**1. File and Directory Management**

* ls: List directory contents.
* cd: Change directory.
* pwd: Print working directory.
* mkdir: Create a new directory.
* rmdir: Remove empty directories.
* rm: Remove files or directories.
* cp: Copy files and directories.
* mv: Move or rename files and directories.
* find: Search for files and directories.
* locate: Find files quickly using a pre-built index.
* touch: Create an empty file.

**2. File Viewing and Editing**

* cat: Display file contents.
* less: View file contents one screen at a time.
* more: View file contents (similar to less).
* nano, vim, emacs: Text editors.
* head: View the first few lines of a file.
* tail: View the last few lines of a file.
* grep: Search for text in files.
* awk: Text processing and data extraction.
* sed: Stream editor for text manipulation.

**3. User and Permission Management**

* whoami: Display the current user.
* id: Show user and group IDs.
* sudo: Run a command as another user, usually root.
* adduser: Add a new user.
* deluser: Delete a user.
* usermod: Modify a user account.
* chmod: Change file permissions.
* chown: Change file owner and group.
* groups: Show groups a user belongs to.

**4. Networking**

* ping: Test connectivity to a host.
* curl: Transfer data from a server.
* wget: Download files from the web.
* netstat: Show network connections.
* ss: Display detailed network connections (modern replacement for netstat).
* ifconfig: View or configure network interfaces (deprecated; use ip).
* ip: Display and manage IP addresses and routes.
* nslookup: Query DNS servers.
* dig: Perform DNS lookups.
* scp: Secure copy over SSH.
* rsync: Synchronize files between systems.

**5. Process and System Monitoring**

* ps: View running processes.
* top: Display system resource usage in real-time.
* htop: Interactive process viewer (requires installation).
* kill: Terminate a process by PID.
* killall: Kill processes by name.
* jobs: Show background jobs.
* bg: Resume a job in the background.
* fg: Resume a job in the foreground.
* uptime: Show system uptime.
* df: Check disk space usage.
* du: Check directory size.
* free: Display memory usage.

**6. Disk and Storage Management**

* mount: Mount a filesystem.
* umount: Unmount a filesystem.
* lsblk: List information about block devices.
* fdisk: Partition a disk.
* mkfs: Create a filesystem.
* blkid: Display block device attributes.
* tune2fs: Adjust ext2/ext3/ext4 filesystem parameters.

**7. Package Management**

* **Debian/Ubuntu-based systems (APT):**
  + apt-get: Install, upgrade, and manage packages.
  + apt-cache: Search package metadata.
  + dpkg: Install, remove, and manage .deb packages.
* **Red Hat/CentOS-based systems (YUM/DNF):**
  + yum: Package manager for older systems.
  + dnf: Modern replacement for yum.
  + rpm: Install, remove, and query .rpm packages.
* **General:**
  + snap: Manage snap packages.

**8. Archiving and Compression**

* tar: Archive files into a tarball.
* gzip: Compress files.
* gunzip: Decompress .gz files.
* zip: Compress files into .zip format.
* unzip: Extract .zip files.
* xz/7z: Advanced compression formats.

**9. Automation and Scripting**

* bash: Execute Bash scripts.
* crontab: Schedule jobs.
* at: Schedule a one-time task.
* systemctl: Manage systemd services.
* service: Manage services (deprecated; use systemctl).

**10. Logs and Debugging**

* dmesg: Display kernel ring buffer.
* journalctl: Query systemd logs.
* tail -f: Follow log files in real-time.
* strace: Trace system calls and signals.
* lsof: List open files.

**11. SSH and Remote Access**

* ssh: Secure shell for remote login.
* scp: Copy files securely between systems.
* sftp: Secure file transfer protocol.
* ssh-keygen: Generate SSH keys.
* ssh-copy-id: Copy SSH public key to a server.

**12. Cloud-Specific Tools**

* aws-cli: Manage AWS services from the command line.
* kubectl: Manage Kubernetes clusters.
* helm: Kubernetes package manager.
* terraform: Infrastructure as Code (IaC) tool.
* ansible: Configuration management and automation.
* docker: Container management.
* docker-compose: Manage multi-container Docker applications.

**13. Other Useful Tools**

* uname: Show system information.
* hostname: Display or set the hostname.
* env: Show environment variables.
* export: Set environment variables.
* echo: Display messages or variables.
* date: Display or set the system date and time.
* time: Measure execution time of commands.

**Tips for Practice**

1. Set up a Linux virtual machine (VM) or use a cloud instance (e.g., AWS EC2, Azure VM) to practice.
2. Combine basic commands into scripts to solve real-world problems.
3. Use online platforms like [OverTheWire](https://overthewire.org/) or [Linux Survival](https://linuxsurvival.com/) for hands-on challenges.

Bottom of Form