Lab No	:	04
Name of the Lab	:	File Operation and Permission
ID	:	IT-16062

Objective:- The file system is the most obvious aspect of any OS. This provides users the method for storage and access to data as well as programs of the operating system.

At the end of this lab we will learn about how file operation and file permission works on linux operating system.

➢ What is File Operation and File Permission in Linux Operating System?

File Operation : A file is an abstract data type. For defining a file properly, we need to consider the operations that can be performed on files. The operating system can provide system calls to create, write, read, reposition, delete, and truncate files. There are six basic file operations within an Operating system. **These are:-**

a) Creating a file
b) Writing a file
c) Reading a file
d) Repositioning inside a file
e) Deleting a file
f) Truncating a file

File Permissions: Linux is a multi-user operating system, so it has security to prevent people from accessing each other's confidential files. Every file and directory in your UNIX/Linux system has following 3 permissions.

- **Read:** This permission gives us the authority to open and read a file. Read permission on a directory gives us the ability to lists its content.

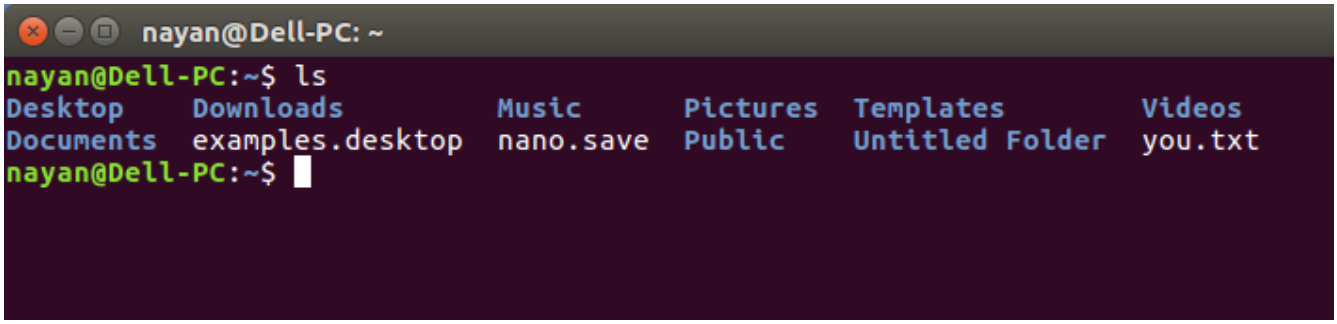
- **Write:** The write permission gives us the authority to modify the contents of a file. The write permission on a directory gives us the authority to add, remove and rename files stored in the directory. Consider a scenario where we have to write permission on file but do not have write permission on the directory where the file is stored. We will be able to modify the file contents. But we will not be able to rename, move or remove the file from the directory.

❖ **Execute:** In Windows, an executable program usually has an extension ".exe" and which we can easily run. In Unix/Linux, we cannot run a program unless the execute permission is set. If the execute permission is not set, we might still be able to see/modify the program code(provided read & write permissions are set), but not run it.

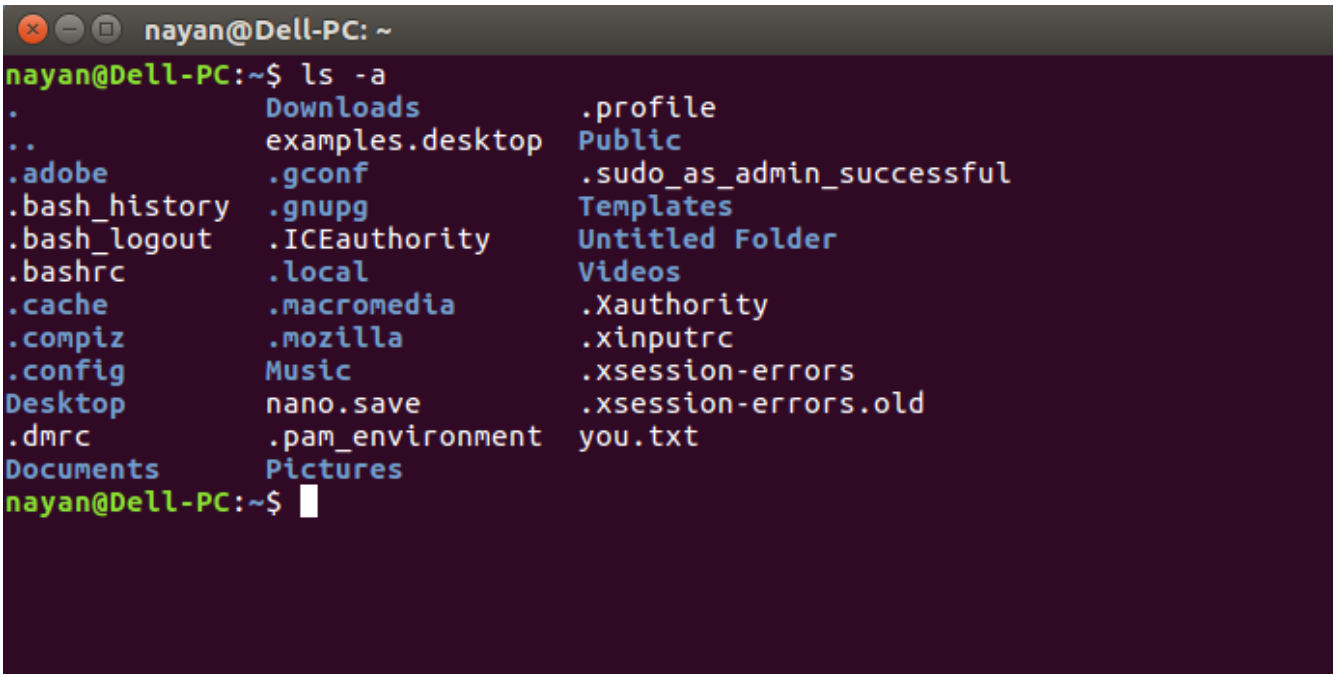
➢ Implementation of File operation and permission:

File operations :

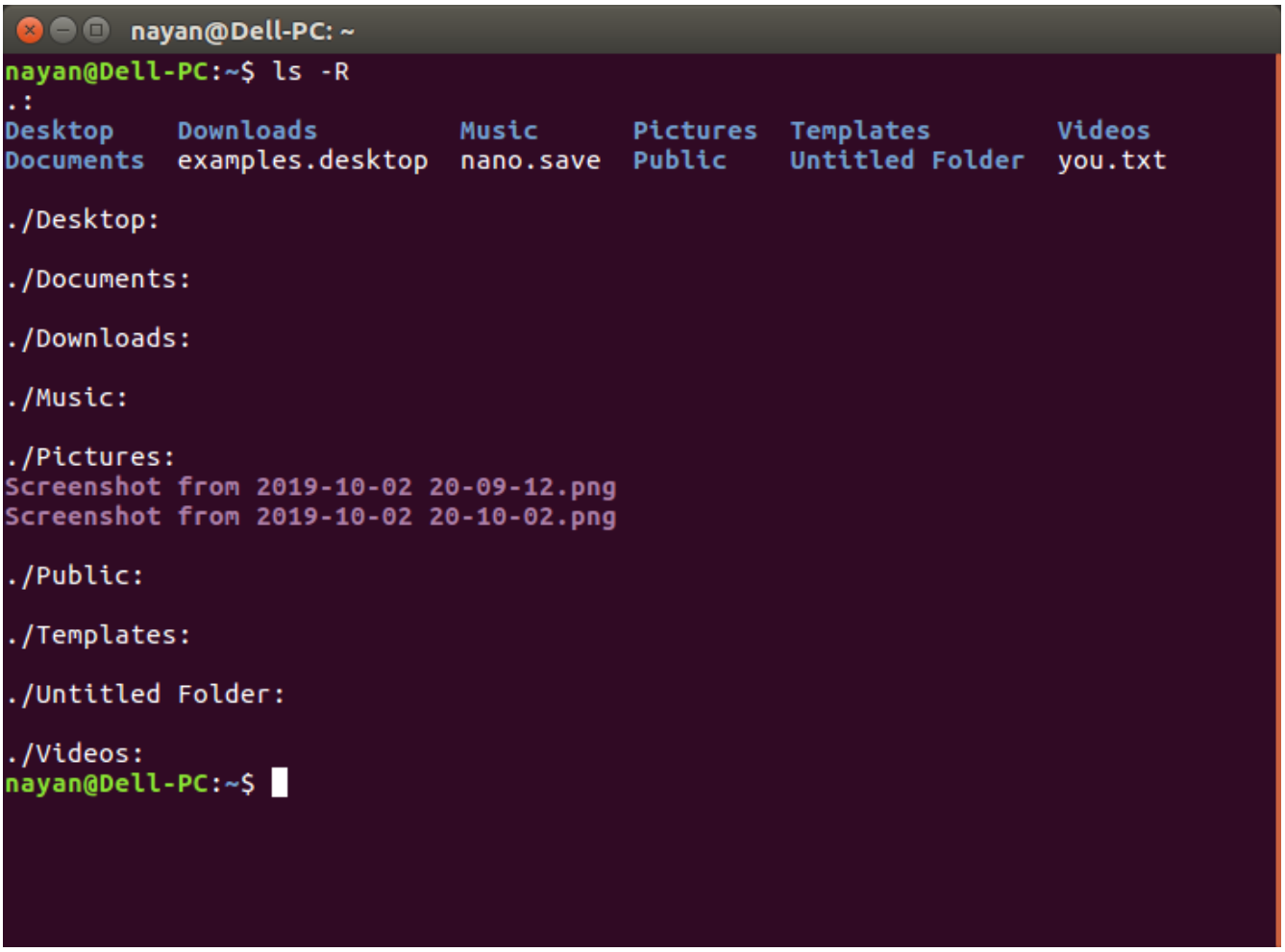
(a) List directories and Files: $ ls



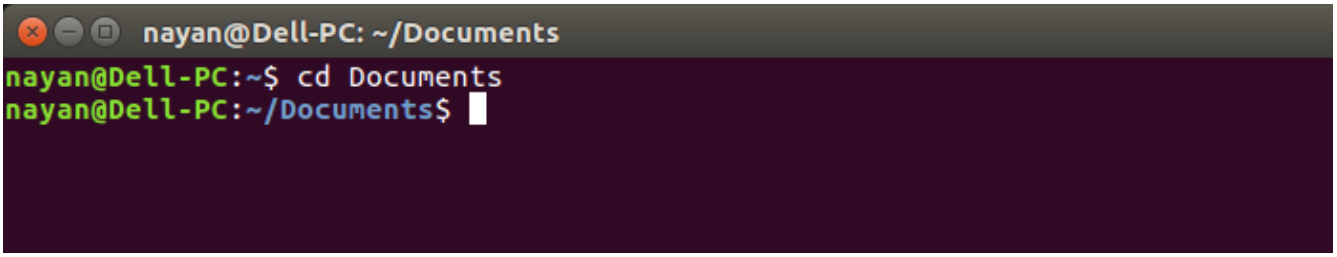
(b) List hidden files and directories : $ ls -a



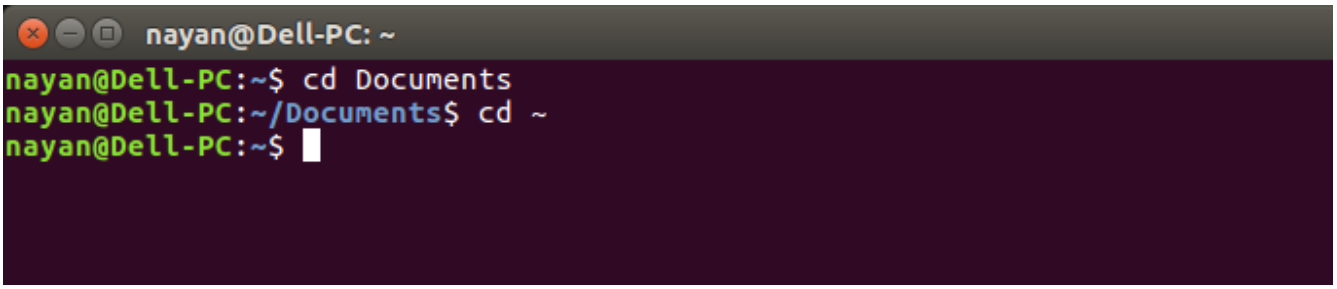
(c)List files and folders recursively : $ ls -R



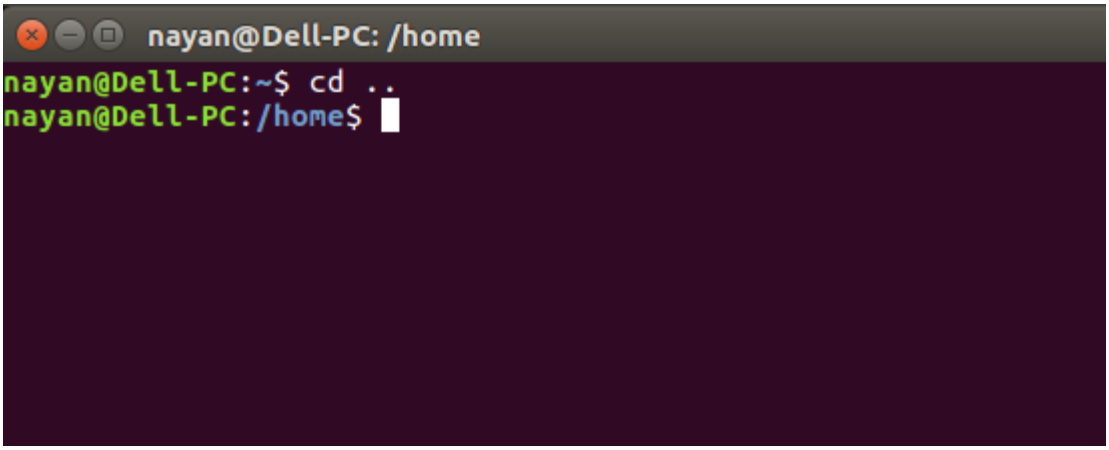
(d)Change Directory : $ cd can be used to change to the different directories.



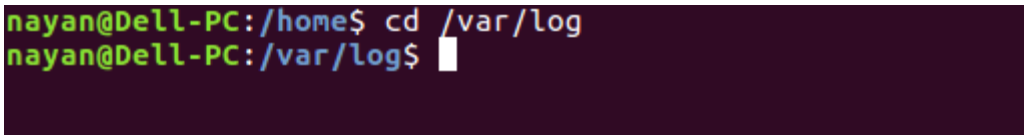
(e)Go User Home Directory : $ cd ~



(f) Go upper and Parent directory : $ cd ..



(g)Go given Path : We can go to the log directory $ cd /*var*/log



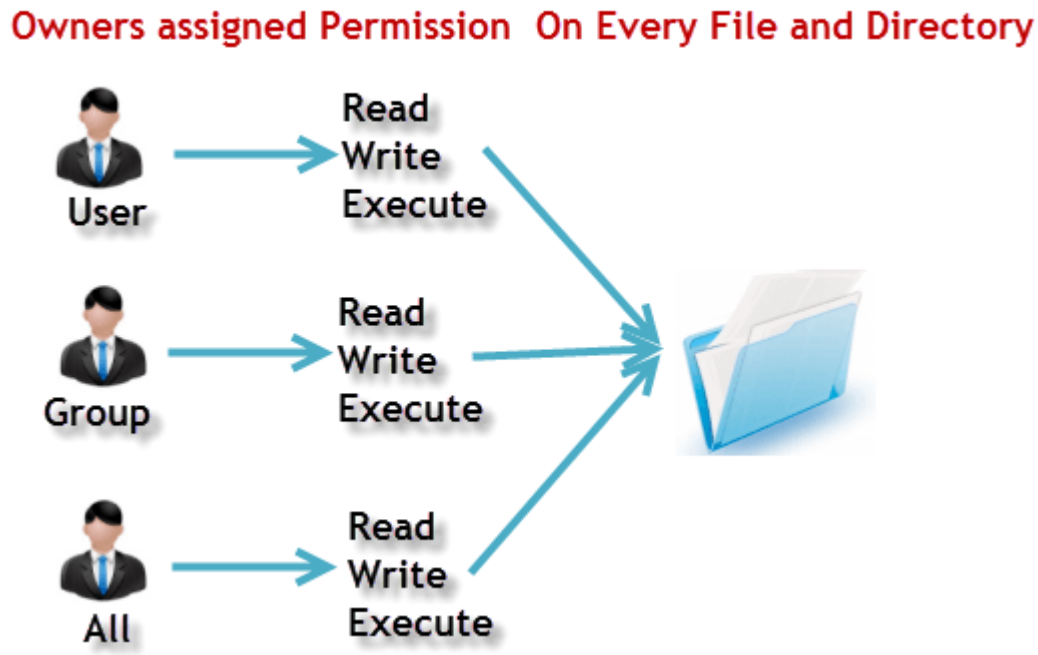
(h) create folder name and make home directory by using mkdir folder name and empty file delete by using rmdir folder name.

```
nayan@Dell-PC: ~/Linux
nayan@Dell-PC:~$ mkdir Linux
nayan@Dell-PC:~$ rmdir Linux
nayan@Dell-PC:~$ mkdir Linux
nayan@Dell-PC:~$ cd Linux
nayan@Dell-PC:~/Linux$ cat> nayan
i am nayan and i love to work on linux operating system
```

File Permissions: **Linux** being a multi-user system uses **permissions** and ownership for security. There are three user types on a **Linux** system. User, Group and Other. **Linux** divides the **file permissions** into read, write and execute denoted by r, w, and x.

Understanding the security permissions :
First, you must think of those nine characters as three sets of three characters (see the box at the bottom). Each of the three "rwx" characters refers to a different operation you can perform on the file.

| --- | --- | --- |
| rwx | rwx | rwx |
| user | group | other |



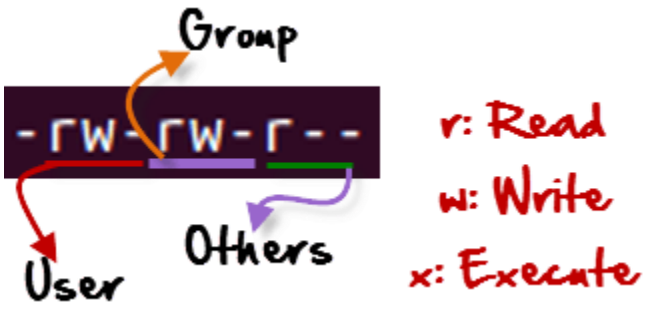
The characters are easy to remember :

r = read permissions

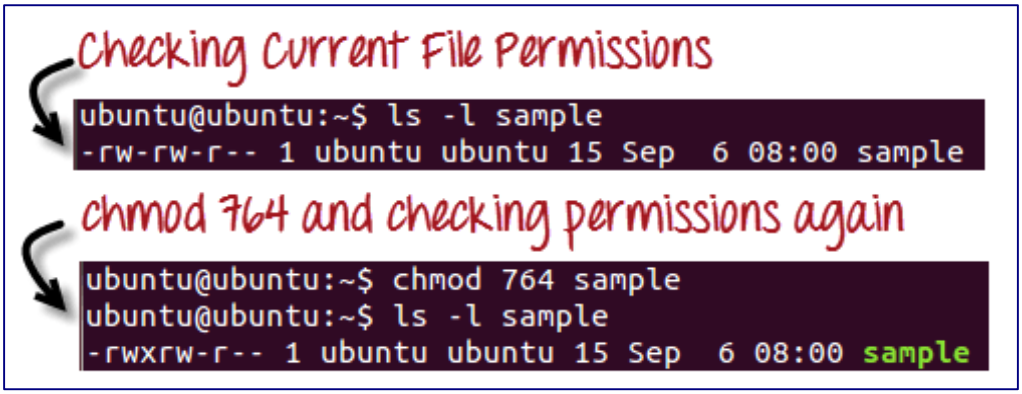
w=write permission

x =execute permission

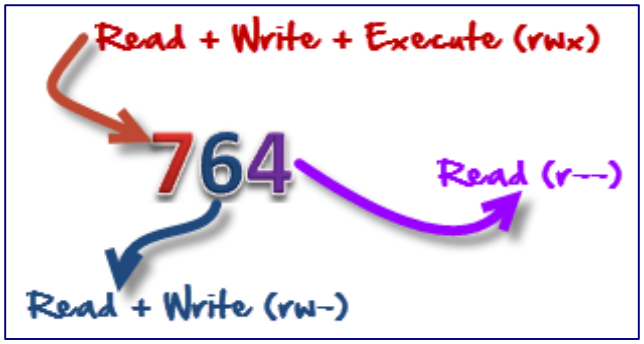
- = no permission



Let's see the chmod command in action.



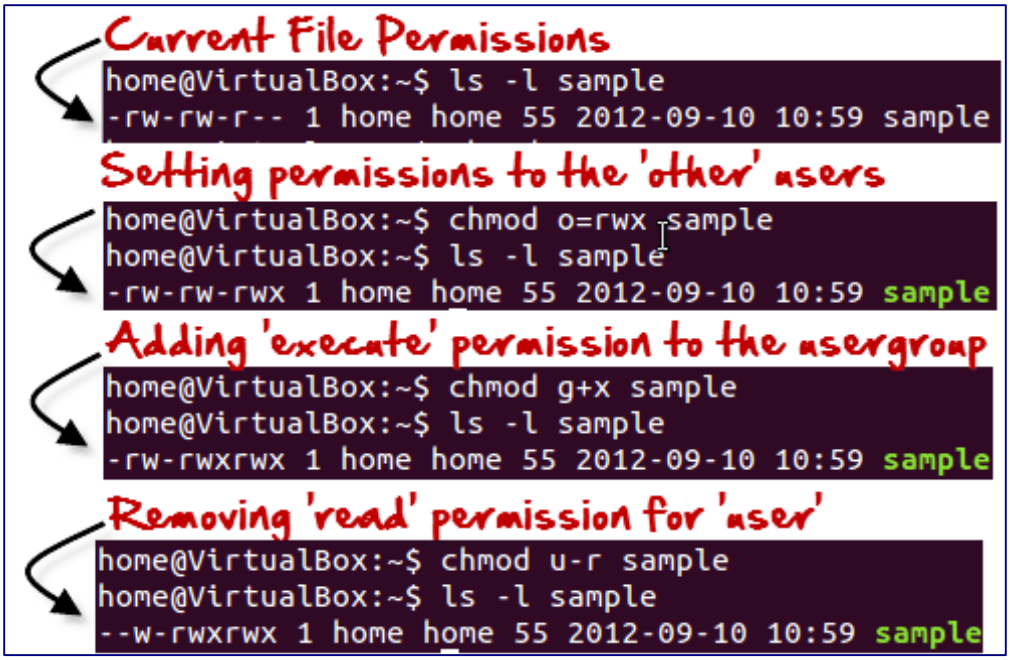
In the above-given terminal window, we have changed the permissions of the file 'sample to '764'.



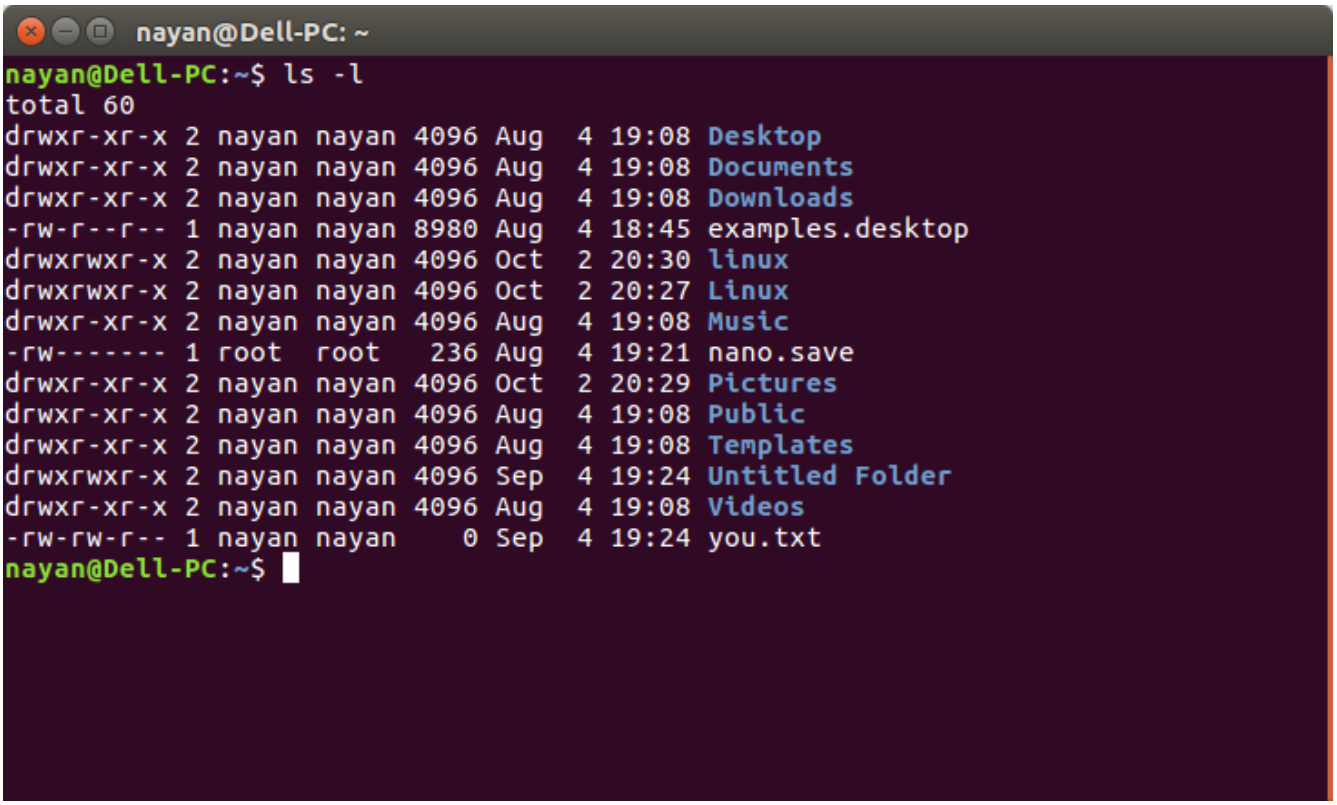
'764' absolute code says the following:

- Owner can read, write and execute
- Usergroup can read and write
- World can only read

Let's look into an example



Adding permission:



Conclusion :- File management system is very important part of any operating system. Linux is one of the most secured operating system available. In linux file operation and permission of any user is securely granted. We have learnt from today's lab that how linux does this two most important operation.