Ex No: 1(b) **Roll no:231901004**

DATE: 22.01.2025

BASIC LINUX COMMANDS

1.1 GENERAL PURPOSE COMMANDS

1. The date command

Description: Displays the current date and time. **Syntax:**

$ date

Input:

$ date **Output:**

Sat Apr 12 10:23:45 IST 2025

Other Formats:

Format	Purpose	Input	Output
+%m	Display month (numeric)	$ date +%m	04
+%h	Display month (name)	$ date +%h	Apr
+%d	Display day of the month	$ date +%d	12
+%y	Last two digits of year	$ date +%y	25
+%H	Display hour	$ date +%H	10
+%M	Display minutes	$ date +%M	23
+%S	Display seconds	$ date +%S	45

---

2. The echo command

Description: Prints a message to the terminal. **Syntax:**

$ echo “your message” **Input:**

$ echo "God is Great"

Output:

God is Great

---

3. The cal command

Description: Displays calendar of specified month/year.
Syntax:

$ cal [month] [year]

Input: $ cal

Jan 2012

Output:

January 2012

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

---

4. The bc command

Description: Launches a basic calculator. **Syntax:**

$ bc

Input:

$ bc -l

16/4

5/2

Output:

4

2

$

5. The who command

Description: Shows users currently logged in. **Syntax:**

$ who **Input:**

who **Output:**

kaviya tty1

2025-04-12

09:00

---

6. The who am i command

Description: Shows info about current session user.

Syntax: $ who am i **Input:** $ who am i

Output: kaviya pts/0 2025-04-

12 09:10

---

7. The id command

Description: Displays UID, GID, and groups of user. **Syntax:**

$ id

Input:

$ id

Output: uid=1000(kaviya) gid=1000(kaviya)

groups=1000(kaviya),10(wheel)

---

8. The tt command

Description: Displays terminal name. **Syntax:**

$ tty

Input:

$ tty

Output:

/dev/pts/0

---

9. The clear command

Description: Clears the terminal screen. **Syntax:**

$ clear **Input:**

$ clear

Output:
(Terminal screen gets cleared)

---

10. The man command

Description: Shows manual page for commands.

Syntax: $ man [command]

Input: $

man date

Output:
(Manual page opens for the date command. Press q to quit.)

---

11. The ps command

Description: Shows running processes. **Syntax:**

$ ps

Input:

$ ps

$

Output:

PID TTY TIME CMD

1234 pts/0 00:00:00 bash

1278 pts/0 00:00:00 ps

---

12. The uname command

Description: Shows system details.

Syntax: $ uname [option]

Input:

uname -a

Output:

Linux fedora 6.5.9-300.fc39.x86_64 #1 SMP x86_64 GNU/Linux

1.2 DIRECTORY COMMANDS

1. The pwd command

Description: Displays current directory path. **Syntax:**

$ pwd

Input:

$ pwd

Output:

/home/kaviya

---

2. The mkdir command

Description: Creates a new directory.

Syntax: $ mkdir dirname **Input:** $ mkdir receee

Output:
(A directory named receee is created)

---

3. The rmdir command

Description: Deletes an empty directory.

Syntax: $ rmdir dirname **Input:** $ rmdir receee

Output:
(The receee directory is removed if empty)

---

4. The cd command

Description: Changes the current directory.

Syntax: $ cd dirname **Input:** $ cd receee

Output:
(You are now inside the receee directory)

---

5. The ls command

Description: Lists contents of the directory. **Syntax:**

$ ls

Input:

$ ls

Output:

file1.txt file2.sh receee

Input (long listing):

$
$ ls -l

Output:

-rw-rw-r-- 1 kaviya kaviya 0 Apr 12 10:24 file1.txt

Input (including hidden files):

$ ls -a

Output:

. .. .bashrc file1.txt receee

1.3 3 FILE HANDLING COMMANDS

1. **The 'cat' command**

Purpose: Used to create a file.

SYNTAX: $ cat > filename

EXAMPLE:

cat > rec

Arun

Kaviya

^D # (Press Ctrl + D to save and exit)

2. **Display contents of a file**

SYNTAX: $ cat

filename

EXAMPLE:

$ cat rec Output:

Arun

Kaviya

3. **The 'cp' command**

Purpose: Copy contents from one file to another.

SYNTAX: $ cp oldfile newfile

EXAMPLE:

$ cp rec cse

$ cat cse Output:

Arun

Kaviya

4. **The ‘rm’ command**

Purpose: Delete a file.

SYNTAX: $ rm filename **EXAMPLES**:

$ rm rec

$ rm -f rec

$ rm -fr directory_name # Deletes folder recursively

5. **The ‘mv’ command**

Purpose: Move or rename a file.

SYNTAX: $ mv oldfile newfile

EXAMPLE:

$ mv cse eee

$ ls

Output: eee

6. **The ‘file’ command**

Purpose: Determine file type.

SYNTAX: $ file filename

EXAMPLE:

$ file eee

Output: eee: ASCII text

7. **The ‘wc’ command**

Purpose: Word, line, and character count.

SYNTAX: $ wc filename **EXAMPLE**:

$ wc eee

Output: 2 2 12 eee

8. **Directing output to a file**

Purpose: Save command output to a file.

SYNTAX: $ ls > filename **EXAMPLE**:

$
$ ls > list.txt

$ cat list.txt

Output: eee

list.txt

9. Pipes

Purpose: Use output of one command as input to another.
SYNTAX:

$ command1 | command2

EXAMPLE:

$ who | wc -l

Output: 3 # (Displays number of logged-in users)

10. The 'tee' command

Purpose: Save output in middle of a pipe.
SYNTAX:

$ command | tee filename

EXAMPLE:

$ who | tee sample | wc -l

Output: 3

$ cat sample

Output: list of logged-in users

11. Metacharacters in Unix

Purpose: Pattern matching with special characters.

Symbol Meaning

*	Matches any number of characters
?	Matches a single character
[ ]	Matches any character in the set
[!]	Negates the set

EXAMPLES:

$ ls r* # Files starting with r

$ ls ?kkk # Files like "rkkk", "skkk"

$ ls [a-m]* # Files starting with a-m

$ ls [!a-m]* # Files NOT starting with a-m

---

13. File Permissions

Each file has:

- **Owner**
- **Group**
- **Others**

Each with:

- **r (read)** = 4
- **w (write)** = 2
- **x (execute)** = 1

EXAMPLE:

$ ls -l college

-rwxr-xr-- 1 Lak std 1525 Jan 10 12:10 college

- **rwx**: Owner has read, write, execute
- **r-x**: Group has read and execute
- **r--**: Others have only read

---

13. The 'chmod' command

SYNTAX:

$ chmod category operation permission filename

EXAMPLES:

$ chmod u-wx college

(Remove write & execute for user)

$ chmod u+rw, g+rw college

(Add read & write to user & group)

$ chmod g=wx college

(Set write & execute to group only)

---

14. Octal Notation SYNTAX:

$ chmod 761 college

Explanation:

- 7 (owner) = rwx
- 6 (group) = rw-
- 1 (others) = --x

1.4 GROUPING COMMANDS

1. Semicolon (;)

Executes multiple commands

sequentially. **EXAMPLE**: $ who; date

Output:

(list of users)

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2. Logical AND (&&)

Executes next only if previous is

successful. **EXAMPLE**: $ ls && date

Output:

(file list)

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3. Logical OR (||)

Executes next only if previous fails.
EXAMPLE:

$ ls nofile || date

Output:

ls: cannot access 'nofile': No such file or directory

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1.5 5 FILTERS

1. head

SYNTAX: $ head

filename

EXAMPLE:

$ head college

(Shows top 10 lines)

$ head -5 college

(Shows top 5 lines)

2. tail

SYNTAX: $ tail

filename

EXAMPLE:

$ tail college

(Shows bottom 10 lines)

$ tail -5 college

(Shows bottom 5 lines)

3. more

Used for paging large outputs.
SYNTAX:

$ ls -l | more

---

4. grep

Search for patterns. **SYNTAX**:

$ grep "pattern" filename

EXAMPLE:

$ cat > student

Arun cse

Ram ece

Kani cse

^D

$ grep "cse" student

Output:

Arun cse

Kani cse

---

5. sort

Sorts lines.

SYNTAX: $ sort filename

EXAMPLES:

$ sort college # Sort alphabetically

$ sort -r college # Reverse order

$ sort -n numbers.txt # Numeric sort

$ sort -u college # Remove duplicates

---

6. nl

Adds line numbers.

SYNTAX: $ nl filename

EXAMPLE:

$ nl college

1 Arun

2 Kaviya

---

7. cut

Extracts specific character positions.
SYNTAX:

$ cut -c1-4 filename

EXAMPLE:

$ cut -c1-3 college

Output:

Aru

Kav

1.5 OTHER ESSENTIAL COMMANDS

---

1. free

Description: Displays the amount of free and used physical and swap memory in the system.

- **Synopsis**: free [options]
- **Example**:

Input:

[root@localhost ~]# free -t

Output:

	total	used	free	shared	buff/cache	available
Mem:	4044380	605464	2045080	148820	1393836	3226708
Swap:	2621436	0	2621436			
Total:	6665816	605464	4666516			

---

2. top

Description: Provides a dynamic real-time view of processes in the system.

- **Synopsis**: top [options]
- **Example**:

Input:

[root@localhost ~]# top

Output:

top - 08:07:28 up 24 min, 2 users, load average: 0.01, 0.06, 0.23 Tasks:

211 total, 1 running, 210 sleeping, 0 stopped, 0 zombie

%Cpu(s): 0.8 us, 0.3 sy, 0.0 ni, 98.9 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st

KiB Mem : 4044380 total, 2052960 free, 600452 used, 1390968 buff/cache

KiB Swap: 2621436 total, 2621436 free, 0 used. 3234820 avail Mem

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1105	root	20	0	175008	75700	51264	S	1.7	1.9	0:20.46	Xorg
2529	root	20	0	80444	32640	24796	S	1.0	0.8	0:02.47	gnome-term

---

3. ps

Description: Reports a snapshot of current processes.

- **Synopsis**: ps [options]
- **Example**:

Input:

[root@localhost ~]# ps -e

Output:

PID	TTY	TIME	CMD
1	?	00:00:03	systemd
2	?	00:00:00	kthreadd
3	?	00:00:00	ksoftirqd/0

---

4. vmstat

Description: Reports virtual memory statistics.

- **Synopsis**: vmstat [options]
- **Example**:

Input:

[root@localhost ~]# vmstat

Output:

procs -----------memory---------- ---swap-- -----io---- -system-- ------cpu-----

r b swpd free buff cache si so bi bo in cs us sy id wa st

0 0 0 1879368 1604 1487116 0 0 64 7 72 140 1 0 97 1 0

---

5. df

Description: Displays the amount of disk space available on the file system.

- **Synopsis**: df [options]
- **Example**:

Input:

[root@localhost ~]# df

Output:

Filesystem 1K-blocks Used Available Use% Mounted on

devtmpfs 2010800 0 2010800 0% /dev

tmpfs 2022188 148 2022040 1% /dev/shm

tmpfs 2022188 1404 2020784 1% /run

/dev/sda6 487652 168276 289680 37% /boot

---

6. ping

Description: Verifies whether a device can communicate with another over a network.

- **Synopsis**: ping [options] destination
- **Example**:

Input:

[root@localhost ~]# ping 172.16.4.1

Output:

PING 172.16.4.1 (172.16.4.1) 56(84) bytes of data.

64 bytes from 172.16.4.1: icmp_seq=1 ttl=64 time=0.328 ms

64 bytes from 172.16.4.1: icmp_seq=2 ttl=64 time=0.228 ms

64 bytes from 172.16.4.1: icmp_seq=3 ttl=64 time=0.264 ms

64 bytes from 172.16.4.1: icmp_seq=4 ttl=64 time=0.312 ms

^C

--- 172.16.4.1 ping statistics ---

4 packets transmitted, 4 received, 0% packet loss, time 3000ms

rtt min/avg/max/mdev = 0.228/0.283/0.328/0.039 ms

---

7. ifconfig

Description: Used to configure and display network interface parameters.

- **Synopsis**: ifconfig [options]
- **Example**:

Input:

[root@localhost ~]# ifconfig

Output:

enp2s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500 inet

172.16.6.102 netmask 255.255.252.0 broadcast 172.16.7.255 inet6

fe80::4a0f:cfff:fe6d:6057 prefixlen 64 scopeid 0x20<link> ether

48:0f:cf:6d:60:57 txqueuelen 1000 (Ethernet)

RX packets 23216 bytes 2483338 (2.3 MiB)

RX errors 0 dropped 5 overruns 0 frame 0

TX packets 1077 bytes 107740 (105.2 KiB)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

---

8. traceroute

Description: Tracks the route that a packet takes to reach the destination.

- **Synopsis**: traceroute [options] destination
- **Example**:

Input:

[root@localhost ~]# traceroute www.rajalakshmi.org

Output: traceroute to www.rajalakshmi.org (220.227.30.51), 30 hops max, 60

byte packets

1 gateway (172.16.4.1) 0.299 ms 0.297 ms 0.327 ms

2 220.225.219.38 (220.225.219.38) 6.185 ms 6.203 ms 6.189 ms