What is a shell?

Shell is a program that takes commands from the keyboard and gives them to the operating system to perform.

The Linux Terminal

- CLI: A command-line interface (CLI) processes commands to a computer program in the form of lines of text. Two ways to access the CLI
  - Terminal Emulator
  - Linux Console

The Bash Shell

Bash is a command processor that typically runs in a text window where the user types commands that cause actions. Bash is the shell, or command language interpreter, for the GNU operating system. Most Linux distribution use the bash shell as the default. Other shells are:

- Tcsh Shell
- Csh Shell
- Ksh Shell
- Zsh Shell
- Fish Shell

Bash shortcuts | Command Editing Shortcuts

- **Ctrl + A** – go to the start of the command line
- **Ctrl + E** – go to the end of the command line
- **Ctrl + K** – delete from cursor to the end of the command line
- **Ctrl + U** – delete from cursor to the start of the command line
- **Ctrl + W** – delete from cursor to start of word (i.e. delete backwards one word)
- **Ctrl + Y** – paste word or text that was cut using one of the deletion shortcuts (such as the one above) after the cursor
- **Ctrl + XX** – move between start of command line and current cursor position (and back again)

- **Alt + B** – move backward one word (or go to start of word the cursor is currently on)
- **Alt + F** – move forward one word (or go to end of word the cursor is currently on)
- **Alt + D** – delete to end of word starting at cursor (whole word if cursor is at the beginning of word)
- **Alt + C** – capitalize to end of word starting at cursor (whole word if cursor is at the beginning of word)
- **Alt + U** – make uppercase from cursor to end of word
- **Alt + I** – make lowercase from cursor to end of word

- **Alt + T** – swap current word with previous
- **Ctrl + F** – move forward one character
- **Ctrl + B** – move backward one character
- **Ctrl + D** – delete character under the cursor
- **Ctrl + H** – delete character before the cursor
- **Ctrl + T** – swap character under cursor with the previous one

- **Ctrl + R** – search the history backwards
- **Ctrl + G** – escape from history searching mode
- **Ctrl + P** – previous command in history (i.e. walk back through the command history)
- **Ctrl + N** – next command in history (i.e. walk forward through the command history)
- **Alt + .** – use the last word of the previous command

- **Ctrl + L** – clear the screen
- **Ctrl + S** – stops the output to the screen (for long running verbose command)
- **Ctrl + Q** – allow output to the screen (if previously stopped using command above)
- **Ctrl + C** – terminate the command
- **Ctrl + Z** – suspend/stop the command

- **!!** – run last command
- **!blah** – run the most recent command that starts with 'blah' (e.g. !ls)
- **!blah:p** – print out the command that !blah would run (also adds it as the latest command in the command history)
- **!$** – the last word of the previous command (same as Alt + .)
- **!$:p** – print out the word that !$ would substitute
- **!*** – the previous command except for the last word (e.g. if you type '_find somefile.txt /', then !* would give you '_find somefile.txt')
- **!*:p** – print out what !* would substitute

Good To Know!

Sometimes you want to **copy** and **paste** commands from the web browser or text editor. For this cases you may be wondering Can I do **CTRL + C** and **CTRL + V** in the terminal the same way that I do it somewhere else? The answer is yes, but the key bindings are different.

- For copying we use: CTRL + Shift + C
- For pasting CTRL + Shift + V.

This keybindings are for the terminal only and they are not universal. Some terminal emulators may have different key bindings.

Using the Terminal Emulator

Terminal emulator is a program that allows to access the Linux CLI. It is used most often if computer has GUI installed. Some terminal emulators are:

- GNOME Terminal(included in Ubuntu 20.04)
- Konsole
- Terminology
- RXVT-Unicode
- TILIX

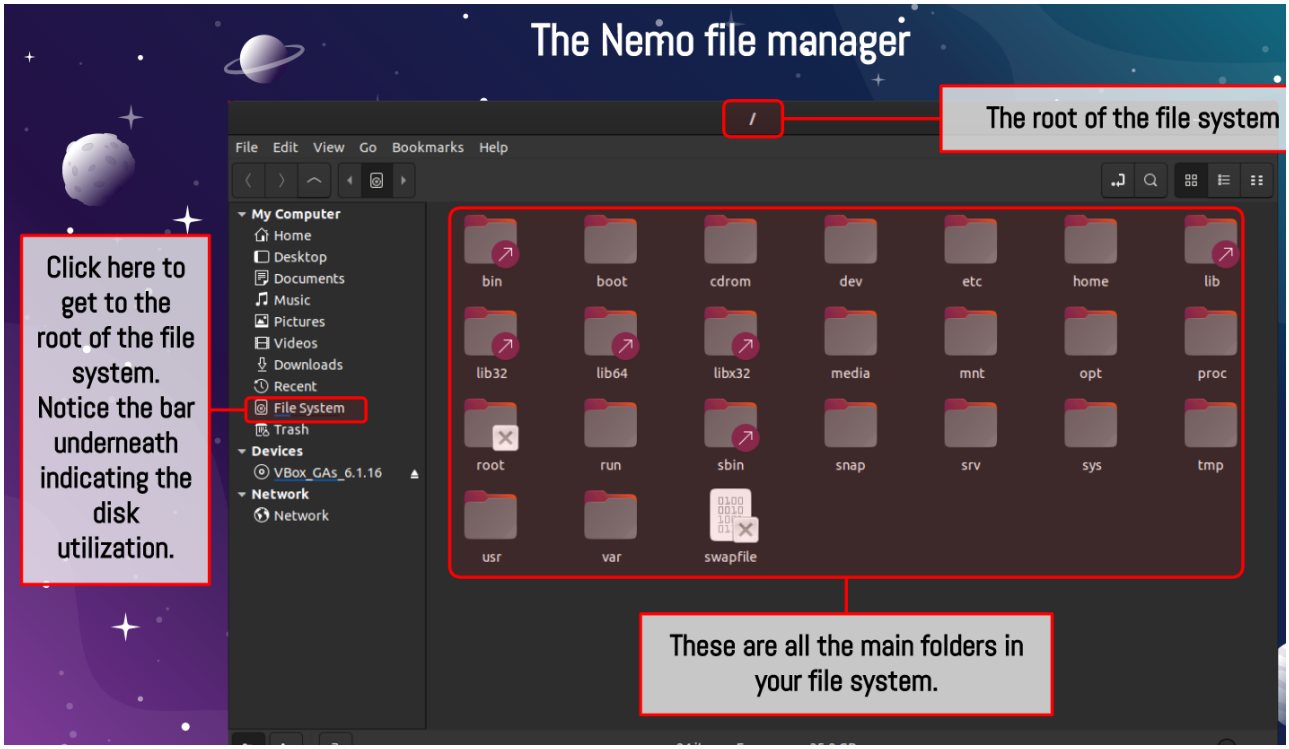
The Linux Filesystem

Navigating the filesystem

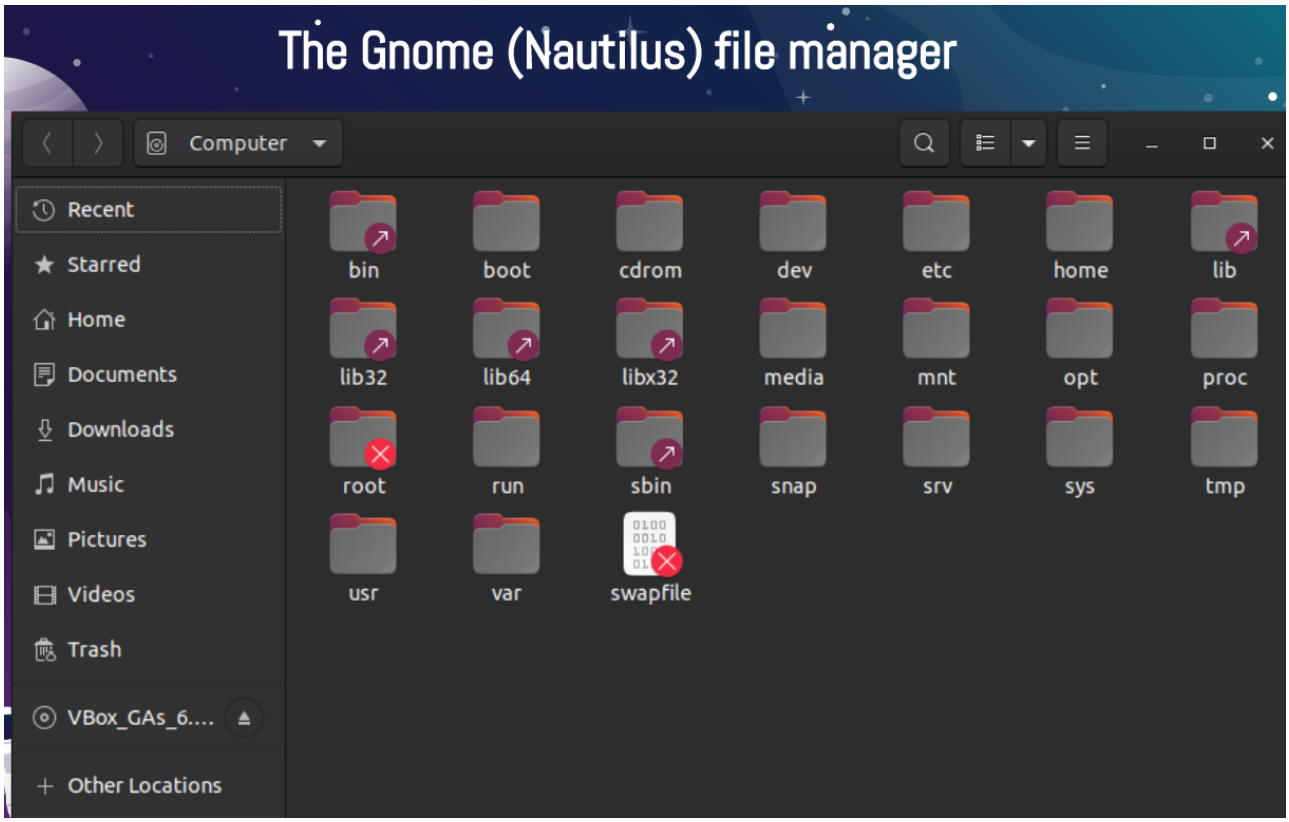
Linux Directory Structure

File System: The way file are stored and organized to simplify access to data. Linux file organized is called hierarchical directory structure (tree like pattern of folders). Unlike Windows, Linux always have a single file system tree regardless of how many drives or storage devices are attached to the computer.

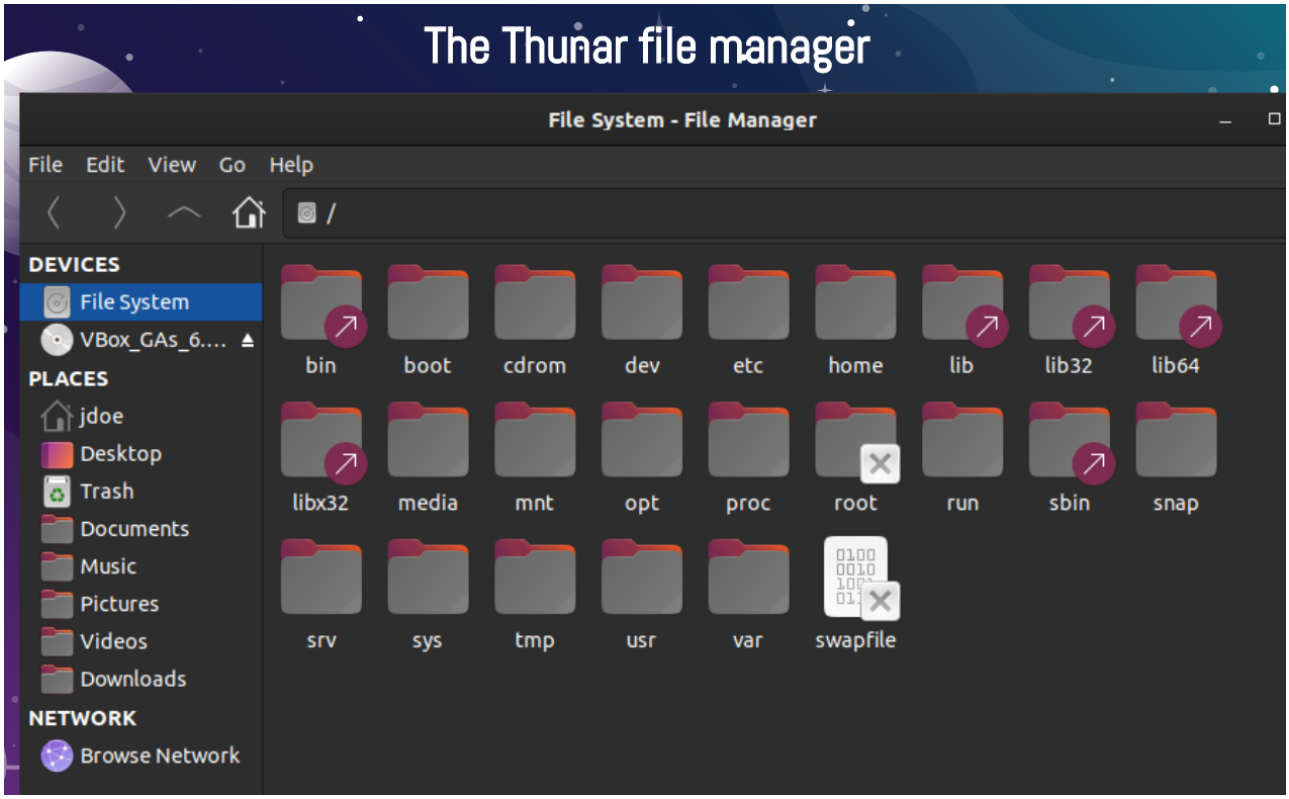
- The Nemo file Manager



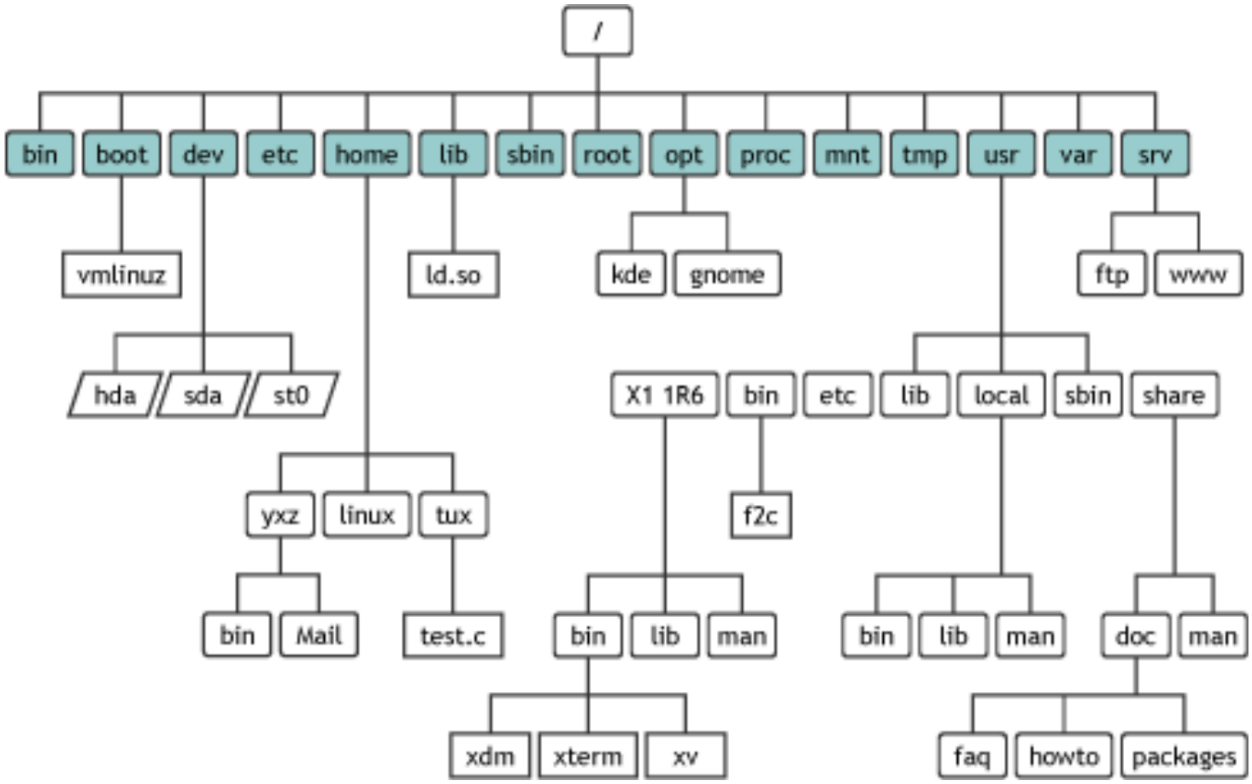
- The Gnome (Nautilus)file manager



- The Thunar file manager



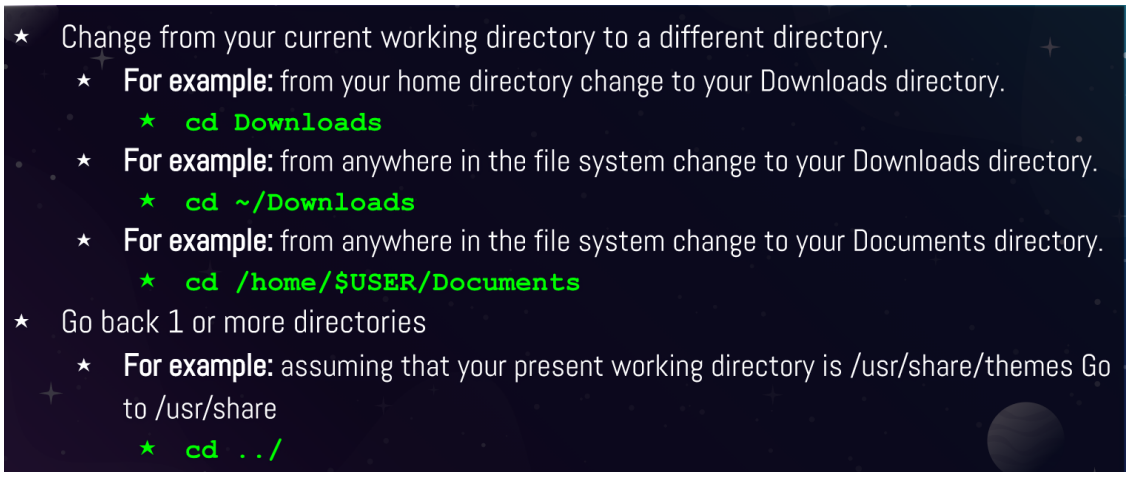
In a file system every file has a pathname which indicates the location of the file in the file system.



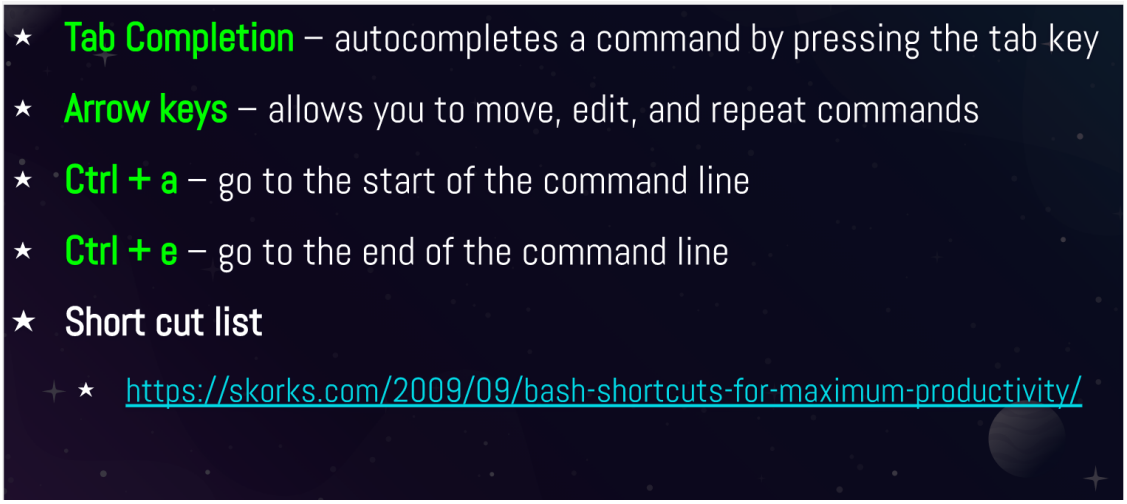
Directory	Description
/bin	Contains binary commands that can be used by system administrators, users, and scripts; this directory shouldn't contain subdirectories and can be accessed in single user mode
/boot	Contains the Linux kernel and static files needed to boot the computer
/dev	Contains device files, such as the CD/DVD-ROM drive
/etc	Contains static configuration files, which are also unshareable files, meaning they're local to the machine
/home	An optional directory that might not be included in all Linux distributions; in openSUSE, it's the user's home directory
/lib	Contains shared libraries that are loaded when a program starts
/media	Contains the mount point for removable media
/mnt	Empty by default, but administrators can use it to mount other resources, such as CD/DVD-ROM drives
/opt	Contains static shareable add-on software packages
/root	Contains the recommended home directory for the root user; not all Linux distributions use it, but it's used in openSUSE
/sbin	Contains system binaries used by the system administrator
/srv	Contains data files for services
/tmp	Contains temporary files that system administrators should delete whenever the system is booted
/usr	Contains shareable, read-only applications and files
/var	Contains variable data files, such as log files

Commands to move around the file system

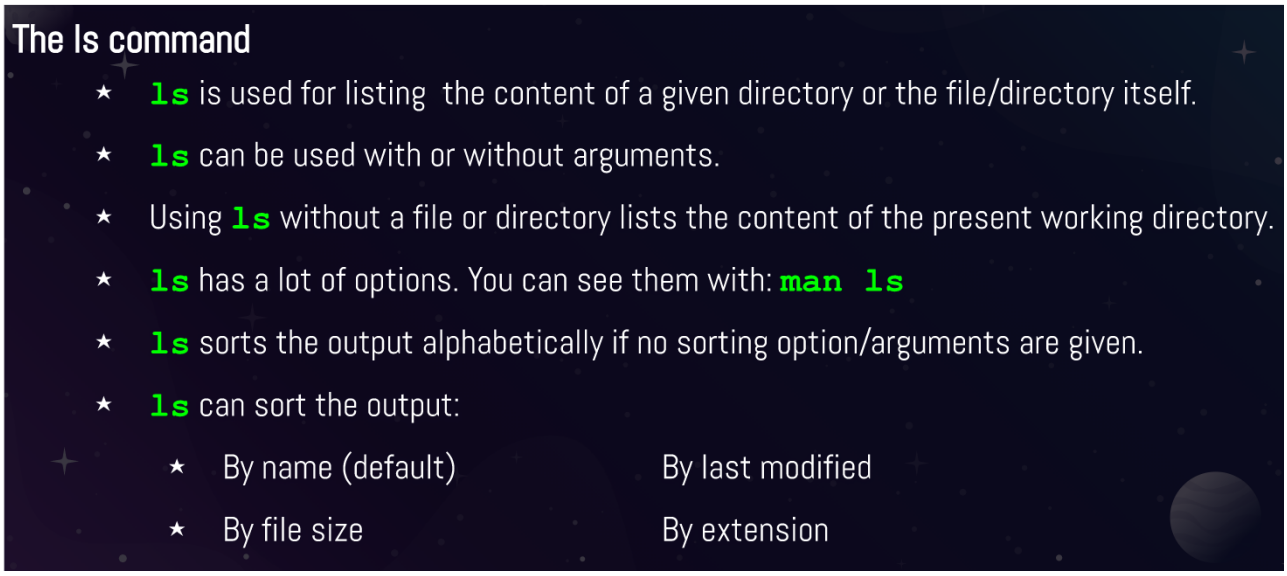
- **The pwd command**: use for displaying the current working directory
- **The cd command:** Use for changing directory.
    - cd + destination
        - Destination can be ab absolute or relative path
        - Can traverse directories backward using (..) which will change one directory back -changes to the parent directory.
        - (.) Single dot means the current working directory
        - If want to go to home directory use
            - cd
            - cd ~
            - cd $HOME
        - If go to the previous current working directory use cd -



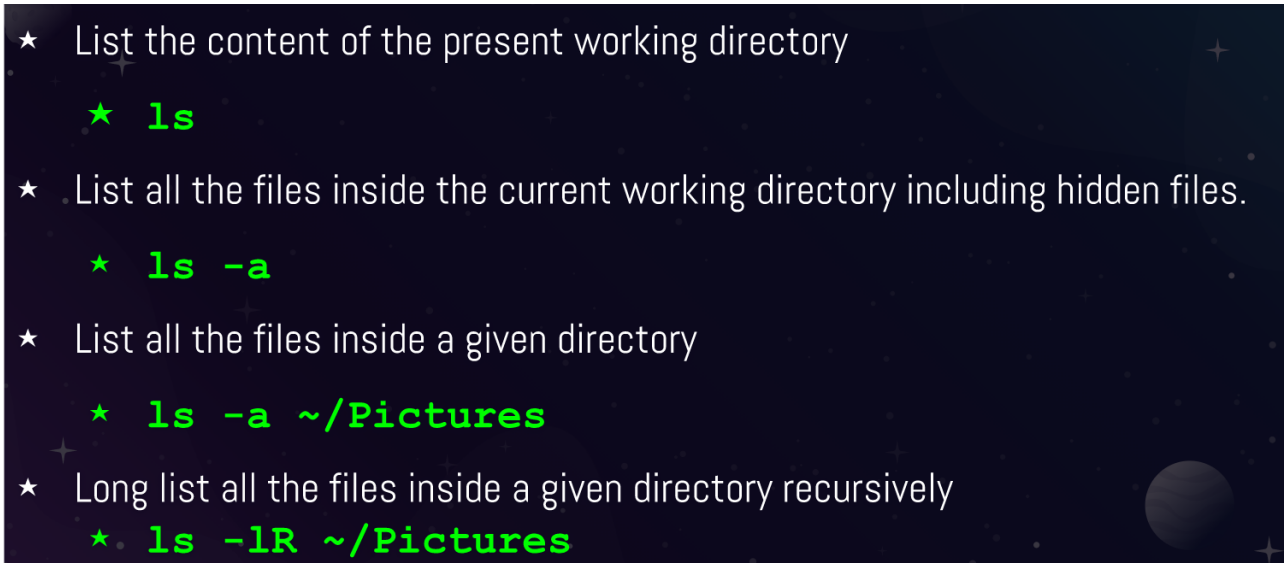
Bash Feature:



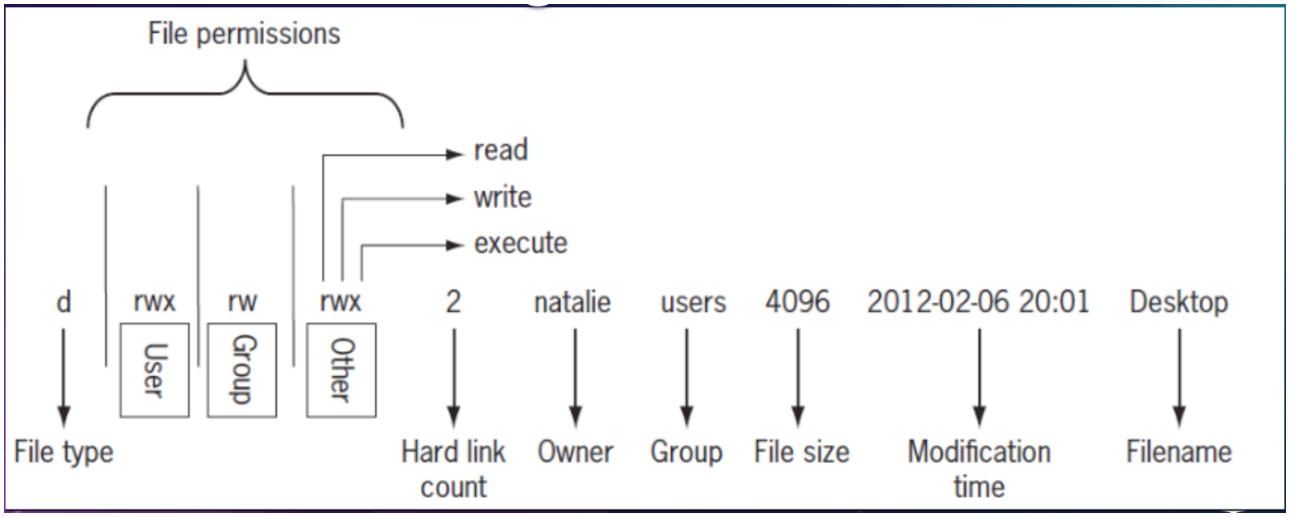
- **The ls command:** Use for displaying all the files inside a given directory

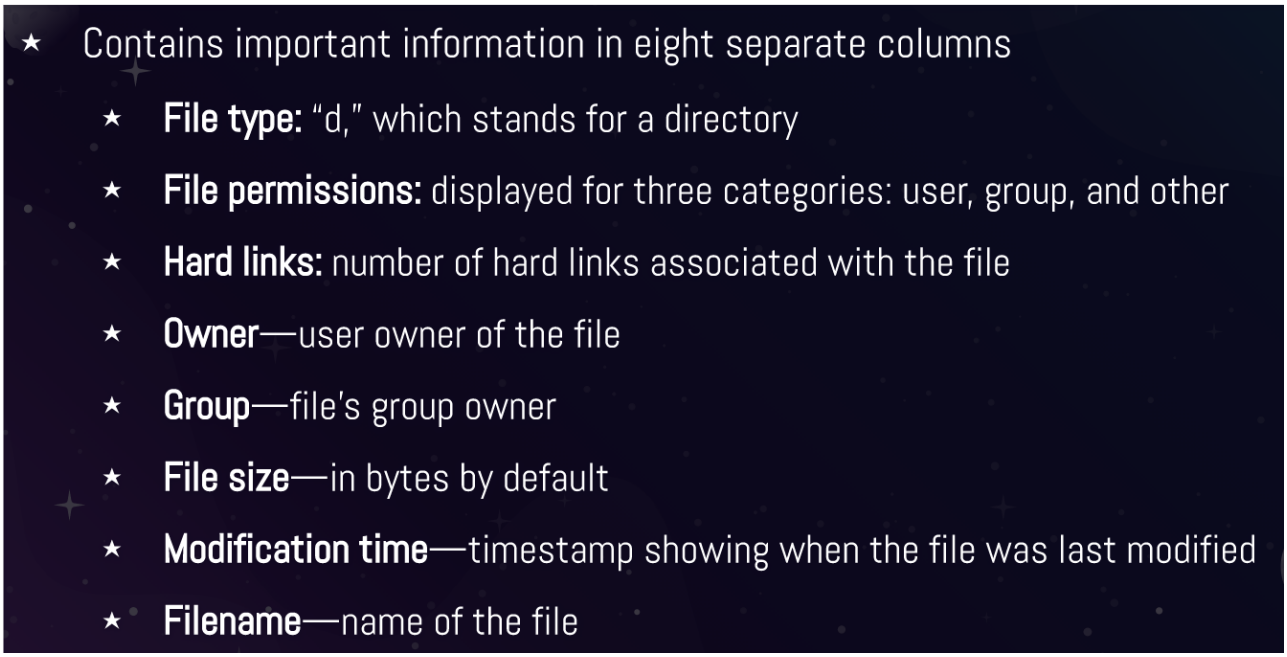


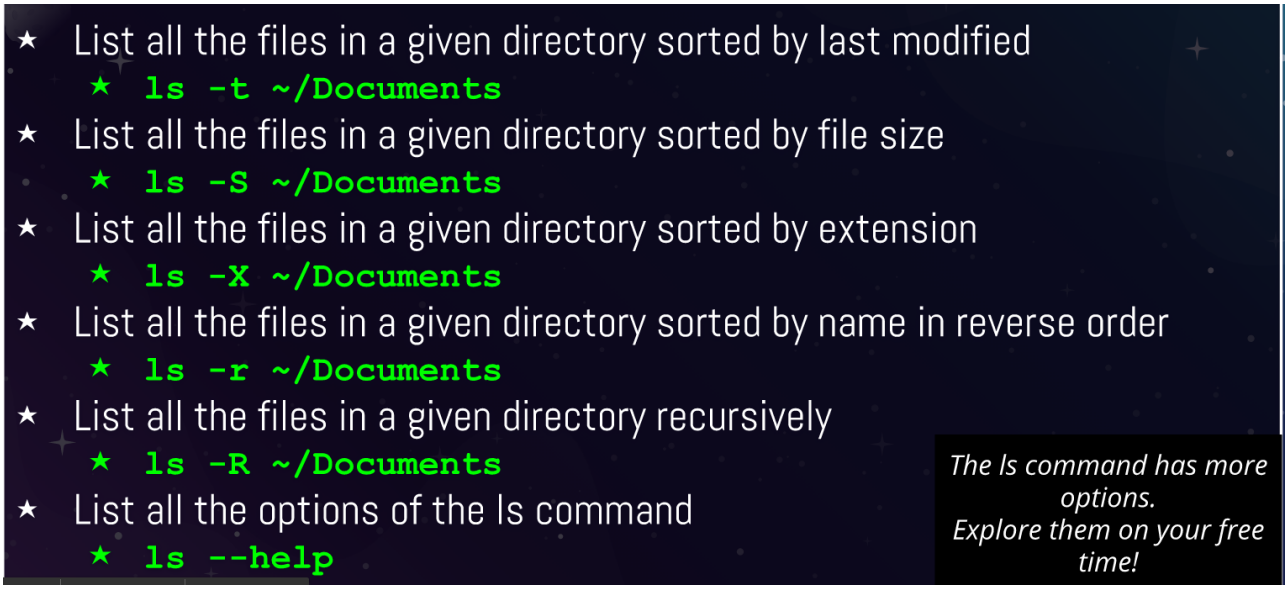
Examples of ls command:



Examining the ls-l command:

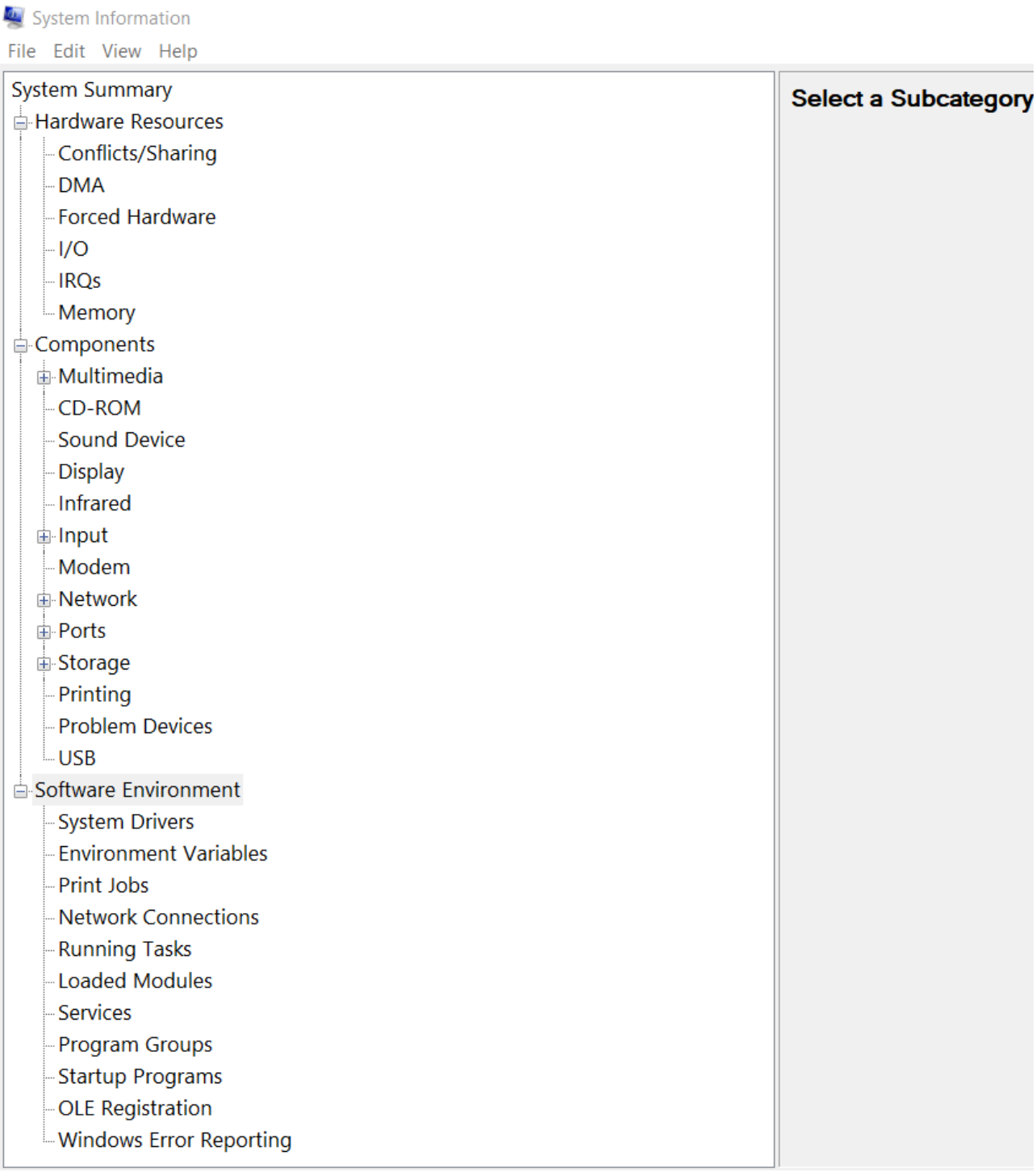






Getting basic information about your system

- In Windows 10, on start button search for system information
- Doing so will open the System Information window. There are four tabs listed in the top-left corner of the window:
    - **System Summary** - This is the default tab to which System Information opens; it contains details about my computer's operating system, installed memory, and processor type.
    - **Hardware Resources** - View a list of all hardware drivers and information associated with devices (e.g., webcams or controllers) associated with my computer.
    - **Components** - View a list of technical components on my computer such as USB ports, the CD drive, and speakers.
    - **Software Environment**- View drivers and running processes on my computer.


System Information
File Edit View Help
System Summary
Hardware Resources
Conflicts/Sharing
DMA
Forced Hardware
I/O
IRQs
Memory
Components
Multimedia
CD-ROM
Sound Device
Display
Infrared
Input
Modem
Network
Ports
Storage
Printing
Problem Devices
USB
Software Environment
System Drivers
Environment Variables
Print Jobs
Network Connections
Running Tasks
Loaded Modules
Services
Program Groups
Startup Programs
OLE Registration
Windows Error Reporting
Select a Subcategory