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A Lab Report
on
“Computer Graphics Lab-I”

[Code No.: COMP 307]

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INTRODUCTION

1. What is Linux?

Linux is an open-source operating system kernel that serves as the foundation for various OS distributions. It is known for its stability, security, and powerful command-line interface.

2. The Linux Hierarchical File System

Linux uses a tree-like directory structure. It starts with the root directory, denoted by a forward slash (/), and all other files and directories branch off from there (e.g., /home, /bin).

3. Importance of Linux commands

The Command Line Interface (CLI) allows users to interact directly with the kernel. It provides greater control, automation capabilities, and efficiency compared to Graphical User Interfaces.

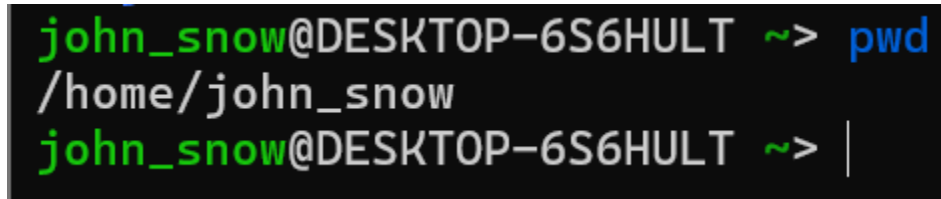
COMMAND FORMAT

1. **Command:** The keyword typed into the terminal.
2. **Explanation:** A brief description of what the command does.
3. **Output:** A screenshot demonstrating the execution and result.

COMMANDS

1. pwd

Explanation: Shows the current working directory (absolute path).

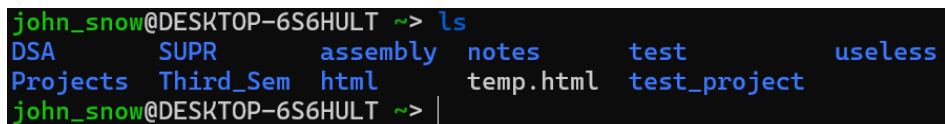
A terminal window with a black background and green text. The prompt is 'john_snow@DESKTOP-6S6HULT ~>'. The command 'pwd' is entered in blue. The output is '/home/john_snow' in white. The prompt is then followed by a vertical bar '|'.

```
john_snow@DESKTOP-6S6HULT ~> pwd
/home/john_snow
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 1: Output for pwd

2. ls

Explanation: Lists visible files and folders inside the current directory.

A terminal window with a black background and green text. The prompt is 'john_snow@DESKTOP-6S6HULT ~>'. The command 'ls' is entered in blue. The output is a list of files and folders: 'DSA', 'SUPR', 'assembly', 'notes', 'test', 'useless', 'Projects', 'Third_Sem', 'html', 'temp.html', and 'test_project'. The prompt is then followed by a vertical bar '|'.

```
john_snow@DESKTOP-6S6HULT ~> ls
DSA      SUPR      assembly  notes     test      useless
Projects Third_Sem html      temp.html test_project
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 2: Output for ls

3. ls -a

Explanation: Shows all files, including hidden files starting with a dot (.).

```
john_snow@DESKTOP-6S6HULT ~> ls -a
.          .gitconfig  .sqlite_history  SUPR
..         .ipython   .ssh             Third_Sem
.bash_history .ivy2      .sudo_as_admin_successful assembly
.bash_logout .jupyter  .vim             html
.bashrc     .lessht   .viminfo         notes
.bashrc_aliases .local    .vimrc          temp.html
.cache      .m2       .vscode-server  test
.cachexit   .motd_shown .w3m            test_project
.config     .npm      .wget-hsts      useless
.dbus       .profile  DSA
.dotnet     .sbt     Projects
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 3: Output for ls -a

4. ls -l

Explanation: Displays detailed information about files (permissions, owner, size, date).

```
DSA
Projects
SUPR
Third_Sem
assembly
html
notes
temp.html
test
test_project
useless
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 4: Output for ls -l

5. cd

Explanation: Used to change directories (navigate folders).

```
john_snow@DESKTOP-6S6HULT ~> cd notes
john_snow@DESKTOP-6S6HULT ~/notes> ls
Third_Sem
john_snow@DESKTOP-6S6HULT ~/notes> |
```

Figure 5: Output for cd

6. mkdir

Explanation: Creates a new directory.

```
test
test_project
useless
john_snow@DESKTOP-6S6HULT ~> mkdir OS_LAB1
john_snow@DESKTOP-6S6HULT ~> ls -l
DSA
OS_LAB1
Projects
SUPR
Third_Sem
```

Figure 6: Output for mkdir

7. rmdir

Explanation: Deletes empty directories only.

```
john_snow@DESKTOP-6S6HULT ~> ls
DSA    Projects Third_Sem html  temp.html test_project
OS_LAB1 SUPR    assembly notes test      useless
john_snow@DESKTOP-6S6HULT ~> rmdir OS_LAB1/
john_snow@DESKTOP-6S6HULT ~> ls
DSA    SUPR    assembly notes      test      useless
Projects Third_Sem html      temp.html test_project
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 7: Output for rmdir

8. touch

Explanation: Creates an empty file or updates file timestamps.

```
john_snow@DESKTOP-6S6HULT ~> touch file.txt
john_snow@DESKTOP-6S6HULT ~> ls
DSA      SUPR      assembly  html    temp.html  test_project
Projects Third_Sem file.txt  notes   test       useless
john_snow@DESKTOP-6S6HULT ~> rm file.txt
john_snow@DESKTOP-6S6HULT ~> ls
DSA      SUPR      assembly  notes    test       useless
Projects Third_Sem html      temp.html test_project
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 8: Output for touch

9. rm

Explanation: Deletes specific files.

```
john_snow@DESKTOP-6S6HULT ~> touch file.txt
john_snow@DESKTOP-6S6HULT ~> ls
DSA      SUPR      assembly  html    temp.html  test_project
Projects Third_Sem file.txt  notes   test       useless
john_snow@DESKTOP-6S6HULT ~> rm file.txt
john_snow@DESKTOP-6S6HULT ~> ls
DSA      SUPR      assembly  notes    test       useless
Projects Third_Sem html      temp.html test_project
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 9: Output for rm

10. rm -r

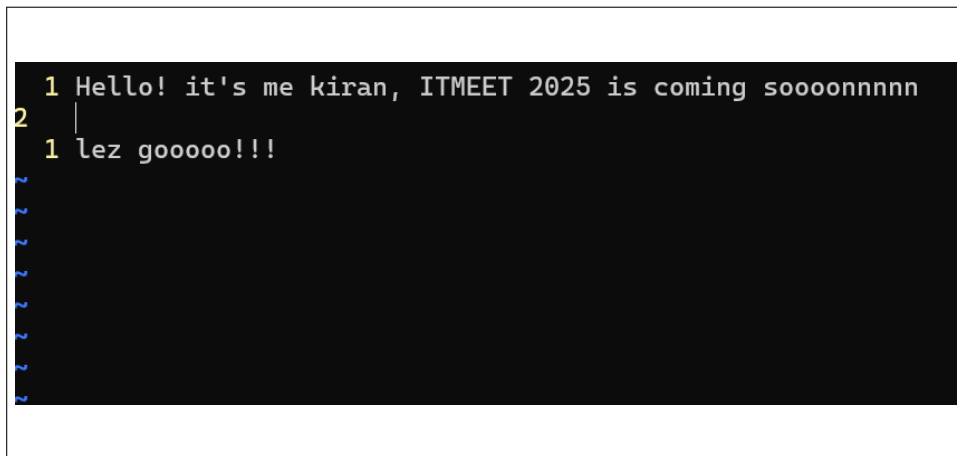
Explanation: Recursively deletes directories and all files inside them.

```
john_snow@DESKTOP-6S6HULT ~> mkdir OS_LAB1
john_snow@DESKTOP-6S6HULT ~> cd OS_LAB1/
john_snow@DESKTOP-6S6HULT ~/OS_LAB1> touch file.txt
john_snow@DESKTOP-6S6HULT ~/OS_LAB1> ls
file.txt
john_snow@DESKTOP-6S6HULT ~/OS_LAB1> cd ..
john_snow@DESKTOP-6S6HULT ~> rm -r OS_LAB1/
john_snow@DESKTOP-6S6HULT ~> ls
DSA      SUPR      assembly  notes    test       useless
Projects Third_Sem html      temp.html test_project
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 10: Output for rm -r

11. vim

Explanation: Opens the Vim text editor to create or modify files.

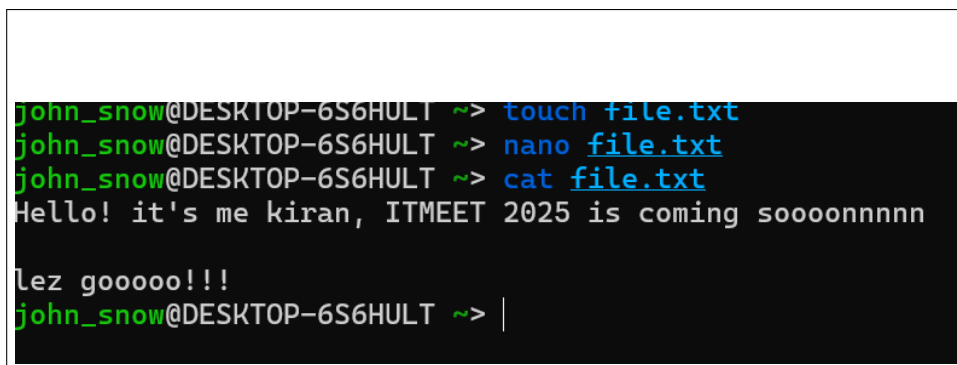


```
1 Hello! it's me kiran, ITMEET 2025 is coming soooooonnnnn
2 |
1 lez gooooo!!!
```

Figure 11: Inside the Vim Editor Interface

12. cat

Explanation: Displays the content of a file on the terminal.



```
john_snow@DESKTOP-6S6HULT ~> touch file.txt
john_snow@DESKTOP-6S6HULT ~> nano file.txt
john_snow@DESKTOP-6S6HULT ~> cat file.txt
Hello! it's me kiran, ITMEET 2025 is coming soooooonnnnn
lez gooooo!!!
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 12: Output for cat

13. cp

Explanation: Copies a file from one location/name to another.

```
john_snow@DESKTOP-6S6HULT ~> cat a.text
this is file 1
john_snow@DESKTOP-6S6HULT ~> cat b.text
this is file 2
john_snow@DESKTOP-6S6HULT ~> cp a.text b.text
john_snow@DESKTOP-6S6HULT ~> cat a.text
this is file 1
john_snow@DESKTOP-6S6HULT ~> cat b.text
this is file 1
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 13: Output for cp

14. mv

Explanation: Moves or renames files and directories.

```
john_snow@DESKTOP-6S6HULT ~> mv a.text b.text
john_snow@DESKTOP-6S6HULT ~> ls
DSA      Third_Sem  file.txt  temp.html  useless
Projects assembly  html     test
SUPR     b.text    notes    test_project
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 14: Output for mv

15. echo

Explanation: Prints text or variable values to the terminal screen.

```
john_snow@DESKTOP-6S6HULT ~> echo "kiran Dahal"
kiran Dahal
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 15: Output for echo

16. uname -a

Explanation: Shows detailed system information (kernel, architecture, OS).

```
john_snow@DESKTOP-6S6HULT ~> uname -a
Linux DESKTOP-6S6HULT 6.6.87.2-microsoft-standard-WSL2 #1 SMP
PREEMPT_DYNAMIC Thu Jun  5 18:30:46 UTC 2025 x86_64 x86_64 x86
_64 GNU/Linux
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 16: Output for uname -a

17. df -h

Explanation: Displays disk space usage in a human-readable format.

```
Filesystem      Size  Used Avail Use% Mounted on
none            3.9G   0 3.9G   0% /usr/lib/modules/6.6.87.2-micro
soft-standard-WSL2
none            3.9G  4.0K 3.9G   1% /mnt/wsl
drivers          432G  213G  219G  50% /usr/lib/wsl/drivers
/dev/sdd        1007G   13G  944G   2% /
none            3.9G   80K 3.9G   1% /mnt/wslg
none            3.9G   0 3.9G   0% /usr/lib/wsl/lib
rootfs          3.9G  2.7M 3.8G   1% /init
none            3.9G   0 3.9G   0% /run
none            3.9G   0 3.9G   0% /run/lock
none            3.9G   0 3.9G   0% /run/shm
none            3.9G   0 3.9G   0% /run/user
none            3.9G   76K 3.9G   1% /mnt/wslg/versions.txt
none            3.9G   76K 3.9G   1% /mnt/wslg/doc
C:\             432G  213G  219G  50% /mnt/c
E:\             250G   88G  163G  36% /mnt/e
```

Figure 17: Output for df -h

18. ps -u \$USER

Explanation: Shows currently running processes for the specific user.

```
john_snow@DESKTOP-6S6HULT ~> ps -u $USER
PID TTY          TIME CMD
  11 pts/0        00:00:00 fish
  30 ?            00:00:00 ssh-agent
  83 pts/0        00:00:03 fish
1115 pts/0        00:00:00 ps
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 18: Output for ps

19. top

Explanation: Displays a real-time view of running processes and system resources.

```
john_snow@DESKTOP-6S6HULT ~> top
top - 23:51:20 up 3:02, 0 users, load average: 0.09, 0.05, 0.01
Tasks: 8 total, 1 running, 7 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni,100.0 id, 0.0 wa, 0.0 hi, 0.0
MiB Mem : 7796.2 total, 7372.0 free, 344.2 used, 79.9 buf
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used. 7329.3 ava
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+
1	root	20	0	3124	2304	2176	S	0.0	0.0	0:00.03
6	root	20	0	3120	1792	1792	S	0.0	0.0	0:00.00
9	root	20	0	3132	768	768	S	0.0	0.0	0:00.00
10	root	20	0	3148	1156	1024	S	0.0	0.0	0:00.23
11	john_sn+	20	0	166632	7808	5632	S	0.0	0.1	0:00.14
30	john_sn+	20	0	7980	4212	3072	S	0.0	0.1	0:00.00
83	john_sn+	20	0	231896	8832	6016	S	0.0	0.1	0:03.76
1130	john_sn+	20	0	7808	3584	3072	R	0.0	0.0	0:00.00

Figure 19: Output for top

20. chmod

Explanation: Changes file access permissions (read, write, execute).

```
john_snow@DESKTOP-6S6HULT ~> ls
DSA      SUPR      assembly  file.txt  notes     test      useless
Projects Third_Sem b.text    html      temp.html test_project
```

```
john_snow@DESKTOP-6S6HULT ~> chmod 744 file.txt
john_snow@DESKTOP-6S6HULT ~> |
```

Figure 20: Output for chmod