Lab No : 04

Name of the Lab : File operation and permission

ID : IT-17005

Objectives:

i) What is the File Operation and File Permission in Linux Operating System?
ii) Implementation of File Operation and File Permission.

File Operation and Permission

i) What is the File Operation and File Permission in Linux Operating System?
Answer:

File Operation: All data in Linux is organized into files. All files are organized into directories. These directories are organized into a tree-like structure called the file system. These operations in File system is known as file operation.

File Permission: File ownership is an important component of Linux that provides a secure method for storing files. Every file in Linux has the following attributes −

- **Owner permissions** − The owner's permissions determine what actions the owner of the file can perform on the file.
- **Group permissions** − The group's permissions determine what actions a user, who is a member of the group that a file belongs to, can perform on the file.
- **Other (world) permissions** − The permissions for others indicate what action all other users can perform on the file.

File Access Modes

The permissions of a file are the first line of defense in the security of a Unix system. The basic building blocks of Unix permissions are the **read**, **write**, and **execute** permissions, which have been described below −

Read : Grants the capability to read, i.e., view the contents of the file.

Write : Grants the capability to modify, or remove the content of the file.

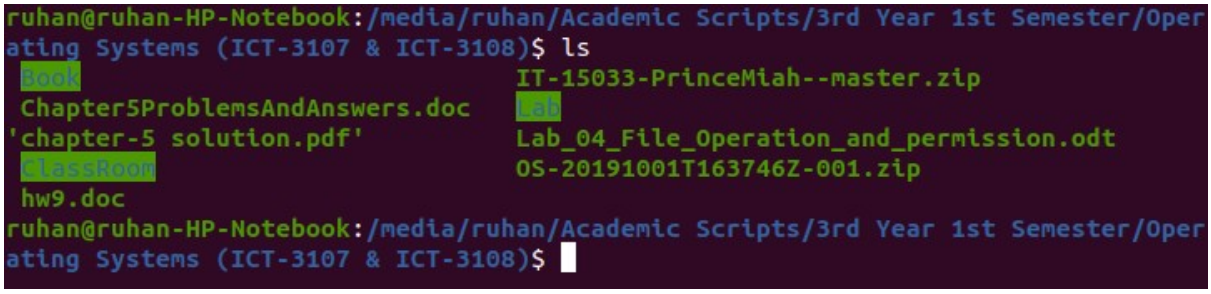
Execute : User with execute permissions can run a file as a program.

ii) Implementation of File Operation and File Permission.

Answer:

The implementation of File Operations are given below with screen shot:

1) List Directories and files:



2) List Hidden files and directories:

3) List Files and folders Recursively:

```
ruhan@ruhan-HP-Notebook:/media/ruhan/Academic Scripts/3rd Year 1st Semester$ ls
-R
.:
'Analog and Digital Communication (ICT-3101 & ICT-3102)'
'Avro Bangla typing.pdf'
 creditfeemanagement.sql
'Financial and Managerial Accounting(ICT-3109)'
 GIT_UPLOAD_PROJECT.mp4
'Microprocessor and Assembly Language(ICT-3103 & ICT-3104)'
'Object Oriented Analysis and Design(ICT-3105)'
'Operating Systems (ICT-3107 & ICT-3108)'
'Routine(27-Aug-2019).jpg'
'Software Development Project-II(ICT-3110)'

'./Analog and Digital Communication (ICT-3101 & ICT-3102)':
Book  pdf

'./Analog and Digital Communication (ICT-3101 & ICT-3102)/Book':
Book-Modern-Digital-And-Analog-Communication-Systems-4th-edition-by-Lathi.pdf
modern-digital-and-analog-communication-systems-by-b-p-lathi.pdf

'./Analog and Digital Communication (ICT-3101 & ICT-3102)/pdf':
nirjhor_n1.DAC.pdf
```

4) Change Directory:

```
ruhan@ruhan-HP-Notebook:/media/ruhan/Academic Scripts/3rd Year 1st Semester$ cd
/
ruhan@ruhan-HP-Notebook:/$
```

5) Go upper and parent directory:

```
ruhan@ruhan-HP-Notebook:/media/ruhan/Academic Scripts/3rd Year 1st Semester$ cd
..
ruhan@ruhan-HP-Notebook:/media/ruhan/Academic Scripts$
```

6) Show Working directory:

```
ruhan@ruhan-HP-Notebook:/media/ruhan/Academic Scripts/3rd Year 1st Semester$ pwd
/media/ruhan/Academic Scripts/3rd Year 1st Semester
ruhan@ruhan-HP-Notebook:/media/ruhan/Academic Scripts/3rd Year 1st Semester$
```

7) Delete file :

```
ruhan@ruhan-HP-Notebook:~$ rm -Rf filename
ruhan@ruhan-HP-Notebook:~$
```

8)Delete directory:

```
ruhan@ruhan-HP-Notebook:~$ rmdir faruk
rmdir: failed to remove 'faruk': Directory not empty
ruhan@ruhan-HP-Notebook:~$
```

9) Move file and directory:

```
ruhan@ruhan-HP-Notebook:~$ mv faruk/ Linux
ruhan@ruhan-HP-Notebook:~$
```

The table below gives numbers for all for permissions types.

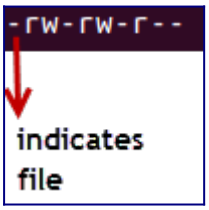
Number	Permission Type	Symbol
0	No Permission	---
1	Execute	--x
2	Write	-w-
3	Execute + Write	-wx
4	Read	r--
5	Read + Execute	r-x
6	Read +Write	rw-
7	Read + Write +Execute	rwx

File type and access permission

```
ruhan@ruhan-HP-Notebook:~$ ls -l
total 1128
drwxr-xr-x 3 ruhan ruhan    4096 সেপ্টেম্বর  3 22:09 Desktop
drwxr-xr-x 2 ruhan ruhan    4096 সেপ্টেম্বর  4 12:11 Documents
drwxr-xr-x 2 ruhan ruhan    4096 সেপ্টেম্বর  4 13:07 Downloads
```

Here, we have highlighted '**-rw-rw-r--**'and this weird looking code is the one that tells us about the permissions given to the owner, user group and the world.

Here, the first '-' implies that we have selected a file.p>



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

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:

- 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

Conclusion: From this lab work we come to learn that the Linux being a multi-user system uses permissions and ownership for security.