

# 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 at the top reads 'rupakkarki — rupakkarki@rupaks-macbook-air — ~ — -zsh — 80x24'. The terminal content shows a login message: 'Last login: Fri Dec 5 11:15:12 on ttys014'. Below this, the command prompt is shown with a green arrow icon, a blue tilde icon, and the text 'pwd'. The output of the command is '/Users/rupakkarki'. The prompt is repeated once more with the same command and output.

```
rupakkarki — rupakkarki@rupaks-macbook-air — ~ — -zsh — 80x24
Last login: Fri Dec 5 11:15:12 on ttys014
[→ ~ pwd
/Users/rupakkarki
[→ ~ pwd
/Users/rupakkarki
```

## 2. ls

**Command:** `ls`

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

**Screenshot:**

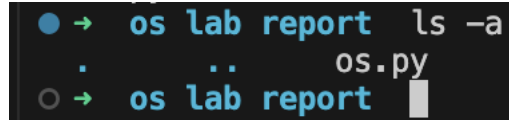
```
● → os lab report pwd
  /Users/rupakkarki/Desktop/os lab report
● → os lab report ls
  os.py
○ → os lab report █
```

### 3. ls -a

**Command:** `ls -a`

**Explanation:**  
including hidden  
dot (.).

**Screenshot:**



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

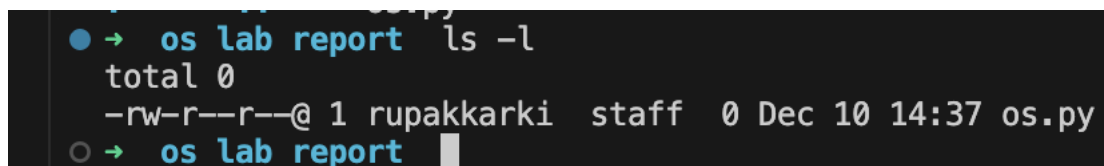
Shows all files  
ones starting with a

### 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**



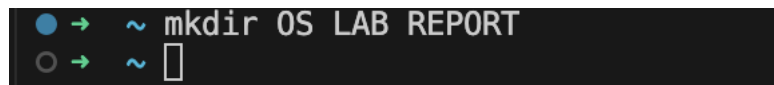
### **Command Examples:**

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

## 6. **mkdir**

**Command:** `mkdir myFolder`

**Explanation:** Creates a new directory.



**Screenshot:**

## 7. **rmdir**

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

Removes an

empty



directory. **Screenshot:**

## 8. **rm**

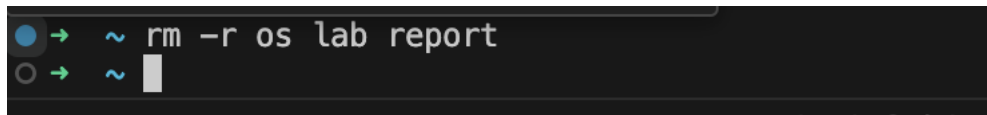
**Command:** `rm file.txt` **Explanation:**

*Deletes a file permanently.*

## 9. `rm -r`

**Command:** `rm -r`

`folderName` **Explanation:** *Deletes a directory and all its contents.*

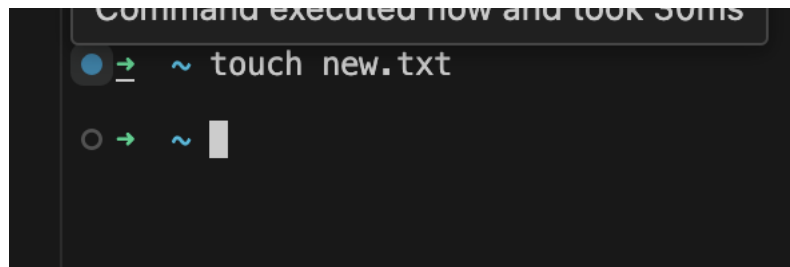
A screenshot of a terminal window with a dark background. The prompt is a blue circle followed by a green arrow and a tilde (~). The command entered is 'rm -r os lab report'. The prompt is followed by a green arrow, a tilde (~), and a white cursor block.

**Screenshot:**

## 10. `touch`

**Command:** `touch new.txt`

**Explanation:** *Creates an empty file if it does not exist.*

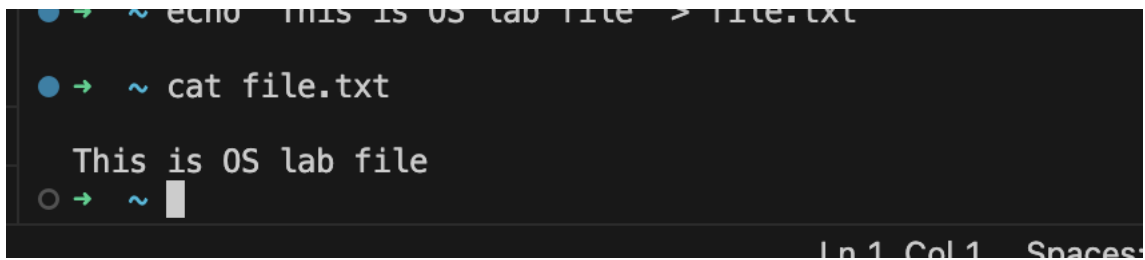


***Screenshot:***

## 11. cat

**Command:** `cat file.txt`

**Explanation:** Displays the contents of a file.



```
● → ~ echo "This is OS lab file" > file.txt
● → ~ cat file.txt
    This is OS lab file
○ → ~
```

Ln 1, Col 1, Spaces:

**Screenshot:**

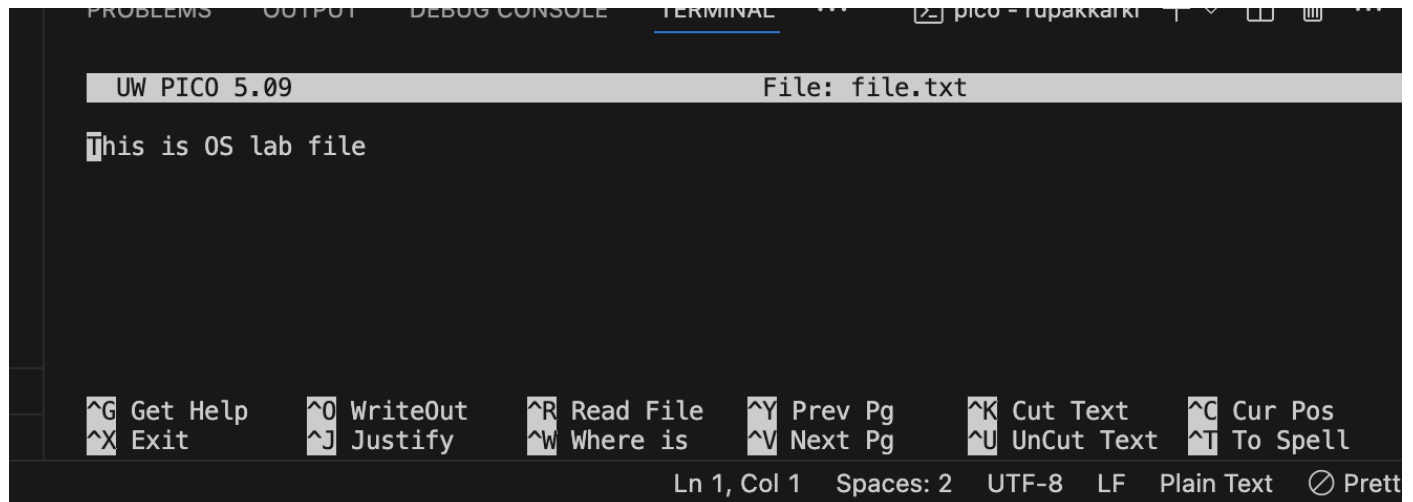
## 12. nano / vi / jed

**Command:** `nano file.txt`

**Explanation:** Opens a text editor inside the terminal.

**Screenshot:**





### 13. cp

**Command:** `cp a.txt b.txt`

**Explanation:** Copies the contents of one file to another.

**Screenshot:**

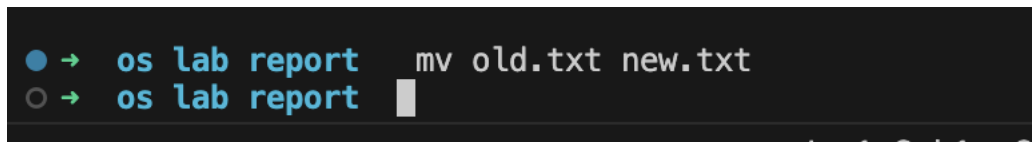
```
● → os lab report touch a.txt
● → os lab report echo "This is file A" > a.txt
○ → os lab report █
```

Ln 1, Col 1 Sp

## 14. mv

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

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

A terminal window with a dark background. The prompt is 'os lab report'. The command 'mv old.txt new.txt' has been entered and executed. The cursor is at the end of the line.

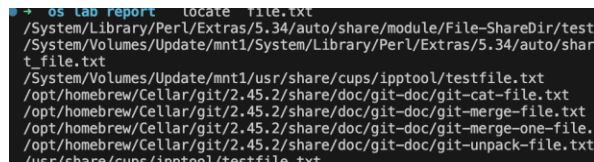
```
os lab report mv old.txt new.txt
```

## 15. locate

**Command:** `locate file.txt`

**Explanation:** Quickly finds files by name using a system index.

**Screenshot:**

A terminal window with a dark background. The prompt is 'os lab report'. The command 'locate file.txt' has been entered and executed. The output shows several file paths found by the system index.

```
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-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.

A terminal window with a dark background. The prompt is 'os lab report'. The command 'echo "Hello World"' has been entered and executed. The output 'Hello World' is printed on the next line.

```
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
%iused Mounted on				
/dev/disk3s1s1	228Gi	14Gi	56Gi	
0% /				
devfs	201Ki	201Ki	0Bi	
100% /dev				
/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/CoreServi
  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 █
```