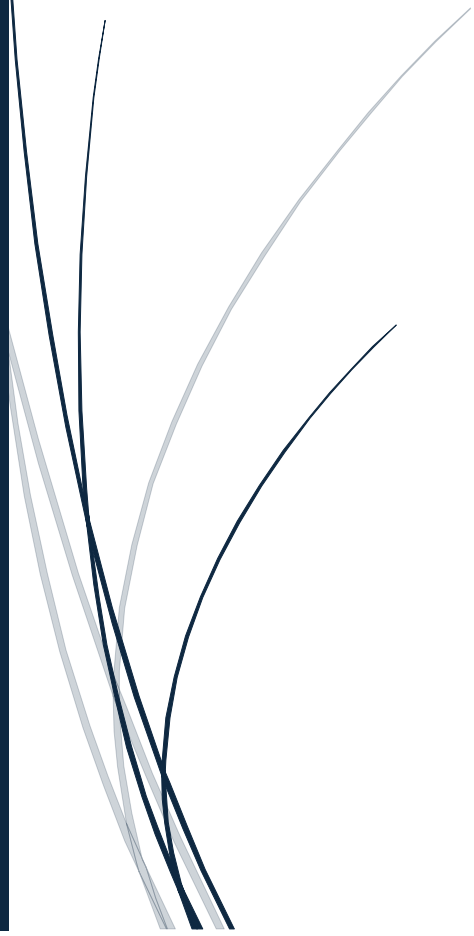
2025 Edition

Linux Basics

Your Ultimate Learning Guide



Kushal Prasad Joshi

kushalprasadjoshi@gmail.com

PREFACE

Welcome to this handbook, a resource created independently to assist learners, practitioners, and enthusiasts in the field of **Computer Science**. This guide is the result of my personal exploration and understanding of **Linux Operating System**, developed outside of any formal course structure. It aims to provide accessible, practical knowledge for anyone eager to explore and deepen their understanding of this subject.

Throughout the creation of this handbook, I have drawn inspiration from a variety of sources, including textbooks, online tutorials, and real-world applications. The content has been carefully curated to ensure that learning is both intuitive and effective. This handbook not only covers theoretical concepts but also offers hands-on examples, practical tips, and insights that will help you apply your learning in real-world scenarios.

Although this work is independent, it is built upon widely recognized principles and industry standards. My goal is to provide a resource that encourages curiosity, creativity, and the pursuit of mastery. This handbook is meant to be a comprehensive companion for anyone looking to advance their skills and knowledge in **Linux Terminal**.

This material is suitable for learners at various levels, whether you're just beginning or looking to deepen your existing knowledge. Each chapter is structured to provide clear explanations, relevant examples, and exercises that encourage active learning and problem-solving.

As you work through the content, I encourage you to experiment with the examples, challenge your understanding, and push the boundaries of your learning. The journey to mastering a new skill may be challenging, but it is always rewarding. This handbook is here to guide you every step of the way, offering the knowledge and insights necessary for your success.

Thank you for choosing this resource. I hope it proves valuable as you explore, learn, and grow.

Happy Learning!

Kushal Prasad Joshi

kushalprasadjoshi@gmail.com

Author

TABLE OF CONTENTS

Preface 1
Basic Linux Commands 3
Introducing Commands 3
Working With Directories 4
Working With Files 4
Chmod Calculator 5
Executing Software 5
Process Manipulation 5
Changing Hostname 6
Changing Domain Name 6
Configuring Apache Server 6
Changing Apache Port 7
Software Installation Without Apt 7
From Debian Files 7
From GitHub 7
Error Resolving in Linux Apt 8
Root Access 8
Check Your Connection 8
Editing Source List 8
Using Fix-Broken 8
Removing Apt List 8
Running Multiple Commands in Single Terminal 9
Semicolon (;) 9
And (&&) 9
Or (||) 9

BASIC LINUX COMMANDS

INTRODUCING COMMANDS

1. **help** : Shows you basic commands and their uses.
2. **man** : Shows you complete manual of that command or program.
3. **ls** : List all the folders and files of a directory.
4. **ls -a** : Shows all files and folders.
5. **ls -l** : Shows permissions of file & DOB & user / groups.
6. **ls -R** : List all directories and subdirectories. (Recursive)
7. **cd** : Change directory. (Enter into directory / node)
8. **pwd** : Present working directory.
9. **clear** : Clean the terminal.
10. **history** : Shows history of commands.
11. **echo** : To print on terminal.
12. **printf** : To print on terminal.
13. **mkdir** : make a new directory in current location.

NOTE:

- To make any file hidden use **.** before file name. (e.g. **.file**)
- **ls /home/kali/Downloads** can be used.
- **cd /home/kali/Downloads** can be used.
- -**h** gives help.
- **cd ..** is used for backspace in directories.
- **' '** for character and **" "** for string is recommended.
- **mkdir Kushal Prasad Joshi** forms three different directories.
- To make a single directory use **mkdir "Kushal Prasad Joshi"** (double quote) or **mkdir Kushal\ Prasad\ Joshi** (escape character).

WORKING WITH DIRECTORIES

1. **dir** : Same as ls.
2. **mkdir** : Create a directory (folder).
3. **cp** : Copy a file or folder.
4. **mv** : Move a file or folder.
5. **rm** : Remove. (Delete a file or folder.)

NOTE:

- mkdir /home/.....
- cp filename /home/.....
- mv filename /home/.....
- rm filename /home/.....
- rm filename
- rm -r folder
- rm /home/.....

WORKING WITH FILES

1. **sudo su root** : Grant root privileges.
2. **cat** : Shows content of a file.
3. **nano** : Linux file editor.
4. **gedit** : File editor software.
5. **chmod** : change directories and files permissions.

NOTE:

- cat /home/.....
- Nano is command line text editor.
- Gedit is graphical text editor.
- **ls -l** gives detailed information about files and folders.
- **chmod +wxr filename** is used to add permissions.

- **chmod -wxr filename** is used to remove permissions.
- **sudo su** can be used instead of **sudo su root** in newer versions of Linux.

CHMOD CALCULATOR

- **chmod filename ch-number** (Changes file permissions)
- **chgroup** (Changes group)

NOTE:

- The format is (Owner Group Public).

EXECUTING SOFTWARE

1. **./filename** : Execute shell file.
2. **bash filename** : Execute shell programs.
3. **apt-get update** : Update packages list. (URL's)
4. **apt-get upgrade** : Update all installed software.
5. **apt-get install software_name** : Install a particular software.
6. **apt-get update software_name** : Update packages for a particular software.
7. **apt-get upgrade software_name** : Update a particular software.

NOTE:

- **apt-get update** updates the store.
- **apt-get upgrade** updates all the packages, programs, tools, etc.
- In the newer version of Linux, **apt** can be used instead of **apt-get.**

PROCESS MANIPULATION

1. **top** : Showing Linux processes consuming more resources.
2. **ps** : print present processes.
3. **ps -a** : print all processes including background processes.
4. **kill** : Terminate process manually.
5. **who** : Who are logged on and what they are doing.

6. **whoami** : Displays the username of current user.
7. **touch** : Create an empty file.

NOTE:

- shortcuts in the tab (process) shown are: PID - process id; PR - priority; NI - priority number; VIRT - virtual; RES - resources used; SHR - shared memory; S - software status.
- **kill PID** (Terminate process with the PID given to kill.)
- **Ctrl + C** is used to stop ongoing process.

CHANGING HOSTNAME

- **sudo su** (Getting root access)
- **cd /etc** (Contains all software configuration)
- **gedit hostname** (Editing hostname file using gedit text editor)
- **reboot** (Restarting system)

CHANGING DOMAIN NAME

- **sudo su** (Getting root access)
- **cd /etc** (Contains all types of configurations)
- **gedit hosts** (Editing hosts file using gedit text editor)
- **service apache2 start** (Opening ports on Apache server)
- Now, go to browser and search for an Ip address and domain name. (e.g. Kushal:80)

CONFIGURING APACHE SERVER

- **service apache2 start** (Starting Apache server)
- **cd /var/www/html/** (Pages that server Apache is executing)
- **sudo gedit index.html** (Editing the html page for confirmation)

NOTE:

- **ifconfig** (Configure private ip) e.g. inet 192.168.78.141 (Using this Ip local area network can be connected.)
- Apache server always works on port 80 by default.

CHANGING APACHE PORT

- **cd /etc** (/etc contains all types of configuration files)
- **cd /apache2** (Entering apache2 folder)
- **gedit ports.conf** (Editing ports.conf file using gedit. Here, change the 80 into any number that will be a new port. e.g. 8080)
- Run **service apache2 restart** to restart your Apache server.
- Now go to browser and check your Ip. (192.168.78.141:80 in my case.)

SOFTWARE INSTALLATION WITHOUT APT

FROM DEBIAN FILES

- **cd Downloads** (Downloads folder contains all the downloaded software.)
- **dpkg -i filename** (Unpacking and installing Debian files.)

FROM GITHUB

- **git clone URL**
- **cd folder**
- **./exe file**

NOTE:

- Use the instructions given by GitHub to install programs and services.

ERROR RESOLVING IN LINUX APT

ROOT ACCESS

You need root access to download any software or service using apt command. So, confirm that you have root access. If you don't have root access, use **sudo su** command to get root access.

CHECK YOUR CONNECTION

You need an internet connection to download any software or services using apt. So, confirm that you are connected to internet. If not, connect to the internet through available network.

EDITING SOURCE LIST

- **cd /etc/apt**
- **gedit sources.list** (Confirm that line2 and line5 doesn't contain # sign because # indicates that line is commented.)
- **apt update** (Updating source list)

USING FIX-BROKEN

- **apt-get install --fix-broken**

REMOVING APT LIST

- **rm -rf /var/lib/apt/list/***
- **apt-get update**

RUNNING MULTIPLE COMMANDS IN SINGLE TERMINAL

SEMICOLON (;)

Second command must work whether first command work or not. Second command is independent of first command and always works.

For example: **cd ; ls** (ls will work whether cd works or not.)

AND (&&)

Runs first command first and second command second. If the first command fails, then the second command doesn't work.

For example: **cd && ls** (ls will work only if cd works.)

OR (||)

Runs first command if it is true, else runs second command. The second command only runs if first command fails.

For example: **cd || ls** (ls will work if cd doesn't work.)