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I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.

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1.1 Introduction

The purpose of this week's logbook is to provide in-depth use of Linux commands, with a focus on file and directory administration and permissions. As we dive into Linux, we want to be able to do more than just use the command line with ease we want to be able to do file operations, create directory structures, and handle permissions with ease.

1.2 Aim

The main aim of this week's logbook is to gain familiarity with various LINUX commands to make files, navigate and to manipulate directory structures and also to manage file permissions.

1.3 Objective

The main objective of this week's logbook

- Create a specific directory structure.
- Perform operations like creating, copying, and moving files.
- Use basic UNIX commands for file and directory management.
- Manipulate file and directory permissions.

1.4 Required Tools and Concepts

a. Permissions

Since Linux are also used for servers this raises security concerns about malicious users trying to corrupt, change or remove crucial data, which permission helps to mitigate

There are different levels of ownership in LINUX

- User
- Group
- Others

In LINUX there are three permissions r, w and x. ’r’ permission only allows us to read the file ‘w’ enables us to read as well as write inside of the file ‘x’ enables us to execute the file. (Brent, 2023)

1.5 Required Steps

1. Create the directory shown in the figure below.

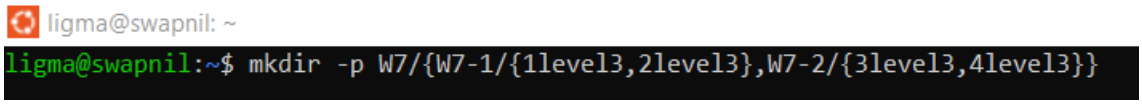

Figure 1:Directory Command

To check if the directory is created or not use the 'tree' command.

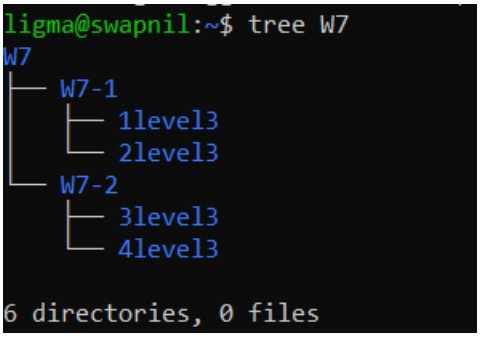

Figure 2:Tree W7

2.Change to the 1level3 directory by one step using relative pathname.

Using 'cd' command and relative path to change directory

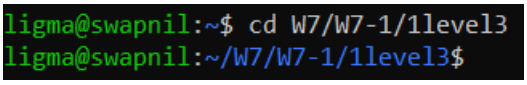

Figure 3:Change directory to 1level3

3. Practice in changing directories in your directory structure by one command using relative pathnames, e.g., from 1level3 to 2level3, from 2level3 to 4level3, from 4level3 to W7, etc. Use names of parent and child directories ('.' and '..') as well.

Changing directory from 1level3 to 2level3

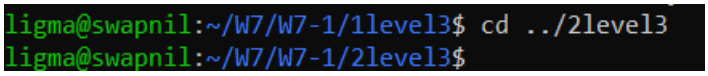

Figure 4:Changing directory

Changing directory from 2level3 to 4level3

```
ligma@swapnil:~/W7/W7-1/2level3$ cd ../../W7-2/4level3
ligma@swapnil:~/W7/W7-2/4level3$
```

Figure 5:Changing directory to 4level3

Changing directory from 4 level 3 to W7

```
ligma@swapnil:~/W7/W7-2/4level3$ cd ../../
ligma@swapnil:~/W7$
```

Figure 6:Changing directory to W7

Using '.' To change directory

```
ligma@swapnil:~/W7/W7-1$ cd ./1level3
ligma@swapnil:~/W7/W7-1/1level3$
```

Figure 7:using'.'

4.Change to 1level3 and create a text file by any tool.

Using 'cat' to create a new file in 1level3.

```
ligma@swapnil:~/W7/W7-1/1level3$ cat>file
this is my file.
^Z
[1]+  Stopped                 cat > file
ligma@swapnil:~/W7/W7-1/1level3$
```

Figure 8:creating a file in 1level3

5.Copy this text file from 1level3 to 1level3 (with the name file1), 2level3, and to 3level3 changing its name. Show that there are these files in corresponding directories.

Copying file using 'cp' command.

```
ligma@swapnil:~/W7/W7-1/1level3$ cp file file1
ligma@swapnil:~/W7/W7-1/1level3$ ls
file  file1
```

Figure 9:copying file

Copying the file to 2level3

```
ligma@swapnil:~/W7/W7-1/1level3$ cp file ../2level3/file1
```

Figure 10:copying to 2level3

Copying the file to 3level3

```
ligma@swapnil:~/W7/W7-1/1level3$ cp file ../../W7-2/3level3/file1
```

Figure 11:copying to 3level3

Updated structure

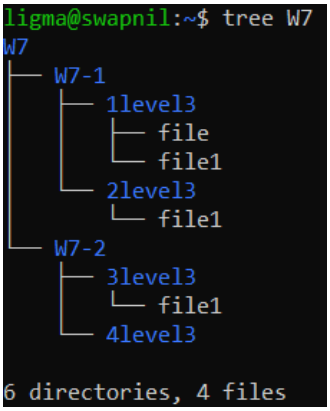

Figure 12:Updated structure

6.Move this file to 4level3.Show that there is this file in 4level3 and there is not in 1level3.

Moving file from 1level3 to 4level3 using ‘mv’ command.

```
ligma@swapnil:~/W7/W7-1/1level3$ mv file ../../W7-2/4level3
```

Figure 13:using 'mv'

```
ligma@swapnil:~$ tree W7
W7
├── W7-1
│   ├── 1level3
│   │   └── file1
│   └── 2level3
│       └── file1
└── W7-2
    ├── 3level3
    │   └── file1
    └── 4level3
        └── file
```

Figure 14:Showing proof (mv)

7.Print the following texts each in one echo or printf command:

Hello! I can do it

```
ligma@swapnil:~/W7/W7-1/1level3$ echo "Hello! I can do it"
Hello! I can do it
```

Figure 15:echo"Hello! I can do it"

5 > (20: 8 < (30 * 2)

```
ligma@swapnil:~/W7/W7-1/1level3$ echo "5>(20:8)<(30*2)"
5>(20:8)<(30*2)
ligma@swapnil:~/W7/W7-1/1level3$
```

*Figure 16:echo "5 > (20: 8 < (30 * 2)"*

Line 1
Line 2
a-b, A-B, –, +, <, >, #, $, %, &.

```
ligma@swapnil:~/W7/W7-1/1level3$ echo -e "Line1\nLine2\na-b,A-B,-,+,<,>#,$,%,&."
Line1
Line2
a-b,A-B,-,+,<,>#,$,%,&.
ligma@swapnil:~/W7/W7-1/1level3$
```

Figure 17:echo in multiple lines

8. Give the ls command (without options and with a, d, g, l, R options) in home directory, w7, w7-1, and 1level3 directories. Explain for yourself the results received.

In home directory

```
ligma@swapnil:~$ ls
W7
ligma@swapnil:~$ ls -a
.  ..  .bash_history  .bash_logout  .bashrc  .cache  .config  .motd_shown  .profile  .sudo_as_admin_successful  W7
ligma@swapnil:~$ ls -g
total 4
drwxr-xr-x 4 ligma 4096 Dec 11 22:46 W7
ligma@swapnil:~$ ls -d
.
ligma@swapnil:~$ ls -i
1197 W7
ligma@swapnil:~$ ls -R
.:
W7

./W7:
W7-1  W7-2

./W7/W7-1:
1level3  2level3

./W7/W7-1/1level3:
file1

./W7/W7-1/2level3:
file1

./W7/W7-2:
3level3  4level3

./W7/W7-2/3level3:
file1

./W7/W7-2/4level3:
file
ligma@swapnil:~$
```

Figure 18:Home directory

In W7

```
ligma@swapnil:~/W7$ ls
W7-1  W7-2
ligma@swapnil:~/W7$ ls -a
.  ..  W7-1  W7-2
ligma@swapnil:~/W7$ ls -g
total 8
drwxr-xr-x 4 ligma 4096 Dec 11 22:46 W7-1
drwxr-xr-x 4 ligma 4096 Dec 11 22:46 W7-2
ligma@swapnil:~/W7$  ls -d
.
ligma@swapnil:~/W7$ ls -i
27121 W7-1  29436 W7-2
ligma@swapnil:~/W7$  ls -R
.:
W7-1  W7-2

./W7-1:
1level3  2level3

./W7-1/1level3:
file1

./W7-1/2level3:
file1

./W7-2:
3level3  4level3

./W7-2/3level3:
file1

./W7-2/4level3:
file
ligma@swapnil:~/W7$
```

Figure 19:W7 directory

In W7-1

```
ligma@swapnil:~/W7$ cd W7-1
ligma@swapnil:~/W7/W7-1$ ls
1level3  2level3
ligma@swapnil:~/W7/W7-1$ ls -a
.  ..  1level3  2level3
ligma@swapnil:~/W7/W7-1$ ls -g
total 8
drwxr-xr-x 2 ligma 4096 Dec 11 23:53 1level3
drwxr-xr-x 2 ligma 4096 Dec 11 23:45 2level3
ligma@swapnil:~/W7/W7-1$ ls -d
.
ligma@swapnil:~/W7/W7-1$ ls -i
27122 1level3  27137 2level3
ligma@swapnil:~/W7/W7-1$ ls -R
.:
1level3  2level3

./1level3:
file1

./2level3:
file1
ligma@swapnil:~/W7/W7-1$
```

Figure 20:W7-1 directory

In W7-2

```
ligma@swapnil:~/W7/W7-1$ cd ../
ligma@swapnil:~/W7$ cd W7-2
ligma@swapnil:~/W7/W7-2$ ls
3level3  4level3
ligma@swapnil:~/W7/W7-2$ ls -a
.  ..  3level3  4level3
ligma@swapnil:~/W7/W7-2$ ls -g
total 8
drwxr-xr-x 2 ligma 4096 Dec 11 23:46 3level3
drwxr-xr-x 2 ligma 4096 Dec 11 23:53 4level3
ligma@swapnil:~/W7/W7-2$ ls -d
.
ligma@swapnil:~/W7/W7-2$ ls -i
29485 3level3  29611 4level3
ligma@swapnil:~/W7/W7-2$ ls -R
.:
3level3  4level3

./3level3:
file1

./4level3:
file
ligma@swapnil:~/W7/W7-2$
```

Figure 21:W7-2 directory

In 1 level 3

```
ligma@swapnil:~/W7/W7-1/1level3$ ls
file1
ligma@swapnil:~/W7/W7-1/1level3$ ls -a
.  ..  file1
ligma@swapnil:~/W7/W7-1/1level3$ ls -g
total 4
-rw-r--r-- 1 ligma 17 Dec 11 23:36 file1
ligma@swapnil:~/W7/W7-1/1level3$ ls -d
.
ligma@swapnil:~/W7/W7-1/1level3$ ls -i
29573 file1
ligma@swapnil:~/W7/W7-1/1level3$ ls -R
.:
file1
```

Figure 22:1level3

9.Change to the W7 directory. Remove the directory files w7-2, 3level-3, 4level3 and all ordinary files in them. Use the option –i of the rm and rmdir commands. Show that there are not these ordinary and directory files in your file structure.

Write the command ‘rm –rf –I cd W7-2’ to delete all the files.

```
ligma@swapnil:~/W7$ rm -rf -i /W7-2
rm: cannot remove '/W7-2': No such file or directory
ligma@swapnil:~/W7$ rm -rf -i cd W7-2
rm: cannot remove 'cd': No such file or directory
rm: descend into directory 'W7-2'? y
rm: descend into directory 'W7-2/4level3'? y
rm: remove regular file 'W7-2/4level3/file'? y
rm: remove directory 'W7-2/4level3'? y
rm: descend into directory 'W7-2/3level3'? y
rm: remove regular file 'W7-2/3level3/file1'? y
rm: remove directory 'W7-2/3level3'? y
rm: remove directory 'W7-2'? y
ligma@swapnil:~/W7$ cd ../
ligma@swapnil:~$ W7 tree
W7: command not found
ligma@swapnil:~$ tree W7
W7
└── W7-1
    ├── 1level3
    │   └── file1
    └── 2level3
        └── file1

3 directories, 2 files
ligma@swapnil:~$
```

Figure 23:Delete W7-2 directory

10.Change to w7-1.

- Display access permissions for the file file1 in 1level3.

Use the ‘ls –l’ command to view the permissions

```
ligma@swapnil:~/W7/W7-1/1level3$ ls -l file1
-rw-r--r-- 1 ligma ligma 17 Dec 11 23:36 file1
```

Figure 24:permission of file1

- Remove all access permissions for this file.

Use the command ’chmod –rw file1’ to remove all the permissions for the file.

```
ligma@swapnil:~/W7/W7-1/1level3$ chmod -rw file1
```

Figure 25:deleting permission in file1

- Display access permissions for this file.

Use the ‘ls –l’ to display the permission.

```
ligma@swapnil:~/W7/W7-1/1level3$ ls -l
total 4
---------- 1 ligma ligma 17 Dec 11 23:36 file1
```

Figure 26:displaying updated permissions

- Try to read this file using any utility (e.g.,cat).

Using the ‘cat ‘command to view the file. The file does not open because we do not have any permission to do anything to the file.

```
ligma@swapnil:~/W7/W7-1/1level3$ cat file1
cat: file1: Permission denied
```

Figure 27:Using cat to view file1

- Try to write into this file using any utility (e.g., cat with the sign >> – append).

```
ligma@swapnil:~/W7/W7-1/1level3$ cat >>- file1
cat: file1: Permission denied
```

Figure 28:Trying to write in file

- Add read and write access permissions for yourself for this file.

Use ‘chmod u+rw file1’ to add read and write permission.

```
ligma@swapnil:~/W7/W7-1/1level3$ chmod u+rw file1
```

Figure 29:adding access

- Display access permissions for this file.

Use ‘ls –l file1’ command to view the permission

```
ligma@swapnil:~/W7/W7-1/1level3$ ls -l file1
-rw------- 1 ligma ligma 17 Dec 11 23:36 file1
```

Figure 30:Displaying access permission

- Try to read this file using any utility.

Use ‘cat ‘command’ to view the file.

```
ligma@swapnil:~/W7/W7-1/1level3$ cat file1
this is my file.
This is me john cena
```

Figure 31:Reading the file

- Try to write into this file using any utility.

Use ‘cat>>file1’ to write into the file

```
ligma@swapnil:~/W7/W7-1/1level3$ cat >>file1
i am writing^Z
[1]+  Stopped                 cat >> file1
```

Figure 32:Trying to write into the file

11)

- Display access permissions for 1level3.

Use ‘ls-l’ command to view access permissions.

```
ligma@swapnil:~/W7/W7-1$ ls -l
total 8
drwxr-xr-x 2 ligma ligma 4096 Dec 13 09:24 1level3
drwxr-xr-x 2 ligma ligma 4096 Dec 11 23:45 2level3
ligma@swapnil:~/W7/W7-1$
```

Figure 33:Displaying permissions

- Remove all access permissions for the 1level3 directory.

Use ‘chmod –rwx 1level3’ to remove all access permissions.

```
ligma@swapnil:~/W7/W7-1$ chmod -rwx 1level3
```

Figure 34:Removing access permissions

- Display access permissions for 1level3.

Use ‘ls –l’ to display access permissions

```
ligma@swapnil:~/W7/W7-1$ ls -l
total 8
d--------- 2 ligma ligma 4096 Dec 13 09:24 1level3
drwxr-xr-x 2 ligma ligma 4096 Dec 11 23:45 2level3
```

Figure 35:Displaying access permissions

- Try to read a file from 1level3 using any utility.

Use ‘cat’ command to view the file. You won’t be able to access it because you don’t have any permissions.

```
ligma@swapnil:~/W7/W7-1$ cat 1level3/file1
cat: 1level3/file1: Permission denied
```

Figure 36:Trying to read a file

- Try to put a file into 1level3 using any utility.

Due to no permissions we cant add text into the file.

```
ligma@swapnil:~/W7/W7-1$ cat>>1level3/file1
-bash: 1level3/file1: Permission denied
```

Figure 37:trying to put into a file

- Try to search in 1level3 using any command (e.g., the ls command).

You won’t be able to view the files too.

```
igma@swapnil:~/W7/W7-1$ ls 1level3
s: cannot open directory '1level3': Permission denied
```

Figure 38;trying to execute a command

- Add read, write, and execute access permissions for yourself for the 1level3 directory.

Use ’chmod u+rwx 1level3’ to add permission.

```
ligma@swapnil:~/W7/W7-1$ chmod  u+rwx 1level3
```

Figure 39:adding permissions

- Display access permissions for 1level3.

Use ’ls –l’ to view all the file permissions.

```
ligma@swapnil:~/W7/W7-1$ ls -l
total 8
drwx------ 2 ligma ligma 4096 Dec 13 09:24 1level3
drwxr-xr-x 2 ligma ligma 4096 Dec 11 23:45 2level3
```

Figure 40:access permission 1level

- Try to read a file from 1level3 using any utility.

Use ‘cat’ to view the file

```
ligma@swapnil:~/W7/W7-1$ cat 1level3/file1
this is my file.
This is me john cena
```

Figure 41::Trying to read 1level3

- Try to put a file into 1level3 using any utility.

To add into the file ‘cat>1level3/file’ and press ctrl+z

```
ligma@swapnil:~/W7/W7-1$ cat>1level3/file1
this is random
^Z
[2]+  Stopped                 cat > 1level3/file1
```

Figure 42:Putting a file into 1level3

- Try to search in 1level3 using any command (e.g., the ls command).

Use ‘ls 1level3’ to search in the directory

```
ligma@swapnil:~/W7/W7-1$ ls 1level3/
file1
```

Figure 43:searching in 1level3

1.6 Conclusion

While working on this logbook I was able to learn many things and also get comfortable with various LINUX commands and concepts which helped me to gain a deeper insight into LINUX. I learned how to create directory structures, creating, manipulate file directories as well as to manage permissions.

1.7 Bibliography

Brent, M. (2023, October 25). *File Permissions in Linux/Unix:how to Read,Write & Change?* Retrieved from GURU99: https://www.guru99.com/file-permissions.html