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PRACTICAL COMPUTING

THAPAR INSTITUTE
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(Deemed to be University)

Submitted to
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Practical Computing LAB Assignment 2

Question 1

What command is used on Linux to change the group of a file or directory?

Solution -

In Linux, each file is associated with an owner and a group and has permissions that determine which users may read, write, or execute the file. Unlike the chown command that allows you to change the user and group ownership, chgrp changes only the group ownership. To find out to which group the file belongs to, use the ls -l command. Regular users can change the group of the file only if they own the file and only to a group of which they are a member.
Administrative users can change the group ownership of all files.

```
harsh@harsh-VirtualBox:~$ ls -l cricket.txt
-rwxrwxrwx 1 root root 29 Aug 25 00:49 cricket.txt
harsh@harsh-VirtualBox:~$ sudo chgrp harsh cricket.txt
harsh@harsh-VirtualBox:~$
```

Question 2

Make sure you have all the rights to the files, and others can only read.

Solution

We can have all write for ourselves by giving read write and execute permissions for ourselves and giving the others only read permission.
We can give us 7 read-write and execute and groups and others 4 so that they can only read.

```
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rw-rw-r-- 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$ chmod 744 commands.txt
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rwxr--r-- 1 harsh harsh 98 Aug 25 00:40 commands.txt
```

Question 3

With chmod, is 770 the same as rwxrwx---?

Solution

Yes, they both are same.

```
harsh@harsh-VirtualBox:~$ ls -l commands.txt
---------- 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$ chmod 770 commands.txt
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rwxrwx--- 1 harsh harsh 98 Aug 25 00:40 commands.txt
```

Question 4

With chmod, is 400 the same as r--------?

Solution -

Yes, both are same.

```
harsh@harsh-VirtualBox:~$ ls -l commands.txt
---------- 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$ chmod 400 commands.txt
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-r-------- 1 harsh harsh 98 Aug 25 00:40 commands.txt
```

Question 5

Q5. With chmod, is 734 the same as rwxr-xr--?

Solution -

No, they are different.

```
harsh@harsh-VirtualBox:~$ ls -l commands.txt
---------- 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$ chmod 734 commands.txt
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rwx-wxr-- 1 harsh harsh 98 Aug 25 00:40 commands.txt
```

Question 6

Create a file as root, give only read to others.

Solution -

```
harsh@harsh-VirtualBox:~$ sudo touch f1
harsh@harsh-VirtualBox:~$ ls -l f1
-rw-r--r-- 1 root root 0 Sep 20 16:12 f1
```

```
harsh@harsh-VirtualBox:~$ sudo chmod 744 f1
harsh@harsh-VirtualBox:~$ ls -l f1
-rwxr--r-- 1 root root 0 Sep 20 16:12 f1
```

Question 7

Create a directory that belongs to a group, where every member of that group can read and write to the files and create files. Make sure that people can only delete their own files.

Solution -

The restricted deletion flag or sticky bit is a single bit, whose interpretation depends on the file type. For directories, it prevents unprivileged users from removing or renaming a file in the directory unless they own the file or the directory; this is called the restricted deletion flag for the directory and is commonly found on world-writable directories like /tmp.

So, to make sure that people can create and delete files but can delete their own files only, we will add 1 in chmod.

```
harsh@harsh-VirtualBox:~$ mkdir PCThapar
harsh@harsh-VirtualBox:~$ ls -l PCThapar
total 0
harsh@harsh-VirtualBox:~$ chmod 1777 PCThapar
harsh@harsh-VirtualBox:~$ ls -l PCThapar
total 0
harsh@harsh-VirtualBox:~$ ls -l
total 236
```

Below is the basic representation of how Linux based system allows user to delete their own files.

```
harsh@harsh-VirtualBox:~$ mkdir group1
harsh@harsh-VirtualBox:~$ ls -ld group1
drwxrwxr-x 2 harsh harsh 4096 Sep 16 21:50 group1
harsh@harsh-VirtualBox:~$ chmod 777 group1
harsh@harsh-VirtualBox:~$ su thapar
Password:
thapar@harsh-VirtualBox:/home/harsh$ cd group1
thapar@harsh-VirtualBox:/home/harsh/group1$ ls -l
total 0
thapar@harsh-VirtualBox:/home/harsh/group1$ touch p1 p2
thapar@harsh-VirtualBox:/home/harsh/group1$ ls -l
total 0
-rw-rw-r-- 1 thapar thapar 0 Sep 16 21:52 p1
-rw-rw-r-- 1 thapar thapar 0 Sep 16 21:52 p2
thapar@harsh-VirtualBox:/home/harsh/group1$ exit
exit
harsh@harsh-VirtualBox:~$ su user2
Password:
```

```
user2@harsh-VirtualBox:/home/harsh$ cd group1
user2@harsh-VirtualBox:/home/harsh/group1$ touch q1 q2
user2@harsh-VirtualBox:/home/harsh/group1$ ls -l
total 0
-rw-rw-r-- 1 thapar thapar 0 Sep 16 21:52 p1
-rw-rw-r-- 1 thapar thapar 0 Sep 16 21:52 p2
-rw-rw-r-- 1 user2  user2  0 Sep 16 21:53 q1
-rw-rw-r-- 1 user2  user2  0 Sep 16 21:53 q2
user2@harsh-VirtualBox:/home/harsh/group1$ exit
exit
harsh@harsh-VirtualBox:~$ chmod ugo+t group1
harsh@harsh-VirtualBox:~$ ls -ld group1
drwxrwxrwt 2 harsh harsh 4096 Sep 16 21:53 group1
harsh@harsh-VirtualBox:~$ cd group1
harsh@harsh-VirtualBox:~/group1$ ls -l
total 0
-rw-rw-r-- 1 thapar thapar 0 Sep 16 21:52 p1
-rw-rw-r-- 1 thapar thapar 0 Sep 16 21:52 p2
-rw-rw-r-- 1 user2  user2  0 Sep 16 21:53 q1
-rw-rw-r-- 1 user2  user2  0 Sep 16 21:53 q2
```

```
harsh@harsh-VirtualBox:~/group1$ rm p1
rm: remove write-protected regular empty file 'p1'? y
harsh@harsh-VirtualBox:~/group1$ ls -l
total 0
-rw-rw-r-- 1 thapar thapar 0 Sep 16 21:52 p2
-rw-rw-r-- 1 user2  user2  0 Sep 16 21:53 q1
-rw-rw-r-- 1 user2  user2  0 Sep 16 21:53 q2
harsh@harsh-VirtualBox:~/group1$ cd
```

```
harsh@harsh-VirtualBox:~$ su thapar
Password:
thapar@harsh-VirtualBox:/home/harsh$ cd group1
thapar@harsh-VirtualBox:/home/harsh/group1$ ls -l
total 0
-rw-rw-r-- 1 thapar thapar 0 Sep 16 21:52 p2
-rw-rw-r-- 1 user2  user2  0 Sep 16 21:53 q1
-rw-rw-r-- 1 user2  user2  0 Sep 16 21:53 q2
thapar@harsh-VirtualBox:/home/harsh/group1$ rm q1
rm: remove write-protected regular empty file 'q1'? y
rm: cannot remove 'q1': Operation not permitted
thapar@harsh-VirtualBox:/home/harsh/group1$ rm p2
thapar@harsh-VirtualBox:/home/harsh/group1$ ls -l
total 0
-rw-rw-r-- 1 user2 user2 0 Sep 16 21:53 q1
-rw-rw-r-- 1 user2 user2 0 Sep 16 21:53 q2
thapar@harsh-VirtualBox:/home/harsh/group1$ exit
exit
```

```
harsh@harsh-VirtualBox:~$ cd group1
harsh@harsh-VirtualBox:~/group1$ ls -l
total 0
-rw-rw-r-- 1 user2 user2 0 Sep 16 21:53 q1
-rw-rw-r-- 1 user2 user2 0 Sep 16 21:53 q2
harsh@harsh-VirtualBox:~/group1$ rm q1
rm: remove write-protected regular empty file 'q1'? y
harsh@harsh-VirtualBox:~/group1$ ls -l
total 0
-rw-rw-r-- 1 user2 user2 0 Sep 16 21:53 q2
```

Question 8

Allow read permissions to everyone.

Solution -

```
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rwx-wxr-- 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$ chmod 444 commands.txt
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-r--r--r-- 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$
```

Question 9

Allow everyone to read, write and execute the files.

Solution -

```
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-r--r--r-- 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$ chmod 777 commands.txt
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rwxrwxrwx 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$
```

Question 10

Deny execute permission from everyone.

Solution -

```
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rwxrwxrwx 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$ chmod 666 commands.txt
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rw-rw-rw- 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$
```

Question 11

Write permissions will the following command give: chmod 641?

Solution -

This will give read and write permission to the owner, read permission to the group and execute permission to others.

```
harsh@harsh-VirtualBox:~$ chmod 641 commands.txt
harsh@harsh-VirtualBox:~$ ls -l commands.txt
-rw-r----x 1 harsh harsh 98 Aug 25 00:40 commands.txt
harsh@harsh-VirtualBox:~$
```

Question 12

Copy a file owned by root from /etc/ to your permissions dir, who owns this file now.

Solution -

```
harsh@harsh-VirtualBox:~$ sudo cp /etc/pyt3 PCThapar
harsh@harsh-VirtualBox:~$ ls -l PCThapar
total 0
-rw-r--r-- 1 root root 0 Sep  8 14:57 pyt3
harsh@harsh-VirtualBox:~$
```

```
harsh@harsh-VirtualBox:~$ cd /etc/
harsh@harsh-VirtualBox:/etc$ ls -l network
total 16
drwxr-xr-x 2 root root 4096 Aug  2 21:54 if-down.d
drwxr-xr-x 2 root root 4096 Aug  2 21:54 if-post-down.d
drwxr-xr-x 2 root root 4096 Aug  2 21:54 if-pre-up.d
drwxr-xr-x 2 root root 4096 Aug  2 21:54 if-up.d
harsh@harsh-VirtualBox:/etc$ cd
harsh@harsh-VirtualBox:~$ ls
ABC             Downloads  ispositive          PC.txt     sys.c
a.out           f1         linuxcommands.txt   Pictures   Templates
case            first      multiply            prac       Thapar
commands.txt    fork       Music               prac.c     Thapar.tar
count           fork.c     new                 Practical  Thapar.zip
count.txt       games.txt  new.txt             prime      Videos
cricket.txt     group1     num.txt             Public
demo            hello      os                  read
Desktop         hello.c    PC                  root
Documents       isnum      PCThapar            sys
harsh@harsh-VirtualBox:~$ sudo cp -r /etc/network PCThapar
harsh@harsh-VirtualBox:~$ ls -l PCThapar
total 12
drwxr-xr-x 6 root  root  4096 Sep 16 22:07 network
-rwxrwxr-x 1 harsh harsh   78 Sep  8 15:25 PC
-rw-rw-r-- 1 harsh harsh   56 Sep  8 15:14 PC.txt
-rw-r--r-- 1 root  root     0 Sep  8 14:57 pyt3
```
