Ex No: 1b **BASIC LINUX COMMANDS**

Date: 22.01.2025

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:

arsath 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:

arsath 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(arsath) gid=1000(arsath) groups=1000(arsath),10(wheel)

---

8. The tty 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/arsath

---

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 arsath arsath 0 Apr 12 10:24 file1.txt

Input (including hidden files):

$ ls -a

Output:

. .. .bashrc file1.txt receee

1.3 FILE HANDLING COMMANDS

1. The 'cat' command

Purpose: Used to create a file.
SYNTAX:

$ cat > filename

EXAMPLE:

$ cat > rec

Arun

Arsath

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

2. Display contents of a file

SYNTAX:

$ cat filename

EXAMPLE:

$ cat rec

Output:

Arun

Arsath

3. The ‘cp’ command

Purpose: Copy contents from one file to another.
SYNTAX:

$ cp oldfile newfile

EXAMPLE:

$ cp rec cse

$ cat cse

Output:

Arun

Arsath

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 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 Arsath

---

7. cut

Extracts specific character positions.
SYNTAX:

$ cut -c1-4 filename

EXAMPLE:

$ cut -c1-3 college

Output:

Aru

Kav

1.5 OTHER ESSENTIAL COMMANDS

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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