File handling Utilities

1. Files Listing: To perform Files listings or to list files and directories ls command is used:
$ls

All your files and directories in the current directory would be listed and each type of file would be displayed with a different color. Like in the output directories are displayed with dark blue color.

$ls -l

It returns the detailed listing of the files and directories in the current directory. The command gives OS the owner of the file and even which file could be managed by which user or group and which user/group has the right to access or execute which file.

2. Creating Files: touch command can be used to create a new file. It will create and open a new blank file if the file with a filename does not exist. And in case the file already exists then the file will not be affected.

$touch filename

3. Displaying File Contents: cat command can be used to display the contents of a file. This command will display the contents of the 'filename' file. And if the output is very large then we could use more or less to fit the output on the terminal screen otherwise the content of the whole file is displayed at once.

$cat filename

4. Copying a File

cp command could be used to create the copy of a file. It will create the new file in destination with the same name and content as that of the file 'filename'.

$cp source/filename destination/

5. Moving a File

mv command could be used to move a file from source to destination. It will remove the file filename from the source folder and would be creating a file with the same name and content in the destination folder.

```
$mv source/filename destination/
```

6. Renaming a File

mv command could be used to rename a file. It will rename the filename to new_filename or in other words, it will remove the filename file and would be creating a new file with the new_filename with the same content and name as that of the filename file.

```
$mv filename new_filename
```

7. Deleting a File

rm command could be used to delete a file. It will remove the filename file from the directory.

```
$rm filename
```

Process utilities

Fields described by ps are described as:

- UID: User ID that this process belongs to (the person running it)
- PID: Process ID
- PPID: Parent process ID (the ID of the process that started it)
- C: CPU utilization of process
- STIME: Process start time
- TTY: Terminal type associated with the process
- TIME: CPU time is taken by the process
- CMD: The command that started this process

ps (Process status) can be used to see/list all the running processes.

```
$ ps

PID     TTY     TIME      CMD
19      pts/1   00:00:00   sh
24      pts/1   00:00:00   ps
```

For more information -f (full) can be used along with ps

```
$ ps –f

UID     PID  PPID C STIME    TTY       TIME CMD
52471    19    1 0 07:20   pts/1  00:00:00f    sh
52471    25   19 0 08:04   pts/1  00:00:00     ps -f
```

For single-process information, ps along with process id is used

```
$ ps 19

PID      TTY     TIME       CMD
19       pts/1    00:00:00    sh
```

There are other options which can be used along with ps command:

-a: Shows information about all users
-x: Shows information about processes without terminals
-u: Shows additional information like -f option
-e: Displays extended information

Stopping as process: When running in foreground, hitting Ctrl + c (interrupt character) will exit the command. For processes running in background kill command can be used if it's pid is known.

```
$ ps –f

UID      PID  PPID C STIME    TTY        TIME CMD
52471     19     1 0 07:20    pts/1  00:00:00      sh
52471     25    19 0 08:04    pts/1  00:00:00      ps –f
$ kill 19
Terminated
```

If a process ignores a regular kill command, you can use kill -9 followed by the process ID.

```
$ kill -9 19
Terminated
```

Disk Utilities

1. Using du Command

We can check the disk space with the help of the du command. The full-form of du is "Disk Usage." The du command shows the usage of disk. The du command will show you the disk usage for specific directories in Linux.

Syntax: .$ du

du -a: - This will show you the disk usage for all the files.
Syntax:$ du -a

du -s: - This will show you the total disk space used by a specific directory or file.

Syntax: $ du -s

2. Using the df option

The full-form of df command is "disk-free,". Using this command, we can check the used and available disk space in the Linux system.

Syntax: $ df [optios].........FILESYSTEM.........

When we use this command with no parameter, then this command will show you the information related to all the mounted file systems:

1.$ df
The following columns are contained in each line:

- "Filesystem" - The filesystem's name.
- "1K-blocks"- The filesystem's size in 1K blocks.
- "Used"- Used means the used space in 1K blocks.
- "Available" - Available means space available in 1K blocks.
- "Use%"- The percentage of the used space.
- "Mounted on"- The directory on which the filesystem is mounted/

If we want to show the information for a particular file system only, we can pass the name or the mount point of the file system to the **df** command.

For example, if we need to display the space which is available on the file system mounted to the root directory **(/)** then we can use the df/dev/nvme0n1p3 or df/.

Syntax: $ df /

File System Types

In order to check the file system type of our system, use the 'T' option. The 'T' option will show the file system type with other information.

We can use the -T option to tell df to display the file system types:

Syntax: .$ df -T

The output contains an extra column named "Type: which displaying the filesystem's type.

Display Information of File System in Bytes

If want to see the information and usage of file system in 1024-byte blocks, then we can use the '-k' option.

Syntax: $ df -k

Display Information of File System in MB

We can use the '-m' option in order to show the information of all file system usage in MegaByte (MB).

Display Information of File System in GB

We can use the 'df -h' option if we want to show information of all file system statistics in Gigabyte (GB).

Syntax: $ df -h