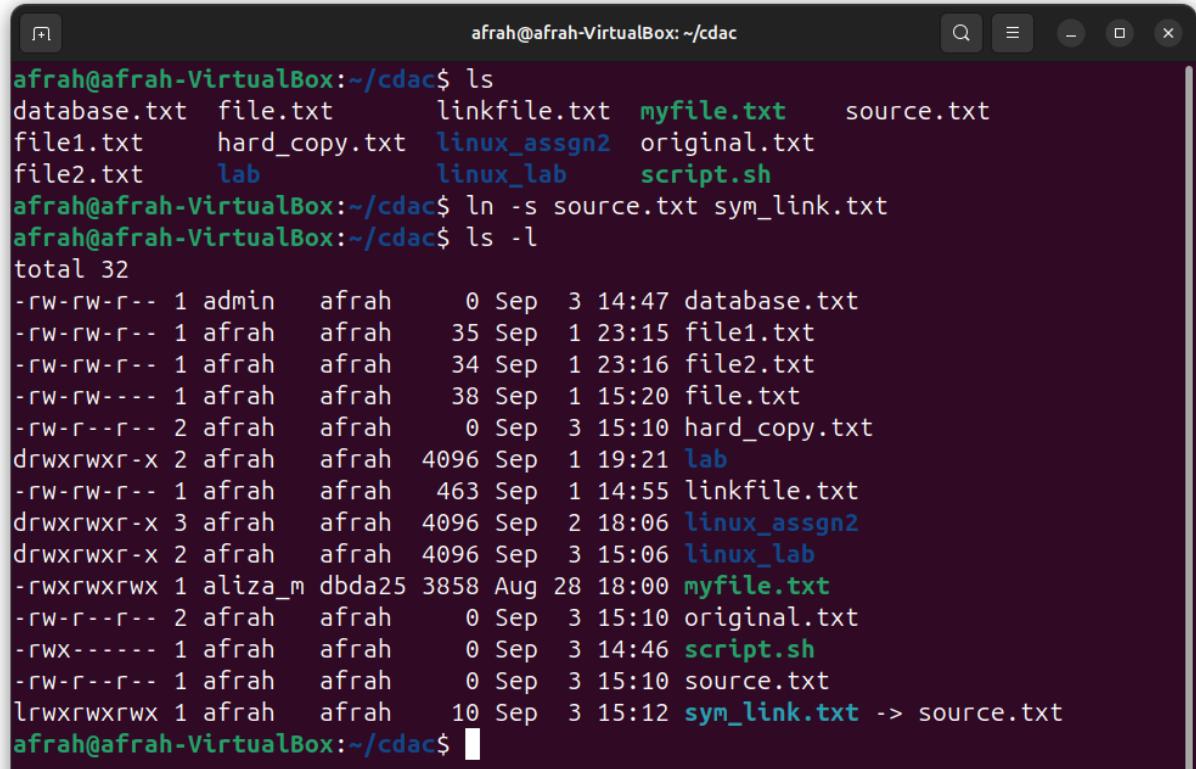
```
afrah@afrah-VirtualBox:~/cdac$ du -h | sort -h
4.0K    ./linux_lab
8.0K    ./home/afrah/cdac/lab
12K    ./home/afrah/cdac
16K    ./home/afrah
20K    ./home
72K    ./lab
96K    ./linux_assgn2/manual
192K   ./linux_assgn2
348K   .
afrah@afrah-VirtualBox:~/cdac$
```

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

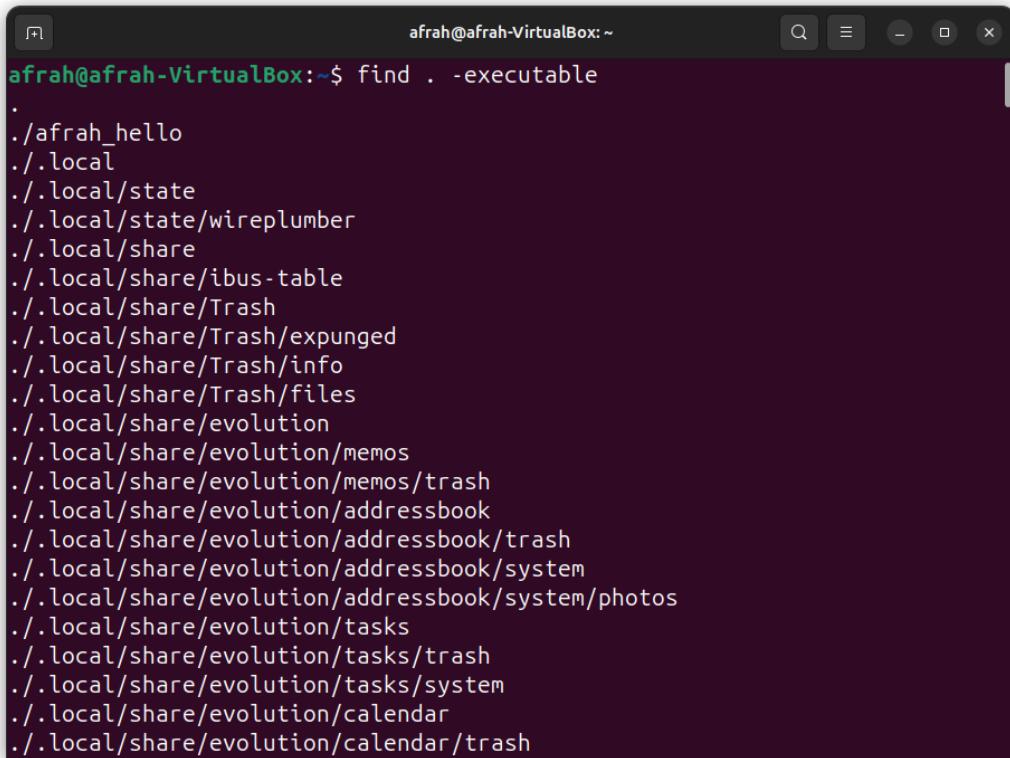


```
afrah@afrah-VirtualBox:~/cdac$ pkill firefox
afrah@afrah-VirtualBox:~/cdac$
```

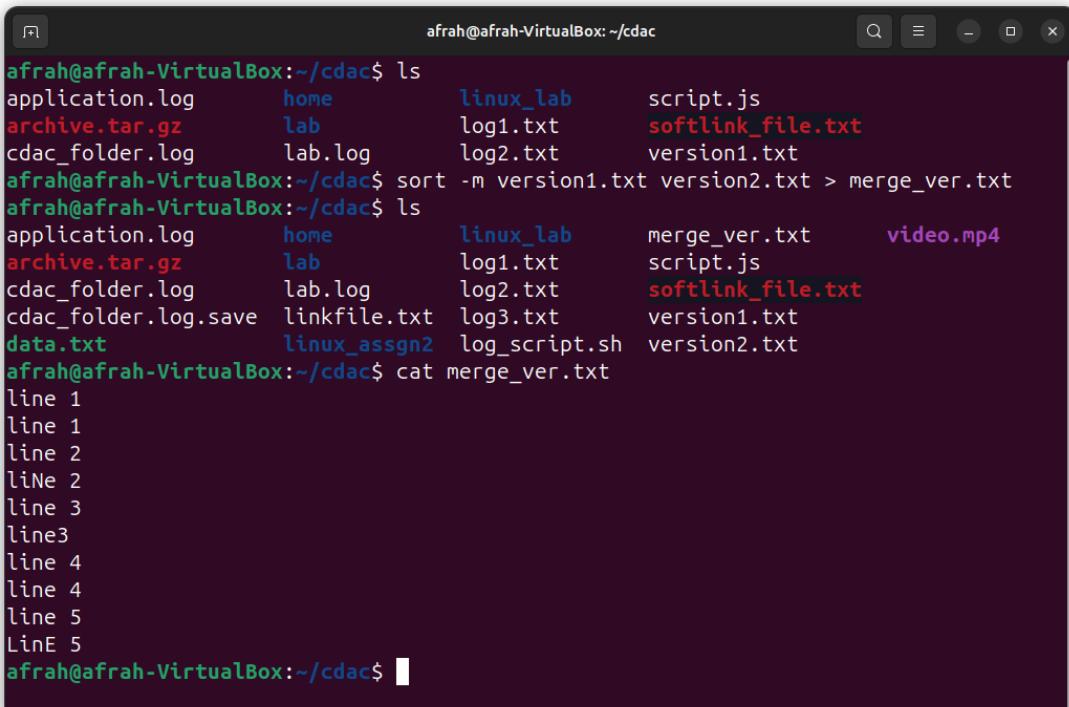
60. How do you create a symbolic link that points to a directory instead of a file?



```
afrah@afrah-VirtualBox:~/cdac$ ls
database.txt  file.txt      linkfile.txt  myfile.txt  source.txt
file1.txt     hard_copy.txt  linux_assgn2  original.txt
file2.txt     lab           linux_lab    script.sh
afrah@afrah-VirtualBox:~/cdac$ ln -s source.txt sym_link.txt
afrah@afrah-VirtualBox:~/cdac$ ls -l
total 32
-rw-rw-r-- 1 admin  afrah    0 Sep  3 14:47 database.txt
-rw-rw-r-- 1 afrah  afrah  35 Sep  1 23:15 file1.txt
-rw-rw-r-- 1 afrah  afrah  34 Sep  1 23:16 file2.txt
-rw-rw---- 1 afrah  afrah  38 Sep  1 15:20 file.txt
-rw-r--r-- 2 afrah  afrah    0 Sep  3 15:10 hard_copy.txt
drwxrwxr-x 2 afrah  afrah  4096 Sep  1 19:21 lab
-rw-rw-r-- 1 afrah  afrah  463 Sep  1 14:55 linkfile.txt
drwxrwxr-x 3 afrah  afrah  4096 Sep  2 18:06 linux_assgn2
drwxrwxr-x 2 afrah  afrah  4096 Sep  3 15:06 linux_lab
-rwxrwxrwx 1 aliza_m dbda25 3858 Aug 28 18:00 myfile.txt
-rw-r--r-- 2 afrah  afrah    0 Sep  3 15:10 original.txt
-rwx----- 1 afrah  afrah    0 Sep  3 14:46 script.sh
-rw-r--r-- 1 afrah  afrah    0 Sep  3 15:10 source.txt
lrwxrwxrwx 1 afrah  afrah   10 Sep  3 15:12 sym_link.txt -> source.txt
afrah@afrah-VirtualBox:~/cdac$
```

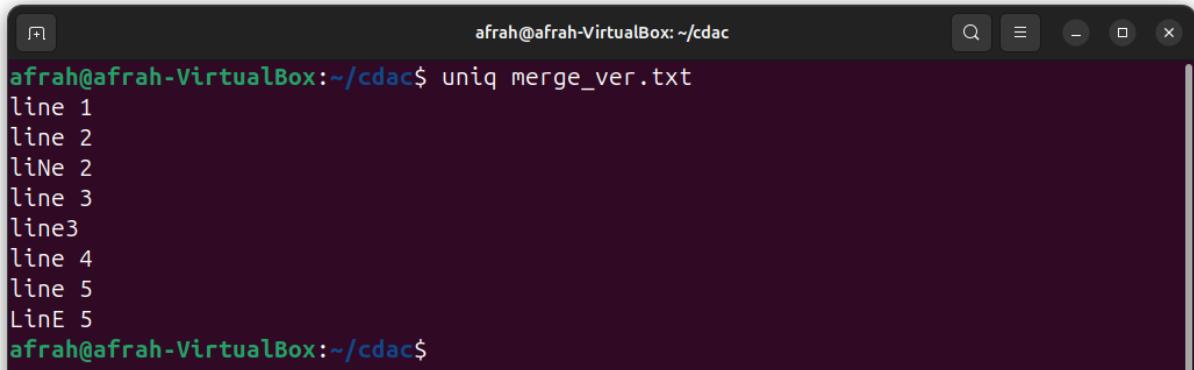
61. How do you find all executable files in your PATH?

```
afrah@afrah-VirtualBox:~$ find . -executable
.
./afrah_hello
./local
./local/state
./local/state/wireplumber
./local/share
./local/share/ibus-table
./local/share/Trash
./local/share/Trash/expunged
./local/share/Trash/info
./local/share/Trash/files
./local/share/evolution
./local/share/evolution/memos
./local/share/evolution/memos/trash
./local/share/evolution/addressbook
./local/share/evolution/addressbook/trash
./local/share/evolution/addressbook/system
./local/share/evolution/addressbook/system/photos
./local/share/evolution/tasks
./local/share/evolution/tasks/trash
./local/share/evolution/tasks/system
./local/share/evolution/calendar
./local/share/evolution/calendar/trash
```

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

```
afrah@afrah-VirtualBox:~/cdac$ ls
application.log      home      linux_lab      script.js
archive.tar.gz       lab       log1.txt       softlink_file.txt
cdac_folder.log      lab.log    log2.txt       version1.txt
afrah@afrah-VirtualBox:~/cdac$ sort -m version1.txt version2.txt > merge_ver.txt
afrah@afrah-VirtualBox:~/cdac$ ls
application.log      home      linux_lab      merge_ver.txt      video.mp4
archive.tar.gz       lab       log1.txt       script.js
cdac_folder.log      lab.log    log2.txt       softlink_file.txt
cdac_folder.log.save linkfile.txt  log3.txt       version1.txt
data.txt              linux_assgn2 log_script.sh  version2.txt
afrah@afrah-VirtualBox:~/cdac$ cat merge_ver.txt
line 1
line 1
line 2
line 2
line 3
line3
line 4
line 4
line 5
line 5
line 5
afrah@afrah-VirtualBox:~/cdac$
```

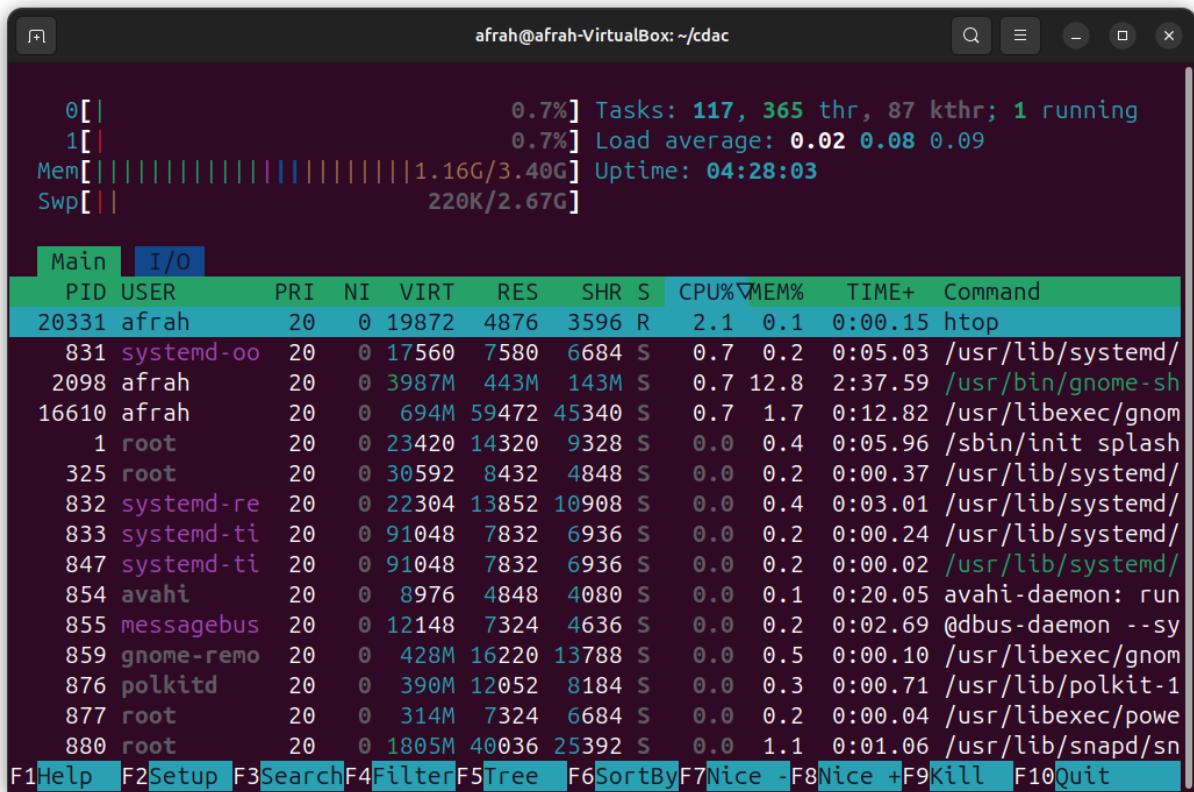
63. How do you display only unique lines from a file that contains duplicates?



```
afrah@afrah-VirtualBox:~/cdac$ uniq merge_ver.txt
line 1
line 2
liNe 2
line 3
line3
line 4
line 5
LinE 5
afrah@afrah-VirtualBox:~/cdac$
```

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

Command: htop



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

```
afrah@afrah-VirtualBox:~/cdac$ find . -type f -empty
./log3.txt
./linux_lab/permissions_test.txt
./linux_lab/new_permissions_test.txt
./log1.txt
./log2.txt
afrah@afrah-VirtualBox:~/cdac$
```

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

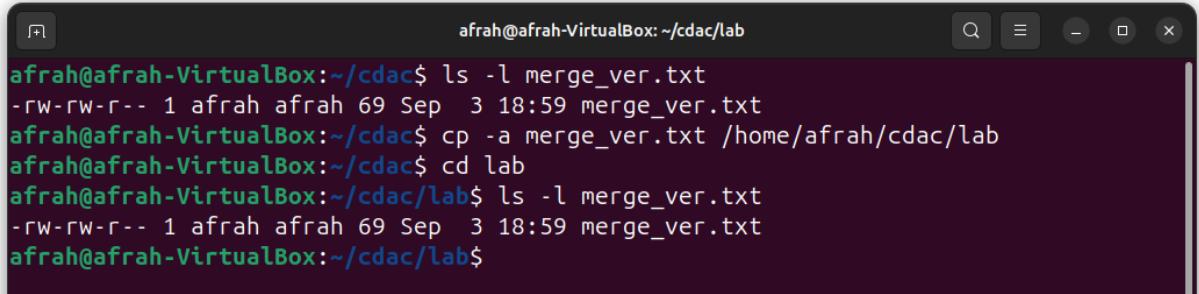
67. How do you create a file that can only be read by the owner and no one else?

```
afrah@afrah-VirtualBox:~/cdac$ ls -l linkfile.txt
-rw-rw-r-- 1 afrah afrah 463 Sep 1 14:55 linkfile.txt
afrah@afrah-VirtualBox:~/cdac$ chmod 400 linkfile.txt
afrah@afrah-VirtualBox:~/cdac$ ls -l linkfile.txt
-r----- 1 afrah afrah 463 Sep 1 14:55 linkfile.txt
afrah@afrah-VirtualBox:~/cdac$
```

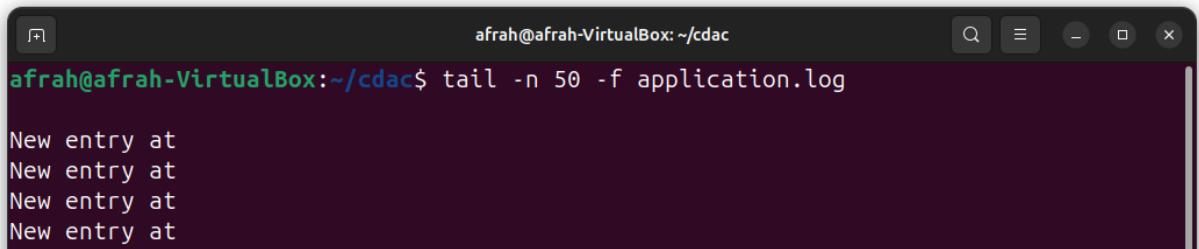
68. How do you find broken symbolic links in a directory?

When `ls -l`, is executed the first character in file permissions, if it is 'l' (small L), and the file name is in red color indicates broken symbolic link, because the original file must have been deleted.

```
afrah@afrah-VirtualBox:~/cdac$ ls
application.log      data.txt    lab.log      log1.txt      script.js
archive.tar.gz       file.txt    linkfile.txt  log2.txt      version1.txt
cdac_folder.log      home       linux_assgn2  log3.txt      version2.txt
cdac_folder.log.save lab        linux_lab    log_script.sh video.mp4
afrah@afrah-VirtualBox:~/cdac$ ln -s file.txt softlink_file.txt
afrah@afrah-VirtualBox:~/cdac$ ls -l softlink_file.txt
lrwxrwxrwx 1 afrah afrah 8 Sep 3 18:49 softlink_file.txt -> file.txt
afrah@afrah-VirtualBox:~/cdac$ rm file.txt
afrah@afrah-VirtualBox:~/cdac$ ls -l softlink_file.txt
lrwxrwxrwx 1 afrah afrah 8 Sep 3 18:49 softlink_file.txt -> file.txt
afrah@afrah-VirtualBox:~/cdac$
```

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

```
afrah@afrah-VirtualBox:~/cdac$ ls -l merge_ver.txt
-rw-rw-r-- 1 afrah afrah 69 Sep  3 18:59 merge_ver.txt
afrah@afrah-VirtualBox:~/cdac$ cp -a merge_ver.txt /home/afrah/cdac/lab
afrah@afrah-VirtualBox:~/cdac$ cd lab
afrah@afrah-VirtualBox:~/cdac/lab$ ls -l merge_ver.txt
-rw-rw-r-- 1 afrah afrah 69 Sep  3 18:59 merge_ver.txt
afrah@afrah-VirtualBox:~/cdac/lab$
```

A terminal window titled "afrah@afrah-VirtualBox: ~/cdac/lab". It shows the user performing a recursive copy operation using the command "cp -a merge_ver.txt /home/afrah/cdac/lab". After the copy, the user changes directory to "lab" and lists the contents again, confirming that the file "merge_ver.txt" exists with its original permissions and timestamp intact.**70. How do you display the last 50 lines of a log file and continue monitoring new additions?**

```
afrah@afrah-VirtualBox:~/cdac$ tail -n 50 -f application.log
New entry at
New entry at
New entry at
New entry at
```

A terminal window titled "afrah@afrah-VirtualBox: ~/cdac". It shows the user running the command "tail -n 50 -f application.log". The output displays four lines of text starting with "New entry at", indicating that the user is monitoring the log file for new entries.