

- 1) Create user with name Techie and provide sudo access to user.

```
aslam@aslam-Virtual-Machine:~$ cat /etc/passwd
techie:x:1003:1003::/home/techie:/bin/sh
aslam@aslam-Virtual-Machine:~$

# Allow members of group sudo to execute any command
%sudo  ALL=(ALL:ALL) ALL
MBA ALL=(ALL:ALL) ALL
techie ALL=(ALL:ALL) ALL
```

- 2) Navigate to the home directory.

```
aslam@aslam-Virtual-Machine: ~
aslam@aslam-Virtual-Machine:~/Desktop$ cd ~
aslam@aslam-Virtual-Machine:~$ pwd
/home/aslam
aslam@aslam-Virtual-Machine:~$
```

- 3) Create a new directory.

```
aslam@aslam-Virtual-Machine:~$ mkdir task
aslam@aslam-Virtual-Machine:~$ ls
Desktop  Downloads  Pictures  snap  Templates
Documents  Music      Public    task  Videos
aslam@aslam-Virtual-Machine:~$
```

- 4) List the contents of a directory.

```
aslam@aslam-Virtual-Machine:/$ ls
bin             home            mnt             sbin.usr-is-
bin.usr-is-merged  lib             opt             snap
boot            lib64           proc            srv
cdrom           lib.usr-is-merged  root           swap.img
dev             lost+found      run            sys
etc             media           sbin           tmp
aslam@aslam-Virtual-Machine:/$
```

5) Change the current directory.

```
aslam@aslam-Virtual-Machine:~/task$ cd ..  
aslam@aslam-Virtual-Machine:~$ pwd  
/home/aslam  
aslam@aslam-Virtual-Machine:~$
```

6) Create a new empty file.

```
aslam@aslam-Virtual-Machine:~/task$ touch testemptyfile  
aslam@aslam-Virtual-Machine:~/task$ ls  
1 2 a b c d e testemptyfile  
aslam@aslam-Virtual-Machine:~/task$
```

7) View the contents of a file.

```
aslam@aslam-Virtual-Machine:~/task$ cat a  
hello i am viewing the content of the files for my task  
aslam@aslam-Virtual-Machine:~/task$
```

8) Copy a file to another location.

```
aslam@aslam-Virtual-Machine:~/Downloads$ pwd  
/home/aslam/Downloads  
aslam@aslam-Virtual-Machine:~/Downloads$ cp /home/aslam/task/aslam /home/aslam/Downloads  
aslam@aslam-Virtual-Machine:~/Downloads$ ls  
aslam  
aslam@aslam-Virtual-Machine:~/Downloads$
```

9) Move a file to another location.

```
aslam@aslam-Virtual-Machine:~/Documents$ ls  
aslam  
aslam@aslam-Virtual-Machine:~/Documents$ mv /home/aslam/task/aslam /home/aslam/Documents  
aslam@aslam-Virtual-Machine:~/Documents$ ls  
aslam  
aslam@aslam-Virtual-Machine:~/Documents$
```

10) Rename a file.

```
aslam@aslam-Virtual-Machine:~/Documents$ ls  
aslam  
aslam@aslam-Virtual-Machine:~/Documents$ mv aslam document  
aslam@aslam-Virtual-Machine:~/Documents$ ls  
document  
aslam@aslam-Virtual-Machine:~/Documents$
```

11) Delete a file.

```
aslam@aslam-Virtual-Machine:~/Documents$ ls
document
aslam@aslam-Virtual-Machine:~/Documents$ rm document
aslam@aslam-Virtual-Machine:~/Documents$ ls
aslam@aslam-Virtual-Machine:~/Documents$
```

12) Grant or revoke permissions on a file or directory.

```
aslam@aslam-Virtual-Machine:~/Documents$ touch permissions
aslam@aslam-Virtual-Machine:~/Documents$ ls
permissions
aslam@aslam-Virtual-Machine:~/Documents$ ll
total 8
drwxr-xr-x  2 aslam aslam 4096 May 27 15:37 ./
drwxr-x--- 16 aslam aslam 4096 May 27 15:28 ../
-rw-rw-r--  1 aslam aslam   0 May 27 15:37 permissions
aslam@aslam-Virtual-Machine:~/Documents$ chmod 777 permissions
aslam@aslam-Virtual-Machine:~/Documents$ ll
total 8
drwxr-xr-x  2 aslam aslam 4096 May 27 15:37 ./
drwxr-x--- 16 aslam aslam 4096 May 27 15:28 ../
-rwxrwxrwx  1 aslam aslam   0 May 27 15:37 permissions*
aslam@aslam-Virtual-Machine:~/Documents$
```

13) View the current date and time.

```
aslam@aslam-Virtual-Machine:~/Documents$ date
Tue May 27 03:38:53 PM IST 2025
aslam@aslam-Virtual-Machine:~/Documents$
```

14) Check the system uptime.

```
aslam@aslam-Virtual-Machine:~/Documents$ uptime
15:40:01 up  8:15,  1 user,  load average: 0.00, 0.01, 0.00
aslam@aslam-Virtual-Machine:~/Documents$
```


15) View the running processes.

```
aslam@aslam-Virtual-Machine:~/Documents$ ps -ef
UID          PID    PPID  C STIME TTY          TIME CMD
root           1         0  0  07:24 ?           00:00:06 /sbin/init splash
root           2         0  0  07:24 ?           00:00:00 [kthreadd]
root           3         2  0  07:24 ?           00:00:00 [pool_workqueue_release]
root           4         2  0  07:24 ?           00:00:00 [kworker/R-rcu_gp]
root           5         2  0  07:24 ?           00:00:00 [kworker/R-sync_wq]
root           6         2  0  07:24 ?           00:00:00 [kworker/R-slub_flushwq]
root           7         2  0  07:24 ?           00:00:00 [kworker/R-netns]
root           9         2  0  07:24 ?           00:00:00 [kworker/0:0H-events_highpri]
root          12         2  0  07:24 ?           00:00:00 [kworker/R-mm_percpu_wq]
root          13         2  0  07:24 ?           00:00:00 [rcu_tasks_kthread]
root          14         2  0  07:24 ?           00:00:00 [rcu_tasks_rude_kthread]
root          15         2  0  07:24 ?           00:00:00 [rcu_tasks_trace_kthread]
root          16         2  0  07:24 ?           00:00:00 [ksoftirqd/0]
root          17         2  0  07:24 ?           00:00:03 [rcu_preempt]
root          18         2  0  07:24 ?           00:00:00 [rcu_exp_par_gp_kthread_worker/0]
root          19         2  0  07:24 ?           00:00:00 [rcu_exp_gp_kthread_worker]
root          20         2  0  07:24 ?           00:00:00 [migration/0]
root          21         2  0  07:24 ?           00:00:00 [idle_inject/0]
root          22         2  0  07:24 ?           00:00:00 [cpuhp/0]
root          23         2  0  07:24 ?           00:00:00 [cpuhp/2]
root          24         2  0  07:24 ?           00:00:00 [idle_inject/2]
root          25         2  0  07:24 ?           00:00:00 [migration/2]
root          26         2  0  07:24 ?           00:00:00 [ksoftirqd/2]
root          28         2  0  07:24 ?           00:00:00 [kworker/2:0H-events_highpri]
```

16) Kill a running process.

```
aslam@aslam-Virtual-Machine:~/Documents$ kill -9 30361
bash: kill: (30361) - Operation not permitted
aslam@aslam-Virtual-Machine:~/Documents$ sudo kill -9 30361
[sudo] password for aslam:
aslam@aslam-Virtual-Machine:~/Documents$ ps -ef
UID          PID    PPID  C STIME TTY          TIME CMD
root           1         0  0  07:24 ?           00:00:06 /sbin/init splash
root           2         0  0  07:24 ?           00:00:00 [kthreadd]
root           3         2  0  07:24 ?           00:00:00 [pool_workqueue_release]
root           4         2  0  07:24 ?           00:00:00 [kworker/R-rcu_gp]
root           5         2  0  07:24 ?           00:00:00 [kworker/R-sync_wq]
root           6         2  0  07:24 ?           00:00:00 [kworker/R-slub_flushwq]
root           7         2  0  07:24 ?           00:00:00 [kworker/R-netns]
root           9         2  0  07:24 ?           00:00:00 [kworker/0:0H-events_highpri]
```

17) Install a package using the package manager (e.g., apt or yum).

```
aslam@aslam-Virtual-Machine:~$ sudo apt install git
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  git-man liberror-perl
Suggested packages:
  git-daemon-run | git-daemon-sysvinit git-doc git-email git-gui gitk gitweb git-cvs
  git-mediawiki git-svn
The following NEW packages will be installed:
  git git-man liberror-perl
0 upgraded, 3 newly installed, 0 to remove and 116 not upgraded.
Need to get 4,804 kB of archives.
After this operation, 24.5 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu noble/main amd64 liberror-perl all 0.17029-2 [25.6 kB]
Get:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 git-man all 1:2.43.0-1ubuntu2 [1,100 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 git amd64 1:2.43.0-1ubuntu2 [3,679 kB]
Fetched 4,804 kB in 2s (2,944 kB/s)
Selecting previously unselected package liberror-perl.
(Reading database ... 187930 files and directories currently installed.)
Preparing to unpack .../liberror-perl_0.17029-2_all.deb ...
Unpacking liberror-perl (0.17029-2) ...
Selecting previously unselected package git-man.
Preparing to unpack .../git-man_1%3a2.43.0-1ubuntu7.2_all.deb ...
Unpacking git-man (1:2.43.0-1ubuntu7.2) ...
```

18) Update the system packages.

```
aslam@aslam-Virtual-Machine:~$ sudo apt update
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.6 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [161 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:8 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:10 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [376 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Get:12 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:13 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7,068 B]
Get:14 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:15 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [16.4 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Fetched 1,015 kB in 4s (239 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
116 packages can be upgraded. Run 'apt list --upgradable' to see them.
aslam@aslam-Virtual-Machine:~$
```


19) Create a symbolic link.

```
aslam@aslam-Virtual-Machine:~/Desktop$ ln -s /d1/d2/link.txt
aslam@aslam-Virtual-Machine:~/Desktop$ ls
alphabet  aslam  d1  helloworld.txt  link.txt  test
aslam@aslam-Virtual-Machine:~/Desktop$
```

20) Search for files using the find command.

```
aslam@aslam-Virtual-Machine:~$ sudo find / -name sudoers
/etc/sudoers
/usr/share/doc/sudo/examples/sudoers
/snap/core22/1963/etc/sudoers
/snap/core22/1748/etc/sudoers
find: '/run/user/1000/doc': Permission denied
find: '/run/user/1000/gvfs': Permission denied
aslam@aslam-Virtual-Machine:~$
```

21) Compress and decompress files using tar.

```
aslam@aslam-Virtual-Machine:~$ cd task
aslam@aslam-Virtual-Machine:~/task$ ls
aslam@aslam-Virtual-Machine:~/task$ touch a b c d e 1 2
aslam@aslam-Virtual-Machine:~/task$ ls
1 2 a b c d e
aslam@aslam-Virtual-Machine:~/task$ cd ..
aslam@aslam-Virtual-Machine:~$ tar cvf task.tar task
task/
task/d
task/2
task/b
task/1
task/a
task/e
task/c
aslam@aslam-Virtual-Machine:~$ ls
Desktop  Downloads  Pictures  snap  task.tar  Videos
Documents  Music      Public   task  Templates
aslam@aslam-Virtual-Machine:~$
```

```

aslam@aslam-Virtual-Machine:~$ tar xvf task.tar task
task/
task/d
task/2
task/b
task/1
task/a
task/e
task/c
aslam@aslam-Virtual-Machine:~$ ls
Desktop  Downloads  Pictures  snap  task.tar  Videos
Documents  Music      Public    task  Templates
aslam@aslam-Virtual-Machine:~$ cd task
aslam@aslam-Virtual-Machine:~/task$ ls
1 2 a b c d e
aslam@aslam-Virtual-Machine:~/task$

```

22) Monitor system resources with top or htop.

```

top - 15:43:50 up 8:19, 1 user, load average: 0.00, 0.01, 0.00
tasks: 216 total, 1 running, 215 sleeping, 0 stopped, 0 zombie
Cpu(s): 0.2 us, 0.2 sy, 0.0 ni, 99.6 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 15615.0 total, 10550.0 free, 1423.3 used, 3977.6 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used. 14191.7 avail Mem

```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
2091	aslam	20	0	4822512	385252	144608	S	0.3	2.4	3:53.90	gnome-shell
29479	root	20	0	0	0	0	I	0.3	0.0	0:00.41	kworker/u16:2-event
1	root	20	0	23148	14220	9484	S	0.0	0.1	0:06.08	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_rele
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-slub_flus
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
9	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-events
12	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-mm_percpu
13	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_kthread
14	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_rude_kthr
15	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_trace_kth
16	root	20	0	0	0	0	S	0.0	0.0	0:00.50	ksoftirqd/0
17	root	20	0	0	0	0	I	0.0	0.0	0:03.47	rcu_preempt
18	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_exp_par_gp_kthr
19	root	20	0	0	0	0	S	0.0	0.0	0:00.41	rcu_exp_gp_kthread
20	root	rt	0	0	0	0	S	0.0	0.0	0:00.24	migration/0
21	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
22	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
23	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/2

23) Create and manage user groups.

```
aslam@aslam-Virtual-Machine:~/task$ cat /etc/passwd | grep techiehorizon
techiehorizon:x:1004:1004::/home/techiehorizon:/bin/sh
aslam@aslam-Virtual-Machine:~/task$ usermod -aG accounts techiehorizon
usermod: Permission denied.
usermod: cannot lock /etc/passwd; try again later.
aslam@aslam-Virtual-Machine:~/task$ sudo usermod -aG accounts techiehorizon
aslam@aslam-Virtual-Machine:~/task$ cat /etc/passwd | grep techiehorizon
techiehorizon:x:1004:1004::/home/techiehorizon:/bin/sh
aslam@aslam-Virtual-Machine:~/task$ groups techiehorizon
techiehorizon : techiehorizon accounts
aslam@aslam-Virtual-Machine:~/task$
```

24) Set up SSH password less authentication.

```
asla@Hplaptop MINGW64 ~/Downloads
$ ssh -i "mylinux.pem" admin@ec2-52-23-167-4.compute-1.amazonaws.com
The authenticity of host 'ec2-52-23-167-4.compute-1.amazonaws.com (52.23.167.4)'
can't be established.
ED25519 key fingerprint is SHA256:YhNFKmwV8tEZS1Lg3uNURDINQq6MIgWtZOtyAwad7q8.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:4: 52.23.167.4
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-52-23-167-4.compute-1.amazonaws.com' (ED25519) t
o the list of known hosts.
Linux ip-172-31-76-160 6.1.0-32-cloud-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.12
9-1 (2025-03-06) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
admin@ip-172-31-76-160:~$ |
```

25) Monitor log files using tail or grep.

```
aslam@aslam-Virtual-Machine:~/task$ tail -f /var/log/syslog
2025-05-27T17:17:15.553488+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 33 with keysym 33 (keycode c).
2025-05-27T17:17:15.553514+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 37 with keysym 37 (keycode 10).
2025-05-27T17:17:15.553525+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 38 with keysym 38 (keycode 11).
2025-05-27T17:17:15.553535+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 34 with keysym 34 (keycode d).
2025-05-27T17:17:15.553545+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 39 with keysym 39 (keycode 12).
2025-05-27T17:17:15.553559+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 35 with keysym 35 (keycode e).
2025-05-27T17:17:15.553575+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 36 with keysym 36 (keycode f).
2025-05-27T17:17:15.553591+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 38 with keysym 38 (keycode 11).
2025-05-27T17:17:15.553606+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 37 with keysym 37 (keycode 10).
2025-05-27T17:17:15.553621+05:30 aslam-Virtual-Machine gnome-shell[2091]: Window manager warni
ng: Overwriting existing binding of keysym 39 with keysym 39 (keycode 12).
2025-05-27T17:17:40.223940+05:30 aslam-Virtual-Machine systemd[1]: fprintd.service: Deactivate
```

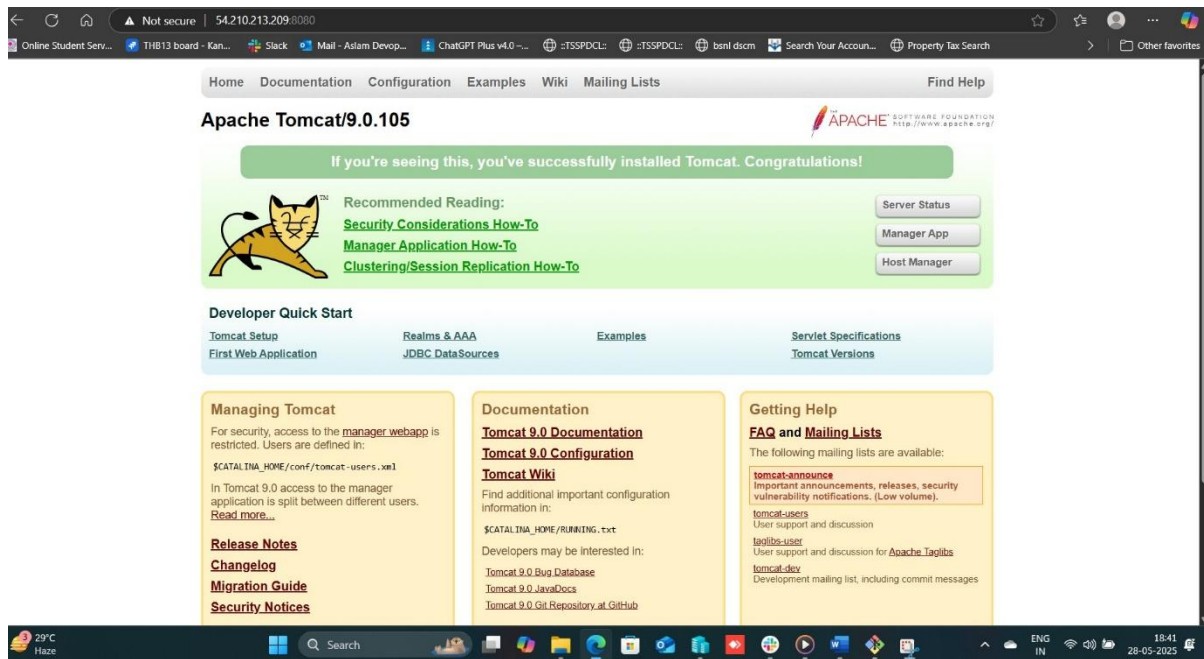

26) Set up a web server (e.g., Apache or Nginx).

```
aslam@aslam-Virtual-Machine:~/Desktop$ sudo lsof -i :80
COMMAND PID    USER  FD  TYPE DEVICE SIZE/OFF NODE NAME
nginx   927    root   5u  IPv4  10063      0t0  TCP *:http (LISTEN)
nginx   927    root   6u  IPv6  10064      0t0  TCP *:http (LISTEN)
nginx   928 www-data 5u  IPv4  10063      0t0  TCP *:http (LISTEN)
nginx   928 www-data 6u  IPv6  10064      0t0  TCP *:http (LISTEN)
nginx   929 www-data 5u  IPv4  10063      0t0  TCP *:http (LISTEN)
nginx   929 www-data 6u  IPv6  10064      0t0  TCP *:http (LISTEN)
nginx   930 www-data 5u  IPv4  10063      0t0  TCP *:http (LISTEN)
nginx   930 www-data 6u  IPv6  10064      0t0  TCP *:http (LISTEN)
nginx   931 www-data 5u  IPv4  10063      0t0  TCP *:http (LISTEN)
nginx   931 www-data 6u  IPv6  10064      0t0  TCP *:http (LISTEN)
aslam@aslam-Virtual-Machine:~/Desktop$ systemctl stop nginx
aslam@aslam-Virtual-Machine:~/Desktop$ sudo lsof -i :80
aslam@aslam-Virtual-Machine:~/Desktop$ sudo systemctl start apache2
aslam@aslam-Virtual-Machine:~/Desktop$ sudo lsof -i :80
COMMAND PID    USER  FD  TYPE DEVICE SIZE/OFF NODE NAME
apache2 5454    root   4u  IPv6  29259      0t0  TCP *:http (LISTEN)
apache2 5456 www-data 4u  IPv6  29259      0t0  TCP *:http (LISTEN)
apache2 5457 www-data 4u  IPv6  29259      0t0  TCP *:http (LISTEN)
```

27) Configure and secure a MySQL Database.

```
start status stop
aslam@ubuntu24:~/Desktop$ systemctl status mysql.service
● mysql.service - MySQL Community Server
   Loaded: loaded (/usr/lib/systemd/system/mysql.service; enabled; preset: en>
   Active: active (running) since Sat 2025-05-31 08:53:03 UTC; 1min 36s ago
   Process: 3721 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=e>
   Main PID: 3730 (mysqld)
     Status: "Server is operational"
    Tasks: 37 (limit: 19102)
   Memory: 363.6M (peak: 378.1M)
      CPU: 4.547s
   CGroup: /system.slice/mysql.service
           └─3730 /usr/sbin/mysqld
```

28) Set up a Application Server (e.g.,Apache Tomcat)



29) create a service file for Apache Tomcat.(Should execute by using systemctl command)

```
[root@ip-172-31-66-207 ~]# systemctl start tomcat
[root@ip-172-31-66-207 ~]# systemctl status tomcat
● tomcat.service - Apache Tomcat Web Application Container
   Loaded: loaded (/etc/systemd/system/tomcat.service; disabled; vendor preset: disabled)
   Active: active (running) since Thu 2025-05-29 12:28:49 UTC; 8s ago
     Process: 30255 ExecStart=/home/ec2-user/tomcat/bin/startup.sh (code=exited, status=0/SUCCESS)
    Main PID: 30268 (Java)
   CGroup: /system.slice/tomcat.service
           └─30268 /usr/bin/java -Djava.util.logging.config.file=/home/ec2-user/tomcat/conf/logging.properties -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djdk.tls.ephemeralDHKeySize=2...

May 29 12:28:49 ip-172-31-66-207.ec2.internal systemd[1]: Starting Apache Tomcat Web Application Container...
May 29 12:28:49 ip-172-31-66-207.ec2.internal startup.sh[30255]: Tomcat started.
May 29 12:28:49 ip-172-31-66-207.ec2.internal systemd[1]: Started Apache Tomcat Web Application Container.
[root@ip-172-31-66-207 ~]# cat /etc/systemd/system/tomcat.service
[Unit]
Description=Apache Tomcat Web Application Container
After=network.target

[Service]
Type=forking

Environment=CATALINA_PID=/home/ec2-user/tomcat/temp/tomcat.pid
Environment=CATALINA_HOME=/home/ec2-user/tomcat
Environment=CATALINA_BASE=/home/ec2-user/tomcat
Environment=CATALINA_OPTS=""
ExecStart=/home/ec2-user/tomcat/bin/startup.sh
ExecStop=/home/ec2-user/tomcat/bin/shutdown.sh

User=root
Group=root
Mask=.0007
Restart=sec10
RestartAlways

[Install]
WantedBy=multi-user.target
[root@ip-172-31-66-207 ~]#
```

30) Print specific columns from a delimited file.


```

aslam@aslam-Virtual-Machine:~/Desktop$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           1.6G  1.6M  1.6G   1% /run
/dev/sda2       125G   11G  108G   9% /
tmpfs           7.7G    0  7.7G   0% /dev/shm
tmpfs           5.0M    0  5.0M   0% /run/lock
tmpfs           1.6G  140K  1.6G   1% /run/user/1000
aslam@aslam-Virtual-Machine:~/Desktop$ df -h | awk '{print $4 }'
Avail
1.6G
108G
7.7G
5.0M
1.6G
aslam@aslam-Virtual-Machine:~/Desktop$

```

31) Filter and print lines based on a specific pattern or condition.

```

[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic
Aslam,001,Mtech,13,scripting
Gopi,002,Btech,13,webservers
ramu,003,btech,13,linux
nikhilesh,004,degree,13,linux
xxx,005,degree,13,introduction
[root@ip-172-31-77-229 tasks]# sed -n '/004/p' aslam.txt
nikhilesh,004,degree,13,linux
[root@ip-172-31-77-229 tasks]# |

```

32) Calculate and print the average, sum, or other statistics of a column.

```
[root@ip-172-31-77-229 tasks]# ls
aslam.txt
[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
xxx,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# awk -F ',' '{sum+=$6} END {print "Sum: " sum; print "Average: " sum/NR}' aslam.txt
Sum: 9000
Average: 1500
[root@ip-172-31-77-229 tasks]# |
```

33) Perform string manipulation, such as extracting substrings or changing case.

```
[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
xxx,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# awk -F ',' '{print toupper($1)}' aslam.txt
STUDENTNAME
ASLAM
GOPI
RAMU
NIKHILESH
XXX
[root@ip-172-31-77-229 tasks]# |
```

34) Count the occurrences of a specific pattern in a file.

```
[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
xxx,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# grep -o "linux" aslam.txt | wc -l
2
[root@ip-172-31-77-229 tasks]# |
```

35) Sort lines based on a specific field or column.


```
root@ip-172-31-77-229:/home/ec2-user/tasks
[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,webserver,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
xxx,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# sort -t ',' -k 6 aslam.txt
Aslam,001,Mtech,13,scripting,1000
ramu,003,btech,13,linux,1000
xxx,005,degree,13,introduction,1000
Gopi,002,Btech,13,webserver,2000
nikhilesh,004,degree,13,linux,4000
Studentname,id,qualification,batch,topic,gymfees
[root@ip-172-31-77-229 tasks]#
```

36) Merge multiple files based on a common field or column.

```

[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,webservers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# cat aslam1.txt
Studentname,id,qualification,batch,topic,gymfees
khan,008,btech,13,bash,5000
amer,009,btech,14,bash,4555
[root@ip-172-31-77-229 tasks]# ls
aslam1.txt  aslam.txt
[root@ip-172-31-77-229 tasks]# { head -n 1 aslam1.txt; tail -n +2 aslam1
tail -n +2 aslam.txt; } > totaldata.txt
[root@ip-172-31-77-229 tasks]# ls
aslam1.txt  aslam.txt  totaldata.txt
[root@ip-172-31-77-229 tasks]# cat totaldata.txt
Studentname,id,qualification,batch,topic,gymfees
khan,008,btech,13,bash,5000
amer,009,btech,14,bash,4555
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,webservers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# |

```

37) Substitute text in a file using search and replace.

```

[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,webservers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
xxx,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# sed -i 's/xxx/salmankhan/g' aslam.txt
[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,webservers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# |

```

38) Delete specific lines based on a pattern or line number.


```
[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# sed '4d' aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# |
```

39) Append or insert text before or after a specific pattern or line.

```
[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# sed '/ramu/amerkhan,006,inter,12,intro,500' aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
ramu,003,btech,13,linux,1000
merkhan,006,inter,12,intro,500
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# |
```

40) Print only specific lines from a file.

```
[root@ip-172-31-77-229 tasks]# cat aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# sed -n '2,4p' aslam.txt
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,web servers,2000
ramu,003,btech,13,linux,1000
[root@ip-172-31-77-229 tasks]# |
```

41) Copy file from linux to windows machine

```
MINGW64:/c/Users/masla/Downloads/test
masla@HpLaptop MINGW64 ~/Downloads/test
$ scp -i linuxm.pem ec2-user@44.203.119.234:/tmp/1731.pdf /c/Users/masla/Downloa
ds/test
1731.pdf                                100% 252KB 75.6KB/s 00:03
masla@HpLaptop MINGW64 ~/Downloads/test
$
masla@HpLaptop MINGW64 ~/Downloads/test
$ ls
1731.pdf  linuxm.pem
masla@HpLaptop MINGW64 ~/Downloads/test
$ |
```

42) 5 use cases for AWK and 5 use cases for sed

Awk cases

```
[root@ip-172-31-77-229 tasks]# awk -F',' '{print $1, $3}' aslam.txt
Studentname qualification
Aslam Mtech
Gopi Btech
ramu btech
nikhilesh degree
salmankhan degree
[root@ip-172-31-77-229 tasks]# |

[root@ip-172-31-77-229 tasks]# awk -F',' '$4 == 13 {print}' aslam.txt
Aslam,001,Mtech,13,scripting,1000
Gopi,002,Btech,13,webrowsers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# |

[root@ip-172-31-77-229 tasks]# awk -F',' '{total+=$6} END {print "Total gym fees:", total}' aslam.txt
Total gym fees: 9000
[root@ip-172-31-77-229 tasks]# |

[root@ip-172-31-77-229 tasks]# awk -F',' '{if ($4 == 13) $7="Active"; else $7="Inactive"; print}' aslam.txt
Studentname id qualification batch topic gymfees Inactive
Aslam 001 Mtech 13 scripting 1000 Active
Gopi 002 Btech 13 webrowsers 2000 Active
ramu 003 btech 13 linux 1000 Active
nikhilesh 004 degree 13 linux 4000 Active
salmankhan 005 degree 13 introduction 1000 Active
[root@ip-172-31-77-229 tasks]# |

[root@ip-172-31-77-229 tasks]# awk -F',' '$1 ~ /khan$/ {print $1}' aslam.txt
salmankhan
[root@ip-172-31-77-229 tasks]# |
```

Sed 5 cases

```
[root@ip-172-31-77-229 tasks]# sed 's/Mtech/MTech/g' aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,MTech,13,scripting,1000
Gopi,002,Btech,13,webservers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# |
```

```
[root@ip-172-31-77-229 tasks]# sed '/ramu/d' aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,MTech,13,scripting,1000
Gopi,002,Btech,13,webservers,2000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
[root@ip-172-31-77-229 tasks]# |
```

```
[root@ip-172-31-77-229 tasks]# sed '$a\john,006,BSC,13,programming,1500' aslam.txt
Studentname,id,qualification,batch,topic,gymfees
Aslam,001,MTech,13,scripting,1000
Gopi,002,Btech,13,webservers,2000
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
salmankhan,005,degree,13,introduction,1000
john,006,BSC,13,programming,1500
[root@ip-172-31-77-229 tasks]# |
```

```
[root@ip-172-31-77-229 tasks]# sed 's/,/ /g;s/ /,/2;s/ /,/3' aslam.txt
Studentname id,qualification batch,topic gymfees
Aslam 001,MTech 13,scripting 1000
Gopi 002,Btech 13,webservers 2000
ramu 003,btech 13,linux 1000
nikhilesh 004,degree 13,linux 4000
salmankhan 005,degree 13,introduction 1000
[root@ip-172-31-77-229 tasks]# |
```

```
salmankhan 005,degree 13,introduction 1000
[root@ip-172-31-77-229 tasks]# sed -n '/linux/p' aslam.txt
ramu,003,btech,13,linux,1000
nikhilesh,004,degree,13,linux,4000
[root@ip-172-31-77-229 tasks]# |
```