Lab 05/Part02 – Linux
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1. Compress a file by compress, gzip, zip commands and decompress it again. State the differences between compress and gzip commands.

    1. compress & uncompress

    ```
    sharaf@sharaf:~/Desktop$ compress -vf file
    file:  -- replaced with file.Z Compression: -41.66%
    sharaf@sharaf:~/Desktop$ uncompress -v file.Z
    file.Z: -41.7% -- replaced with file
    ```

    2. gzip & gunzip

    ```
    sharaf@sharaf:~/Desktop$ gzip -vf file
    file:    -16.7% -- replaced with file.gz
    sharaf@sharaf:~/Desktop$ gunzip -v file
    file.gz:        -16.7% -- replaced with file
    ```

    3. zip & unzip

    ```
    sharaf@sharaf:~/Desktop$ zip file.zip file
      adding: file (stored 0%)
    sharaf@sharaf:~/Desktop$ unzip file.zip
    Archive:  file.zip
    replace file? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
     extracting: file
    sharaf@sharaf:~/Desktop$
    ```

compress	gzip	zip
Compress only one file at time	Compress one file at time (multiple file need tar)	Compress and Archiving
Low eff	High eff	Moderate eff

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

    ```
    sharaf@sharaf:~/Desktop$ echo "hello linux" > hi
    sharaf@sharaf:~/Desktop$ compress -vf hi
    hi:  -- replaced with hi.Z Compression: -41.66%
    sharaf@sharaf:~/Desktop$ zcat hi.Z
    hello linux
    sharaf@sharaf:~/Desktop$
    ```

3. Backup /etc directory using tar utility.

    ```
    sharaf@sharaf:~$ tar -cvf Desktop/backup /etc
    ```

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

```
sharaf@sharaf:~$ find ~ -type f -mtime 2
```

n (exactly n ago) / -n (less than n ago) / +n (more than n ago)

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

```
sharaf@sharaf:~$ find /etc -type f -user root
```

6. Find all directories in your home directory.

```
sharaf@sharaf:~$ find ~ -type d
```

7. Write a command to search for all files on the system that, its name is ".profile".

```
sharaf@sharaf:~$ find / -name .profile 2> /dev/null
/home/sharaf/.profile
/etc/skel/.profile
/snap/core22/2045/etc/skel/.profile
/snap/core22/2139/etc/skel/.profile
```

8. Identify the file types of the following: /etc/passwd, /dev/pts/0, /etc, /dev/sda.

```
sharaf@sharaf:~$ file /etc/passwd
/etc/passwd: ASCII text
sharaf@sharaf:~$ file /dev/pts/0
/dev/pts/0: character special (136/0)
sharaf@sharaf:~$ file /etc/dev/sda
/etc/dev/sda: cannot open `/etc/dev/sda' (No such file or directory)
sharaf@sharaf:~$
```

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

```
sharaf@sharaf:~$ ls -i /
     12 bin              4456449 etc              11 lost+found   2621441 root                       131073 srv
1703937 bin.usr-is-merged  917505 home          3276801 media           1 run                           16 swap.img
2359297 boot                  13 lib            2490369 mnt            15 sbin                           1 sys
 393217 cdrom                14 lib64           1572865 opt         786433 sbin.usr-is-merged  3014657 tmp
      1 dev               524289 lib.usr-is-merged     1 proc       2752513 snap                   262145 usr
sharaf@sharaf:~$ ls -i /etc
4456816 adduser.conf        4456499 fwupd              4456858 lsb-release        4456559 rsyslog.d
4456462 alsa                4456835 gai.conf           4456859 machine-id         4456879 rygel.conf
4456463 alternatives        4456500 gdb                4456860 magic              4456560 sane.d
4456817 anacrontab          4456501 gdm3               4456861 magic.mime         4456561 security
4456818 apg.conf            4456502 geoclue            4456862 manpath.config     4456562 selinux
```

```
sharaf@sharaf:~$ ls -i /etc/hosts
4456840 /etc/hosts
```

10. Copy /etc/passwd to your home directory, use the commands diff and cmp, and Edit in the file you copied, and then use these commands again, and check the output.

```
sharaf@sharaf:~/Desktop$ cp /etc/passwd ~/pass_copy
sharaf@sharaf:~/Desktop$ echo "hi" > ~/pass_copy
sharaf@sharaf:~/Desktop$ diff /etc/passwd ~/pass_copy
1,49c1
sharaf@sharaf:~/Desktop$ cmp /etc/passwd ~/pass_copy
/etc/passwd /home/sharaf/pass_copy differ: byte 1, line 1
```

diff	cmp
Show line differences	*Show first byte difference*

11. Create a symbolic link of /etc/passwd in /boot.

```
sharaf@sharaf:~$ sudo ln -s /etc/passwd /boot/soft_link
sharaf@sharaf:~$ ls -li /boot/soft_link
2359312 lrwxrwxrwx 1 root root 11 Nov 10 14:50 /boot/soft_link -> /etc/passwd
```

12. Create a hard link of /etc/passwd in /boot. Could you? Why?

```
sharaf@sharaf:~$ ln /etc/passwd /boot/hard_link
ln: failed to create hard link '/boot/hard_link' => '/etc/passwd': Operation not permitted
sharaf@sharaf:~$
```

- Not Same Partitions