## 🐧 Linux Basics Command Reference Guide

### 🗂️ File & Directory Management

| Command | Description | Example |
| --- | --- | --- |
| ls | List files and directories | ls -l |
| cd | Change directory | cd /home/user/Documents |
| pwd | Show current directory path | pwd |
| mkdir | Create a new directory | mkdir new\_folder |
| rmdir | Remove an empty directory | rmdir old\_folder |
| rm | Remove files or directories | rm file.txt or rm -r folder/ |
| cp | Copy files or directories | cp file1.txt file2.txt |
| mv | Move or rename files | mv old.txt new.txt |
| touch | Create an empty file | touch newfile.txt |
| tree | Show directory tree (requires install) | tree |
| basename | Get file name from path | basename /path/to/file.txt |
| dirname | Get directory path from file path | dirname /path/to/file.txt |

### 📄 Viewing & Editing Files

| Command | Description | Example |
| --- | --- | --- |
| cat | Show file content | cat file.txt |
| more/less | View long files page by page | less bigfile.txt |
| head | View first lines | head -n 10 file.txt |
| tail | View last lines | tail -n 10 log.txt |
| tac | Show file in reverse | tac file.txt |
| nano | Simple terminal-based editor | nano file.txt |
| vim | Advanced terminal-based editor | vim file.txt |
| echo | Print or write text to file | echo "text" > file.txt |
| cat > | Create file and input text | cat > notes.txt |

### 📝 File Editing: Write, Save, Exit

| Tool | How to Write | Save | Exit | Notes |
| --- | --- | --- | --- | --- |
| vim | Press i | Esc, :w | :q or :wq | Advanced editor |
| nano | Start typing | Ctrl + O | Ctrl + X | Beginner-friendly |
| cat > | Type after command | Ctrl + D | Auto-exit | Overwrites file |
| echo | Add in command | Auto | Auto | For single-line text |
| less / more | View only | N/A | q | Read-only |
| head / tail | View only | N/A | Auto | Use for partial views |

### 📦 Package Management (Debian/Ubuntu)

| Command | Description | Example |
| --- | --- | --- |
| sudo apt update | Update package list | sudo apt update |
| sudo apt upgrade | Upgrade installed packages | sudo apt upgrade |
| sudo apt install | Install a package | sudo apt install curl |
| sudo apt remove | Remove a package | sudo apt remove nano |

### 🔍 Search and Filter

| Command | Description | Example |
| --- | --- | --- |
| find | Find files/folders | find / -name file.txt |
| grep | Search text in files | grep 'hello' file.txt |
| xargs | Run commands on input | cat list.txt | xargs rm |
| diff | Compare two files | diff file1.txt file2.txt |
| cut | Cut columns of text | cut -d: -f1 /etc/passwd |
| sort, uniq | Sort and remove duplicates | sort file.txt | uniq |

### 📊 System Info & Monitoring

| Command | Description | Example |
| --- | --- | --- |
| top | System processes | top |
| htop | Advanced system monitor | htop |
| df -h | Show disk space | df -h |
| du -sh | Show folder size | du -sh Documents/ |
| free -h | Show memory usage | free -h |
| uptime | Show uptime and load | uptime |
| uname -a | System information | uname -a |
| ps aux | View running processes | ps aux |
| kill | Terminate process | kill -9 <PID> |
| nice | Run process with priority | nice -n 10 command |

### 🔐 User and Permissions

| Command | Description | Example |
| --- | --- | --- |
| chmod | Change permissions | chmod 755 script.sh |
| chown | Change owner | chown user:group file.txt |
| umask | Default permission mask | umask 022 |
| passwd | Change user password | passwd |
| groups | Show user groups | groups |
| id | Show UID/GID | id |
| whoami | Show current user | whoami |
| sudo | Run as root | sudo command |

### 🌐 Networking and Downloads

| Command | Description | Example |
| --- | --- | --- |
| ping | Test network | ping google.com |
| curl | Download content | curl https://example.com |
| wget | Download files | wget http://example.com/file.zip |
| ip a | Show IP address | ip a |
| ifconfig | View IP (older systems) | ifconfig |
| netstat -tuln | Show open ports | netstat -tuln |
| traceroute | Trace network route | traceroute google.com |
| nslookup / dig | DNS queries | nslookup example.com |
| nc | Network utility tool | nc -zv example.com 80 |

### 🗜️ Archiving & Compression

| Command | Description | Example |
| --- | --- | --- |
| tar | Archive files/folders | tar -cvf backup.tar folder/ |
| zip / unzip | Compress/uncompress files | zip my.zip file.txt |
| gzip / gunzip | Compress/uncompress .gz | gzip file.txt |

### ⌨️ Useful Shell Shortcuts

| Shortcut | Action |
| --- | --- |
| Ctrl + C | Stop current command |
| Ctrl + R | Reverse search history |
| Ctrl + U | Clear entire line |
| Ctrl + A / Ctrl + E | Move to beginning / end of line |
| !! | Repeat last command |
| Tab | Autocomplete commands/paths |

This guide covers essential Linux commands and operations for beginners, QA engineers, and developers. Let me know if you want a downloadable PDF or continue with advanced topics like scripting or cron jobs!