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1. AIM

To perform several Linux commands to create or manipulate directories and files.

2. STEPS

2.1. Step 1

A directory and subdirectory was creating using linux command mkdir.

```
dikshya@DESKTOP-FL3C4R0:~$ mkdir -p W7/{W7-1/{1level3,2level3},W7-2/{3level3,4level3}}
dikshya@DESKTOP-FL3C4R0:~$ tree W7
W7
├── W7-1
│   ├── 1level3
│   └── 2level3
└── W7-2
    ├── 3level3
    └── 4level3

7 directories, 0 files
dikshya@DESKTOP-FL3C4R0:~$
```

Figure 1: Creating Directory

2.2. Step 2

Home directory was changed to 1level3 directory using relative pathname.

```
dikshya@DESKTOP-FL3C4R0:~$ cd W7/W7-1/1level3/
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$
```

Figure 2: Changing home directory

1level3 directory was changed to 2level3 directory.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$ cd ../../W7-1/2level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/2level3$ █
```

Figure 3: Changing 1level3 directory to 2level directory

2level3 directory was changed to 4level3 directory.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/2level3$ cd ../../W7-2/4level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-2/4level3$ █
```

Figure 4: Changing 2level3 directory to 4level3 directory

4level3 directory was changed to W7 directory.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-2/4level3$ cd ../../
dikshya@DESKTOP-FL3C4R0:~/W7$ █
```

Figure 5: Changing 4level3 directory to W7 directory.

2.3. Step 3

W7 directory was changed to 1level3 directory and file named “text1” was created.

```
dikshya@DESKTOP-FL3C4R0:~/W7$ cd W7-1/1level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$ cd > text1
```

Figure 6: Creating a file in 1level3 directory.

Tree command was used to show the directory and its content in the form of tree.

```
dikshya@DESKTOP-FL3C4R0:~$ tree W7
W7
├── W7-1
│   ├── 1level3
│   │   └── text1
│   └── 2level3
└── W7-2
    ├── 3level3
    └── 4level3

7 directories, 1 file
dikshya@DESKTOP-FL3C4R0:~$
```

Figure 7: Tree command to view the directory and subdirectory and files inside it.

2.4. Step 4

Text file from directory 1level3 was copied to 1level3 directory itself but by renaming it to file1.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$ cp text1 file1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$ ls
file1  text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$
```

Figure 8: Copying file from 1level3 directory to 1level3 directory by renaming it.

Then, the file1 was copied to 2level3 directory.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$ cp file1 ../2level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$
```

Figure 9: Copying file to 2level3 directory.

Similarly, it was also copied to 3level3 directory.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$ cp file1 ../../W7-2/3level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$ cd ../../../
dikshya@DESKTOP-FL3C4R0:~$ tree W7
W7
├── W7-1
│   ├── 1level3
│   │   ├── file1
│   │   └── text1
│   └── 2level3
│       └── file1
└── W7-2
    ├── 3level3
    │   └── file1
    └── 4level3

7 directories, 4 files
```

Figure 10: Copying file to 3level3 directory.

2.5. Step 5

Text file “file1” from 1level3 directory was again moved to 4level3 directory.

```
file1 text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1/1level3$ mv file1 ../../W7-2/4level3
```

Figure 11: moving file from 1level3 to 4level3 directory.

Tree Command to show the directory and the files.

```
dikshya@DESKTOP-FL3C4R0:~$ tree W7
W7
├── W7-1
│   ├── 1level3
│   │   └── text1
│   └── 2level3
│       └── file1
└── W7-2
    ├── 3level3
    │   └── file1
    └── 4level3
        └── file1
```

Figure 12: Tree Command

2.6. Step 6

Contents was printed using “echo” command and “printf” command.

```
dikshya@DESKTOP-FL3C4R0:~$ echo Hello\! I can do it
Hello! I can do it
dikshya@DESKTOP-FL3C4R0:~$
```

Figure 13: echo command for printing provided data

```
dikshya@DESKTOP-FL3C4R0:~$ echo "5>(20:8)<(30*2)"
5>(20:8)<(30*2)
```

Figure 14: echo command

```
dikshya@DESKTOP-FL3C4R0:~$ printf "Line 1\nLine 2\na-b,A-B,-,+,<,>,#,$,%%,&\n"
Line 1
Line 2
a-b,A-B,-,+,<,>,#,$,%%,&
dikshya@DESKTOP-FL3C4R0:~$
```

Figure 15: printf command to print data

```
dikshya@DESKTOP-FL3C4R0:~$ echo -e "Line 1\nLine 2\na-b,A-B,-,+,<,>,#,$,%%,&"
Line 1
Line 2
a-b,A-B,-,+,<,>,#,$,%%,&
dikshya@DESKTOP-FL3C4R0:~$
```

2.7. Step 7

“ls” command was tested with and without options in home directory, W7 directory, W7-1 directory and 1level3 directory.

Where,

ls – listed the contents of particular directory without any additional details.

ls -a – listed all files including hidden files.

ls -d – listed information about particular directory.

ls -g – displayed group ownership.

ls -i – displayed inode number of directory.

ls -R – displayed the contents of all subdirectories within particular directory.

```
dikshya@DESKTOP-FL3C4R0:~$ ls
alscript alscript Computing Laptop test1 test2 W7
dikshya@DESKTOP-FL3C4R0:~$ ls -a
. alscript .bash_history .bashrc Laptop .sudo_as_admin_successful test2
.. alscript .bash_logout Computing .profile test1 W7
dikshya@DESKTOP-FL3C4R0:~$ ls -d
.
dikshya@DESKTOP-FL3C4R0:~$ ls -g
total 8
-rw-r--r-- 1 dikshya 0 Dec 4 21:26 alscript
-rw-r--r-- 1 dikshya 5999 Dec 4 10:45 alscript
drwxr-xr-x 1 dikshya 512 Dec 7 12:55 Computing
drwxr-xr-x 1 dikshya 512 Dec 7 12:14 Laptop
-rw-r--r-- 1 dikshya 22 Dec 4 10:40 test1
-rw-r--r-- 1 dikshya 62 Dec 4 10:42 test2
drwxr-xr-x 1 dikshya 512 Dec 11 10:43 W7
```

Figure 16: ls command with and without it's options.

```

dikshya@DESKTOP-FL3C4R0:~$ ls -i
1407374883638150 alscript 14918173765733151 Computing 2533274790566397 test1 3940649674032740 W7
16888498602648731 alscript 4222124650743360 Laptop 4222124650933898 test2
dikshya@DESKTOP-FL3C4R0:~$ ls -R
.:
alscript alscript Computing Laptop test1 test2 W7

./Computing:
C1 C2 C3

./Computing/C1:

./Computing/C2:

./Computing/C3:

./Laptop:
Dell HP

./Laptop/Dell:
File1 File2

./Laptop/Dell/File1:

./Laptop/Dell/File2:

./Laptop/HP:

./W7:
W7-1 W7-2

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

./W7/W7-1/1level3:
text1

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

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

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

./W7/W7-2/4level3:
file1
dikshya@DESKTOP-FL3C4R0:~$

```

Figure 17: ls command with it's options.

```

dikshya@DESKTOP-FL3C4R0:~$ cd W7
dikshya@DESKTOP-FL3C4R0:~/W7$ ls
W7-1  W7-2
dikshya@DESKTOP-FL3C4R0:~/W7$ ls -a
.  ..  W7-1  W7-2
dikshya@DESKTOP-FL3C4R0:~/W7$ ls -d
.
dikshya@DESKTOP-FL3C4R0:~/W7$ ls -g
total 0
drwxr-xr-x 1 dikshya 512 Dec 11 10:24 W7-1
drwxr-xr-x 1 dikshya 512 Dec 11 10:24 W7-2
dikshya@DESKTOP-FL3C4R0:~/W7$ ls -i
2533274791754960 W7-1  1407374884912914 W7-2
dikshya@DESKTOP-FL3C4R0:~/W7$ ls -r
W7-2  W7-1
dikshya@DESKTOP-FL3C4R0:~/W7$ █

```

Figure 18: `ls` command with and without it's option on `W7` directory.

```

dikshya@DESKTOP-FL3C4R0:~/W7$ cd W7-1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls
1level3  2level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -a
.  ..  1level3  2level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -d
.
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -g
total 0
drwxr-xr-x 1 dikshya 512 Dec 11 18:00 1level3
drwxr-xr-x 1 dikshya 512 Dec 11 11:15 2level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -i
1970324838333674 1level3  1688849861623561 2level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -r
2level3  1level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ █

```

Figure 19: `ls` command with and without it's option on `W7-1` directory.

2.8. Step 8

Following that, directory was changed to W7 directory and the directory “W7-2” was removed including files inside it using rm command.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cd ../
dikshya@DESKTOP-FL3C4R0:~/W7$ rm -iR W7-2
rm: descend into directory 'W7-2'? 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: descend into directory 'W7-2/4level3'? y
rm: remove regular file 'W7-2/4level3/file1'? y
rm: remove directory 'W7-2/4level3'? y
rm: remove directory 'W7-2'? y
dikshya@DESKTOP-FL3C4R0:~/W7$ cd
dikshya@DESKTOP-FL3C4R0:~$ tree W7
W7
├── W7-1
│   ├── 1level3
│   │   └── text1
│   └── 2level3
│       └── file1
└── 4 directories, 2 files
dikshya@DESKTOP-FL3C4R0:~$
```

Figure 20: Removing directory and subdirectory.

2.9. Step 9

Likewise, directory was changed to W7-1 and access permissions was displayed.

Similarly, access permissions for 1level3 and text1 was also displayed.

Then, all access permissions for file text1 was removed. After that, reading permission was checked using cat command which didn't allow user to even read the file.

```
dikshya@DESKTOP-FL3C4R0:~$ cd W7/W7-1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cd
dikshya@DESKTOP-FL3C4R0:~$ cd W7/W7-1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l 1level3
total 0
-rw-r--r-- 1 dikshya dikshya 1 Dec 11 11:09 text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l 1level3/
total 0
-rw-r--r-- 1 dikshya dikshya 1 Dec 11 11:09 text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ chmod -rw 1level3/text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l 1level3/
total 0
----- 1 dikshya dikshya 1 Dec 11 11:09 text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/file1
cat: 1level3/file1: No such file or directory
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/text1
cat: 1level3/text1: Permission denied
```

Figure 21: Manipulating Access Permissions on file.

Then, for user, read and write permission was added and displayed.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ chmod u+rw 1level3/text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l 1level3/
total 0
-rw-r--r-- 1 dikshya dikshya 0 Dec 11 18:57 file1
-rw----- 1 dikshya dikshya 1 Dec 11 11:09 text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l 1level3/text1
-rw----- 1 dikshya dikshya 1 Dec 11 11:09 1level3/text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$
```

Figure 22: Manipulating access permissions.

Then, read and write permission was checked which in fact allowed to write and read the file.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/text1
```

Figure 23: cat command to check the read permission.

```
cat: Helloooo!: No such file or directory
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat>>1level3/text1
Checking if it allows to write
^C
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$
```

Figure 24: checking write permissions.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/text1
Checking if it allows to write
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$
```

Figure 25: Displaying content.

2.10. Step 10

Access Permission for directory 1level3 was displayed. And all the access permissions for 1level3 was removed and then displayed. Then, it was tried to read, execute and put some content inside it but permission was denied because of removing the permission earlier.

And then, read write and executing permission was added.

```
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l
total 0
drwxr-xr-x 1 dikshya dikshya 512 Dec 11 18:57 1level3
drwxr-xr-x 1 dikshya dikshya 512 Dec 11 11:15 2level3
-rw-r--r-- 1 dikshya dikshya  0 Dec 11 18:56 hell
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ chmod -rwx 1level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l
total 0
d----- 1 dikshya dikshya 512 Dec 11 18:57 1level3
drwxr-xr-x 1 dikshya dikshya 512 Dec 11 11:15 2level3
-rw-r--r-- 1 dikshya dikshya  0 Dec 11 18:56 hell
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/file1
cat: 1level3/file1: Permission denied
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/text1
cat: 1level3/text1: Permission denied
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat>>1level3/file1
-bash: 1level3/file1: Permission denied
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls level3/
ls: cannot access 'level3/': No such file or directory
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls 1level3/
ls: cannot open directory '1level3/': Permission denied
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ chmod +rwx 1level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l
total 0
drwxr-xr-x 1 dikshya dikshya 512 Dec 11 18:57 1level3
drwxr-xr-x 1 dikshya dikshya 512 Dec 11 11:15 2level3
-rw-r--r-- 1 dikshya dikshya  0 Dec 11 18:56 hell
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$
```

Figure 26: Manipulating access permission on 1level3 directory.

After successfully adding permissions, access permissions were displayed in 1level3 directory. Similarly, it was tried to read, execute, and write into the file which in fact allowed the permissions.

```
13: cannot open directory '1level3': Permission denied
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ chmod +rwx 1level3
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls -l
total 0
drwxr-xr-x 1 dikshya dikshya 512 Dec 11 18:57 1level3
drwxr-xr-x 1 dikshya dikshya 512 Dec 11 11:15 2level3
-rw-r--r-- 1 dikshya dikshya  0 Dec 11 18:56 hell
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/text1

Checking if it allows to write
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat > 1level3/text1
Write??
^C
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ ls 1level3
file1  text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat > 1level3/text1
^C
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/text1
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat > 1level3/text1
Checking if we can write
^C
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ cat 1level3/text1
Checking if we can write
dikshya@DESKTOP-FL3C4R0:~/W7/W7-1$ █
```

Figure 27: Adding and checking access permissions.