Ubuntu
and basic Linux command part 1

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    - Change working directory.
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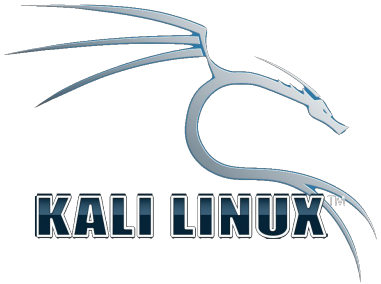
1. Introduction

Some popular Operating Systems

Distributions of linux (OS)

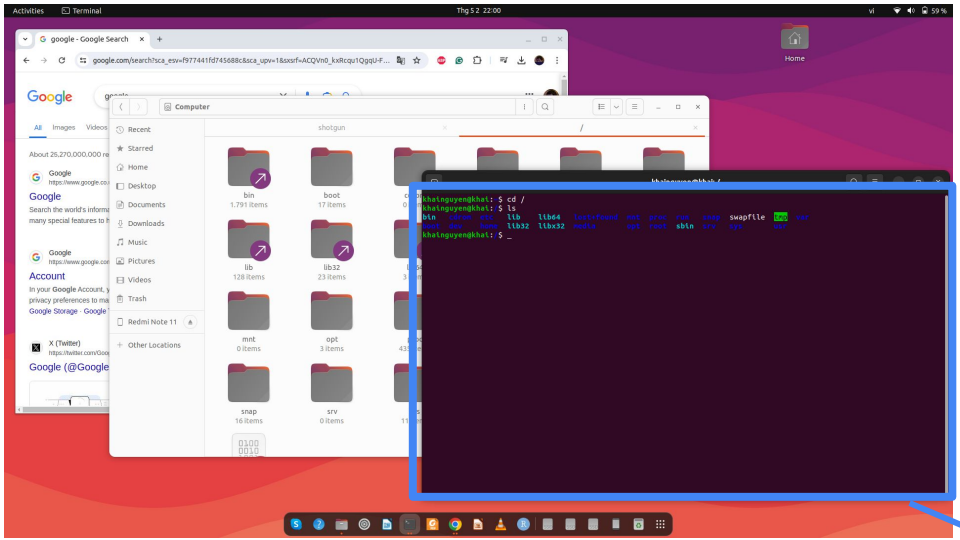
Ubuntu OS has the most users

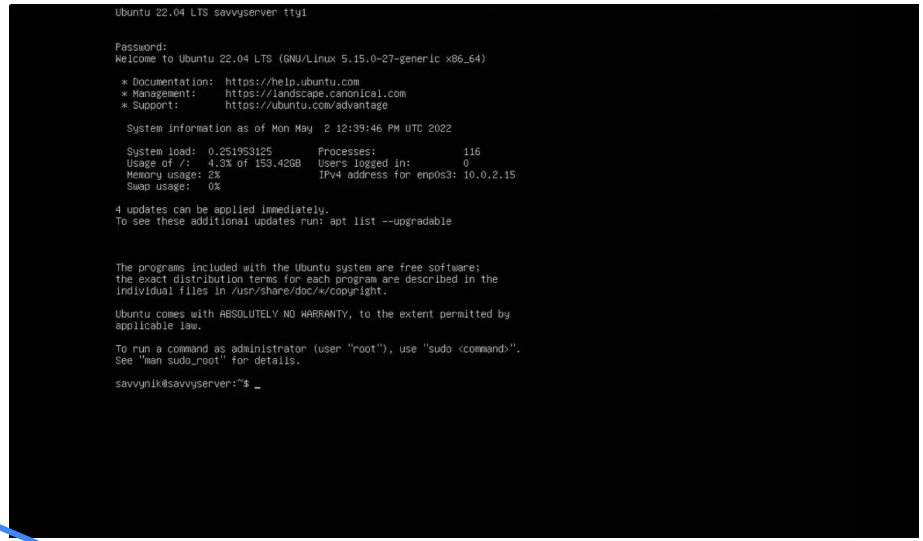


Why linux in bioinformatics?

1. Linux is an open-source operating system.
   - Allows users to customize their systems according to their specific needs.
   - It is free.
2. Linux is the most commonly used operating system in High-Performance Computing (HPC). HPC unlocks primary challenges in bioinformatics:
   - Data processing limits.
   - Slow analysis times.
   - Impact on research progress.
3. Most bioinformatics tools and applications are designed to be run on Linux-based operating systems.

interact with the software/package





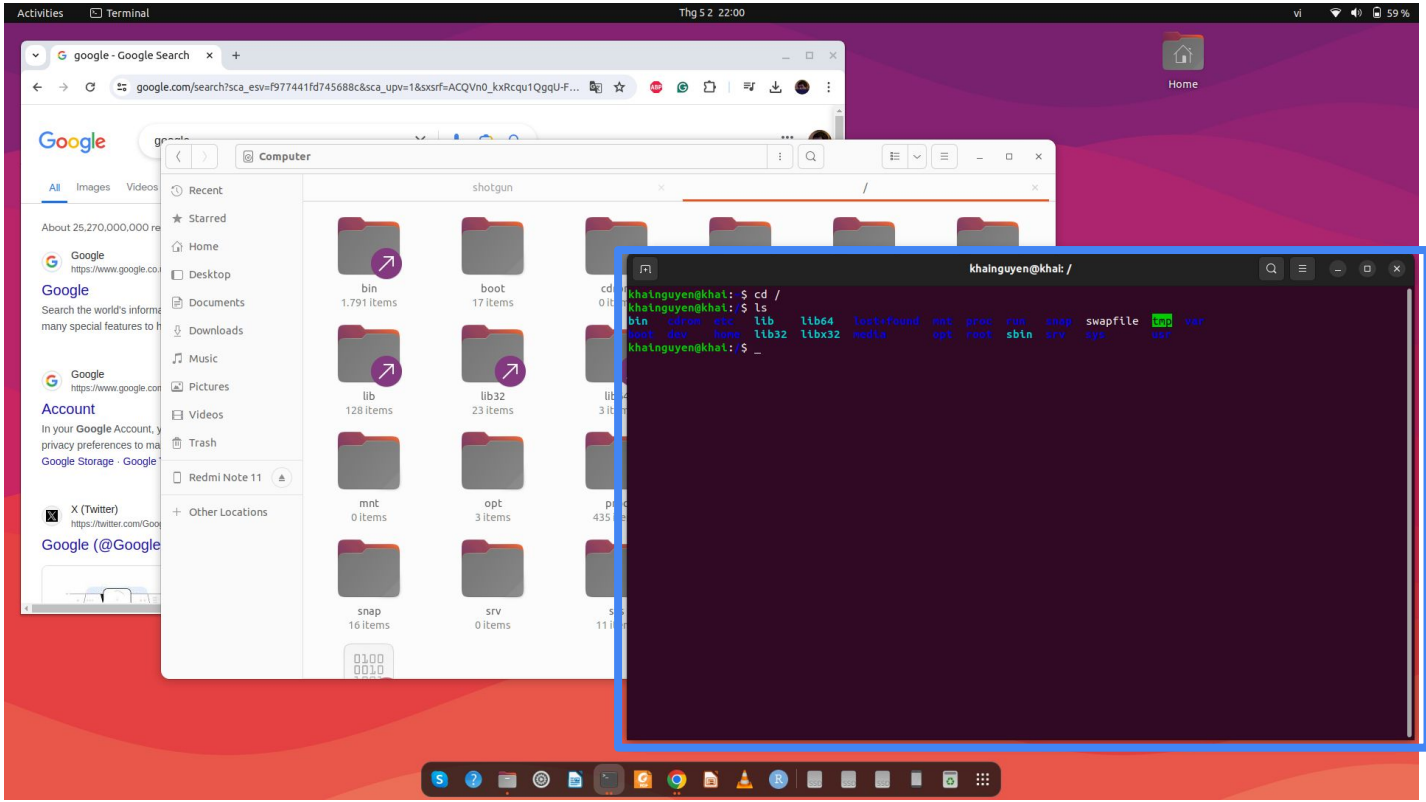
graphic user interface - GUI
(mouse + keyboard)

also called

command line interface - CLI
(keyboard)

Ubuntu desktop: GUI + CLI
Ubuntu server: only CLI

Terminal



Terminal window

is where you
type commands

Open:
Ctrl + Alt + T keys
on the keyboard

Ubuntu desktop

What is Shell?

- A shell is a special user program that provides an interface for the user to use operating system services.

- Terminal is where we interact with the shell through commands.

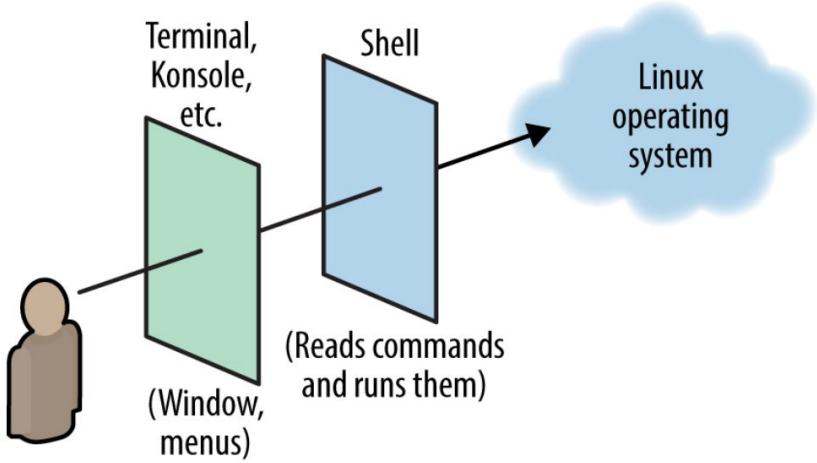
- Several types of Shell:

  +Bourne Shell (sh)

  + C Shell (csh)

  +**Bourne Again Shell (bash): most popular**

  + Z Shell (zsh)

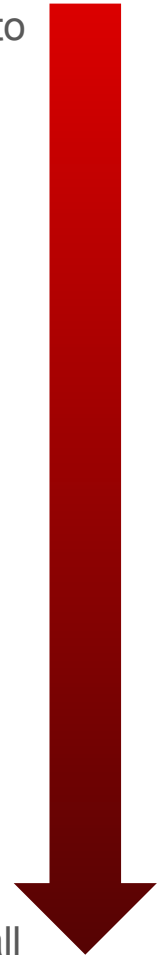


(Daniel J. Barrett, Linux pocket guide)

BASH
THE BOURNE-AGAIN SHELL

Some ways to get the Terminal

easy to install



a bit difficult to install

1.

macOS: How to open Terminal:

https://support.apple.com/en-vn/guide/terminal/apd5265185d-f365-44cb-8b09-71a064a42125/mac

Windows 10/11: Install Ubuntu on Windows Subsystem for Linux (WSL): Recommended for beginners

https://canonical-ubuntu-wsl.readthedocs-hosted.com/en/latest/guides/install-ubuntu-wsl2/

2. Install Ubuntu on virtual machine (VM):

Windows: Install Ubuntu on VirtualBox: https://www.youtube.com/watch?v=ngJQPt-xEeo

macOS: Install Ubuntu on VirtualBox: https://www.youtube.com/watch?v=b_tOialCSXE

3. Install Ubuntu on physical computer: Best for long term use

Delete Windows & install Ubuntu: https://www.youtube.com/watch?v=oZcvqfWf_ps&t=100s

If you don't want to delete windows:

or a) Dual boot: Ubuntu and Windows on the same hard drive:

https://www.youtube.com/watch?v=GXxTxBPKecQ&t=229s

or b) Dual boot: Ubuntu and Windows on the separate hard drive:

(Ubuntu on hard drive 1, Windows on hard drive 2)

https://www.youtube.com/watch?v=KX85vZ3ANVk

Recommended method b) if you want dual-boot.

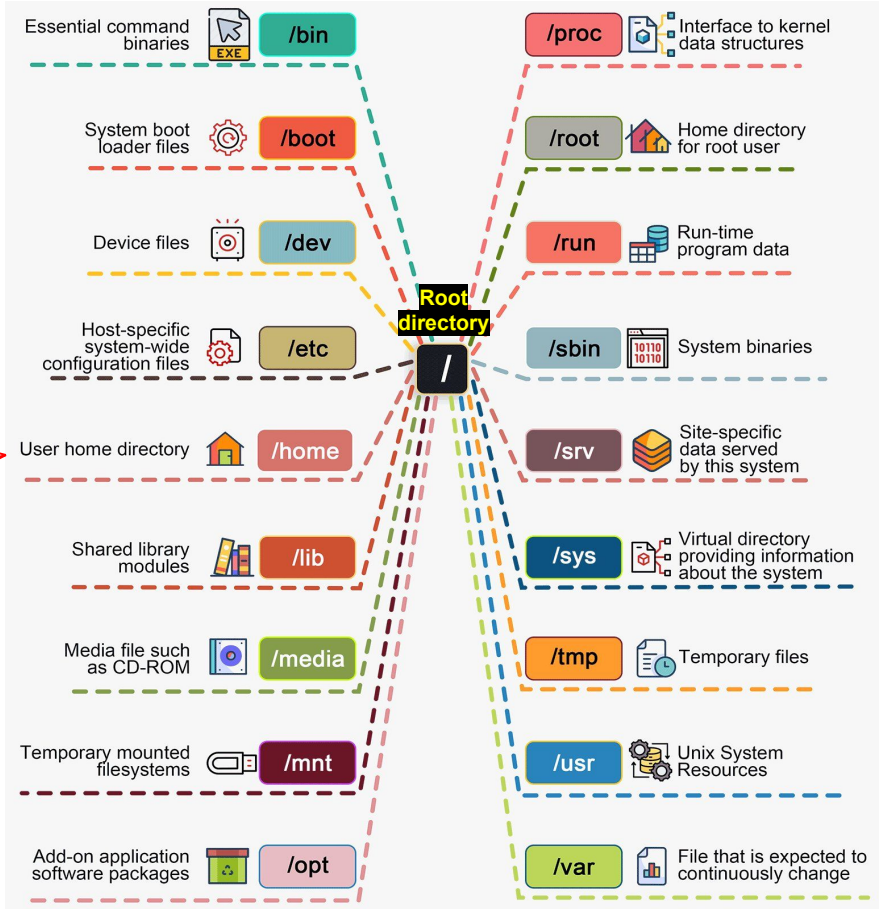
Warning: backup your data before install!!

More reference: https://www.youtube.com/watch?v=oZcvqfWf_ps&t=100s

Linux file systems

user_name directory (or folder):

/home/khainguyen/
/home/vanA/
/home/vanB/



The root directory is a special directory that contains all of the other files and directories on the computer. The root directory is specified as a / at the beginning of a path

https://x.com/bytebytego/status/1764911444993495121

When opening the terminal, default:

tell you the computer is ready to accept a command

$ means non-root user

command prompt

user_name

host name

The tilde (~) represents the home directory of the currently logged in 'user_name'

cursor

This case, user_name is khainguyen, so the path is: /home/khainguyen

ENTER

To print the current path, type the command: pwd → stands for 'print working directory'
,then hitting the ENTER key on keyboard to run the command

A basic command, could be:

Example: ls command

The command line will be read **from left to right** by the shell once press ENTER

command
(must have)

a space

option/flag
(optional)
hyphen-prefixed characters

a space

parameter
(optional)

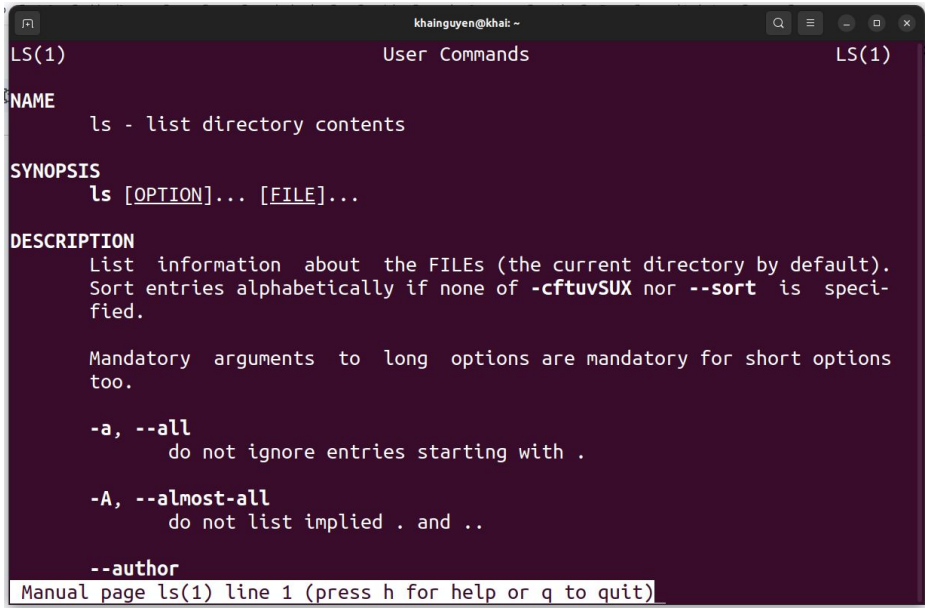
How do I know what options a command has?

man command_name

command_name --help

Example: ls command

```
khainguyen@khai:~$ man ls
```



Press q key on keyboard to exit

```
khainguyen@khai:~$ ls --help
```