

## Lab-Report

Report No: 04

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### Submitted by

Name: Shakhera khanom

ID: IT-18033

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Dept. of ICT

MBSTU.

### Submitted To

Nazrul Islam

Assistant Professor

Dept. of ICT

MBSTU.

## Experiment No: 04

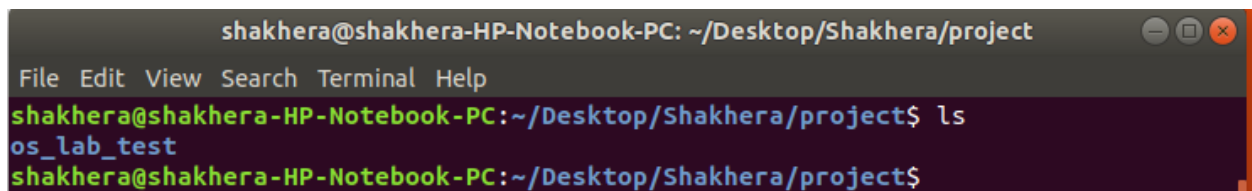
**Experiment Name:** File operation and permission.

### Objectives:

- What is File Operation and File Permission in Linux Operating System?
- Implementation of File Operation and File Permission.

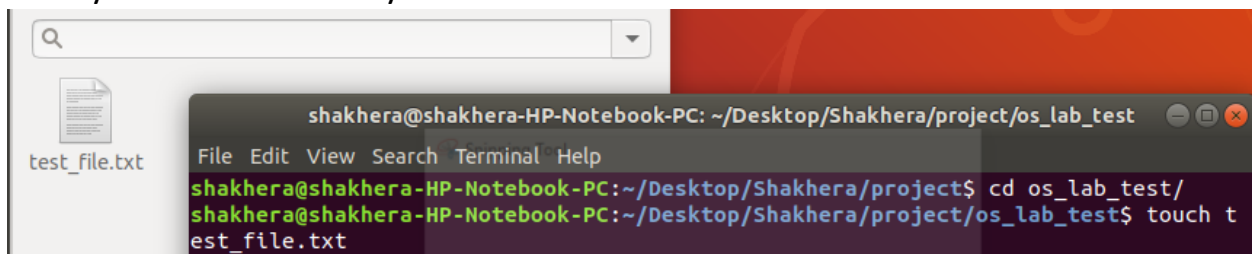
**File Operation in Linux Operating:** To use the Linux terminal like a pro, we'll need to know the basics of managing files and navigating directories. Different file operation is given below...

**ls** – The ls command lists the files in a directory. By default, ls lists files in the current directory.



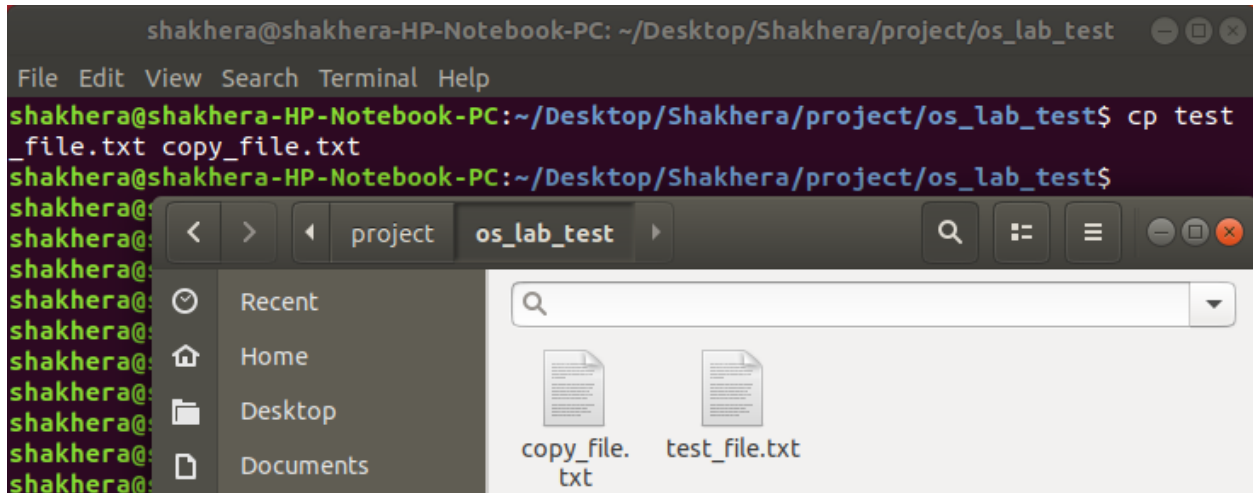
```
shakhera@shakhera-HP-Notebook-PC: ~/Desktop/Shakhera/project
File Edit View Search Terminal Help
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project$ ls
os_lab_test
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project$
```

**cd** – Change Directory The cd command changes to another directory. For example, cd Desktop will take you to your Desktop directory if you're starting from your home directory.



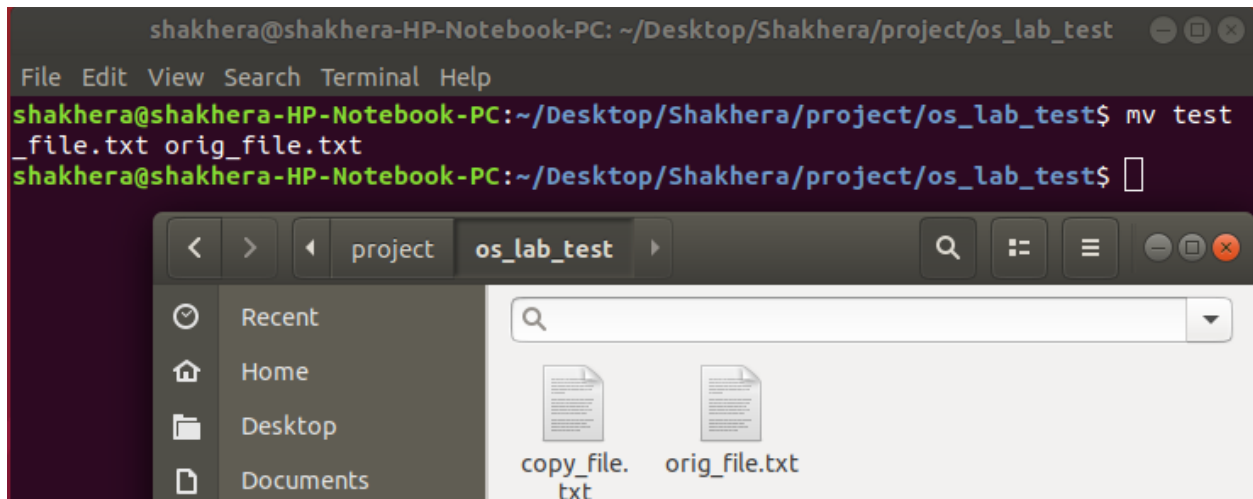
```
shakhera@shakhera-HP-Notebook-PC: ~/Desktop/Shakhera/project/os_lab_test
File Edit View Search Terminal Help
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project$ cd os_lab_test/
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$ touch test_file.txt
```

**Cp-** file1 file2 is the command which makes a copy of file1 in the current working directory and calls it file2.



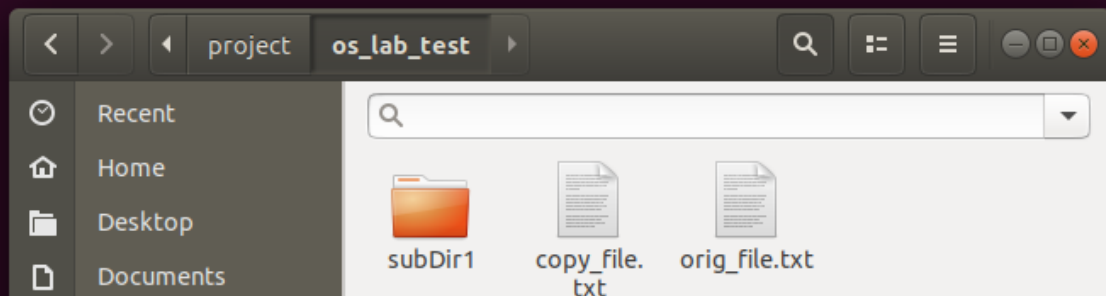
The screenshot shows a terminal window with the command `cp test_file.txt copy_file.txt` executed. Below the terminal, a file manager window displays the contents of the `os_lab_test` directory, showing two files: `copy_file.txt` and `test_file.txt`.

**mv-** the mv command moves files and directories from one directory to another or renames a file or directory. If you move a file or directory to new directory, it retains the base file name.

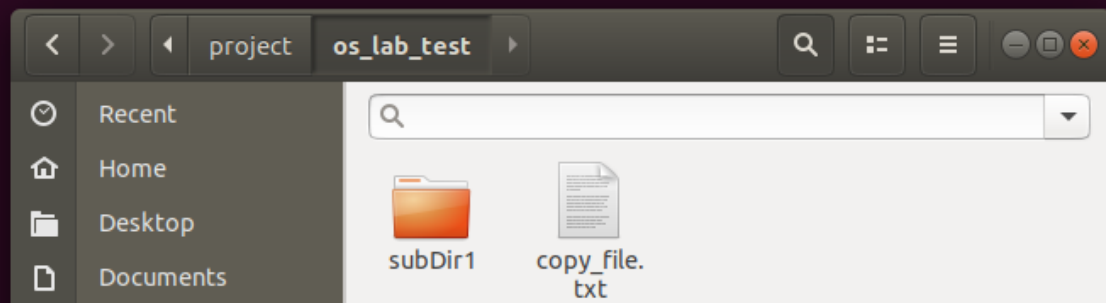


The screenshot shows a terminal window with the command `mv test_file.txt orig_file.txt` executed. Below the terminal, a file manager window displays the contents of the `os_lab_test` directory, showing two files: `copy_file.txt` and `orig_file.txt`.

```
shakhera@shakhera-HP-Notebook-PC: ~/Desktop/Shakhera/project/os_lab_test
File Edit View Search Terminal Help
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$ mkdir subDir1
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$
```

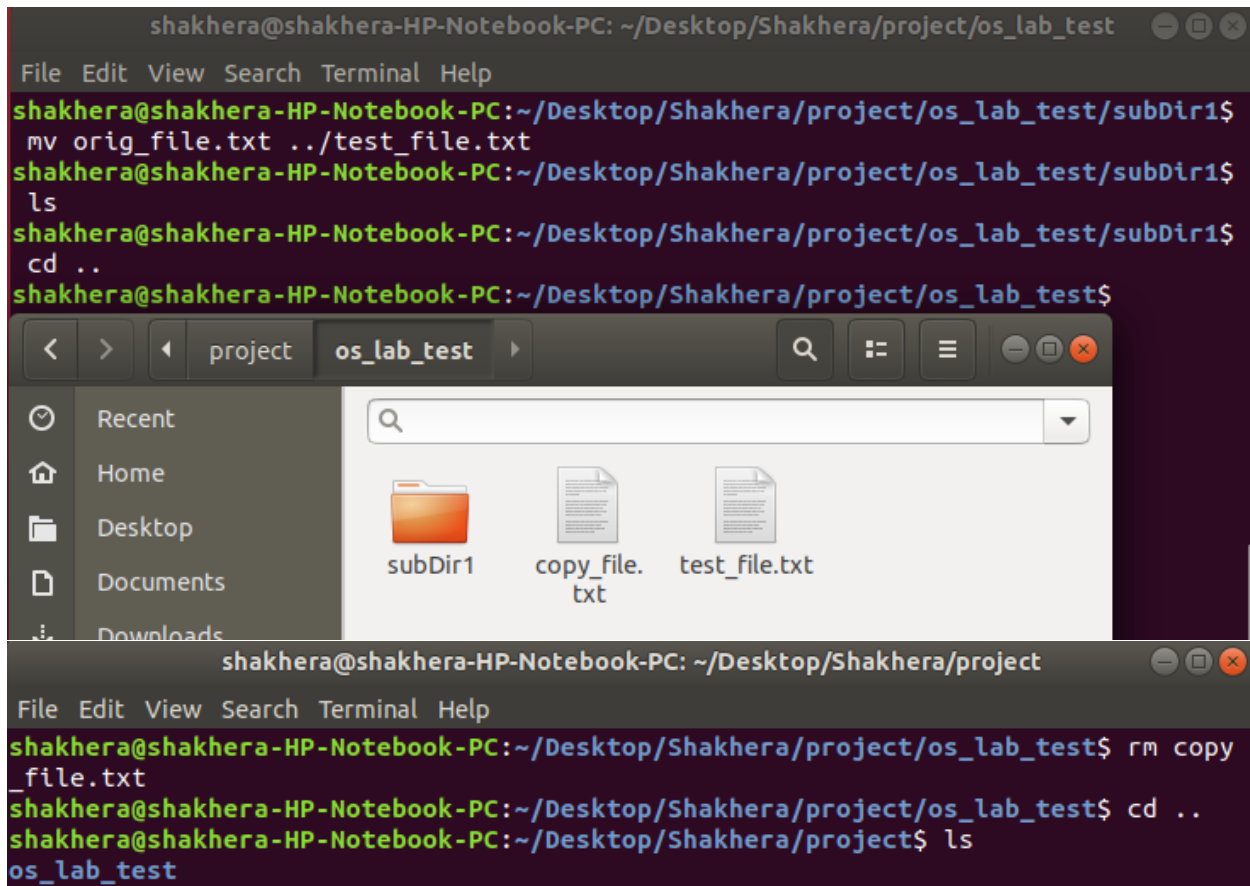


```
shakhera@shakhera-HP-Notebook-PC: ~/Desktop/Shakhera/project/os_lab_test
File Edit View Search Terminal Help
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$ mkdir subDir1
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$ mv orig_file.txt subDir1/
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$
```



```
shakhera@shakhera-HP-Notebook-PC: ~/Desktop/Shakhera/project/os_lab_test/subDir1
File Edit View Search Terminal Help
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$ mkdir subDir1
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$ mv orig_file.txt subDir1/
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$ cd subDir1/
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test/subDir1$ ls
orig_file.txt
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test/subDir1$
```

`cd ..` will take you up a directory.



The screenshot displays two windows from a Linux desktop environment. The top window is a terminal titled 'shakhera@shakhera-HP-Notebook-PC: ~/Desktop/Shakhera/project/os\_lab\_test'. It shows the following commands and output:

```
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test/subDir1$ mv orig_file.txt ../test_file.txt
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test/subDir1$ ls
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test/subDir1$ cd ..
shakhera@shakhera-HP-Notebook-PC:~/Desktop/Shakhera/project/os_lab_test$
```

The bottom window is a file manager titled 'shakhera@shakhera-HP-Notebook-PC: ~/Desktop/Shakhera/project'. It shows a sidebar with 'Recent', 'Home', 'Desktop', 'Documents', and 'Downloads'. The main pane displays the contents of the 'os\_lab\_test' directory, which includes a folder named 'subDir1' and two files: 'copy\_file.txt' and 'test\_file.txt'.

### File Permission in Linux Operating:

Linux is a clone of UNIX, the multi-user operating system which can be accessed by many users simultaneously. Linux can also be used in mainframes and servers without any modifications. But this raises security concerns as an unsolicited or malign user can corrupt, change or remove crucial data. For effective security, Linux divides authorization into 2 levels.

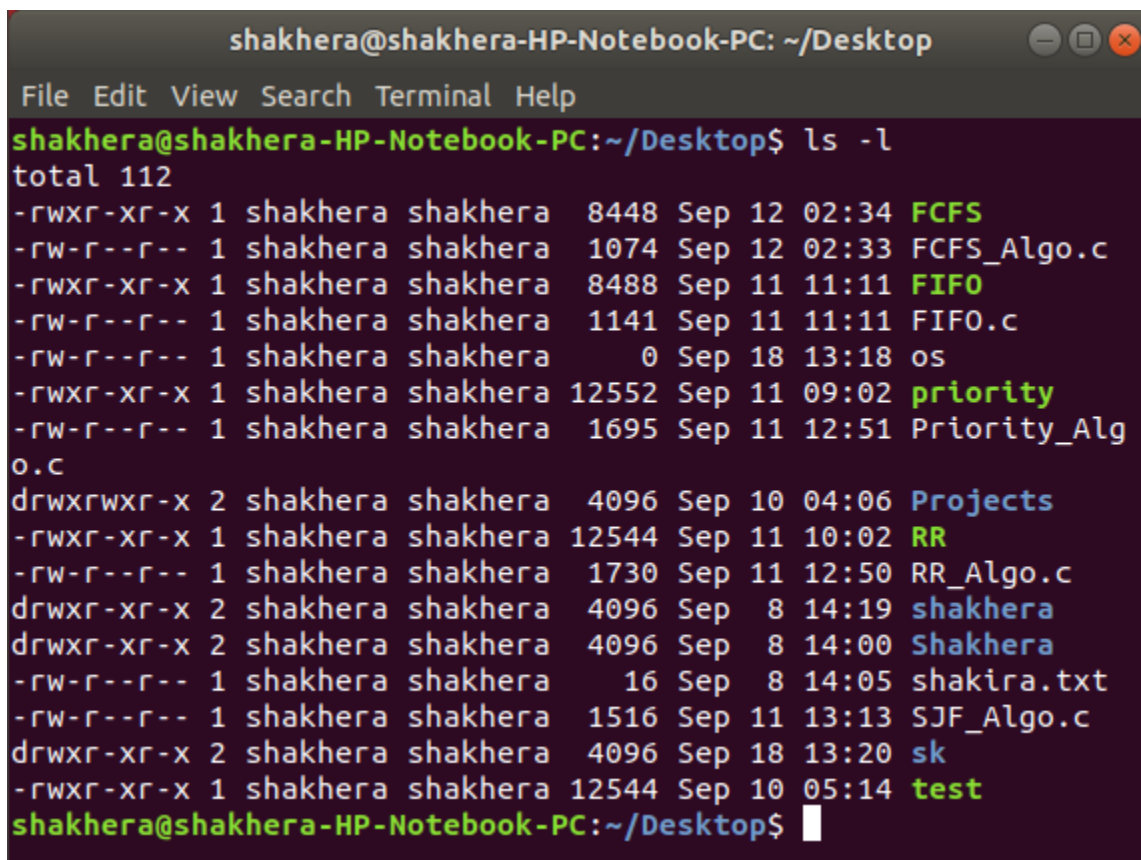
1. Ownership
2. Permission

Every file and directory in your Linux system has following 3 permissions defined for all the 3 owners discussed above.

1. Read
2. Write
3. Execute permission

- **Read (r):** This permission give you the authority to open and read a file. Read permission on a directory gives you the ability to lists its content.
- **Write (w):** The write permission gives you the authority to modify the contents of a file. That's mean to add, remove and rename files stored in the directory.
- **Execute (x):** In Windows, an executable program usually has an extension ".exe" and which you can easily run. In Linux, you cannot run a program unless the execute permission is set. If the execute permission is not set, you might still be able to see/modify the program code (provided read & write permissions are set), but not run it.

`ls -l`



```
shakhera@shakhera-HP-Notebook-PC: ~/Desktop
File Edit View Search Terminal Help
shakhera@shakhera-HP-Notebook-PC:~/Desktop$ ls -l
total 112
-rwxr-xr-x 1 shakhera shakhera 8448 Sep 12 02:34 FCFS
-rw-r--r-- 1 shakhera shakhera 1074 Sep 12 02:33 FCFS_Algo.c
-rwxr-xr-x 1 shakhera shakhera 8488 Sep 11 11:11 FIFO
-rw-r--r-- 1 shakhera shakhera 1141 Sep 11 11:11 FIFO.c
-rw-r--r-- 1 shakhera shakhera 0 Sep 18 13:18 os
-rwxr-xr-x 1 shakhera shakhera 12552 Sep 11 09:02 priority
-rw-r--r-- 1 shakhera shakhera 1695 Sep 11 12:51 Priority_Algo.c
drwxrwxr-x 2 shakhera shakhera 4096 Sep 10 04:06 Projects
-rwxr-xr-x 1 shakhera shakhera 12544 Sep 11 10:02 RR
-rw-r--r-- 1 shakhera shakhera 1730 Sep 11 12:50 RR_Algo.c
drwxr-xr-x 2 shakhera shakhera 4096 Sep 8 14:19 shakhera
drwxr-xr-x 2 shakhera shakhera 4096 Sep 8 14:00 Shakhera
-rw-r--r-- 1 shakhera shakhera 16 Sep 8 14:05 shakira.txt
-rw-r--r-- 1 shakhera shakhera 1516 Sep 11 13:13 SJF_Algo.c
drwxr-xr-x 2 shakhera shakhera 4096 Sep 18 13:20 sk
-rwxr-xr-x 1 shakhera shakhera 12544 Sep 10 05:14 test
shakhera@shakhera-HP-Notebook-PC:~/Desktop$
```

```
shakhera@shakhera-HP-Notebook-PC: ~/Desktop
File Edit View Search Terminal Help
shakhera@shakhera-HP-Notebook-PC:~/Desktop$ ls -l
total 112
-rwxr-xr-x 1 shakhera shakhera 8448 Sep 12 02:34 FCFS
```

```
-rw-r--r-- 1 shakhera shakhera 1074 Sep 12 02:33 FCFS_Algo.c
```

File type and Access Permissions.

Here , we have highlighted ‘-rw-r--r--’ and this weird looking code is the one that tells us about the permissions gives to the owner, user group and the world. Here the first ‘-’ implies that we have selected a file.p>

-rw-r--r-- → indicates file

Else, if it were a directory, d would have been shown.

```
drwxr-xr-x 2 shakhera shakhera 4096 Sep 8 14:19 shakhera
```

d means represents directory.

The characters are pretty easy to remember.

- r = read permission
- w = write permission
- x = execute permission
- = no permission

Let us look at it this way.

The first part of the code is 'rw-'. This suggests that the owner 'Home' can:

`-rw-r--r--`



no execute permission

- Read the file
- Write or edit the file
- He cannot execute the file since the execute bit is set to '-'.

By design, many Linux distributions like Fedora, CentOS, Ubuntu, etc. will add users to a group of the same group name as the user name. Thus, a user 'tom' is added to a group named 'tom'.

The second part is '**rw-**'. It for the user group 'Home' and group-members can:

- Read the file
- Write or edit the file

The third part is for the world which means any user. It says '**r--**'. This means the user can only:

- Read the file

**Discussion: Linux file system** is generally a built-in layer of a Linux operating system used to handle the data management of the storage. It helps to arrange the file on the disk storage. It manages the file name, file size, creation date, and much more information about a file.