

# Lab 04 - File operation and permission

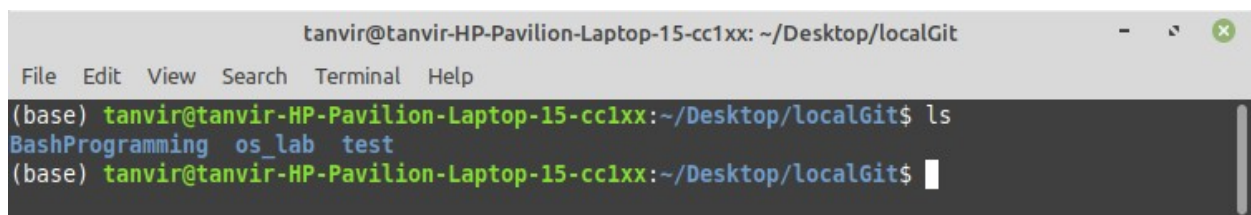
## Objectives:

- i. File operation
- ii. File permission

**File Operation :** 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...

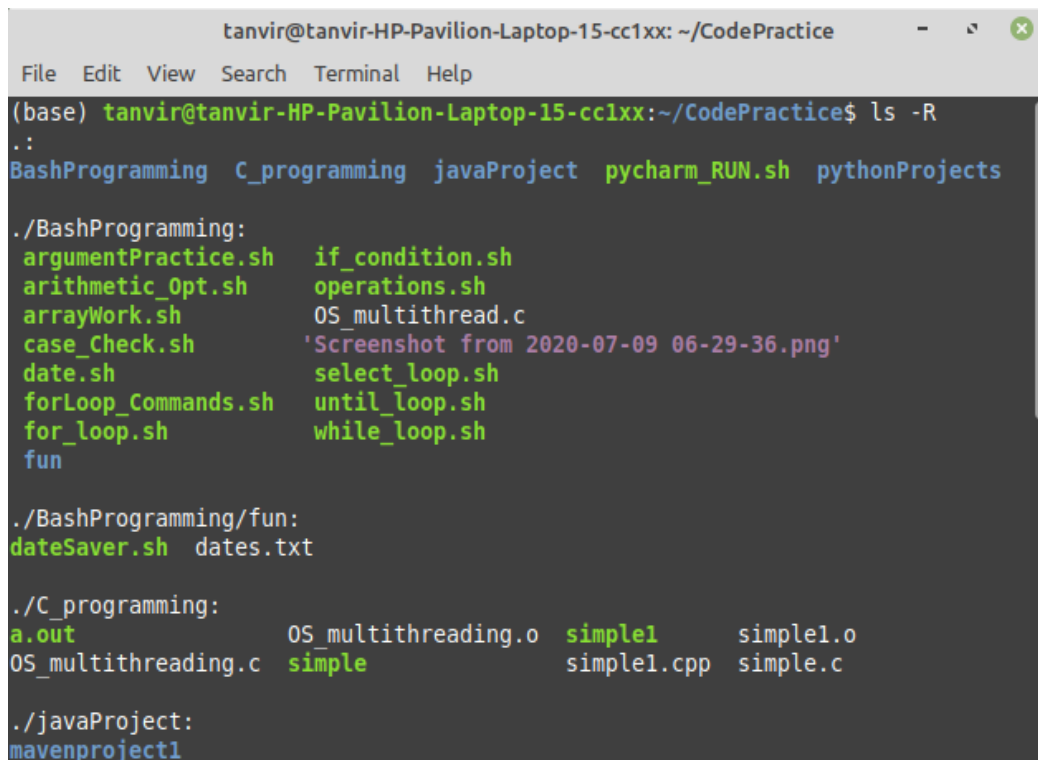
### 1. **ls** – List Files

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



```
tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx: ~/Desktop/localGit
File Edit View Search Terminal Help
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/localGit$ ls
BashProgramming os_lab test
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/localGit$
```

2. we can also list files recursively — that is, list all files in directories inside the current directory — with **ls -R**.



```
tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx: ~/CodePractice
File Edit View Search Terminal Help
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$ ls -R
.:
BashProgramming C_programming javaProject pycharm_RUN.sh pythonProjects

./BashProgramming:
argumentPractice.sh  if_condition.sh
arithmetic_Opt.sh   operations.sh
arrayWork.sh         OS_multithread.c
case_Check.sh        'Screenshot from 2020-07-09 06-29-36.png'
date.sh              select_loop.sh
forLoop_Commands.sh until_loop.sh
for_loop.sh          while_loop.sh
fun

./BashProgramming/fun:
dateSaver.sh  dates.txt

./C_programming:
a.out          OS_multithreading.o  simple1  simple1.o
OS_multithreading.c  simple               simple1.cpp  simple.c

./javaProject:
mavenproject1
```

### 3. **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.

```
tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx: ~/CodePractice/javaProject
File Edit View Search Terminal Help
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$ ls
BashProgramming C_programming javaProject pycharm_RUN.sh pythonProjects
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$ cd javaProject/
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice/javaProject$
```

### 4. **cd ..** will take you up a directory.

```
tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx: ~/CodePractice
File Edit View Search Terminal Help
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice/javaProject$ cd ..
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$ pwd
/home/tanvir/CodePractice
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$
```

### 5. **rmdir** – Remove Directories

The `rmdir` command removes an empty directory. `rmdir directory` would delete the directory named "directory" in the current directory.

```
tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx: ~/CodePractice
File Edit View Search Terminal Help
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$ ls
BashProgramming C_programming javaProject pycharm_RUN.sh pythonProjects tanvir
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$ rmdir tanvir
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$
```

## 6) **mkdir** – Make Directories

The mkdir command makes a new directory. mkdir example will make a directory with the name "example" in the current directory.

```
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cclxx:~/CodePractice$ mkdir tanvir
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cclxx:~/CodePractice$ ls
BashProgramming  C_programming  javaProject  pycharm_RUN.sh  pythonProjects  tanvir
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cclxx:~/CodePractice$
```

## 7) **ln** – Create Links

The ln command creates links. The most commonly used type of link is probably the symbolic link, which you can create with ln -s.

For example, the following command creates a link to our Downloads folder on our Desktop:

```
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cclxx:~/CodePractice$ ln -s /home/Desktop
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cclxx:~/CodePractice$ ls
BashProgramming  C_programming  Desktop  javaProject  pycharm_RUN.sh  pythonProjects
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cclxx:~/CodePractice$
```

# File Permissions:

There are 3 types of permissions:

- 1) Read
- 2) Write
- 3) Execute permission

Read (r): this gives permission to merely open a file or folder and view its contents.

Write (w): this gives permission to overwrite, append-to or delete a file or folder.

Execute (x): this gives permission to "run" a file. For example to run a script or a program.

So, how can we put this all into context? Let's have a look at the contents of a typical folder. I used the command `ls -l` to bring up this list:

```
tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx: ~/CodePractice
File Edit View Search Terminal Help
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$ ls -l
total 20
drwxrwxr-x 4 tanvir tanvir 4096 অগস্ট 26 22:15 BashProgramming
drwxrwxr-x 2 tanvir tanvir 4096 অগস্ট 27 00:03 C_programming
lrwxrwxrwx 1 tanvir tanvir 13 অগস্ট 27 00:49 Desktop -> /home/Desktop
drwxrwxr-x 3 tanvir tanvir 4096 জুন 19 23:37 javaProject
-rwxrwxr-x 1 tanvir tanvir 101 জুলাই 8 22:06 pycharm_RUN.sh
drwxrwxr-x 3 tanvir tanvir 4096 জুন 19 12:05 pythonProjects
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$
```

we can also do this via the command-line. Go to a directory that has files in it and type the following command to view all files in a list:

**ls -al**

```
tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx: ~/CodePractice
File Edit View Search Terminal Help
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$ ls -al
total 28
drwxrwxr-x 6 tanvir tanvir 4096 অগস্ট 27 00:49 .
drwxr-xr-x 48 tanvir tanvir 4096 অগস্ট 26 18:49 ..
drwxrwxr-x 4 tanvir tanvir 4096 অগস্ট 26 22:15 BashProgramming
drwxrwxr-x 2 tanvir tanvir 4096 অগস্ট 27 00:03 C_programming
lrwxrwxrwx 1 tanvir tanvir 13 অগস্ট 27 00:49 Desktop -> /home/Desktop
drwxrwxr-x 3 tanvir tanvir 4096 জুন 19 23:37 javaProject
-rwxrwxr-x 1 tanvir tanvir 101 জুলাই 8 22:06 pycharm_RUN.sh
drwxrwxr-x 3 tanvir tanvir 4096 জুন 19 12:05 pythonProjects
(base) tanvir@tanvir-HP-Pavilion-Laptop-15-cc1xx:~/CodePractice$
```

Next to each file and directory, we'll see a special section that outlines the permissions it has. It looks like this:

**-rwx rw- r--**

The `r` stands for "read," the `w` stands for "write," and the `x` stands for "execute." Directories will be start with a "d" instead of a "-". You'll also notice that there are 10 spaces which hold value. You can ignore the first, and then there are 3 sets of 3. The first set is for the owner, the second set is for the group, and the last set is for the world.

To change a file or directory's permissions, let's look at the basic form of the chmod command.

```
chmod [class][operator][permission] file
```

```
chmod [ugoa][+ or -] [rwx] file
```

u: This is for the owner.

g: This is for the group.

o: This is for all others.

a: This will change permissions for all of the above.

+: The plus sign will add the permissions which follow.

-: The minus sign will remove the permissions which follow.

r: Allows read access.

w: Allows write access.

x: Allows execution.