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Assignment no. 1

1) ls — The most frequently used command in Linux to list directories

```
[kaustubh@debian]--[~/cc]  
$ls  
file1.txt  file2.txt  file3.txt  folder
```

2) pwd — Print working directory command in Linux

```
[kaustubh@debian]--[~/cc]  
$pwd  
/home/student/cc
```

3) cd — Linux command to navigate through directories

```
[kaustubh@debian]--[~/cc]  
$cd folder
```

4) mkdir — Command used to create directories in Linux

```
[kaustubh@debian]--[~/cc/folder]  
$mkdir files
```

5) mv — Move or rename files in Linux

```
[kaustubh@debian]--[~/cc/folder]
└─ $ls
files

[kaustubh@debian]--[~]
└─ $cd cc

[kaustubh@debian]--[~/cc]
└─ $mv file3.txt folder/files/

[kaustubh@debian]--[~/cc]
└─ $ls folder/files/
file3.txt

[kaustubh@debian]--[~/cc]
└─ $cd folder/files/

[kaustubh@debian]--[~/cc/folder/files]
└─ $mv file3.txt newfile.txt

[kaustubh@debian]--[~/cc/folder/files]
└─ $ls
newfile.txt
```

6) cp — Similar usage as mv but for copying files in Linux

```
[kaustubh@debian]--[~/cc]
└─ $cp file2.txt file3.txt

[kaustubh@debian]--[~/cc]
└─ $ls
file1.txt  file2.txt  file3.txt  folder
```

7) rm — Delete files or directories

```
[kaustubh@debian]--[~/cc]
└─ $ls
file1.txt  file2.txt  file3.txt  folder
```

```
[kaustubh@debian]~[~/cc]
$rm file3.txt

[kaustubh@debian]~[~/cc]
$ls
file1.txt  file2.txt  folder
```

8) touch — Create blank/empty files

```
[kaustubh@debian]~[~/cc]
$touch file3.txt

[kaustubh@debian]~[~/cc]
$ls
file1.txt  file2.txt  file3.txt  folder
```

9) ln — Create symbolic links (shortcuts) to other files

```
[kaustubh@debian]~[~/cc]
$ln file3.txt ln_file3.txt

[kaustubh@debian]~[~/cc]
$ls
file1.txt  file2.txt  file3.txt  folder  ln_file3.txt

[kaustubh@debian]~[~/cc]
$cat ln_file3.txt
Hello, world!
```

10) cat — Display file contents on the terminal

```
[kaustubh@debian]~[~/cc]
$cat > file3.txt
Hello, world!
```

11) clear — Clear the terminal display

```
[kaustubh@debian]-[~/cc]  
$clear
```

12) echo — Print any text that follows the command

```
[kaustubh@debian]-[~/cc]  
$echo "Hello, world!"  
Hello, world!
```

13) less — Linux command to display paged outputs in the terminal

```
[kaustubh@debian]-[~/cc]  
$less file3.txt  
Hello, world!  
file3.txt (END)
```

14) man — Access manual pages for all Linux commands

```
[kaustubh@debian]-[~/cc]  
$man whoami  
WHOAMI(1) User Commands WHOAMI(1)  
  
NAME  
    whoami - print effective userid  
  
SYNOPSIS  
    whoami [OPTION]...  
  
DESCRIPTION  
    Print the user name associated with the current  
    effective user ID. Same as id -un.  
  
    --help display this help and exit  
  
    --version  
        output version information and exit
```

15) uname — Linux command to get basic information about the OS

```
[kaustubh@debian]~[~/cc]
└─$ uname
Linux
```

16) whoami — Get the active username

```
[kaustubh@debian]~[~/cc]
└─$ whoami
student
```

17) tar — Command to extract and compress files in Linux

```
[kaustubh@debian]~[~/cc]
└─$ tar -cvf files.tar.xz file*
file1.txt
file2.txt
file3.txt

[kaustubh@debian]~[~/cc]
└─$ ls
files.tar.xz  folder

[kaustubh@debian]~[~/cc]
└─$ tar -xvf files.tar.xz
file1.txt
file2.txt
file3.txt

[kaustubh@debian]~[~/cc]
└─$ ls
file1.txt  file2.txt  file3.txt  files.tar.xz  folder
```

18) grep — Search for a string within an output

```
[kaustubh@debian]~[~/cc]
└─$ cat file3.txt | grep world
Hello, world!
```

19) head — Return the specified number of lines from the top

```
[kaustubh@debian]~[~/cc]
└─$ head file3.txt
Hello, world!
```

20) tail — Return the specified number of lines from the bottom

```
[kaustubh@debian]~[~/cc]
└─$ tail file3.txt
Hello, world!
```

21) diff — Find the difference between two files

```
[kaustubh@debian]~[~/cc]
└─$ diff file2.txt file3.txt
2d1
< C++ is the best programming language
```

22) cmp — Allows you to check if two files are identical

```
[kaustubh@debian]~[~/cc]
└─$ cmp file2.txt file3.txt
file2.txt file3.txt differ: byte 1, line 1
```

23) comm — Combines the functionality of diff and cmp

```
[kaustubh@debian]~[~/cc]
└─$ comm file2.txt file3.txt
C++ is the best programming language
      Hello, world!
```

24) sort — Linux command to sort the content of a file while outputting


```
[kaustubh@debian]--[~/cc]
→ $ls
file1.txt  file2.txt  file3.txt  folder  numbers.txt

[kaustubh@debian]--[~/cc]
→ $cat numbers.txt
5
4
2
1
3

[kaustubh@debian]--[~/cc]
→ $cat numbers.txt | sort
1
2
3
4
5
```

25) export — Export environment variables in Linux

```
[kaustubh@debian]--[~/cc]
→ $export var="Hello, world!"

[kaustubh@debian]--[~/cc]
→ $echo $var
Hello, world!
```

26) zip — Zip files in Linux

```
[kaustubh@debian]--[~/cc]
→ $zip files.zip file*
updating: file1.txt (deflated 98%)
updating: file2.txt (stored 0%)
updating: file3.txt (stored 0%)
```

```
[kaustubh@debian]--[~/cc]
└─ $ls
file1.txt  file2.txt  file3.txt  files.zip  folder

[kaustubh@debian]--[~/cc]
└─ $rm *.txt

[kaustubh@debian]--[~/cc]
└─ $ls
files.zip  folder
```

27) unzip — Unzip files in Linux

```
[kaustubh@debian]--[~/cc]
└─ $unzip files.zip
Archive:  files.zip
  inflating: file1.txt
  extracting: file2.txt
  extracting: file3.txt

[kaustubh@debian]--[~/cc]
└─ $ls
file1.txt  file2.txt  file3.txt  files.zip  folder
```

28) ssh — Secure Shell command in Linux

```
[kaustubh@debian]--[~/cc]
└─ $ssh student@127.0.0.1
student@127.0.0.1's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-58-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Mon Jan 23 16:54:45 2023 from 127.0.0.1
student@student-Vostro-3470:~$
```


29) service — Linux command to start and stop services

```
[kaustubh@debian]~[~/cc]
$service ssh start

[kaustubh@debian]~[~/cc]
$service ssh status
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-01-23 16:48:00 UTC; 1min 45s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
  Main PID: 7429 (sshd)
    Tasks: 1 (limit: 4406)
   Memory: 1.1M
    CGroup: /system.slice/ssh.service
            └─7429 sshd: /usr/sbin/sshd -D [listener] 0
```

30) ps — Display active processes

```
[kaustubh@debian]~[~]
$python3 -m http.server
Serving HTTP on 0.0.0.0 port 8000 (http://0.0.0.0:8000/):
...
^Z
[1]+  Stopped                  python3 -m http.server

[x]-[kaustubh@debian]~[~]
$ps
  PID TTY          TIME CMD
 11928 pts/0        00:00:00 bash
 11941 pts/0        00:00:00 python3
 11943 pts/0        00:00:00 ps
```

31) kill and killall — Kill active processes by process ID or name

```
[kaustubh@debian]~[~]
$kill -9 11941
```

```

[kaustubh@debian]--[~]
$ps
  PID TTY          TIME CMD
 11928 pts/0        00:00:00 bash
 11946 pts/0        00:00:00 ps
[1]+  Killed                  python3 -m http.server

```

32) df — Display disk filesystem information

```

[kaustubh@debian]--[~/cc]
$df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            1.8G   0    1.8G   0% /dev
tmpfs           375M  1.9M  373M   1% /run
/dev/sda6       96G   13G   78G  15% /
tmpfs           1.9G   0    1.9G   0% /dev/shm
tmpfs           5.0M  4.0K  5.0M   1% /run/lock
tmpfs           1.9G   0    1.9G   0% /sys/fs/cgroup

```

33) mount — Mount file systems in Linux

```

[kaustubh@debian]--[~/cc]
$mkdir /tmp/mount

[kaustubh@debian]--[~/cc]
$sudo mount /dev/sdb5 /tmp/mount

[kaustubh@debian]--[~/cc]
$ls /tmp/mount/
bin      initrd.img      libx32      proc      sys      vmlinuz.old
boot     initrd.img.old  lost+found  root     tmp
dev      lib             media       run      usr
etc      lib32           mnt         sbin     var
home     lib64           opt         srv      vmlinuz

```

34) chmod — Command to change file permissions

```
[kaustubh@debian]--[~/cc]
└─ $ls -l
total 24
-rw-rw-r-- 1 student student 10240 Jan 23 16:39 file1.txt
-rw-rw-r-- 1 student student   51 Jan 23 16:23 file2.txt
-rw-rw-r-- 1 student student   14 Jan 23 16:31 file3.txt
drwxrwxr-x 3 student student 4096 Jan 23 15:58 folder

[kaustubh@debian]--[~/cc]
└─ $chmod 445 folder/

[kaustubh@debian]--[~/cc]
└─ $ls -l
total 24
-rw-rw-r-- 1 student student 10240 Jan 23 16:39 file1.txt
-rw-rw-r-- 1 student student   51 Jan 23 16:23 file2.txt
-rw-rw-r-- 1 student student   14 Jan 23 16:31 file3.txt
dr--r--r-x 3 student student 4096 Jan 23 15:58 folder
```

35) chown — Command for granting ownership of files or folders

```
[kaustubh@debian]--[~/cc]
└─ $ls -l
total 24
-rw-rw-r-- 1 student student 10240 Jan 23 16:39 file1.txt
-rw-rw-r-- 1 student student   51 Jan 23 16:23 file2.txt
-rw-rw-r-- 1 student student   14 Jan 23 16:31 file3.txt
dr--r--r-x 3 student student 4096 Jan 23 15:58 folder

[kaustubh@debian]--[~/cc]
└─ $sudo chown root:root folder

[kaustubh@debian]--[~/cc]
└─ $ls -l
total 24
-rw-rw-r-- 1 student student 10240 Jan 23 16:39 file1.txt
-rw-rw-r-- 1 student student   51 Jan 23 16:23 file2.txt
-rw-rw-r-- 1 student student   14 Jan 23 16:31 file3.txt
dr--r--r-x 3 root      root      4096 Jan 23 15:58 folder
```

36) ifconfig — Display network interfaces and IP addresses

```
[kaustubh@debian]--[~/cc]
$ifconfig
enp1s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    ether e4:54:e8:a7:59:8f txqueuelen 1000 (Ethernet)
    RX packets 63241 bytes 86077545 (86.0 MB)
    RX errors 0 dropped 79 overruns 0 frame 0
    TX packets 18648 bytes 2250898 (2.2 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 2977 bytes 316874 (316.8 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 2977 bytes 316874 (316.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

37) traceroute — Trace all the network hops to reach the destination

```
[kaustubh@debian]--[~/cc]
$traceroute 127.0.0.1
traceroute to 127.0.0.1 (127.0.0.1), 30 hops max, 60 byte packets
 1 localhost (127.0.0.1) 0.340 ms 0.307 ms 0.290 ms
```

38) wget — Direct download files from the internet

```
[kaustubh@debian]--[~/cc]
$wget https://www.freepnglogos.com/uploads/dog-png/bow-wow-gourmet-dog-treats-are-healthy-natural-low-4.png
--2023-01-23 17:28:48-- https://www.freepnglogos.com/uploads/dog-png/bow-wow-gourmet-dog-treats-are-healthy-natural-low-4.png
```



```
Resolving www.freepnglogos.com (www.freepnglogos.com)...
162.55.233.23
Connecting to www.freepnglogos.com (www.freepnglogos.com)
|162.55.233.23|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 345197 (337K) [image/png]
Saving to: 'bow-wow-gourmet-dog-treats-are-healthy-natural-low-4.png'

bow-wow-gourme 100% 337.11K   662KB/s   in 0.5s

2023-01-23 17:28:49 (662 KB/s) - 'bow-wow-gourmet-dog-treats-are-healthy-natural-low-4.png' saved [345197/345197]

[kaustubh@debian]--[~/cc]
└─$ ls
bow-wow-gourmet-dog-treats-are-healthy-natural-low-4.png
file1.txt
file2.txt
file3.txt
folder
```

39) ufw — Firewall command

```
[kaustubh@debian]--[~/cc]
└─$ sudo ufw status
Status: inactive

[kaustubh@debian]--[~/cc]
└─$ sudo ufw enable
Firewall is active and enabled on system startup

[kaustubh@debian]--[~/cc]
└─$ sudo ufw status
Status: active
```


40) iptables — Base firewall for all other firewall utilities to interface with

```
[kaustubh@debian]~[~/cc]
$ sudo iptables --list
Chain INPUT (policy DROP)
target      prot opt source                destination

ufw-before-logging-input  all  --  anywhere               anywhere
ufw-before-input          all  --  anywhere               anywhere
ufw-after-input           all  --  anywhere               anywhere
ufw-after-logging-input   all  --  anywhere               anywhere
ufw-reject-input          all  --  anywhere               anywhere
ufw-track-input           all  --  anywhere               anywhere
```

41) apt, pacman, yum, rpm — Package managers depending on the distro

```
[kaustubh@debian]~[~/cc]
$ sudo apt-get install tree
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 libxmlb1
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  tree
0 upgraded, 1 newly installed, 0 to remove and 13 not upgraded.
Need to get 43.0 kB of archives.
After this operation, 115 kB of additional disk space will be used.
```

```
[kaustubh@debian]--[~/cc]
$ sudo apt-get install tree
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 libxmlb1
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  tree
0 upgraded, 1 newly installed, 0 to remove and 13 not upgraded.
Need to get 43.0 kB of archives.
After this operation, 115 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 tree amd64 1.8.0-1 [43.0 kB]
Fetched 43.0 kB in 1s (45.1 kB/s)
Selecting previously unselected package tree.
(Reading database ... 188591 files and directories currently installed.)
Preparing to unpack .../tree_1.8.0-1_amd64.deb ...
Unpacking tree (1.8.0-1) ...
Setting up tree (1.8.0-1) ...
Processing triggers for man-db (2.9.1-1) ...
```

```
[kaustubh@debian]--[~/cc]
$ tree
```

```
.
├── file1.txt
├── file2.txt
├── file3.txt
└── folder
    └── files
        └── newfile.txt
```

```
2 directories, 4 files
```

42) sudo — Command to escalate privileges in Linux

```
[kaustubh@debian]--[~/cc]
└─$ sudo su
[sudo] password for student:
root@student-Vostro-3470:/home/student/cc# exit
exit
```

43) cal — View a command-line calendar

```
[kaustubh@debian]--[~/cc]
└─$ cal
      January 2023
Su Mo Tu We Th Fr Sa
 1  2  3  4  5  6  7
 8  9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31
```

44) alias — Create custom shortcuts for your regularly used commands

```
[kaustubh@debian]--[~]
└─$ alias ssh_status="service ssh status"

[kaustubh@debian]--[~]
└─$ ssh_status
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; en>
   Active: active (running) since Mon 2023-01-23 16:48>
     Docs: man:sshd(8)
           man:sshd_config(5)
  Main PID: 7429 (sshd)
    Tasks: 1 (limit: 4406)
   Memory: 1.1M
    CGroup: /system.slice/ssh.service
            └─7429 sshd: /usr/sbin/sshd -D [listener] 0>
```

45) whereis — Locate the binary, source, and manual pages for a command

```
[kaustubh@debian]~[~/cc]
$whereis g++
g++: /usr/bin/g++
```

46) whatis — Find what a command is used for

```
[kaustubh@debian]~[~/cc]
$whatis bash
bash (1) - GNU Bourne-Again SHell
```

47) top — View active processes live with their system usage

```
[kaustubh@debian]~[~/cc]
$top

top - 18:59:55 up 42 min, 2 users, load average: 1.18, 0.85
Tasks: 218 total, 1 running, 217 sleeping, 0 stopped, 0
%Cpu(s): 3.7 us, 1.7 sy, 0.0 ni, 94.4 id, 0.0 wa, 0.0 hi
MiB Mem : 3717.2 total, 108.1 free, 2904.2 used, 154
MiB Swap: 976.0 total, 856.7 free, 119.2 used. 81

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM
   2531 aditya    20   0 3526656 441020 210216 S   8.0  11.6
   1546 aditya    20   0 4614240 233040 124336 S   7.0   6.1
   4980 aditya    20   0 2501584 171740 114488 S   2.7   4.5
   2536 aditya    20   0  654560 100252  59388 S   1.7   2.6
   5845 root       20   0      0      0      0 I   0.7   0.0
     31 root       20   0      0      0      0 S   0.3   0.0
```

48) useradd and usermod — Add new user or change existing users data

```
[kaustubh@debian]~[~/cc]
$sudo useradd -g 1000 newuser

[kaustubh@debian]~[~/cc]
$id newuser
uid=1003(newuser) gid=1000(aditya) groups=1000(aditya)
```

```
[kaustubh@debian]~[~/cc]
$ sudo usermod -g 0 newuser

[kaustubh@debian]~[~/cc]
$ id newuser
uid=1003(newuser) gid=0(root) groups=0(root)
```

49) passwd — Create or update passwords for existing users

```
[kaustubh@debian]~[~/cc]
$ sudo passwd newuser
New password:
Retype new password:
passwd: password updated successfully
```

50) ls -l | wc -l — Command to get the count of the files present into directory.

```
[kaustubh@debian]~[~/cc]
$ ls -l | wc -l
3
```

51) w — to check how many users logged into the linux

```
[kaustubh@debian]~[~/cc]
$ w
18:56:52 up 39 min,  2 users,  load average: 1.06, 0.70, 0.51
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU   WHAT
aditya    tty2     tty2            18:17    39:23  0.05s  0.05s  /usr/libe
```

52) date — used to check the current date, time in linux

```
[kaustubh@debian]~[~/cc]
$ date
Mon Jan 23 06:56:56 PM IST 2023
```

53) ls -a — List the hidden files in directory (hidden files are denoted as ..)


```
[kaustubh@debian]~[/cc]
$ls -a
.  ..  file1.txt  file2.txt  file3.txt  folder  .hidden.txt
```

54) `ls -l` — Use to check the permissions on all the files

```
[kaustubh@debian]~[/cc]
$ls -l
total 4
-rw-r--r-- 1 aditya aditya    0 Jan 23 18:42 file1.txt
-rw-r--r-- 1 aditya aditya    0 Jan 23 18:42 file2.txt
-rw-r--r-- 1 aditya aditya    0 Jan 23 18:42 file3.txt
drwxr-xr-x 2 aditya aditya 4096 Jan 23 18:42 folder
```

55) `ls -R` — used to list information about files and directories within the file system.

```
[kaustubh@debian]~[/cc]
$ls -R
.:
file1.txt  file2.txt  file3.txt  folder

./folder:
```

56) `rm -rf` — remove directory with the files

```
[kaustubh@debian]~[/cc]
$ls folder
file1.txt  file2.txt  file3.txt

[kaustubh@debian]~[/cc]
$rm -rf folder/

[kaustubh@debian]~[/cc]
$ls
file1.txt  file2.txt  file3.txt
```