

Linux

Commands Lab

Report

1. What is Linux?

Linux is an open-source operating system known for its stability, security, and flexibility. It powers servers, desktops, mobile devices, embedded systems, and cloud infrastructure. Unlike proprietary systems, Linux allows users full control over how the system is customized and used.

2. The Linux Hierarchical File System

The Linux filesystem follows a hierarchical tree structure starting from the root directory `/`. All files and directories branch out from this point. Some important directories include:

- `/home` – Stores user home directories
- `/etc` – Configuration files
- `/bin` – Essential binaries
- `/usr` – User-installed programs
- `/var` – Logs and variable data

3. Importance of Linux Commands in Operating Systems

Linux commands allow users to interact directly with the system. They enable file management, process monitoring, system configuration, and automation. For developers and system administrators, mastering these commands is essential for productivity and system-level control.

Commands and Outputs

1. pwd

Command: `pwd`

Explanation: Displays the absolute path of your current working directory.

Screenshot:



A screenshot of a macOS terminal window. The title bar shows the user's name and the host as "rupakkarki — rupakkarki@RUPAKS-MACBOOK-AIR — ~ — -zsh — 80x24". The window contains the following text:

```
Last login: Fri Dec  5 11:15:12 on ttys014
[→ ~ pwd
/Users/rupakkarki
[→ ~ pwd
```

2. ls

Command: `ls`

Explanation: Lists all files and directories in the current location.

Screenshot:

```
● → os lab report pwd  
/Users/rupakkarki/Desktop/os lab report  
● → os lab report ls  
os.py  
○ → os lab report █
```

3. ls -a

Command: `ls -a`

Explanation:

including hidden
dot (`.`).

Screenshot:

```
● → os lab report ls -a
.
..
os.py
○ → os lab report █
```

Shows all files
ones starting with a

4. ls -l

Command: `ls -l`

Explanation: Displays detailed file information such as permissions, size, owner, and date.

Screenshot:

```
● → os lab report ls -l
total 0
-rw-r--r--@ 1 rupakkarki staff 0 Dec 10 14:37 os.py
○ → os lab report █
```

5) **cd**

```
● → ~ cd
```

Command Examples:

- *cd Documents*
- *cd ..*
- *cd /Users/yourname*
- **Explanation:** Used to change directories.
- **Screenshot:**

6. mkdir

Command: *mkdir myFolder*

Explanation: Creates a new directory.

```
● → ~ mkdir OS LAB REPORT  
○ → ~ └
```

Screenshot:

7. rmdir

Command: *rmdir folderName* **Explanation:**

Removes an

empty

```
● → ~ rmdir OS LAB REPORT
```

directory. **Screenshot:**

8. rm

Command: `rm file.txt` **Explanation:**

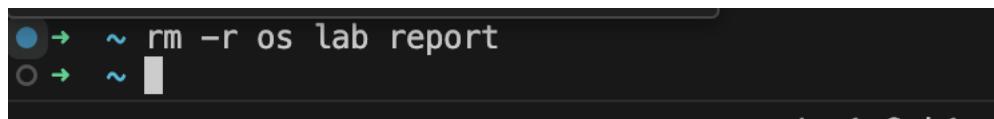
Deletes a file permanently.

9. rm -r

Command: `rm -r`

folderName **Explanation:** Deletes a

directory and all its contents.



A screenshot of a terminal window. The command `rm -r os lab report` is being typed in. The terminal shows two lines of text: the first line has a blue dot icon and ends with `~ rm -r os lab report`; the second line has a grey circle icon and ends with `~ |`. The cursor is positioned at the end of the command line.

Screenshot:

10. touch

Command: `touch new.txt`

Explanation: Creates an empty file if it

does not exist.

Command executed now and took 30ms

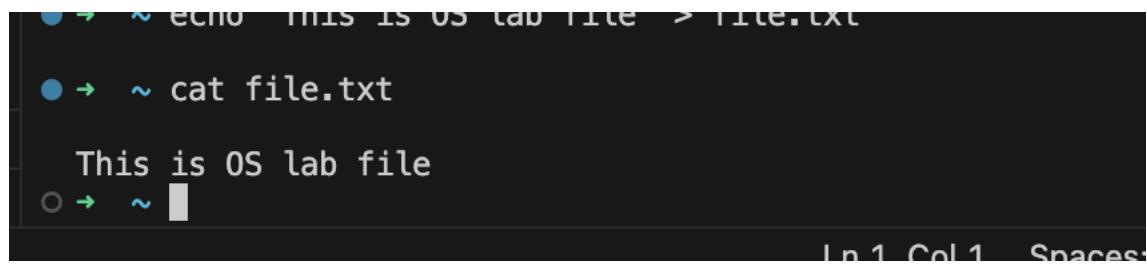
```
● ➔ ~ touch new.txt  
○ ➔ ~ █
```

Screenshot:

11. cat

Command: `cat file.txt`

Explanation: Displays the contents of a file.



A screenshot of a terminal window. The user has run the command `echo This is OS lab file > file.txt`. Then, they run the command `cat file.txt`, which outputs the text "This is OS lab file". The terminal interface includes a status bar at the bottom right showing "Ln 1 Col 1 Spaces".

Screenshot:

12. nano / vi / jed

Command: `nano file.txt`

Explanation: Opens a text editor inside the terminal.

Screenshot:

The screenshot shows a terminal window titled "pico - Tupakkari" with the following interface elements:

- Top bar: PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, and a file icon labeled "pico - Tupakkari".
- Title bar: "UW PICO 5.09" and "File: file.txt".
- Text area: "This is OS lab file".
- Bottom menu: A series of keyboard shortcuts with their descriptions: ^G Get Help, ^X Exit, ^O WriteOut, ^J Justify, ^R Read File, ^W Where is, ^Y Prev Pg, ^V Next Pg, ^K Cut Text, ^U UnCut Text, ^C Cur Pos, and ^T To Spell.
- Status bar: "Ln 1, Col 1" and "Spaces: 2" followed by file encoding options: UTF-8, LF, Plain Text, and a prettify button.

13. cp

Command: `cp a.txt b.txt`

Explanation: Copies the contents of one file to another.

Screenshot:

The screenshot shows a terminal window with the following session:

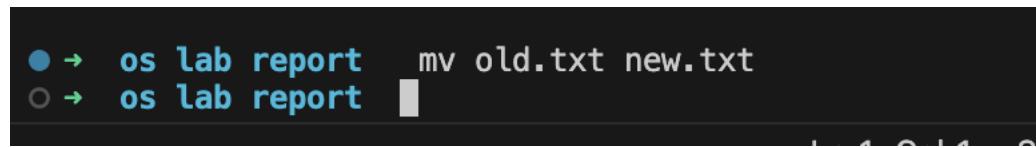
```
● → os lab report touch a.txt
● → os lab report echo "This is file A" > a.txt
○ → os lab report 
```

The status bar at the bottom right shows "Ln 1, Col 1" and "Sp".

14. mv

Command: `mv old.txt new.txt` **Explanation:**

Moves or renames a file or folder. **Screenshot:**



```
● → os lab report  mv old.txt new.txt
○ → os lab report
```

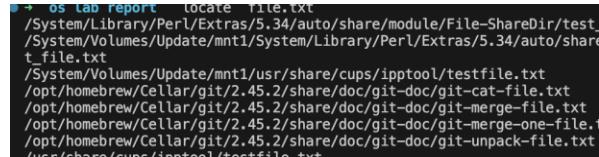
15. locate

Command: `locate file.txt`

Explanation: Quickly finds files by

name using a system index.

Screenshot:



```
● → os lab report  locate file.txt
/System/Library/Perl/Extras/5.34/auto/share/module/File-ShareDir/test_
/System/Volumes/Update/mnt1/System/Library/Perl/Extras/5.34/auto/share_
t_file.txt
/System/Volumes/Update/mnt1/usr/share/cups/ippool/testfile.txt
/opt/homebrew/Cellar/git/2.45.2/share/doc/git-cat-file.txt
/opt/homebrew/Cellar/git/2.45.2/share/doc/git-doc/git-merge-file.txt
/opt/homebrew/Cellar/git/2.45.2/share/doc/git-doc/git-merge-one-file.t
/opt/homebrew/Cellar/git/2.45.2/share/doc/git-doc/git-unpack-file.txt
/usr/share/cups/ippool/testfile.txt
```

16. echo

Command: `echo "Hello World"`

Explanation: Prints text to the terminal.



```
● → os lab report  echo "Hello World"
Hello World
○ → os lab report
```

Screenshot:

17. *uname -a*

Command: *uname -a*

Explanation: Shows full system information including kernel version.

Screenshot:

```
● → os lab report uname -a
Darwin Rupaks-MacBook-Air.local 24.5.0 Darwin Kernel Version 24.5.0: Tue Apr 22 19:54:26 PDT 2025; root:xnu-11417.121.6~2/RELEASE_ARM64_T8112 arm64
```

18. **df -h**

Command: `df -h`

Explanation: Displays disk usage in human-readable format.

Screenshot:

```
● → os lab report df -h
Filesystem      Size  Used  Avail Capacity
/dev/disk3s1s1   228Gi  14Gi   56Gi    0%
                /      201Ki  201Ki   0Bi
devfs           100%   /dev/disk3s6   228Gi  7.0Gi   56Gi
```

19. **ps -u \$USER**

Command: `ps -u $USER`

Explanation: Shows processes

currently running under your user.

Screenshot:

```
0% /System/Volumes/Update/mnt1
● → os lab report ps -u $USER
UID PID TTY      TIME CMD
501 1848 ??      5:18.36 /usr/sbin/distnoted agent
501 1849 ??      10:44.33 /usr/sbin/cfprefsd agent
501 1859 ??      13:50.04 /usr/libexec/UserEventAge
501 1863 ??      6:55.32 /System/Library/CoreServ
501 1866 ??      0:30.66 /usr/sbin/universalaccess
```

20. top

Command: `top`

Explanation: Displays real-time system
resource usage.

```
Processes: 406 total, 4 running, 402 sleeping, 2832 threads          21:39:
Load Avg: 4.04, 3.31, 3.06 CPU usage: 9.51% user, 3.82% sys, 86.65% idle
SharedLibs: 344M resident, 84M data, 51M linkedit.
MemRegions: 0 total, 0B resident, 166M private, 875M shared.
PhysMem: 7559M used (1478M wired, 2208M compressor), 61M unused.
VM: 195T vsize, 5709M framework vsize, 3538768(0) swapins, 4493095(0) swapouts.
Networks: packets: 60033380/67G in, 50863408/11G out.
Disks: 96899378/2040G read, 40972793/587G written.

PID   COMMAND      %CPU TIME      #TH  #WQ  #PORT MEM    PURG  CMPRS  PGRP  PPID  STATE
1674  WindowServer 31.5 21:02:38 20    6    4802- 489M-  672K+  152M- 1674   1     sleeping
1690  coreaudiod   16.8 10:34:04 10    1    17677 32M    0B     19M    1690   1     sleeping
2192  corespeechd  10.5 06:39:25 12    4    324   30M    0B     16M    2192   1     sleeping
```

Screenshot:

21. chmod

COMMAND: CHMOD 755 SCRIPT.SH

EXPLANATION: CHANGES FILE PERMISSIONS.
SCREENSHOT:

```
● → os lab report chmod 755 script.sh
● → os lab report ls -l script.sh
-rwxr-xr-x@ 1 rupakkarki staff 32 Dec 10 21:40 script.sh
● → os lab report ./script.sh
Hello OS Lab
● → os lab report █
```