

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

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ compgen -c > /tmp/commands.list
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$
```

2. Count the number of user commands

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ compgen -c | wc -l
4132
```

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

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ cut -d: -f1 /etc/passwd | egrep "^g"
games
geoclue
gnome-initial-setup
gdm
gnome-remote-desktop
```

4. Get the logins name and full names (comment) of logins starts with "gu".

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ tail -l /etc/passwd | cut -d: -f1,5 | egrep "^gu"
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$
```

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

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ tail -l /etc/passwd | cut -d: -f1,5 | egrep "^gu" |
sort -t: -k2 > file
```

6. Write two commands: first: to search for all files on the system that named .bash_profile.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ find / -name .bash_profile
find: '/snap/core18/2823/etc/ssl/private': Permission denied
find: '/snap/core18/2823/root': Permission denied
find: '/snap/core18/2823/var/cache/ldconfig': Permission denied
find: '/snap/core18/2823/var/lib/private': Permission denied
find: '/snap/core18/2829/etc/ssl/private': Permission denied
find: '/snap/core18/2829/root': Permission denied
find: '/snap/core18/2829/var/cache/ldconfig': Permission denied
find: '/snap/core18/2829/var/lib/private': Permission denied
find: '/snap/core22/1380/etc/polkit-1/localauthority': Permission denied
find: '/snap/core22/1380/etc/ssl/private': Permission denied
find: '/snap/core22/1380/root': Permission denied
find: '/snap/core22/1380/var/cache/ldconfig': Permission denied
find: '/snap/core22/1380/var/cache/private': Permission denied
find: '/snap/core22/1380/var/lib/polkit-1': Permission denied
find: '/snap/core22/1380/var/lib/private': Permission denied
find: '/snap/core22/1380/var/lib/snapd/void': Permission denied
find: '/snap/vlc/3777/etc/ssl/private': Permission denied
find: '/snap/core20/2318/etc/ssl/private': Permission denied
find: '/snap/core20/2318/root': Permission denied
find: '/snap/core20/2318/var/cache/ldconfig': Permission denied
find: '/snap/core20/2318/var/cache/private': Permission denied
find: '/snap/core20/2318/var/lib/private': Permission denied
find: '/snap/core20/2318/var/lib/snapd/void': Permission denied
/home/abdelrahman-abdelhady/Desktop/.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.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ ls -lR / > output 2> err &
[1] 9900
```

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

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ who
abdelrahman-abdelhady seat0      2024-06-28 23:04 (login screen)
abdelrahman-abdelhady tty2      2024-06-28 23:04 (tty2)
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ who | wc -l
2
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$
```

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

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ head -n 10 /etc/passwd | tail -n +7
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
```

9. What happens if you execute:

- cat filename1 | cat filename2 : cat will echo the content of filename1 then pass it as input to after pipe , that will print the content of the first file .
- ls | rm : it will delete files and directors that displayed by ls.
- ls /etc/passwd | wc -l : it will count the lines of this file and print the count number .

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

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ compgen -c > /tmp/commands.list
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$
```

2. Compress a file by compress, gzip, pack, zip commands and decompress it again.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ compress aa
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ uncompress aa.Z
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ gzip aa
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ gunzip aa.gz
```

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ pack aa aa
Packing aa into aa...

Input size: 0
Output size: 4
```

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ pack u aa aa.z
Unpacking aa into aa.z...

Input size: 4
Output size: 0
0%
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$
```

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ zip aa.zip aa
adding: aa (stored 0%)
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ unzip aa.zip
Archive: aa.zip
replace aa? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
extracting: aa
```

State the differences between compress and gzip commands.

gzip is more better performance , compatibility with various tools and faster than compress.

3. What is the command used to view the content of a compressed file.

-bzip filename

4. Backup /etc directory using tar utility.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ sudo tar cvf etcBackup.tar /etc
[sudo] password for abdelrahman-abdelhady:
tar: Removing leading '/' from member names
/etc/
/etc/pki/
/etc/pki/fwupd-metadata/
/etc/pki/fwupd-metadata/GPG-KEY-Linux-Vendor-Firmware-Service
/etc/pki/fwupd-metadata/LVFS-CA.pem
/etc/pki/fwupd-metadata/GPG-KEY-Linux-Foundation-Metadata
/etc/pki/fwupd/
/etc/pki/fwupd/GPG-KEY-Linux-Foundation-Firmware
```

5. Starting from your home directory, find all files that were modified in the last two day.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ find ~ -type f -mtime -2
/home/abdelrahman-abdelhady/snap/snap-store/1147/.local/share/snap-store/snap-store.json
/home/abdelrahman-abdelhady/snap/snap-store/1147/.last_revision
/home/abdelrahman-abdelhady/snap/snap-store/1147/.config/user-dirs.dirs
/home/abdelrahman-abdelhady/snap/snap-store/1147/.config/user-dirs.dirs.md5sum
/home/abdelrahman-abdelhady/snap/snap-store/1147/.config/fontconfig/fonts.conf
/home/abdelrahman-abdelhady/snap/snap-store/1147/.config/user-dirs.locale.md5sum
/home/abdelrahman-abdelhady/snap/snap-store/common/.cache/snap-store/images/b7e64cc0-07a9-1053-81d5-653c30b152f0.png
/home/abdelrahman-abdelhady/snap/snap-store/common/.cache/snap-store/images/61fdbdb0-07a0-1053-81d5-653c30b152f0.png
/home/abdelrahman-abdelhady/snap/snap-store/common/.cache/snap-store/images/603b57c0-07a1-1053-81d5-653c30b152f0.png
```

6. Starting from /etc, find files owned by root user.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ sudo find /etc -type f -user root
/etc/pki/fwupd-metadata/GPG-KEY-Linux-Vendor-Firmware-Service
/etc/pki/fwupd-metadata/LVFS-CA.pem
/etc/pki/fwupd-metadata/GPG-KEY-Linux-Foundation-Metadata
/etc/pki/fwupd/GPG-KEY-Linux-Foundation-Firmware
/etc/pki/fwupd/GPG-KEY-Linux-Vendor-Firmware-Service
/etc/pki/fwupd/LVFS-CA.pem
/etc/ppp/options.pptp
/etc/ppp/pap-secrets
/etc/ppp/ip-down
```

7. Find all directories in your home directory.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ find ~ -type d
/home/abdelrahman-abdelhady
/home/abdelrahman-abdelhady/Music
/home/abdelrahman-abdelhady/snap
/home/abdelrahman-abdelhady/snap/snap-store
/home/abdelrahman-abdelhady/snap/snap-store/1147
/home/abdelrahman-abdelhady/snap/snap-store/1147/.local
/home/abdelrahman-abdelhady/snap/snap-store/1147/.local/share
/home/abdelrahman-abdelhady/snap/snap-store/1147/.local/share/snap-store
/home/abdelrahman-abdelhady/snap/snap-store/1147/.local/share/glib-2.0
```

8. Write a command to search for all files on the system that, its name is “.profile”.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ sudo find / -type f -name ".profile"
/snap/core18/2823/etc/skel/.profile
/snap/core18/2823/root/.profile
/snap/core18/2829/etc/skel/.profile
/snap/core18/2829/root/.profile
/snap/core22/1380/etc/skel/.profile
/snap/core22/1380/root/.profile
/snap/core20/2318/etc/skel/.profile
/snap/core20/2318/root/.profile
/home/abdelrahman-abdelhady/.profile
/etc/skel/.profile
/root/.profile
```

14. List the user commands that have set-uid permissions in the system.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ find /usr/bin -perm /4000
/usr/bin/passwd
/usr/bin/newgrp
/usr/bin/sudo
/usr/bin/gpasswd
/usr/bin/fusermount3
/usr/bin/umount
/usr/bin/su
/usr/bin/pkexec
/usr/bin/chfn
/usr/bin/mount
/usr/bin/chsh
```

15. List the user commands that have set-gid permissions in the system.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ find /usr/bin -perm /2000
/usr/bin/chage
/usr/bin/ssh-agent
/usr/bin/expiry
/usr/bin/crontab
```

16. List the directories that have sticky-bit set in the system.

```
abdelrahman-abdelhady@abdelrahman-abdelhady-HP-Laptop-15-da2xxx:~/Desktop$ find / -type d -perm /1000
find: '/snap/core18/2823/etc/ssl/private': Permission denied
find: '/snap/core18/2823/root': Permission denied
/snap/core18/2823/tmp
find: '/snap/core18/2823/var/cache/ldconfig': Permission denied
find: '/snap/core18/2823/var/lib/private': Permission denied
/snap/core18/2823/var/tmp
find: '/snap/core18/2829/etc/ssl/private': Permission denied
find: '/snap/core18/2829/root': Permission denied
/snap/core18/2829/tmp
find: '/snap/core18/2829/var/cache/ldconfig': Permission denied
find: '/snap/core18/2829/var/lib/private': Permission denied
/snap/core18/2829/var/tmp
find: '/snap/core22/1380/etc/polkit-1/localauthority': Permission denied
```