


مازن عبدالقواب سعد

Lab 5

1. List the user commands and redirect the output to /tmp/commands.list

`ls -R /bin > /tmp/commands.list`

A terminal window with a dark purple background. The title bar at the top reads 'mazen-saad@mazen-saad: ~'. The prompt is 'mazen-saad@mazen-saad:~\$'. The command 'ls -R /bin > /tmp/commands.list' has been entered and executed. A second prompt 'mazen-saad@mazen-saad:~\$' is visible on the next line, followed by a white cursor block.

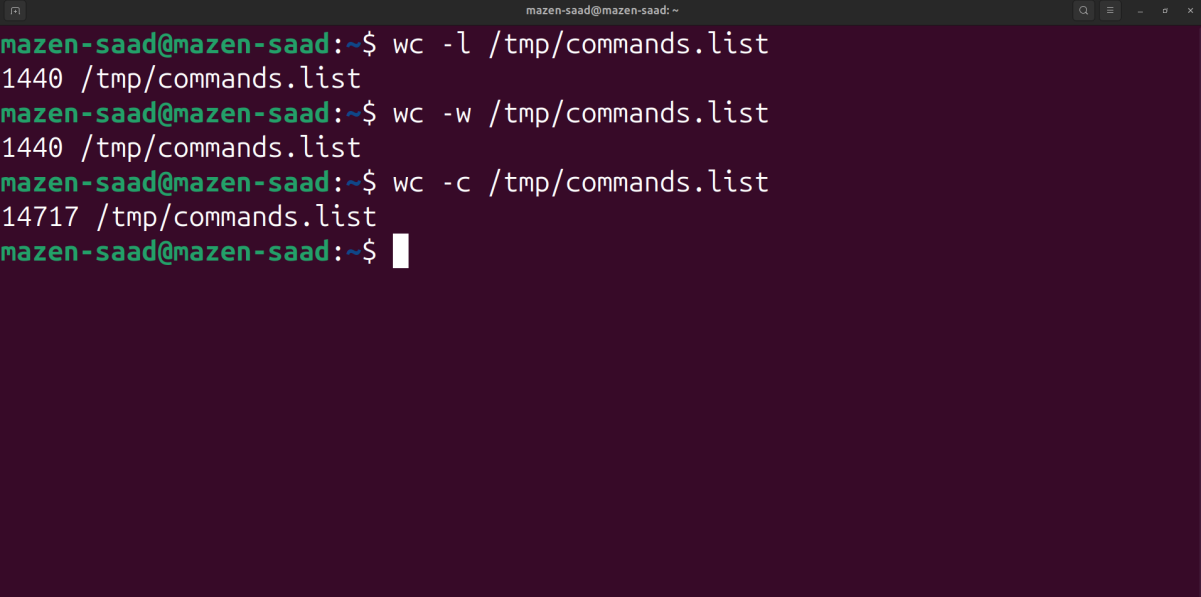
```
mazen-saad@mazen-saad: ~  
mazen-saad@mazen-saad:~$ ls -R /bin > /tmp/commands.list  
mazen-saad@mazen-saad:~$
```

2. Count the number of user commands

```
wc -l /tmp/commands.list
```

```
wc -w /tmp/commands.list
```

```
wc -c /tmp/commands.list
```

A terminal window with a dark purple background and green text. The window title is 'mazen-saad@mazen-saad: ~'. It shows three commands being executed: 'wc -l /tmp/commands.list' resulting in '1440 /tmp/commands.list', 'wc -w /tmp/commands.list' resulting in '1440 /tmp/commands.list', and 'wc -c /tmp/commands.list' resulting in '14717 /tmp/commands.list'. The prompt 'mazen-saad@mazen-saad:~\$' is visible at the end of each line.

```
mazen-saad@mazen-saad:~$ wc -l /tmp/commands.list
1440 /tmp/commands.list
mazen-saad@mazen-saad:~$ wc -w /tmp/commands.list
1440 /tmp/commands.list
mazen-saad@mazen-saad:~$ wc -c /tmp/commands.list
14717 /tmp/commands.list
mazen-saad@mazen-saad:~$
```

3. Get all the users names whose first character in their login is 'g'.

```
grep '^g' /etc/passwd
```

or

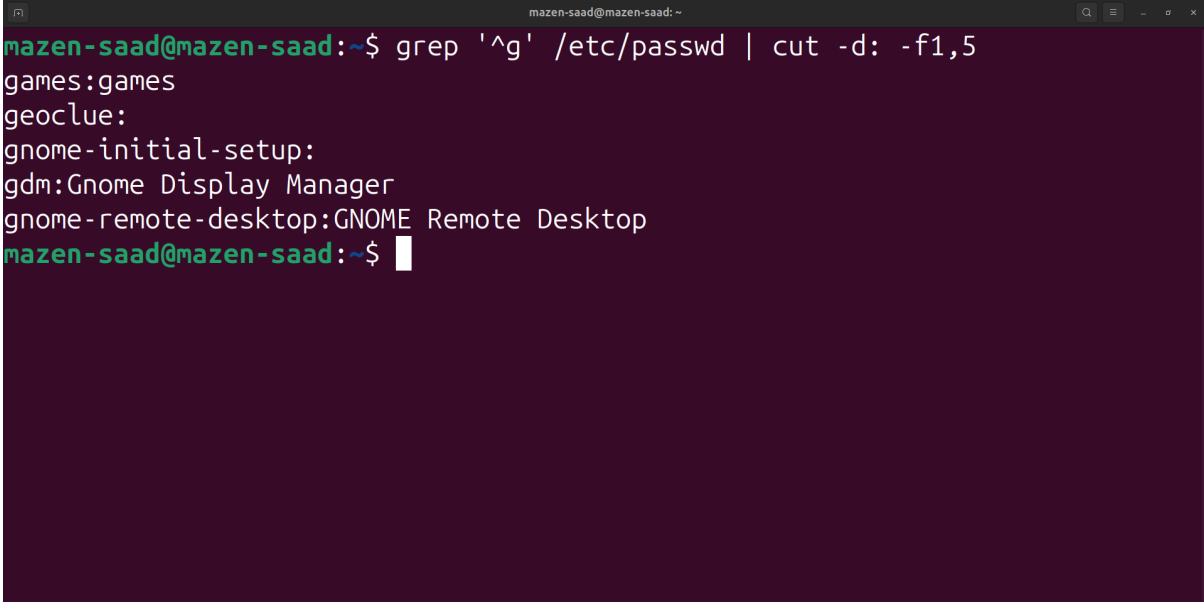
```
cut -d: -f1 /etc/passwd | grep '^g'
```

```
mazen-saad@mazen-saad: ~$ grep '^g' /etc/passwd
games:x:5:60:games:/usr/games:/usr/sbin/nologin
geoclue:x:114:117::/var/lib/geoclue:/usr/sbin/nologin
gnome-initial-setup:x:119:65534::/run/gnome-initial-setup:/bin/false
gdm:x:120:121:Gnome Display Manager:/var/lib/gdm3:/bin/false
gnome-remote-desktop:x:985:985:GNOME Remote Desktop:/var/lib/gnome-remote-de
sktop:/usr/sbin/nologin
mazen-saad@mazen-saad:~$
```

```
mazen-saad@mazen-saad:~$ cut -d: -f1 /etc/passwd | grep '^g'
games
geoclue
gnome-initial-setup
gdm
gnome-remote-desktop
mazen-saad@mazen-saad:~$
```

4. Get the logins name and full names (comment) of logins starts with “g”.

```
grep '^g' /etc/passwd | cut -d: -f1,5
```



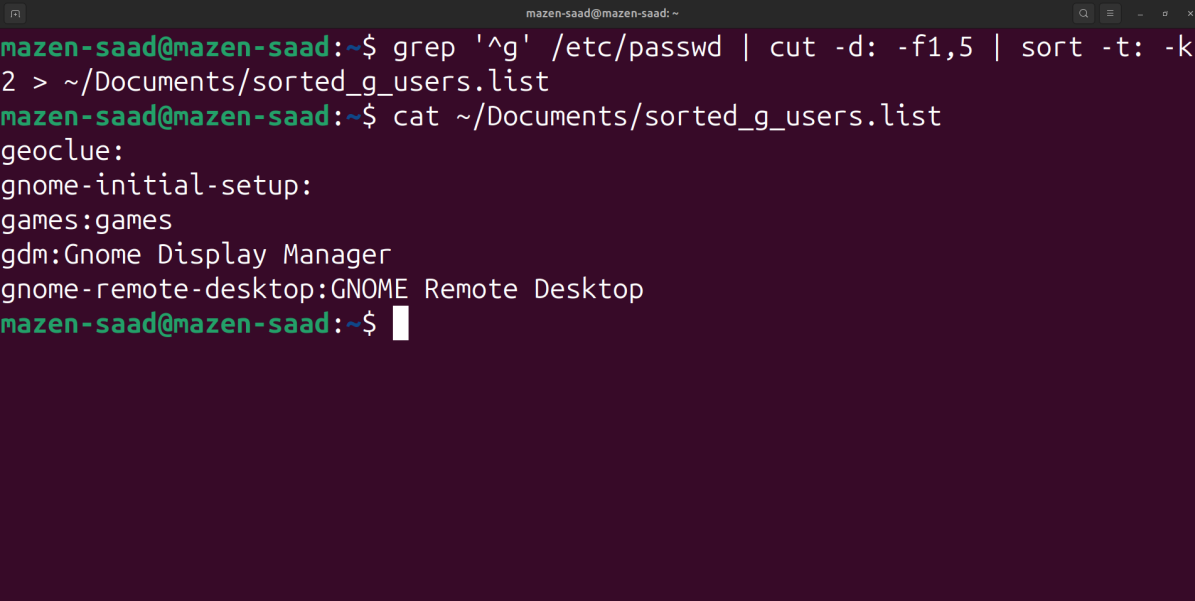
```
mazen-saad@mazen-saad: ~$ grep '^g' /etc/passwd | cut -d: -f1,5
games:games
geoclue:
gnome-initial-setup:
gdm:Gnome Display Manager
gnome-remote-desktop:GNOME Remote Desktop
mazen-saad@mazen-saad: ~$
```

5. Save the output of the last command sorted by their full names in a file.

```
grep '^g' /etc/passwd | cut -d: -f1,5 | sort -t: -k2 >  
~/Documents/sorted_g_users.list
```

or

```
!! | sort -t: -k2 > ~/Documents/sorted_g_users2.list
```



```
mazen-saad@mazen-saad: ~  
mazen-saad@mazen-saad:~$ grep '^g' /etc/passwd | cut -d: -f1,5 | sort -t: -k  
2 > ~/Documents/sorted_g_users.list  
mazen-saad@mazen-saad:~$ cat ~/Documents/sorted_g_users.list  
geoclue:  
gnome-initial-setup:  
games:games  
gdm:Gnome Display Manager  
gnome-remote-desktop:GNOME Remote Desktop  
mazen-saad@mazen-saad:~$
```

6. Write two commands:

first: to search for all files on the system that named .bash_profile.

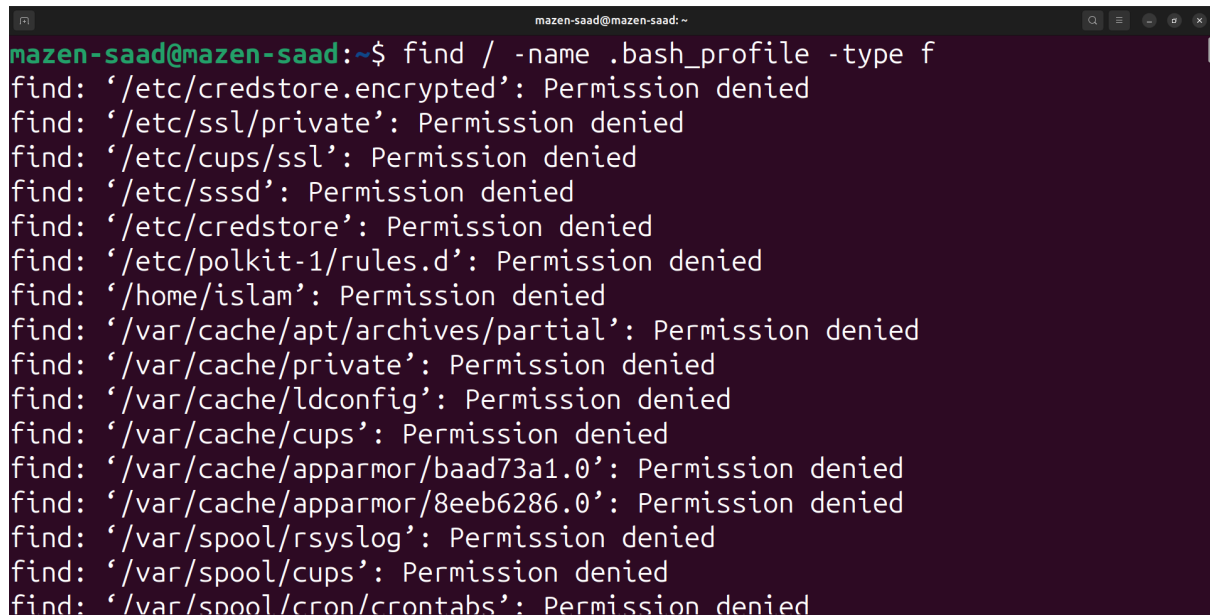
Second: sorts the output of ls command on / recursively, Saving their output and error in 2 different files and sending them to the background.

1-

```
find / -name .bash_profile
```

```
find / -name .bash_profile -type f
```

```
find / -name .bash_profile 2>/dev/null
```

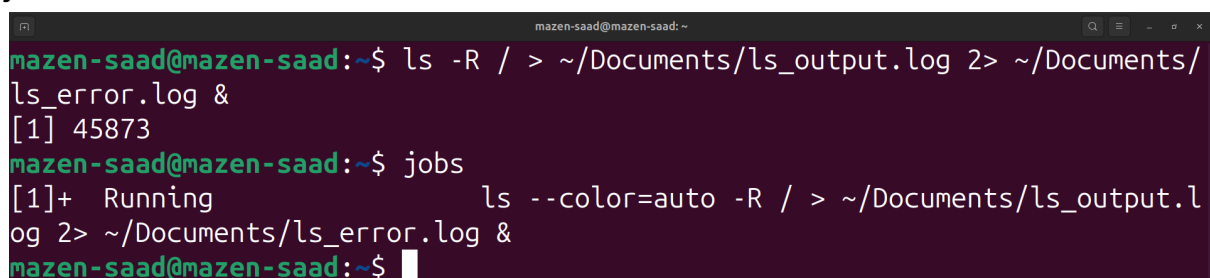
A terminal window with a dark purple background. The prompt is 'mazen-saad@mazen-saad:~'. The command 'find / -name .bash_profile -type f' has been entered. The output consists of 17 lines, each starting with 'find: ' followed by a path and ': Permission denied'. The paths include /etc/credstore.encrypted, /etc/ssl/private, /etc/cups/ssl, /etc/sss, /etc/credstore, /etc/polkit-1/rules.d, /home/islam, /var/cache/apt/archives/partial, /var/cache/private, /var/cache/ldconfig, /var/cache/cups, /var/cache/apparmor/baad73a1.0, /var/cache/apparmor/8eeb6286.0, /var/spool/rsyslog, /var/spool/cups, and /var/spool/cron/crontabs.

```
mazen-saad@mazen-saad:~$ find / -name .bash_profile -type f
find: '/etc/credstore.encrypted': Permission denied
find: '/etc/ssl/private': Permission denied
find: '/etc/cups/ssl': Permission denied
find: '/etc/sss': Permission denied
find: '/etc/credstore': Permission denied
find: '/etc/polkit-1/rules.d': Permission denied
find: '/home/islam': Permission denied
find: '/var/cache/apt/archives/partial': Permission denied
find: '/var/cache/private': Permission denied
find: '/var/cache/ldconfig': Permission denied
find: '/var/cache/cups': Permission denied
find: '/var/cache/apparmor/baad73a1.0': Permission denied
find: '/var/cache/apparmor/8eeb6286.0': Permission denied
find: '/var/spool/rsyslog': Permission denied
find: '/var/spool/cups': Permission denied
find: '/var/spool/cron/crontabs': Permission denied
```

2-

```
ls -R / > ~/Documents/ls_output.log 2> ~/Documents/ls_error.log &
```

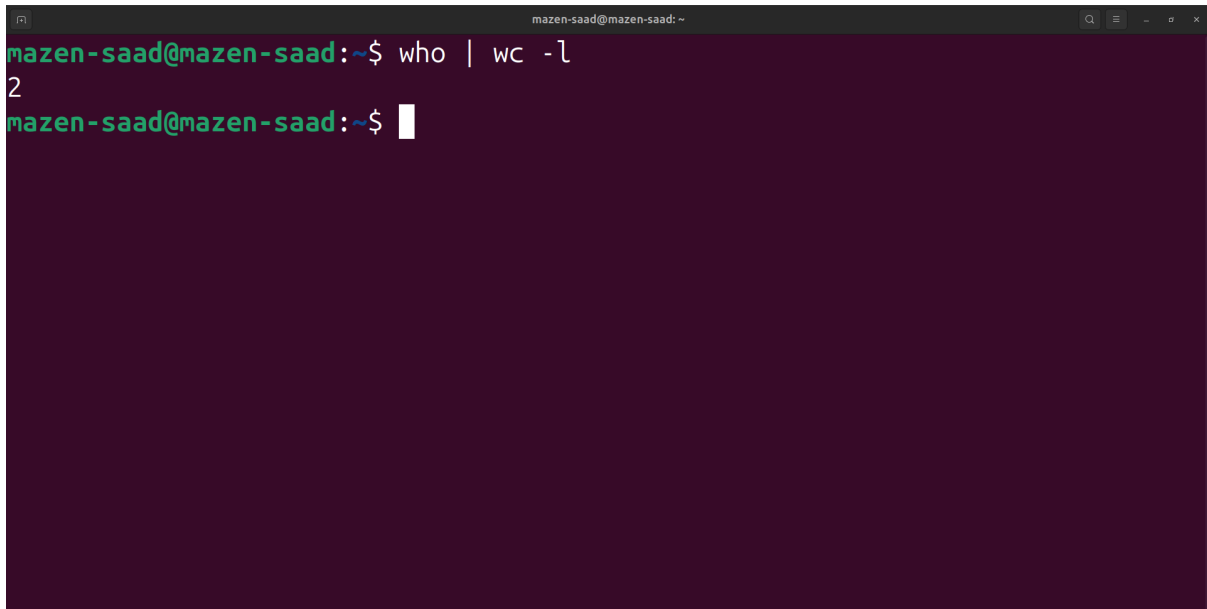
jobs

A terminal window with a dark purple background. The prompt is 'mazen-saad@mazen-saad:~'. The command 'ls -R / > ~/Documents/ls_output.log 2> ~/Documents/ls_error.log &' has been entered. The output shows '[1] 45873'. Then, the command 'jobs' is entered, and the output shows '[1]+ Running ls --color=auto -R / > ~/Documents/ls_output.l' followed by 'og 2> ~/Documents/ls_error.log &'. The prompt is now 'mazen-saad@mazen-saad:~\$'.

```
mazen-saad@mazen-saad:~$ ls -R / > ~/Documents/ls_output.log 2> ~/Documents/ls_error.log &
[1] 45873
mazen-saad@mazen-saad:~$ jobs
[1]+  Running                  ls --color=auto -R / > ~/Documents/ls_output.l
og 2> ~/Documents/ls_error.log &
mazen-saad@mazen-saad:~$
```

7. Display the number of users who is logged now to the system.

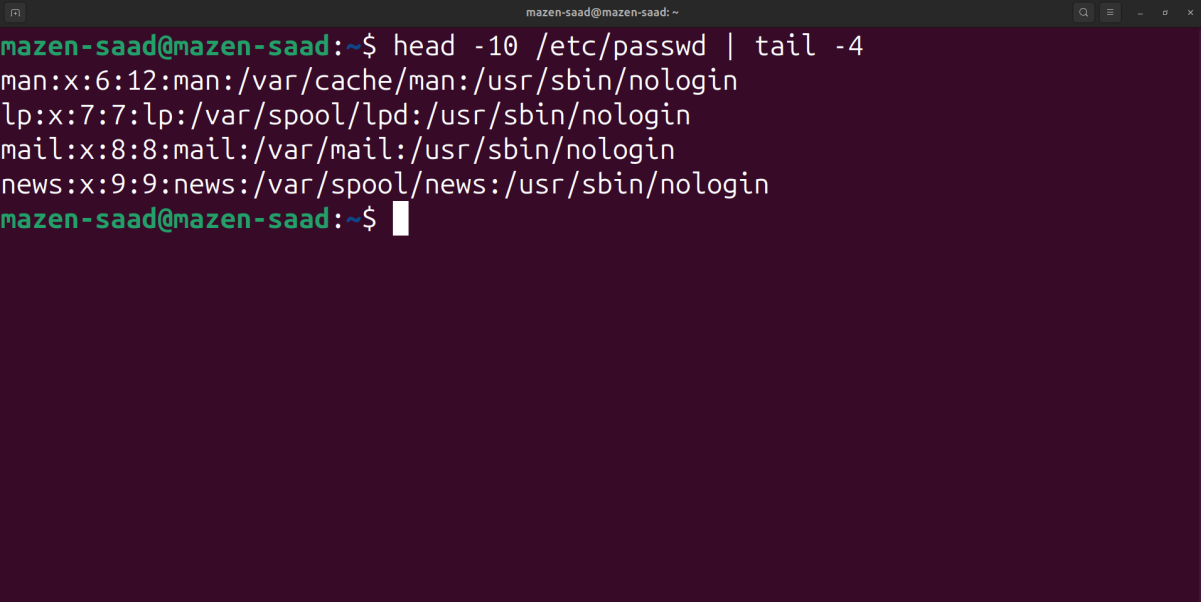
`who | wc -l`

A terminal window with a dark purple background. The title bar at the top reads 'mazen-saad@mazen-saad: ~'. The prompt is 'mazen-saad@mazen-saad:~\$'. The command 'who | wc -l' has been entered and executed. The output '2' is displayed on the line immediately following the command. The prompt 'mazen-saad@mazen-saad:~\$' is shown again on the next line, followed by a white cursor block.

```
mazen-saad@mazen-saad:~$ who | wc -l
2
mazen-saad@mazen-saad:~$
```


8. Display lines 7 to line 10 of /etc/passwd file

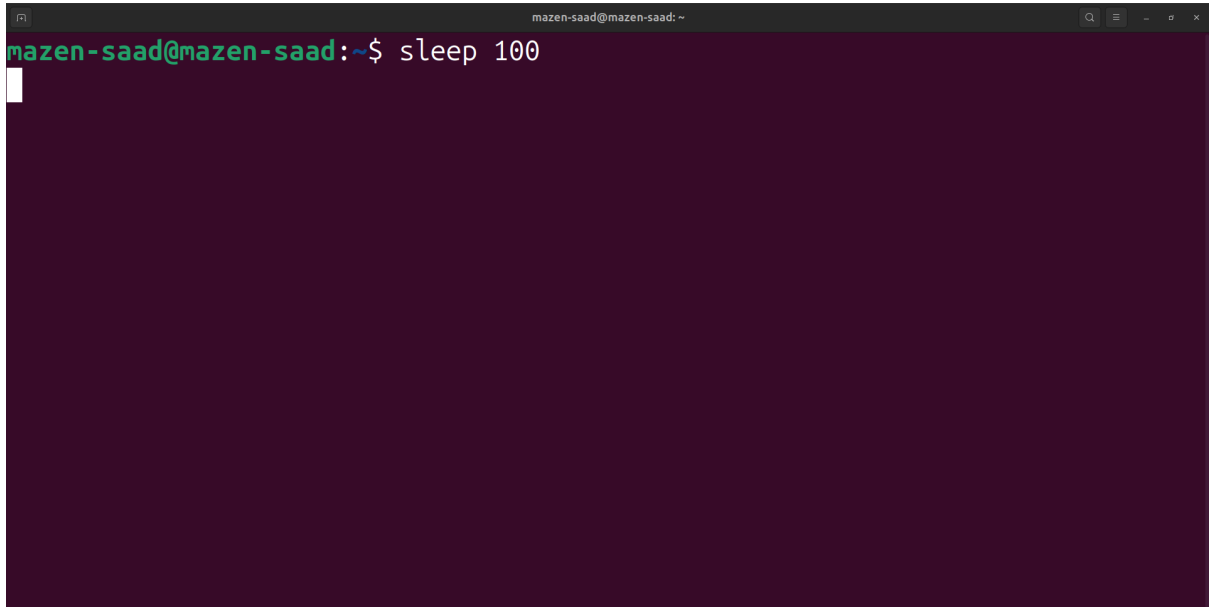
`head -10 /etc/passwd | tail -4`

A terminal window with a dark purple background. The title bar at the top reads 'mazen-saad@mazen-saad: ~'. The prompt is 'mazen-saad@mazen-saad:~\$'. The command 'head -10 /etc/passwd | tail -4' has been entered and executed. The output shows four lines of the /etc/passwd file: 'man:x:6:12:man:/var/cache/man:/usr/sbin/nologin', 'lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin', 'mail:x:8:8:mail:/var/mail:/usr/sbin/nologin', and 'news:x:9:9:news:/var/spool/news:/usr/sbin/nologin'. The prompt 'mazen-saad@mazen-saad:~\$' is visible again at the bottom, followed by a white cursor block.

```
mazen-saad@mazen-saad:~$ head -10 /etc/passwd | tail -4
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
mazen-saad@mazen-saad:~$
```

9. Issue the command sleep 100.

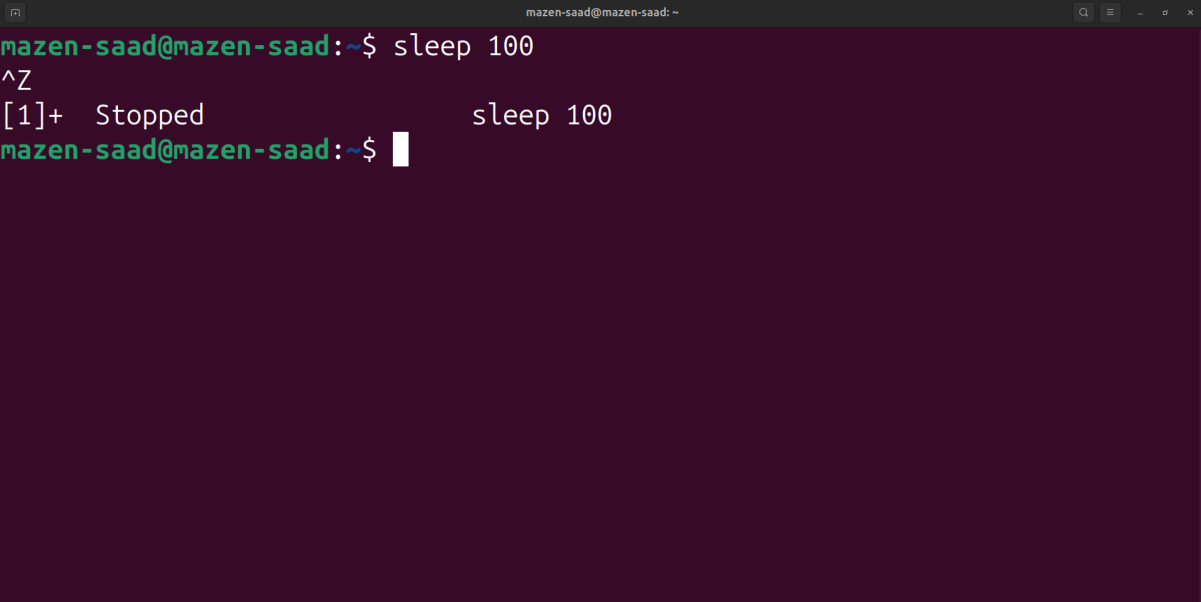
sleep 100

A terminal window with a dark background. The title bar at the top reads "mazen-saad@mazen-saad: ~". The prompt "mazen-saad@mazen-saad:~\$" is followed by the command "sleep 100". A white cursor is positioned at the end of the command line.

```
mazen-saad@mazen-saad:~$ sleep 100
```

10. Stop the last command.

cntrl+z(Stopped)

A terminal window with a dark purple background. The prompt is 'mazen-saad@mazen-saad: ~\$'. The user enters 'sleep 100'. Then, they press Ctrl+Z, which results in '^Z' being displayed. This is followed by '[1]+ Stopped' and 'sleep 100' on the same line. The prompt returns to 'mazen-saad@mazen-saad: ~\$' with a white cursor. The window title bar at the top shows 'mazen-saad@mazen-saad: ~' and standard window controls.

```
mazen-saad@mazen-saad: ~$ sleep 100
^Z
[1]+  Stopped                  sleep 100
mazen-saad@mazen-saad: ~$
```

11. Resume the last command in the background

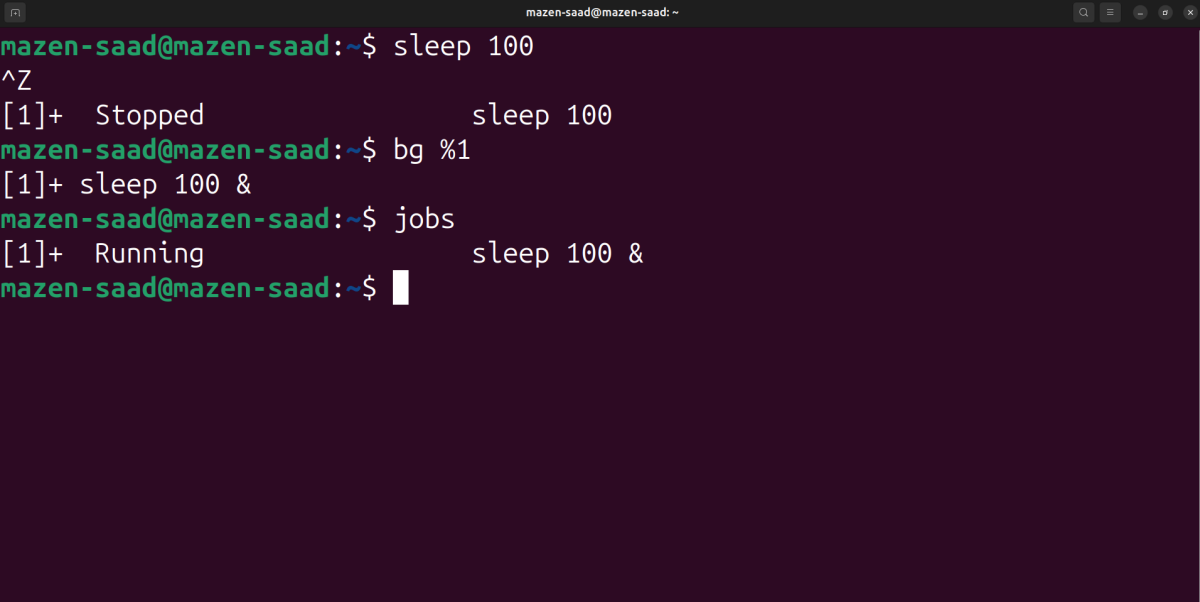
`bg %1`



```
mazen-saad@mazen-saad: ~$ sleep 100
^Z
[1]+  Stopped                  sleep 100
mazen-saad@mazen-saad:~$ jobs
[1]+  Stopped                  sleep 100
mazen-saad@mazen-saad:~$ bg %1
[1]+ sleep 100 &
mazen-saad@mazen-saad:~$
```

12. Issue the jobs command and see its output.

jobs

A terminal window with a dark purple background and green text. The window title is 'mazen-saad@mazen-saad: ~'. The user enters 'sleep 100', followed by '^Z'. The prompt changes to '[1]+ Stopped sleep 100'. The user then enters 'bg %1', and the prompt changes to '[1]+ sleep 100 &'. Finally, the user enters 'jobs', and the prompt changes to '[1]+ Running sleep 100 &'. The terminal ends with the prompt 'mazen-saad@mazen-saad:~\$' and a white cursor.


```
mazen-saad@mazen-saad:~$ sleep 100
^Z
[1]+  Stopped                  sleep 100
mazen-saad@mazen-saad:~$ bg %1
[1]+  sleep 100 &
mazen-saad@mazen-saad:~$ jobs
[1]+  Running                  sleep 100 &
mazen-saad@mazen-saad:~$
```

13. Send the sleep command to the foreground and send it again to the background.

fg %1

ctrl+z => ^Z

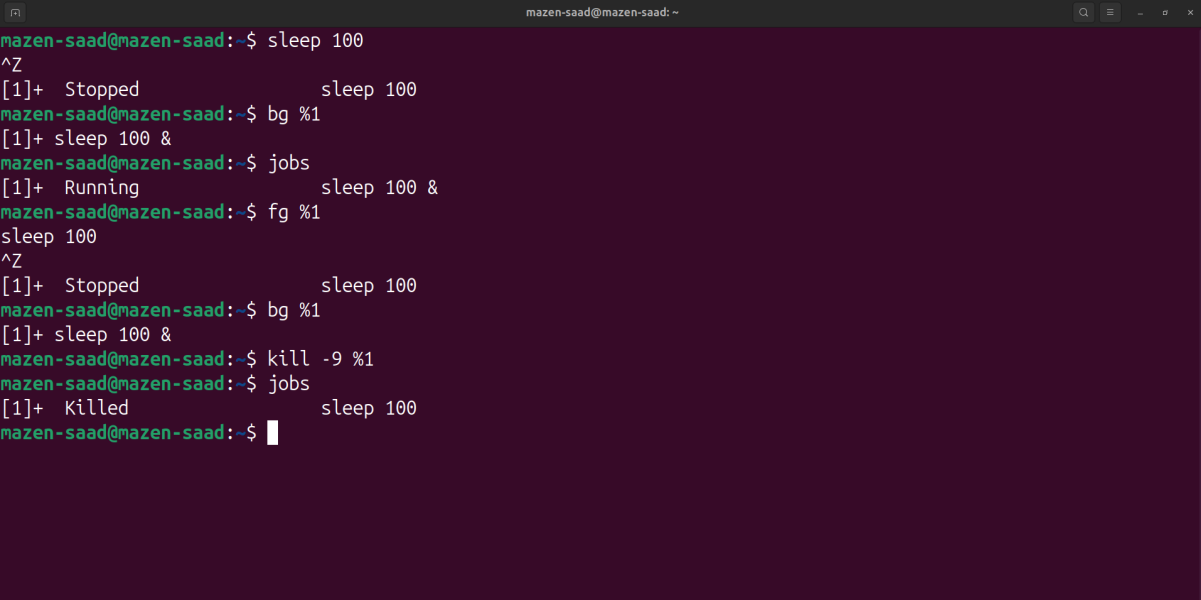
bg %1



```
mazen-saad@mazen-saad: ~$ sleep 100
^Z
[1]+  Stopped                  sleep 100
mazen-saad@mazen-saad: ~$ bg %1
[1]+  sleep 100 &
mazen-saad@mazen-saad: ~$ jobs
[1]+  Running                  sleep 100 &
mazen-saad@mazen-saad: ~$ fg %1
sleep 100
^Z
[1]+  Stopped                  sleep 100
mazen-saad@mazen-saad: ~$ bg %1
[1]+  sleep 100 &
mazen-saad@mazen-saad: ~$
```

14. Kill the sleep command.

kill -9 %1



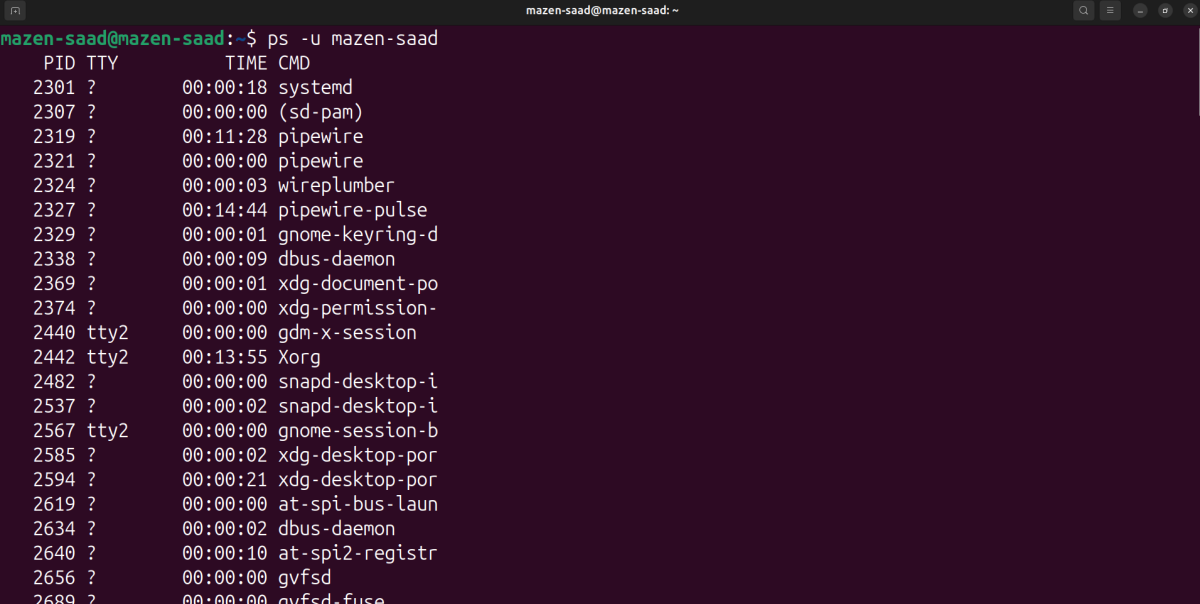
```
mazen-saad@mazen-saad:~$ sleep 100
^Z
[1]+  Stopped                  sleep 100
mazen-saad@mazen-saad:~$ bg %1
[1]+  sleep 100 &
mazen-saad@mazen-saad:~$ jobs
[1]+  Running                  sleep 100 &
mazen-saad@mazen-saad:~$ fg %1
sleep 100
^Z
[1]+  Stopped                  sleep 100
mazen-saad@mazen-saad:~$ bg %1
[1]+  sleep 100 &
mazen-saad@mazen-saad:~$ kill -9 %1
mazen-saad@mazen-saad:~$ jobs
[1]+  Killed                   sleep 100
mazen-saad@mazen-saad:~$
```

15. Display your processes only

`ps -u $(whoami)`

or

`ps -u mazen-saad`



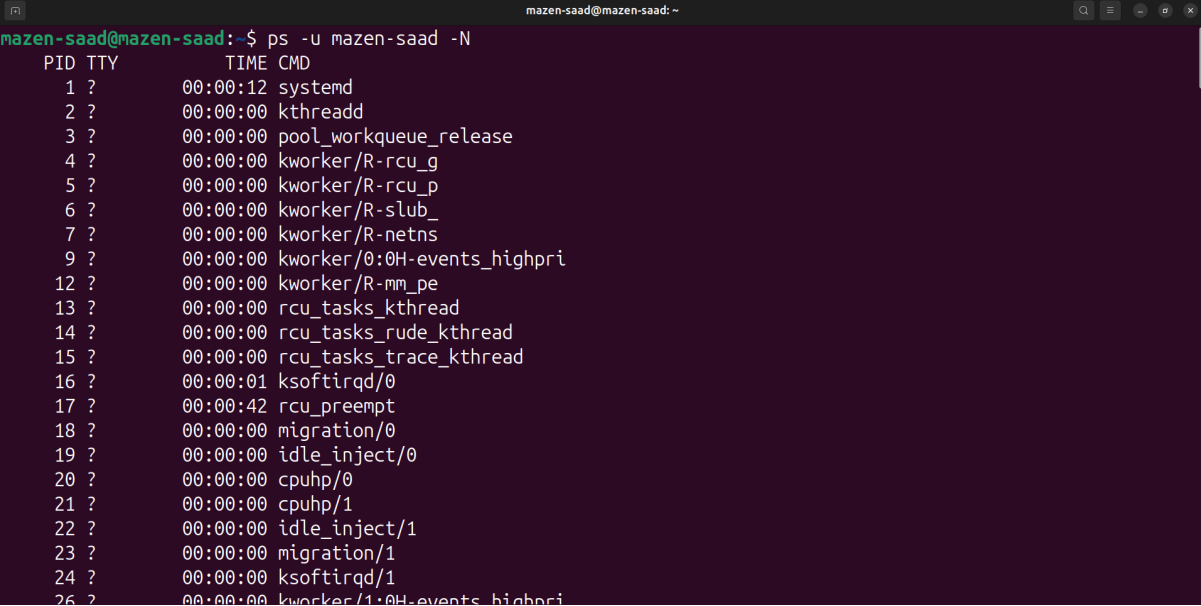
```
mazen-saad@mazen-saad:~$ ps -u mazen-saad
  PID TTY          TIME CMD
 2301 ?        00:00:18 systemd
 2307 ?        00:00:00 (sd-pam)
 2319 ?        00:11:28 pipewire
 2321 ?        00:00:00 pipewire
 2324 ?        00:00:03 wireplumber
 2327 ?        00:14:44 pipewire-pulse
 2329 ?        00:00:01 gnome-keyring-d
 2338 ?        00:00:09 dbus-daemon
 2369 ?        00:00:01 xdg-document-po
 2374 ?        00:00:00 xdg-permission-
 2440 tty2      00:00:00 gdm-x-session
 2442 tty2      00:13:55 Xorg
 2482 ?        00:00:00 snapd-desktop-i
 2537 ?        00:00:02 snapd-desktop-i
 2567 tty2      00:00:00 gnome-session-b
 2585 ?        00:00:02 xdg-desktop-por
 2594 ?        00:00:21 xdg-desktop-por
 2619 ?        00:00:00 at-spi-bus-laun
 2634 ?        00:00:02 dbus-daemon
 2640 ?        00:00:10 at-spi2-registr
 2656 ?        00:00:00 gvfsd
 2689 ?        00:00:00 gvfsd-fuse
```


16. Display all processes except yours

`ps -u $(whoami) -N`

or

`ps -u mazen-saad -N`



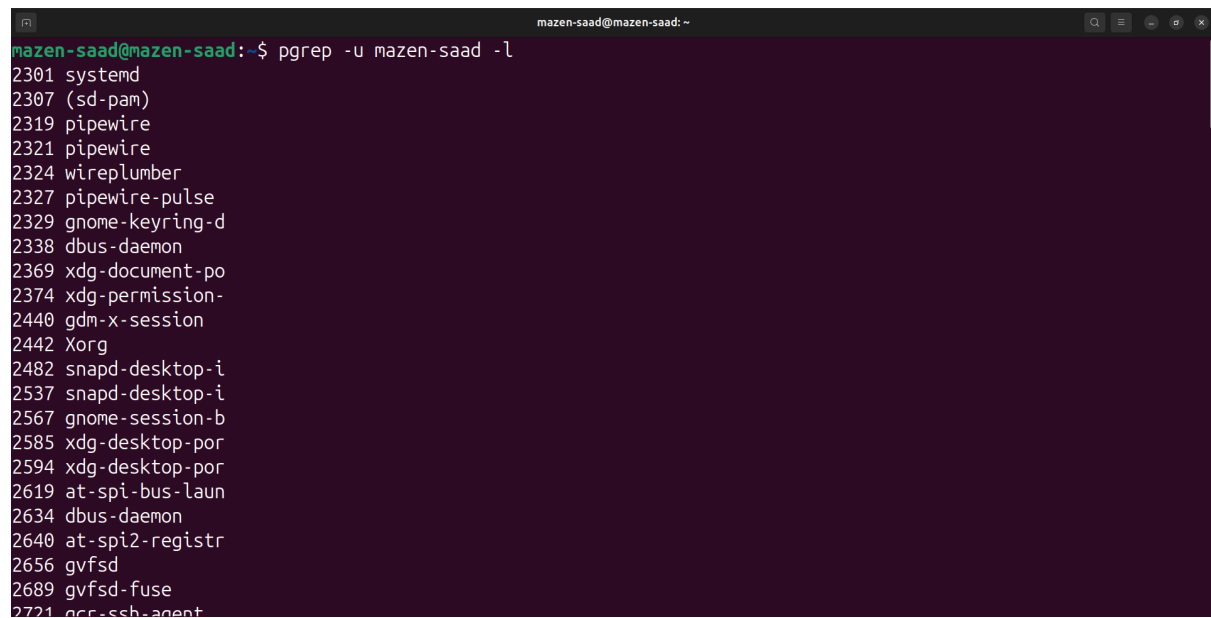
```
mazen-saad@mazen-saad:~$ ps -u mazen-saad -N
PID TTY          TIME CMD
  1 ?            00:00:12 systemd
  2 ?            00:00:00 kthreadd
  3 ?            00:00:00 pool_workqueue_release
  4 ?            00:00:00 kworker/R-rcu_g
  5 ?            00:00:00 kworker/R-rcu_p
  6 ?            00:00:00 kworker/R-slub_
  7 ?            00:00:00 kworker/R-netns
  9 ?            00:00:00 kworker/0:0H-events_highpri
 12 ?            00:00:00 kworker/R-mm_pe
 13 ?            00:00:00 rcu_tasks_kthread
 14 ?            00:00:00 rcu_tasks_rude_kthread
 15 ?            00:00:00 rcu_tasks_trace_kthread
 16 ?            00:00:01 ksoftirqd/0
 17 ?            00:00:42 rcu_preempt
 18 ?            00:00:00 migration/0
 19 ?            00:00:00 idle_inject/0
 20 ?            00:00:00 cpuhp/0
 21 ?            00:00:00 cpuhp/1
 22 ?            00:00:00 idle_inject/1
 23 ?            00:00:00 migration/1
 24 ?            00:00:00 ksoftirqd/1
 26 ?            00:00:00 kworker/1:0H-events_highpri
```

17. Use the pgrep command to list your processes only

```
pgrep -u $(whoami) -l
```

or

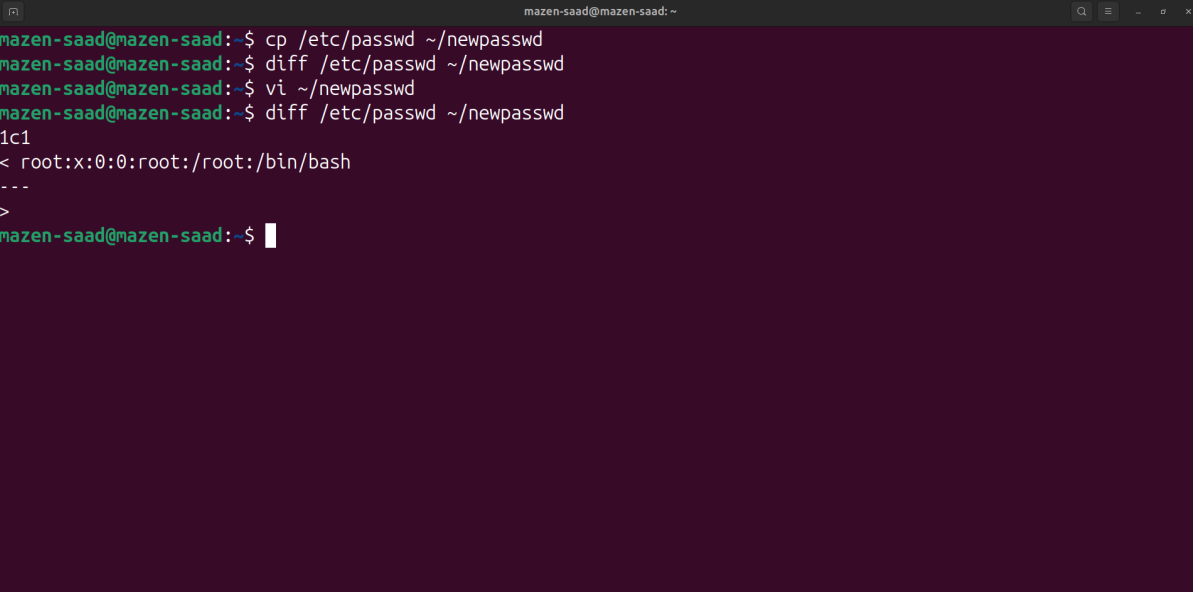
```
pgrep -u mazen-saad -l
```

A terminal window with a dark purple background and white text. The window title is 'mazen-saad@mazen-saad: ~'. The prompt is 'mazen-saad@mazen-saad:~\$'. The command entered is 'pgrep -u mazen-saad -l'. The output lists various system and user processes with their PIDs. The list is as follows:

```
mazen-saad@mazen-saad:~$ pgrep -u mazen-saad -l
2301 systemd
2307 (sd-pam)
2319 pipewire
2321 pipewire
2324 wireplumber
2327 pipewire-pulse
2329 gnome-keyring-d
2338 dbus-daemon
2369 xdg-document-po
2374 xdg-permission-
2440 gdm-x-session
2442 Xorg
2482 snapd-desktop-i
2537 snapd-desktop-i
2567 gnome-session-b
2585 xdg-desktop-por
2594 xdg-desktop-por
2619 at-spi-bus-laun
2634 dbus-daemon
2640 at-spi2-registr
2656 gvfsd
2689 gvfsd-fuse
2721 gcr-ssh-agent
```

18. Copy /etc/passwd to your home directory, use the commands diff and Edit in the

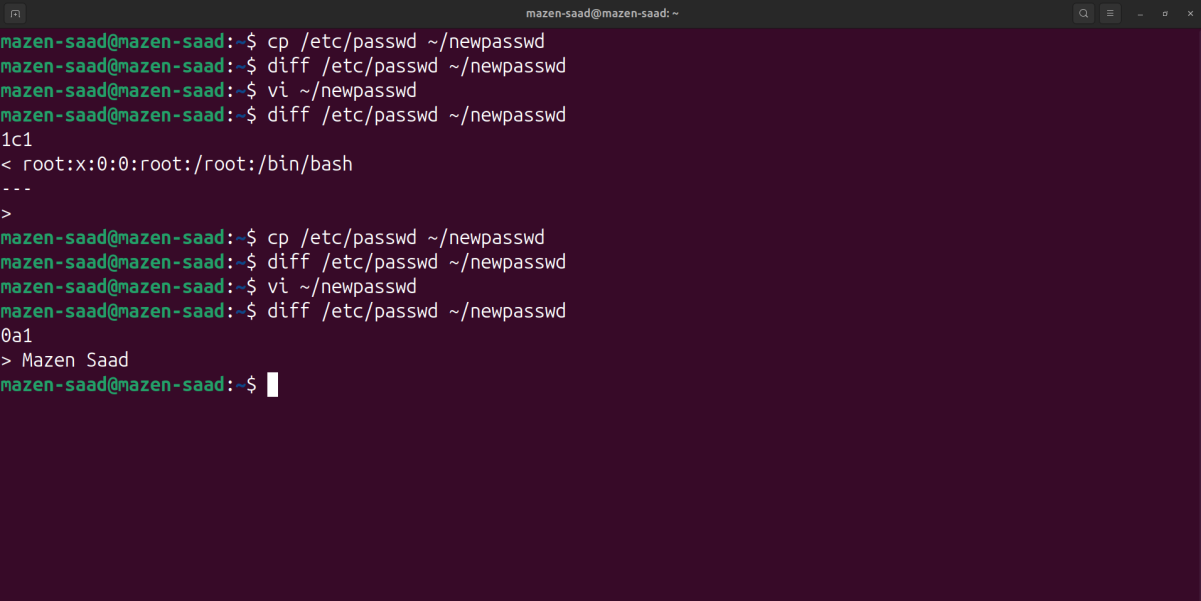
```
cp /etc/passwd ~/newpasswd
diff /etc/passwd ~/newpasswd
vi ~/newpasswd
diff /etc/passwd ~/newpasswd
```



```
mazen-saad@mazen-saad: ~  
mazen-saad@mazen-saad:~$ cp /etc/passwd ~/newpasswd  
mazen-saad@mazen-saad:~$ diff /etc/passwd ~/newpasswd  
mazen-saad@mazen-saad:~$ vi ~/newpasswd  
mazen-saad@mazen-saad:~$ diff /etc/passwd ~/newpasswd  
1c1  
< root:x:0:0:root:/root:/bin/bash  
---  
>  
mazen-saad@mazen-saad:~$
```

19. file you copied, and then use these command again, and check the output.

```
cp /etc/passwd ~/newpasswd
diff /etc/passwd ~/newpasswd
vi ~/newpasswd
diff /etc/passwd ~/newpasswd
```



```
mazen-saad@mazen-saad: ~  
mazen-saad@mazen-saad:~$ cp /etc/passwd ~/newpasswd  
mazen-saad@mazen-saad:~$ diff /etc/passwd ~/newpasswd  
mazen-saad@mazen-saad:~$ vi ~/newpasswd  
mazen-saad@mazen-saad:~$ diff /etc/passwd ~/newpasswd  
1c1  
< root:x:0:0:root:/root:/bin/bash  
---  
>  
mazen-saad@mazen-saad:~$ cp /etc/passwd ~/newpasswd  
mazen-saad@mazen-saad:~$ diff /etc/passwd ~/newpasswd  
mazen-saad@mazen-saad:~$ vi ~/newpasswd  
mazen-saad@mazen-saad:~$ diff /etc/passwd ~/newpasswd  
0a1  
> Mazen Saad  
mazen-saad@mazen-saad:~$
```

20. List the inode numbers of /, /etc, /etc/hosts.

ls -li /

ls -li /etc

ls -li /etc/hosts

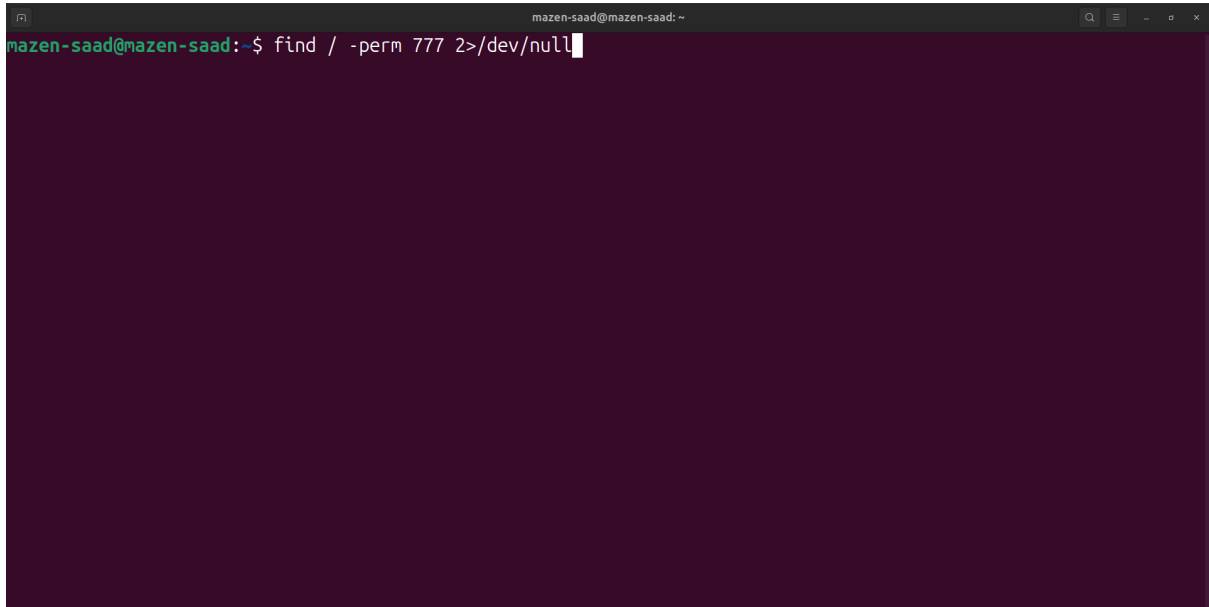
```
mazen-saad@mazen-saad:~$ ls -li /
12 bin
3407873 bin.usr-is-merged
6815745 boot
2883585 cdrom
1 dev
3670017 etc
5111809 home
13 lib
14 lib64
393217 lib.usr-is-merged
11 lost+found
3538945 media
4063233 mnt
9830401 opt
1 proc
5636097 root
1 run
15/sbin
10616833/sbin.usr-is-merged
6291457 snap
11403265 srv
16 swap.img
1 sys
5242881 tmp
7995393 usr
786433 var
```

```
mazen-saad@mazen-saad: ~  
mazen-saad@mazen-saad:~$ ls -i /etc  
3670383 adduser.conf      3670405 hdparm.conf      3672776 prime-discrete  
3672878 adjtime              3670406 host.conf        3670442 profile  
3670030 alsa                  3672767 hostname         3670114 profile.d  
3670031 alternatives          3670407 hosts            3670443 protocols  
3670384 anacrontab           3670409 hosts.allow      3670115 pulse  
3670385 apg.conf             3670410 hosts.deny       3670117 python3  
3670032 apm                  3670080 hp               3670116 python3.12  
3670034 apparmor            3670081 ifplugd          3670118 rc0.d  
3670033 apparmor.d           3670083 init             3670119 rc1.d  
3670035 apport              3670082 init.d           3670120 rc2.d  
3670036 apt                 3670084 initramfs-tools  3670121 rc3.d  
3670037 avahi                3670411 inputrc         3670122 rc4.d  
3670386 bash.bashrc          3670085 inserv.conf.d    3670123 rc5.d  
3670387 bash_completion     3670086 ipp-usb          3670124 rc6.d  
3670388 bindresvport.blacklist 3670087 iproute2         3670125 rcS.d  
3670038 binfmt.d            3670412 issue           3670021 resolv.conf  
3670039 bluetooth            3670413 issue.net        3670022 rmt  
3670389 brlapi.key           3670088 kernel           3670444 rpc  
3670040 brltty               3670414 kerneloops.conf 3670445 rsyslog.conf  
3670390 brltty.conf          3670089 krb5.conf.d      3670126 rsyslog.d  
3670041 ca-certificates       3670091 ldap             3670446 rygel.conf  
3670391 ca-certificates.conf 3670284 ld.so.cache      3670127 sane.d  
3670042 chatscripts           3670416 ld.so.conf       3670128 security
```

```
mazen-saad@mazen-saad: ~  
mazen-saad@mazen-saad:~$ ls -i /etc/hosts  
3670407 /etc/hosts  
mazen-saad@mazen-saad:~$
```

21. Find all the files whose permissions are 777.

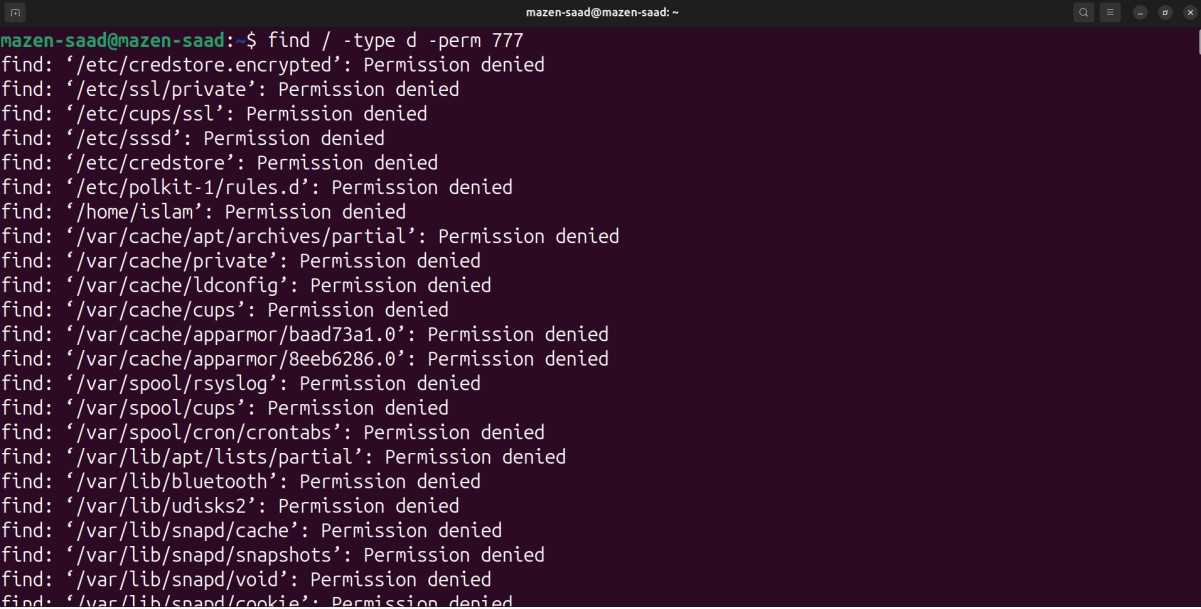
```
find / -perm 777
```

A terminal window with a dark purple background. The title bar at the top reads 'mazen-saad@mazen-saad: ~'. The prompt is 'mazen-saad@mazen-saad:~\$'. The command 'find / -perm 777 2>/dev/null' is entered and the cursor is at the end of the line. The rest of the terminal is empty.

```
mazen-saad@mazen-saad:~$ find / -perm 777 2>/dev/null
```

22. Find all 777 permission directories.

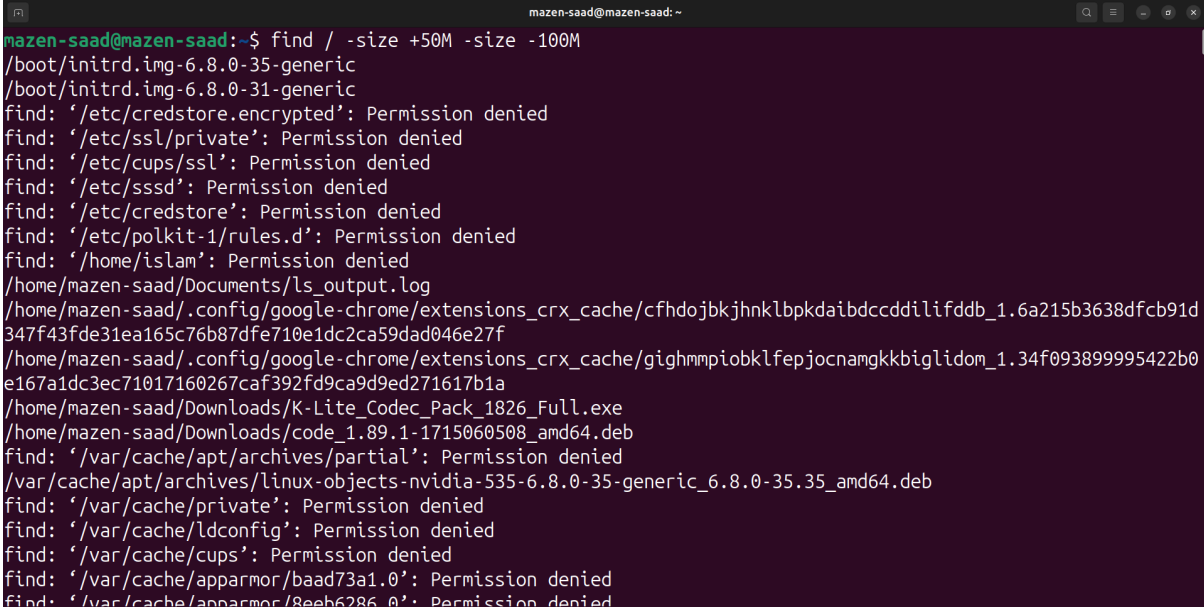
```
find / -type d -perm 777
```



```
mazen-saad@mazen-saad:~$ find / -type d -perm 777
find: '/etc/credstore.encrypted': Permission denied
find: '/etc/ssl/private': Permission denied
find: '/etc/cups/ssl': Permission denied
find: '/etc/sss': Permission denied
find: '/etc/credstore': Permission denied
find: '/etc/polkit-1/rules.d': Permission denied
find: '/home/islam': Permission denied
find: '/var/cache/apt/archives/partial': Permission denied
find: '/var/cache/private': Permission denied
find: '/var/cache/ldconfig': Permission denied
find: '/var/cache/cups': Permission denied
find: '/var/cache/apparmor/baad73a1.0': Permission denied
find: '/var/cache/apparmor/8eeb6286.0': Permission denied
find: '/var/spool/rsyslog': Permission denied
find: '/var/spool/cups': Permission denied
find: '/var/spool/cron/crontabs': Permission denied
find: '/var/lib/apt/lists/partial': Permission denied
find: '/var/lib/bluetooth': Permission denied
find: '/var/lib/udisks2': Permission denied
find: '/var/lib/snapd/cache': Permission denied
find: '/var/lib/snapd/snapshots': Permission denied
find: '/var/lib/snapd/void': Permission denied
find: '/var/lib/snapd/cookie': Permission denied
```


23. find all the files which are greater than 50MB and less than 100MB.

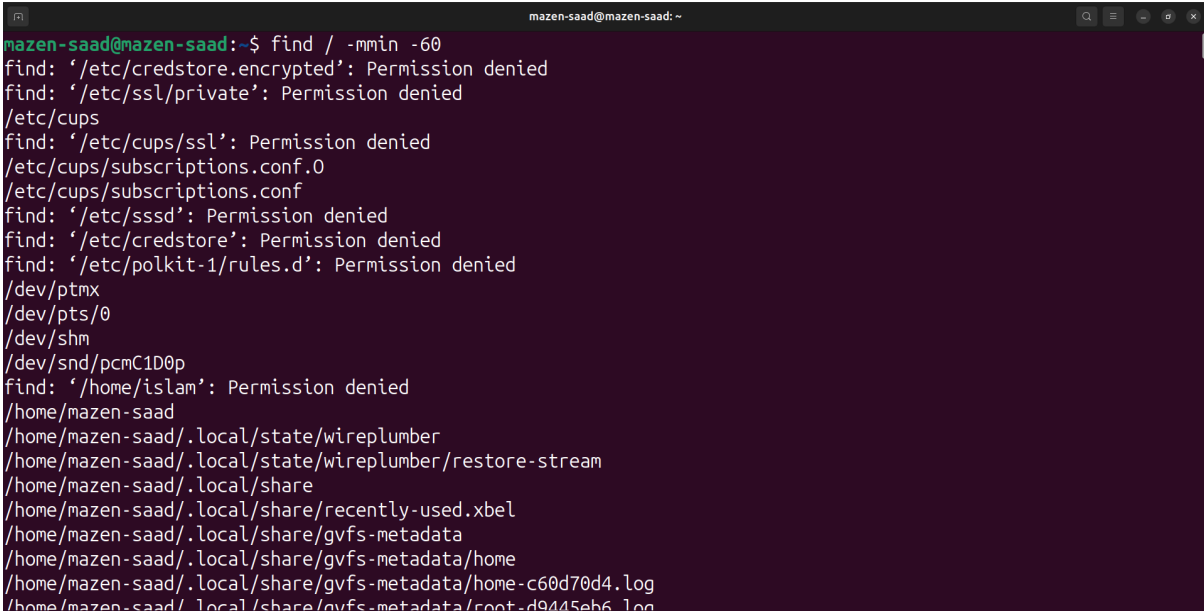
`find / -size +50M -size -100M`



```
mazen-saad@mazen-saad:~$ find / -size +50M -size -100M
/boot/initrd.img-6.8.0-35-generic
/boot/initrd.img-6.8.0-31-generic
find: '/etc/credstore.encrypted': Permission denied
find: '/etc/ssl/private': Permission denied
find: '/etc/cups/ssl': Permission denied
find: '/etc/sss': Permission denied
find: '/etc/credstore': Permission denied
find: '/etc/polkit-1/rules.d': Permission denied
find: '/home/islam': Permission denied
/home/mazen-saad/Documents/ls_output.log
/home/mazen-saad/.config/google-chrome/extensions_crx_cache/cfhdojbkjhnlbpkdaibdccdilifddb_1.6a215b3638dfcb91d
347f43fde31ea165c76b87dfe710e1dc2ca59dad046e27f
/home/mazen-saad/.config/google-chrome/extensions_crx_cache/gighmmpiobklfepjocnamgkbbiglidom_1.34f093899995422b0
e167a1dc3ec71017160267caf392fd9ca9d9ed271617b1a
/home/mazen-saad/Downloads/K-Lite_Codec_Pack_1826_Full.exe
/home/mazen-saad/Downloads/code_1.89.1-1715060508_amd64.deb
find: '/var/cache/apt/archives/partial': Permission denied
/var/cache/apt/archives/linux-objects-nvidia-535-6.8.0-35-generic_6.8.0-35.35_amd64.deb
find: '/var/cache/private': Permission denied
find: '/var/cache/ldconfig': Permission denied
find: '/var/cache/cups': Permission denied
find: '/var/cache/apparmor/baad73a1.0': Permission denied
find: '/var/cache/apparmor/8eeb6286.0': Permission denied
```

24. find all the files which are modified in the last 1 hour.

`find / -mmin -60`



```
mazen-saad@mazen-saad: ~  
mazen-saad@mazen-saad:~$ find / -mmin -60  
find: '/etc/credstore.encrypted': Permission denied  
find: '/etc/ssl/private': Permission denied  
/etc/cups  
find: '/etc/cups/ssl': Permission denied  
/etc/cups/subscriptions.conf.0  
/etc/cups/subscriptions.conf  
find: '/etc/sss': Permission denied  
find: '/etc/credstore': Permission denied  
find: '/etc/polkit-1/rules.d': Permission denied  
/dev/ptmx  
/dev/pts/0  
/dev/shm  
/dev/snd/pcmC1D0p  
find: '/home/islam': Permission denied  
/home/mazen-saad  
/home/mazen-saad/.local/state/wireplumber  
/home/mazen-saad/.local/state/wireplumber/restore-stream  
/home/mazen-saad/.local/share  
/home/mazen-saad/.local/share/recently-used.xbel  
/home/mazen-saad/.local/share/gvfs-metadata  
/home/mazen-saad/.local/share/gvfs-metadata/home  
/home/mazen-saad/.local/share/gvfs-metadata/home-c60d70d4.log  
/home/mazen-saad/.local/share/gvfs-metadata/root-d9445eb6.log
```

25. Compress a file by compress, gzip, bzip2 commands and decompress it again. State the differences between compress, gzip, bzip2 commands.

```
ls -R / > ~/Documents/file25.txt 2> /dev/null
```

```
du -sh ~/Documents/file25.txt
```

```
compress ~/Documents/file25.txt
```

```
du -sh ~/Documents/file25.txt.Z
```

```
uncompress ~/Documents/file25.txt.Z
```

```
gzip ~/Documents/file25.txt
```

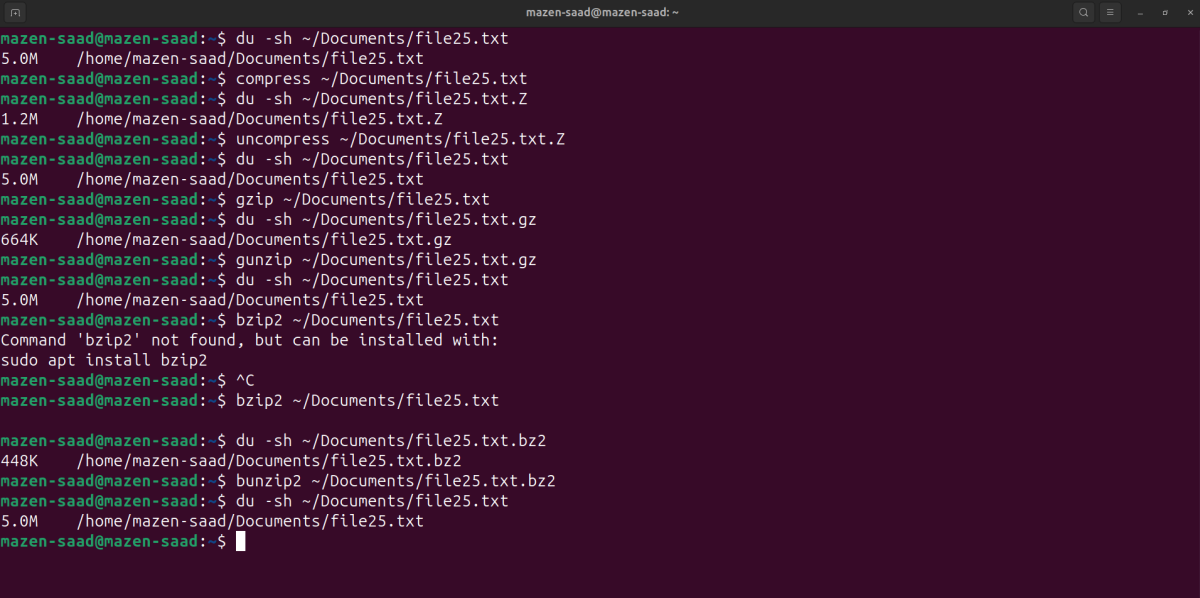
```
du -sh ~/Documents/file25.txt.gz
```

```
gunzip ~/Documents/file25.txt.gz
```

```
bzip2 ~/Documents/file25.txt
```

```
du -sh ~/Documents/file25.txt.bz2
```

```
bunzip2 ~/Documents/file25.txt.bz2
```

A terminal window titled 'mazen-saad@mazen-saad: ~' showing a series of commands and their outputs. The commands are: 1. 'du -sh ~/Documents/file25.txt' with output '5.0M /home/mazen-saad/Documents/file25.txt'. 2. 'compress ~/Documents/file25.txt' with output '1.2M /home/mazen-saad/Documents/file25.txt.Z'. 3. 'uncompress ~/Documents/file25.txt.Z' with output '5.0M /home/mazen-saad/Documents/file25.txt'. 4. 'gzip ~/Documents/file25.txt' with output '664K /home/mazen-saad/Documents/file25.txt.gz'. 5. 'gunzip ~/Documents/file25.txt.gz' with output '5.0M /home/mazen-saad/Documents/file25.txt'. 6. 'bzip2 ~/Documents/file25.txt' with an error message: 'Command 'bzip2' not found, but can be installed with: sudo apt install bzip2'. 7. '^C' (Ctrl-C). 8. 'bzip2 ~/Documents/file25.txt' (re-run). 9. 'du -sh ~/Documents/file25.txt.bz2' with output '448K /home/mazen-saad/Documents/file25.txt.bz2'. 10. 'bunzip2 ~/Documents/file25.txt.bz2' with output '5.0M /home/mazen-saad/Documents/file25.txt'. 11. 'du -sh ~/Documents/file25.txt' with output '5.0M /home/mazen-saad/Documents/file25.txt'. The prompt 'mazen-saad@mazen-saad: ~\$' is shown at the end.

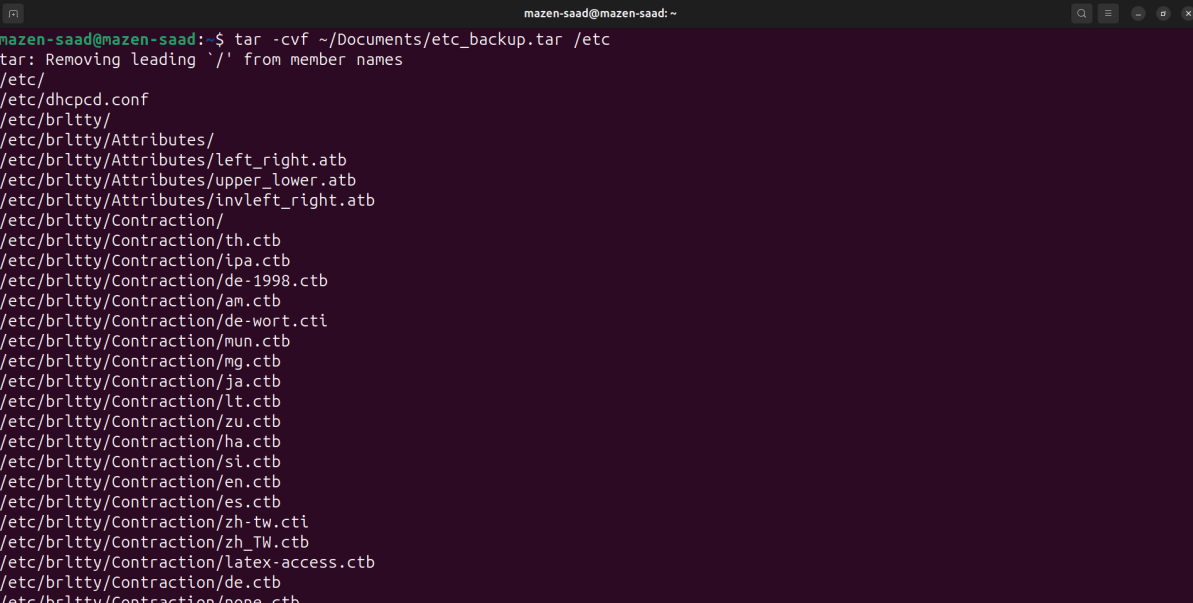
```
mazen-saad@mazen-saad: ~$ du -sh ~/Documents/file25.txt
5.0M /home/mazen-saad/Documents/file25.txt
mazen-saad@mazen-saad: ~$ compress ~/Documents/file25.txt
1.2M /home/mazen-saad/Documents/file25.txt.Z
mazen-saad@mazen-saad: ~$ uncompress ~/Documents/file25.txt.Z
5.0M /home/mazen-saad/Documents/file25.txt
mazen-saad@mazen-saad: ~$ gzip ~/Documents/file25.txt
664K /home/mazen-saad/Documents/file25.txt.gz
mazen-saad@mazen-saad: ~$ gunzip ~/Documents/file25.txt.gz
5.0M /home/mazen-saad/Documents/file25.txt
mazen-saad@mazen-saad: ~$ bzip2 ~/Documents/file25.txt
Command 'bzip2' not found, but can be installed with:
sudo apt install bzip2
mazen-saad@mazen-saad: ~$ ^C
mazen-saad@mazen-saad: ~$ bzip2 ~/Documents/file25.txt
mazen-saad@mazen-saad: ~$ du -sh ~/Documents/file25.txt.bz2
448K /home/mazen-saad/Documents/file25.txt.bz2
mazen-saad@mazen-saad: ~$ bunzip2 ~/Documents/file25.txt.bz2
5.0M /home/mazen-saad/Documents/file25.txt
mazen-saad@mazen-saad: ~$ du -sh ~/Documents/file25.txt
5.0M /home/mazen-saad/Documents/file25.txt
mazen-saad@mazen-saad: ~$
```

26. Backup /etc directory using tar utility.

`tar -cvf ~/Documents/etc_backup.tar /etc`

or

`sudo tar -cvf ~/Documents/etc_backup.tar /etc`



```
mazen-saad@mazen-saad: ~  
mazen-saad@mazen-saad:~$ tar -cvf ~/Documents/etc_backup.tar /etc  
tar: Removing leading '/' from member names  
./etc/  
./etc/dhcpd.conf  
./etc/brlty/  
./etc/brlty/Attributes/  
./etc/brlty/Attributes/left_right.atb  
./etc/brlty/Attributes/upper_lower.atb  
./etc/brlty/Attributes/invleft_right.atb  
./etc/brlty/Contraction/  
./etc/brlty/Contraction/th.ctb  
./etc/brlty/Contraction/ipa.ctb  
./etc/brlty/Contraction/de-1998.ctb  
./etc/brlty/Contraction/am.ctb  
./etc/brlty/Contraction/de-wort.cti  
./etc/brlty/Contraction/mun.ctb  
./etc/brlty/Contraction/mg.ctb  
./etc/brlty/Contraction/ja.ctb  
./etc/brlty/Contraction/lt.ctb  
./etc/brlty/Contraction/zu.ctb  
./etc/brlty/Contraction/ha.ctb  
./etc/brlty/Contraction/si.ctb  
./etc/brlty/Contraction/en.ctb  
./etc/brlty/Contraction/es.ctb  
./etc/brlty/Contraction/zh-tw.cti  
./etc/brlty/Contraction/zh_TW.ctb  
./etc/brlty/Contraction/latex-access.ctb  
./etc/brlty/Contraction/de.ctb  
./etc/brlty/Contraction/none.ctb
```