**Ex No: 1(b) Roll no:231901002**

**DATE: 22.01.2025**

**BASIC LINUX COMMANDS**

* 1. **GENERAL PURPOSE COMMANDS**

## 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 |



1. **The echo command**

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

$ echo “your message” **Input:**

$ echo "God is Great"

## Output:

God is Great



## 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



## The bc command

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

$ bc

## Input:

$ bc -l 16/4

5/2

## Output:

4

2



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$

## The who command

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

$ who **Input:**

who **Output:**

kaviya tty1 2025-04-12

09:00



## 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



## 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)



## The tt command

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

$ tty

## Input:

$ tty

## Output:

/dev/pts/0



## The clear command

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

$ clear **Input:**

$ clear

## Output:

*(Terminal screen gets cleared)*



## 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.)*



## The ps command

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

$ ps

## Input:

$ ps

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$

## Output:

PID TTY TIME CMD

1234 pts/0 00:00:00 bash

1278 pts/0 00:00:00 ps



1. **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



# DIRECTORY COMMANDS

## The pwd command

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

$ pwd

## Input:

$ pwd

## Output:

/home/kaviya



## The mkdir command

**Description:** Creates a new directory. **Syntax:** $ mkdir dirname **Input:** $ mkdir receee

## Output:

*(A directory named receee is created)*



## The rmdir command

**Description:** Deletes an empty directory. **Syntax:** $ rmdir dirname **Input:** $ rmdir receee

## Output:

*(The receee directory is removed if empty)*



## The cd command

**Description:** Changes the current directory.

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

## Output:

*(You are now inside the receee directory)*



## The ls command

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

$ ls

## Input:

$ ls

## Output:

file1.txt file2.sh receee

## Input (long listing):

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$

$ 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

# 3 FILE HANDLING COMMANDS

## 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)

## Display contents of a file SYNTAX: $ cat

filename

# EXAMPLE:

$ cat rec Output:

Arun Kaviya

## The ‘cp’ command

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

**SYNTAX**: $ cp oldfile newfile

# EXAMPLE:

$ cp rec cse

$ cat cse Output:

Arun Kaviya

1. **The ‘rm’ command Purpose**: Delete a file.

**SYNTAX**: $ rm

filename **EXAMPLES**:

$ rm rec

$ rm -f rec

$ rm -fr directory\_name # Deletes folder recursively

## The ‘mv’ command

**Purpose**: Move or rename a file.

**SYNTAX**: $ mv oldfile newfile

# EXAMPLE:

$ mv cse eee

$ ls

Output: eee

## The ‘file’ command

**Purpose**: Determine file type.

**SYNTAX**: $ file filename

# EXAMPLE:

$ file eee

Output: eee: ASCII text

## The ‘wc’ command

**Purpose**: Word, line, and character count.

**SYNTAX**: $ wc filename **EXAMPLE**:

$ wc eee

Output: 2 2 12 eee

## Directing output to a file

**Purpose**: Save command output to a file.

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

CS23431-OPERATING SYSTEMS R o l l N o : 2 3 1 9 0 1 0 3 3

$

$ ls > list.txt

$ cat list.txt Output: eee list.txt

## 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)

## 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

## 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



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## 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



## 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)



## Octal Notation SYNTAX:

$ chmod 761 college

## Explanation:

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



# GROUPING COMMANDS

## Semicolon (;)

Executes multiple commands sequentially. **EXAMPLE**: $ who; date Output:

(list of users)

Sat Apr 12 10:45:00 IST 2025

## Logical AND (&&)

Executes next only if previous is successful. **EXAMPLE**: $ ls && date

Output:

(file list)

Sat Apr 12 10:45:00 IST 2025

## Logical OR (||)

Executes next only if previous fails.

# EXAMPLE:

$ ls nofile || date Output:

ls: cannot access 'nofile': No such file or directory Sat Apr 12 10:45:00 IST 2025

CS23431-OPERATING SYSTEMS R o l l N o : 2 3 1 9 0 1 0 3 3



# 5 FILTERS

## head

**SYNTAX**: $ head filename

# EXAMPLE:

$ head college (Shows top 10 lines)

$ head -5 college (Shows top 5 lines)

## tail

**SYNTAX**: $ tail filename

# EXAMPLE:

$ tail college

(Shows bottom 10 lines)

$ tail -5 college

(Shows bottom 5 lines)

## more

Used for paging large outputs.

# SYNTAX:

$ ls -l | more



## 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



## 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



## nl

Adds line numbers.

**SYNTAX**: $ nl filename

# EXAMPLE:

CS23431-OPERATING SYSTEMS R o l l N o : 2 3 1 9 0 1 0 3 3

$ nl college

* 1. Arun
  2. Kaviya



## cut

Extracts specific character positions.

# SYNTAX:

$ cut -c1-4 filename

# EXAMPLE:

$ cut -c1-3 college Output:

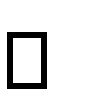
Aru Kav

# 1.5 OTHER ESSENTIAL COMMANDS



## 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

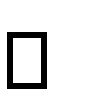
Swap: 2621436 0 2621436

Total: 6665816 605464 4666516



## 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

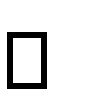
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND 1105 root 20 0 175008 75700 51264 S 1.7 1.9 0:20.46 Xorg

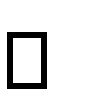
2529 root 20 0 80444 32640 24796 S 1.0 0.8 0:02.47 gnome-term



## 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

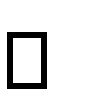
3 ? 00:00:00 ksoftirqd/0

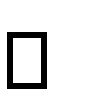
CS23431-OPERATING SYSTEMS R o l l N o : 2 3 1 9 0 1 0 3 3



## vmstat

**Description**: Reports virtual memory statistics.

**Synopsis**: vmstat [options]

 **Example**: **Input**:

[root@localhost ~]# vmstat

## Output:

procs memory swapio -systemcpu

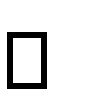
r b swpd free buff cache si so bi bo in cs us sy id wa st

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



## 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

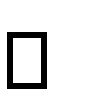
tmpfs 2022188 1404 2020784 1% /run

/dev/sda6 487652 168276 289680 37% /boot



## 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

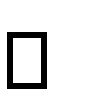
--- 172.16.4.1 ping statistics ---

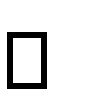
4 packets transmitted, 4 received, 0% packet loss, time 3000ms rtt min/avg/max/mdev = 0.228/0.283/0.328/0.039 ms



## 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)

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RX packets 23216 bytes 2483338 (2.3 MiB)

RX errors 0 dropped 5 overruns 0 frame 0

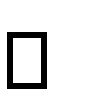
TX packets 1077 bytes 107740 (105.2 KiB)

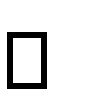
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0



## 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](http://www.rajalakshmi.org/)

**Output**: traceroute to [www.rajalakshmi.org](http://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