



## Navigation & File Management

### Basic Navigation

<code>pwd</code>	Print Working Directory: Displays the current directory path.
<code>cd</code>	Change Directory: Navigates to the specified directory. <code>cd ..</code> - Move up one directory. <code>cd ~</code> - Go to home directory. <code>cd -</code> - Go to previous directory.
<code>ls</code>	List Directory Contents: Shows files and directories in the current directory. <code>ls -l</code> - Long listing format (permissions, size, date). <code>ls -a</code> - Show all files, including hidden ones (starting with <code>.</code> ). <code>ls -t</code> - Sort by modification time (newest first).
<code>mkdir</code>	Make Directory: Creates a new directory. <code>mkdir directory_name</code>
<code>rmdir</code>	Remove Directory: Deletes an empty directory. <code>rmdir directory_name</code>
<code>touch</code>	Create an empty file or update the timestamp of an existing file. <code>touch file_name</code>

## Searching & Redirection

### Searching Files

<code>find</code>	Find files based on criteria. <code>find . -name "*.txt"</code> (find all <code>.txt</code> files in the current directory and its subdirectories). <code>find / -name "important_file"</code> (find 'important_file' in the entire system). <code>find . -size +10M</code> (find files larger than 10MB in the current directory).
<code>grep</code>	Search for patterns within files. <code>grep 'pattern' file_name</code> (search for 'pattern' in file_name). <code>grep -i 'pattern' file_name</code> (case-insensitive search). <code>grep -r 'pattern' directory_name</code> (recursive search in directory). <code>grep -v 'pattern' file_name</code> (find lines that do NOT contain the pattern).
<code>whic</code> <code>h</code>	Locate the executable file associated with a command. <code>which command_name</code>
<code>locate</code> <code>e</code>	Find files by name using a pre-built index. Requires <code>updatedb</code> to update the index. <code>locate file_name</code>

## System Information & Process Management

### File Operations

<code>cp</code>	Copy: Copies files or directories. <code>cp source destination</code> <code>cp -r source_directory destination_directory</code> (recursive copy for directories)
<code>mv</code>	Move/Rename: Moves files or directories, or renames them. <code>mv old_name new_name</code> <code>mv file destination_directory</code>
<code>rm</code>	Remove: Deletes files. <code>rm file_name</code> <code>rm -r directory_name</code> (recursive removal for directories) <code>rm -f file_name</code> (force removal, bypass prompts) <code>rm -rf directory_name</code> (force recursive removal)
<code>ln</code>	Create links between files. <code>ln -s source_file symbolic_link</code> (creates a symbolic link)
<code>cat</code>	Concatenate and display file content. <code>cat file_name</code>
<code>les</code> <code>s</code>	View file content page by page. <code>less file_name</code> Use arrow keys to navigate, <code>q</code> to quit.

### Input/Output Redirection

<code>&gt;</code>	Redirect output to a file (overwrites existing content). <code>command &gt; file.txt</code>
<code>&gt;&gt;</code>	Append output to a file (adds to existing content). <code>command &gt;&gt; file.txt</code>
<code>2&gt;</code>	Redirect standard error to a file. <code>command 2&gt; error.txt</code>
<code>&amp;&gt;</code> or <code>&gt;&amp;</code>	Redirect both standard output and standard error to a file. <code>command &amp;&gt; output.txt</code> or <code>command &gt;&amp; output.txt</code>
<code> </code> (pipe)	Pipe: Sends the output of one command as input to another. <code>command1   command2</code>
<code>&lt;</code>	Redirect input from a file to a command. <code>command &lt; input.txt</code>

## System Information

<code>uname</code>	Print system information. <code>uname -a</code> (all information). <code>uname -r</code> (kernel release).
<code>df</code>	Disk Free: Shows disk space usage. <code>df -h</code> (human-readable format).
<code>du</code>	Disk Usage: Shows disk space usage of files and directories. <code>du -sh directory_name</code> (summary in human-readable format). <code>du -h --max-depth=1 directory_name</code> (show usage for each subdirectory).
<code>free</code>	Display amount of free and used memory in the system. <code>free -m</code> (in MB). <code>free -g</code> (in GB).
<code>uptime</code>	Show how long the system has been running, current time, number of users, and system load average.
<code>date</code>	Display the current date and time.

## User Management & Permissions

### User Management

<code>whoami</code>	Display the current user's username.
<code>id</code>	Display user ID, group ID, and groups.
<code>w</code>	Show who is logged on and what they are doing.
<code>last</code>	List last logged-in users.
<code>passwd</code>	Change user password.
<code>su</code>	Switch user. <code>su username</code>

## Process Management

<code>ps</code>	Process Status: Displays information about active processes. <code>ps aux</code> (show all processes). <code>ps -ef</code> (show all processes with full command lines).
<code>top</code>	Display real-time system processes, CPU usage, and memory usage. Press <code>q</code> to quit.
<code>kill</code>	Terminate a process. <code>kill process_id</code> (sends a TERM signal). <code>kill -9 process_id</code> (forcefully kills the process with a KILL signal).
<code>pkill</code>	Kill processes by name. <code>pkill process_name</code>
<code>bg</code>	Resume a stopped process in the background. <code>bg %job_id</code> (where job_id is the job number).
<code>fg</code>	Bring a background process to the foreground. <code>fg %job_id</code>

### File Permissions

<code>chmod</code>	Change file permissions. <code>chmod 755 file_name</code> (rwxr-xr-x) <code>chmod +x file_name</code> (add execute permission for all) <code>chmod u+w file_name</code> (add write permission for the user) <code>chmod g-r file_name</code> (remove read permission for the group)
<code>chown</code>	Change file owner. <code>chown user file_name</code> <code>chown user:group file_name</code> (change owner and group)
<code>chgrp</code>	Change file group. <code>chgrp group file_name</code>
<code>umask</code>	Set default file permissions. <code>umask 022</code> (removes write permission for group and others)
<code>ls -l</code>	Shows permissions for the file. Example: <code>-rwxr-xr--</code> 1st character: <code>d</code> (directory), <code>-</code> (file), <code>l</code> (link) Next 3 characters: owner permissions (read, write, execute) Next 3 characters: group permissions Last 3 characters: others permissions