

# Linux&Vim Basic commands

## Basic Linux Commands

### A. File & Directory Navigation

Command	Meaning	Examples
<code>pwd</code>	Show current directory	<code>pwd</code>
<code>ls</code> / <code>ls -l</code>	List files / detailed listing	<code>ls</code> <code>ls -l</code>
<code>cd folder</code>	Change directory	<code>cd espresso/</code> <code>cd qe7.4/</code>
<code>cd ..</code> / <code>cd ~</code>	Go up / go to home	<code>cd ..</code> <code>cd ~</code>

### B. Create, Copy, Move, Delete Files/Folders

Command	Meaning	Examples
<code>mkdir folder</code>	Create new folder	<code>mkdir day1</code> <code>mkdir -p vm/linux_commands/</code>
<code>touch filename</code>	create a file	<code>touch test.in</code> <code>touch test2.in test3.in</code>
<code>rm filename</code> / <code>rm -r</code>	Delete file / folder	<code>rm test.in</code> <code>rm -r tmp_dir/</code>
<code>cp src dest</code>	Copy file or folder	<code>cp input.in input1.txt</code> <code>cp *.in day1/</code>
<code>mv src dest</code>	Move or rename	<code>mv input1.txt file.in</code> <code>mv file.in vm/</code>

### C. Viewing File Contents

Command	Meaning	Examples
<code>cat file</code>	View entire file	<code>cat pw.out</code> <code>cat input.in</code>
<code>less file</code>	Scroll through file (q to quit)	<code>less pw.out</code> <code>/total energy</code> (search)
<code>head -n</code>	Show top N lines	<code>head -10 pw.out</code> <code>head -5 input.in</code>
<code>tail -n</code>	Show last N lines	<code>tail -20 pw.out</code> <code>tail input.in</code>

### D. Running Programs & Managing Processes

Command	Meaning	Examples
<code>program &lt; in &gt; out</code>	Run a program with input/output	<code>pw.x &lt; si.in &gt; si.out</code> <code>dos.x &lt; dos.in &gt; dos.out</code>
<code>top</code>	See running processes	<code>top</code> (press <code>q</code> to quit)
<code>kill PID</code>	Stop a running process/force kill	<code>kill 1234</code> <code>kill -9 1234</code>
<code>chmod +x file</code>	Make file executable	<code>chmod +x run_qe.sh</code>

## 💡 E. Handy Tools

Command	Meaning	Examples
<code>history</code>	Show past commands	<code>history</code> <code>!42</code> (re-run command 42)
<code>clear</code>	Clear terminal screen	<code>clear</code> <code>Ctrl + L</code>
<code>tar -zxvf filename</code>	untar tar file	<code>tar -zxvf day1.tar.gz</code>
<code>tar -zcvf name.tar.gz path</code>	create tar file	<code>tar -zcvf test.tar.gz .</code>

## 💡 VIM Quick Reference Sheet

### ☒ A. VIM Modes – The Foundation

Mode Name	How to Enter	What You Can Do	Tip or Example
Normal Mode	Press <code>Esc</code> (default mode)	Navigate, delete, copy, run commands	Always press <code>Esc</code> to reset VIM
Insert Mode	Press <code>i</code>	Start typing text or code	Press <code>i</code> , type <code>Hello QE</code> , then <code>Esc</code>
Command Mode	Press <code>:</code> from Normal mode	Save, quit, search, run shell commands	<code>:wq</code> , <code>:q!</code> , <code>:set number</code> , <code>:!ls</code>
Visual Mode	Press <code>v</code> , <code>V</code> , or <code>Ctrl+v</code>	Select characters, lines, or blocks	Use for deleting or copying selected text

### 💾 B. Saving, Quitting, and Files

Command	What It Does	Example or Tip
<code>:w</code>	Save the file	<code>:w</code> or <code>:w newfile.in</code>
<code>:q</code>	Quit (only if no unsaved changes)	<code>:q</code>
<code>:q!</code>	Force quit (discard changes)	<code>:q!</code>
<code>:wq</code>	Save and quit	<code>:wq</code>

Command	What It Does	Example or Tip
:x	Same as :wq	:x

## 📍 C. Navigation & Movement

Command	What It Does	Example or Tip
h j k l	Move left, down, up, right	Use as arrow keys — h (←), j (↓), etc.
G / gg	Go to end/start of file	G = last line, gg = first line
nG	Go to line number n	50G jumps to line 50
/word	Search forward	/K_POINTS, /ecutwfc, etc.
n / N	Repeat search forward/backward	n (next match), N (previous match)

## ✎ D. Editing, Deleting, Copying

Command	What It Does	Example or Tip
x	Delete character under cursor	Place cursor and press x
dd	Delete line	3dd deletes 3 lines
yy	Copy (yank) current line	2yy copies 2 lines
p	Paste after current line	yy → move → p
u	Undo last change	Press multiple times to undo more
Ctrl + r	Redo last undo	Use if you over-undo
:%s/old/new/g	Replace all in file	:%s/scf/relax/g, :%s/0/H/g

## █ E. Visual Mode – Select & Edit Like a Pro

Mode/Key	What It Does	Example or Tip
v	Visual mode (select characters)	Move with hjkl, then press y to copy
V	Visual Line mode (select whole lines)	v, then j or k, then d to delete
Ctrl + v	Visual Block mode (columns)	Ctrl + v, select block, press I, type text, Esc
d, y, p, >	Apply delete/copy/paste/indent actions	Use after selecting with visual mode
~	Toggle case of selected text	Select and press ~

## ⚙️ F. VIM Settings & Shell Access

Command	What It Does	Example or Tip

Command	What It Does	Example or Tip
<code>:set number</code>	Show line numbers	Helps with debugging QE inputs
<code>:syntax on</code>	Enable syntax highlighting	Colours keywords and comments
<code>:!command</code>	Run shell command from within VIM	<code>:!ls</code> , <code>:!pw.x &lt; scf.in &gt; scf.out</code>

## ⌚ A quick vim test

Try creating a simple input file:

```
vim test.in      # open new file
i                # insert mode
(type a QE input block or random text)
Esc              # return to normal mode
:set number     # show line numbers
:wq              # save and quit
```