INTRODUCTION TO LINUX

SOFTWARE ENGINEERING

ROBOTICS CORNER

CONTENTS

- What is Linux?
- Why use Linux?
- Linux Distributions
- History of Linux
- Command Line & Basic Commands
- Directory Structure

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LINUX?

- Linux has been around since the mid-1990s and has since reached a user base that spans the globe. Linux is actually everywhere: It’s in your phones, your thermostats, in your cars, refrigerators, and televisions. It also runs most of the Internet, all of the world’s top 500 supercomputers, and the world’s stock exchanges.

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WHAT IS LINUX?

- Just like Windows, iOS, and Mac OS, Linux is an operating system. In fact, one of the most popular platforms on the planet, Android, is powered by the Linux operating system.
- An operating system is software that manages all of the hardware resources associated with your desktop or laptop. To put it simply, the operating system manages the communication between your software and your hardware. Without the operating system (OS), the software wouldn’t function.

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WHY LINUX?

- Linux is considered one of the most stable, secure, and reliable operating systems and is widely used in servers, supercomputers, and enterprise environments. Today, Linux is one of the most widely used operating systems in the world because it is open-source.

Check it OUT!: https://github.com/torvalds/linux

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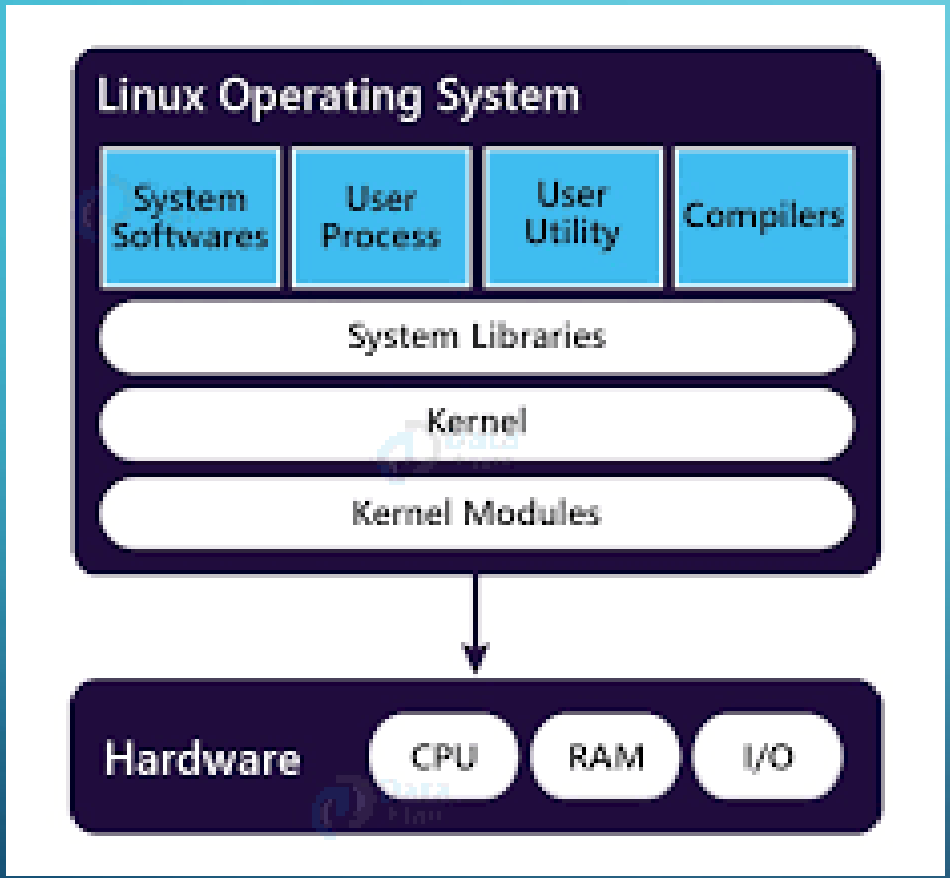
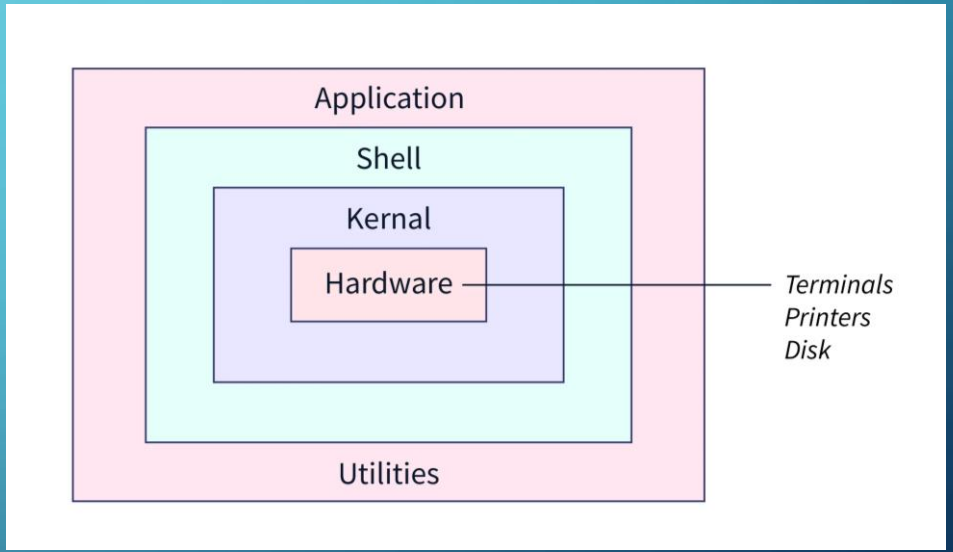
LINUX OS COMPONENTS





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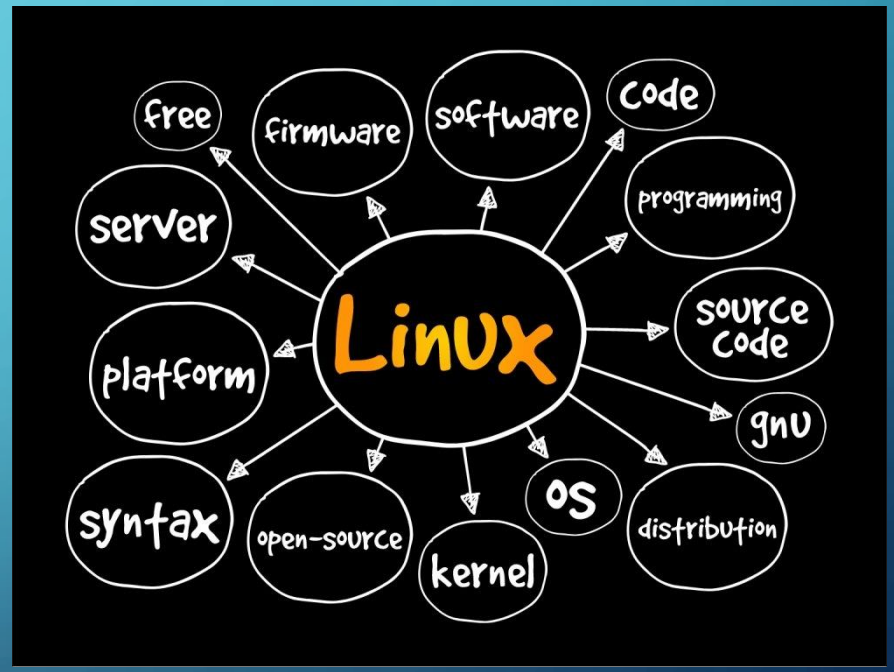
LINUX IS OPEN SOURCE

- The freedom to run the program, for any purpose.
- The freedom to study how the program works, and change it to make it do what you wish.
- The freedom to redistribute copies so you can help your neighbour.
- The freedom to distribute copies of your modified versions to others.



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LINUX DISTRIBUTIONS

Ubuntu

Fedora

Arch

Plasma

KDE

Mint

Manjaro

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LINUX DISTRIBUTIONS

- Basic: Linux Mint, Ubuntu, Elementary OS or Deepin.
- Above-average: Debian or Fedora
- Challenging: Gentoo

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HISTORY OF LINUX

- 1970s: **Unix development,** Unix was developed as a multi-user, multi-tasking operating system and has been widely used in science and research.
- **1980s: Minix is born,** computer science professor Andrew S. Tanenbaum created a small Unix-like operating system called Minix.
- 1991: 21-year-old student named Linus Torvalds began working on a new operating system he named Linux.

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HISTORY OF LINUX CTD

- September 1991: **Release of Linux 0.01:** Linus released the first version of his Linux called Linux 0.01. It was a command-line operating system and was freely distributed on the Internet.
- **Linux community development:** In the years that followed, Linux quickly gained popularity among programmers and enthusiasts.
- **Enterprise Adoption:** In the late 1990s and early 2000s, the open-source nature of Linux made it more flexible, cost-effective, and more secure than proprietary operating systems such as Windows, making it a popular choice for enterprises and businesses.

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OFFICIAL MASCOT OF LINUX

- The official **Linux mascot** is a **penguin** named **Tux**. Created by artist **Larry Ewing** in **1996**.
- Tux was chosen as the mascot because the **penguin** is a **rare animal** found in the wild in Antarctica, just as Linux is a **unique** and **powerful** operating system. The name **Tux** comes from the short form “**Torvalds Unix**“, in honour of the creator of Linux, Linus Torvalds.

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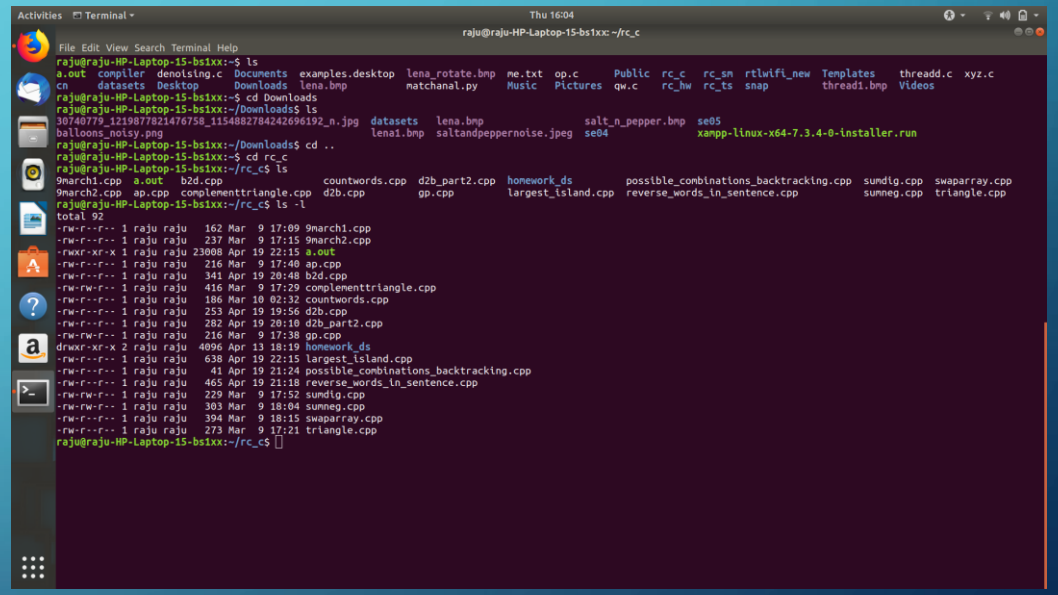
LINUX COMMAND LINE

- The Linux command line is a text interface to your computer. Often referred to as the shell, terminal, console, prompt, or various other names.
- Flexible to copy and paste commands
- Shell is a program that manages the kernel that manages the drivers
- Using the shell the user interfaces with the kernel
- CTRL ALT T



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BASIC TERMINAL COMMANDS

- ls: Lists a directory's content
- cd: Changes the working directory
- pwd: Shows the current working directory's path
- mkdir: Creates a new directory
- rmdir: remove a directory

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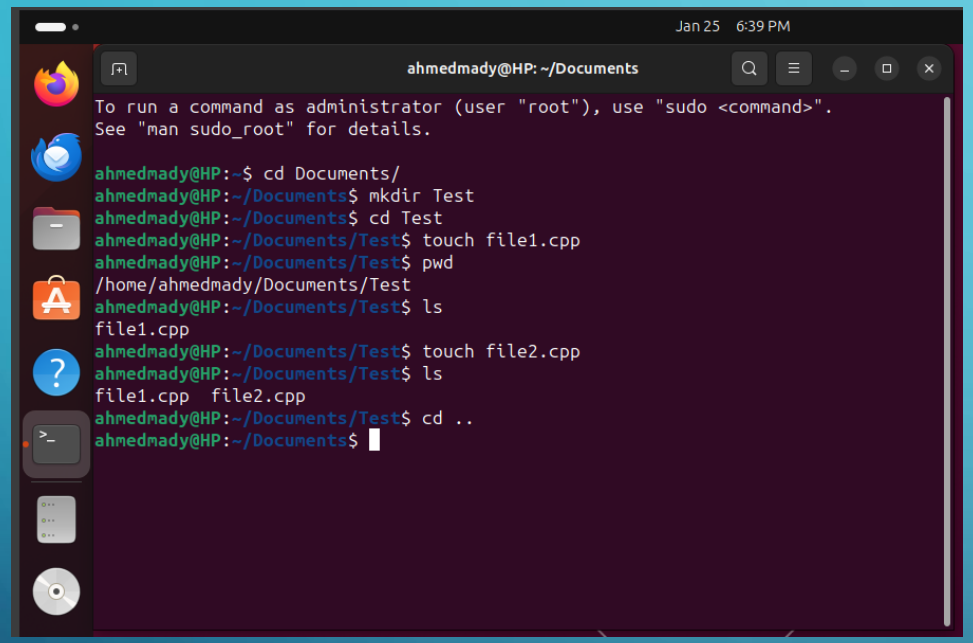
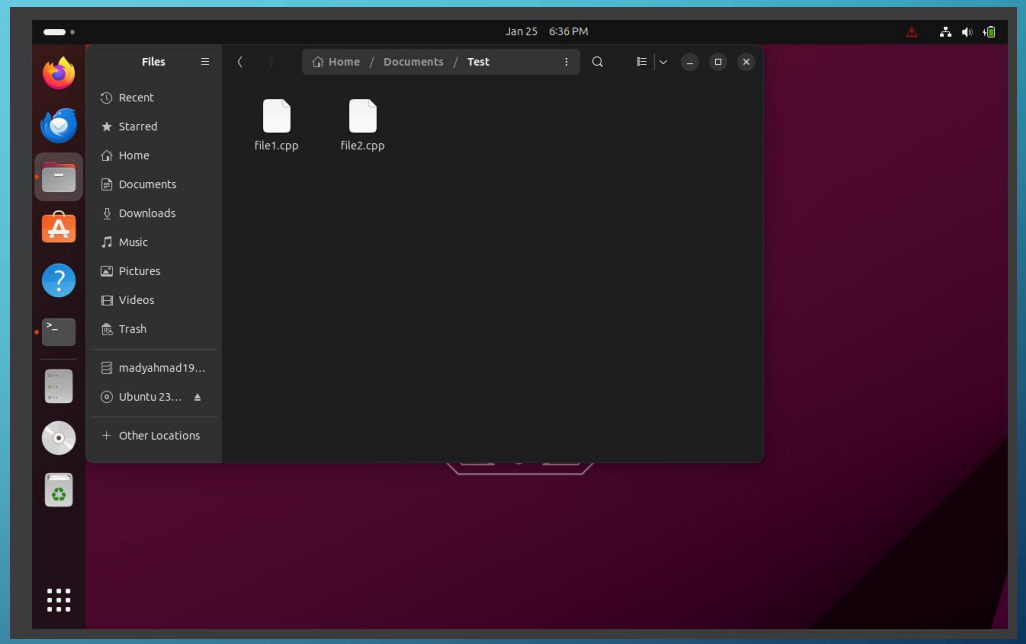
EXAMPLE





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MAN KEYWORD

- The man command is a built-in manual for using Linux commands. It allows users to view the reference manuals of a command or utility run in the terminal. The man page (short for manual page) includes a command description, applicable options, flags, examples, and other informative sections.
- man ls, man pwd, etc…
- Press Q to exit the manual

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CD

- cd .. : Jumps 1 directory back
- cd ~ : goes to the home directory

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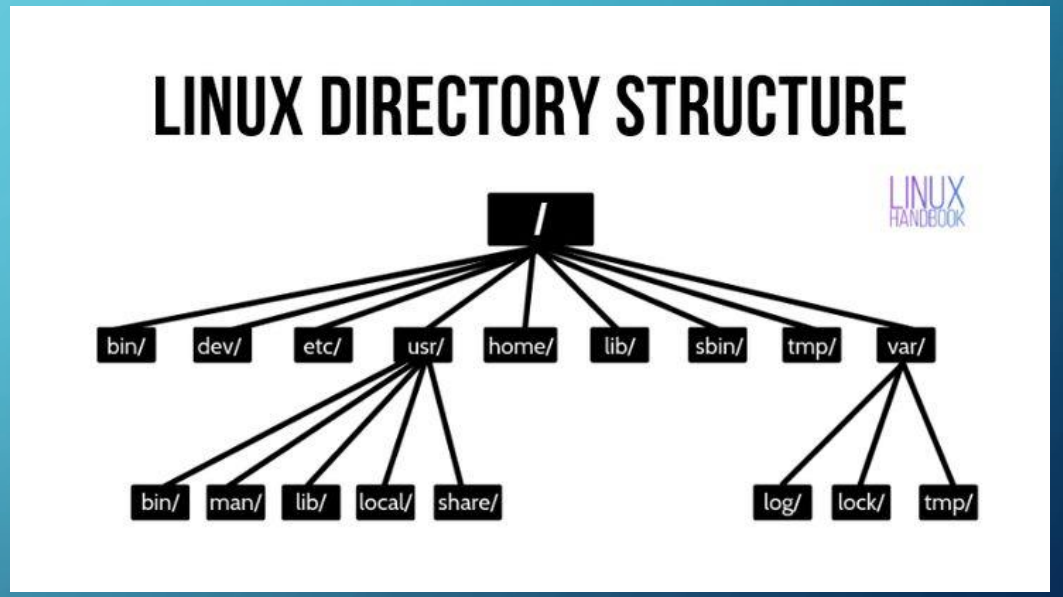
DIRECTORY STRUCTURE IN LINUX (TREE)

1. **General Files** – It is also called ordinary files. It may be an image, video, program, or simple text file. These types of files can be in ASCII or Binary format. It is the most commonly used file in the Linux system.
2. **Directory Files** –It may be a directory file within a directory (subdirectory).
3. **Device Files –** In a Windows-like operating system, devices like CD-ROM, and hard drives are represented as drive letters like F: G: H whereas in the Linux system devices are represented as files. As for example, /dev/sda1, /dev/sda2, and so on.



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DIRECTORY STRUCTURE IN LINUX

/bin	binary or executable programs.
/etc	system configuration files.
/home	home directory. It is the default current directory.
/opt	optional or third-party software.
/tmp	temporary space, typically cleared on reboot.
/usr	User related programs. libraries
/var	log files.

/boot	It contains all the boot-related information files and folders such as conf, grub, etc.
/dev	It is the location of the device files such as dev/sda1, dev/sda2, etc.
/lib	It contains kernel modules and a shared library.
/lost+found	It is used to find recovered bits of corrupted files.
/media	It contains subdirectories where removal media devices are inserted. ▲

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/mnt	It contains temporary mount directories for mounting the file system.
/proc	It is a virtual and pseudo-file system to contains info about the running processes with a specific process ID or PID.
/run	It stores volatile runtime data.
/sbin	binary executable programs for an administrator.
/srv	It contains server-specific and server-related files.

/sys	It is a virtual file system for modern Linux distributions to store and allows modification of the devices connected to the system.

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LS

- -l Lists files and directories in long format, providing detailed information (permissions, owner, size, modification date).
- -a Includes hidden files and directories in the listing (those starting with a dot).
- -h Displays file sizes in a human-readable format (kilobytes, megabytes, gigabytes).
- -t Sort files and directories by their last modification time, displaying the most recently modified ones first.
- -r Reverses the order of the listing, displaying items in reverse alphabetical or chronological order.
- -S Sort files and directories by their sizes, listing the largest ones first.

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RESOURCES

- https://www.linux.com/what-is-linux/
- https://www.geeksforgeeks.org/linux-history/
- https://ubuntu.com/tutorials/command-line-for-beginners#1-overview
- https://www.hostinger.com/tutorials/linux-commands
- https://contabo.com/blog/linux-navigation-and-file-management/

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