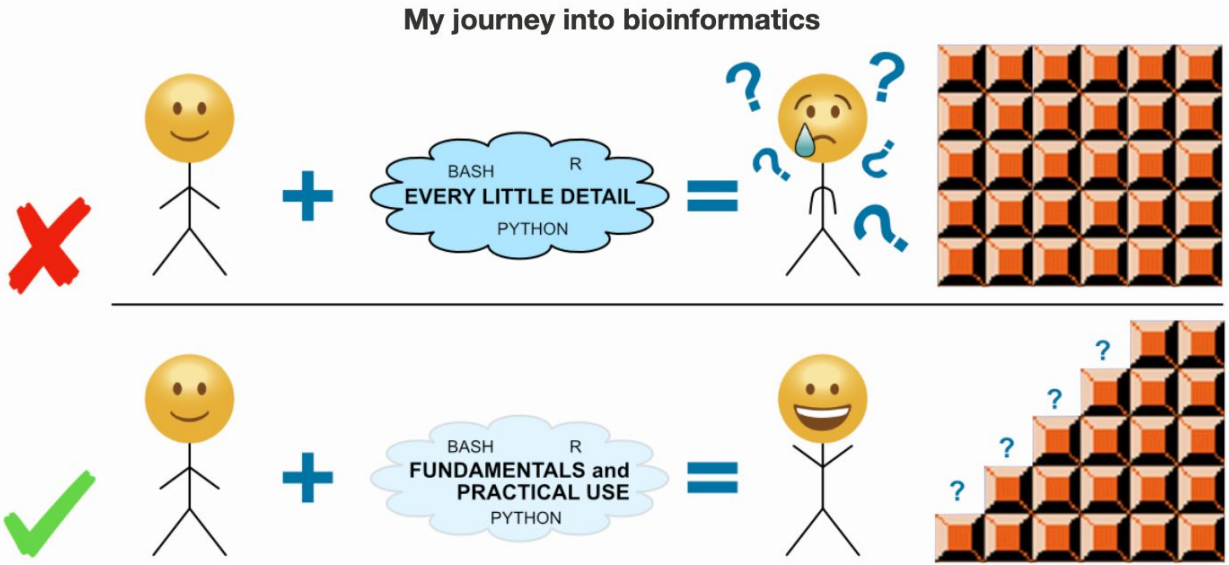
Introduction to Unix

Part 1

Summer 2021
Emilie Skoog

Before we start



NOTE: Maybe the most imporant thing to keep in mind while going through these pages is that this is all about *exposure*, not memorization or mastering anything. Don't worry about the details! Starting to build a foundation of fundamentals will allow us to figure out more details for specific things when we need to 🙂

Terms to go over

- Unix
- Bash
- Terminal (shell)
- Command line
- CLI vs GUI
- Directory

What is Unix?

- **Unix** is an operating system (aka a software that supports a computer's basic functions)
- **Bash** is the most common language used in **Unix**

Why do we care?/ Why is it important?/ Why learn Unix?

- it’s the foundation for most of bioinformatics (and much more)
- enables the use of non-GUI (Graphical User Interface) tools
- reproducibility
- quickly perform operations on large files (without reading into memory)
- automation of repetitive tasks (need to rename 1,000 files?)
- enables use of higher-powered computers elsewhere (server/cloud)

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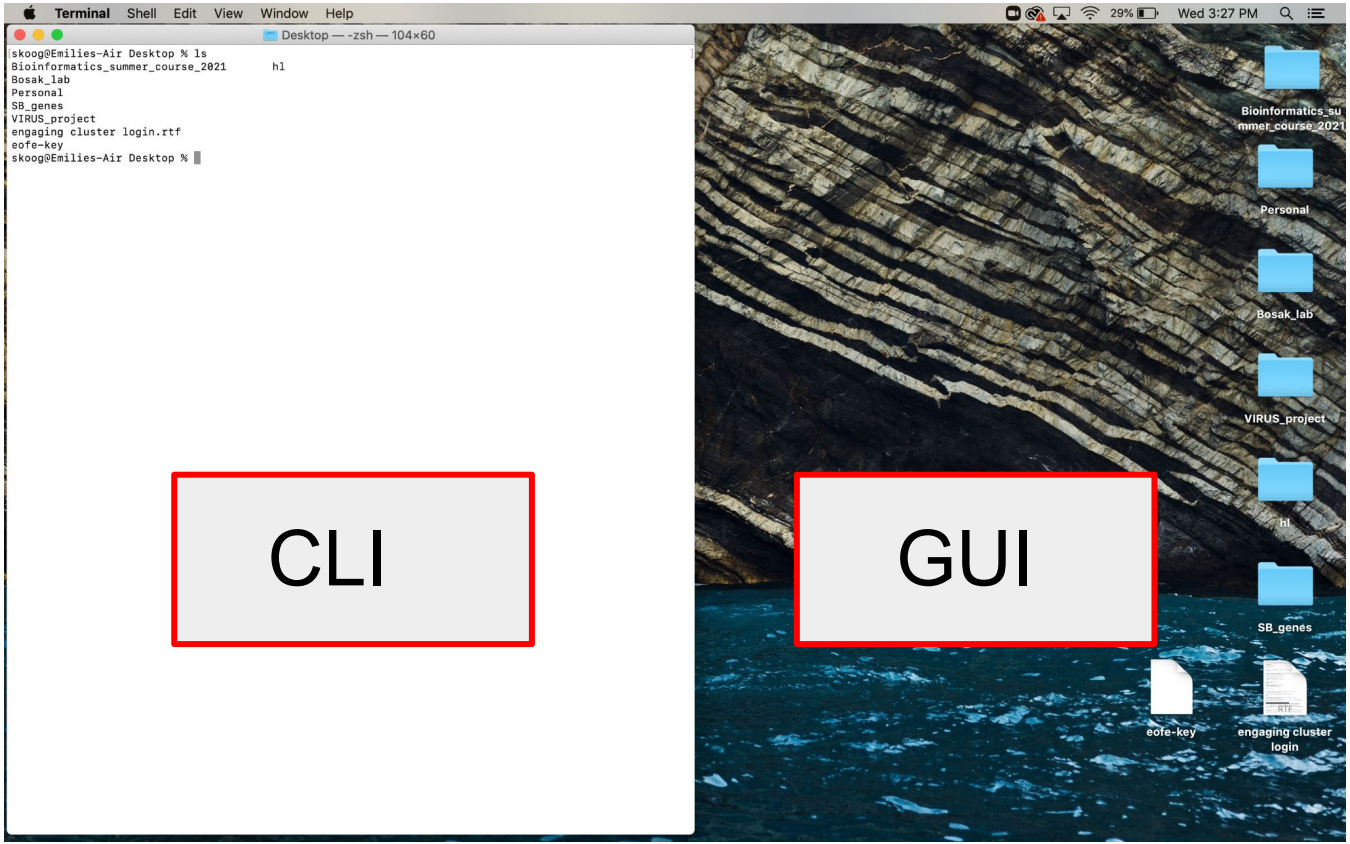
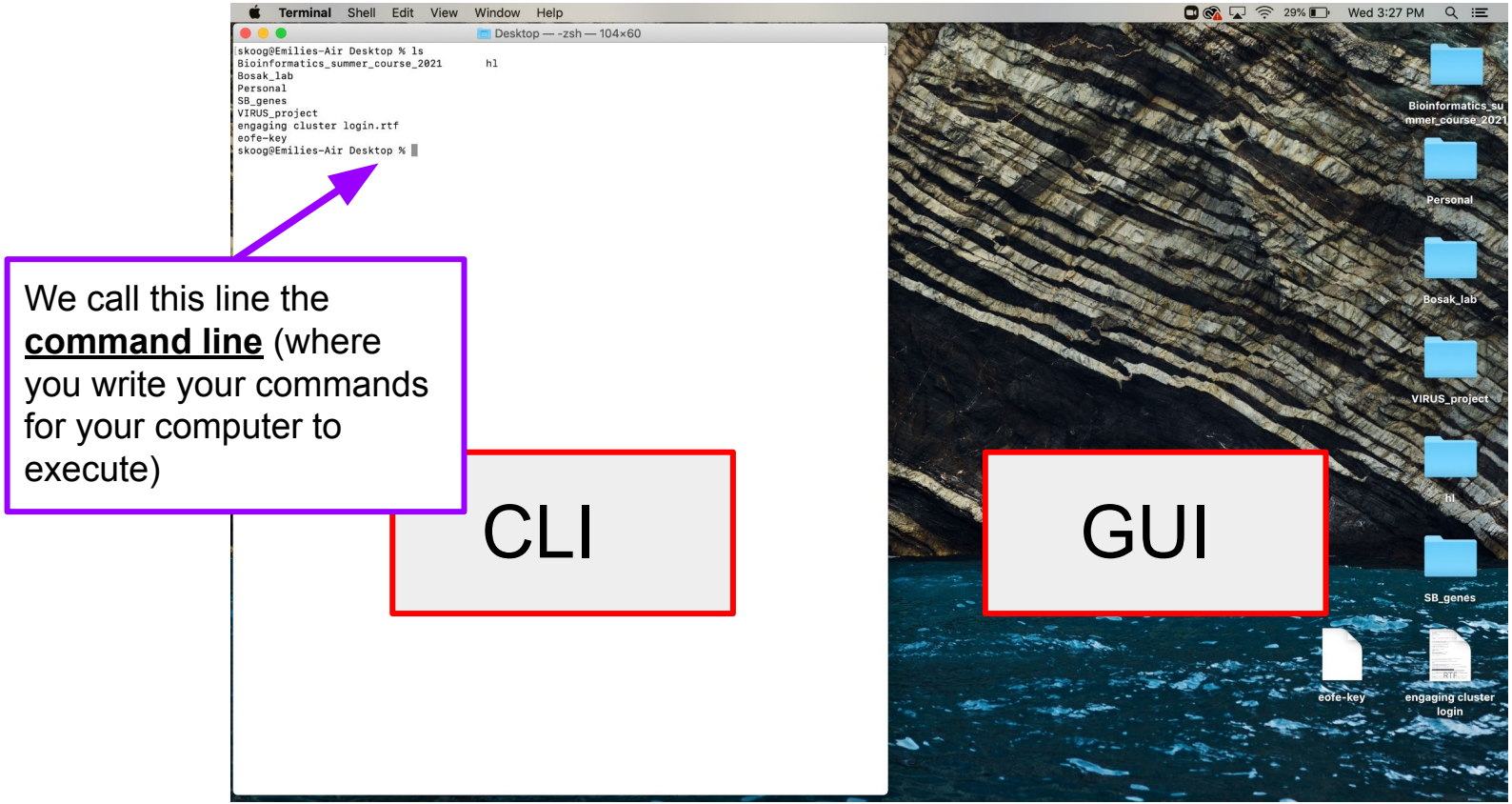
shell	what we use to talk to the computer; anything where you are pointing and clicking with a mouse is a **G**raphical **U**ser **I**nterface (**GUI**) shell; something with text only is a **C**ommand **L**ine **I**nterface (**CLI**) shell

Mike Lee https://astrobiomike.github.io/

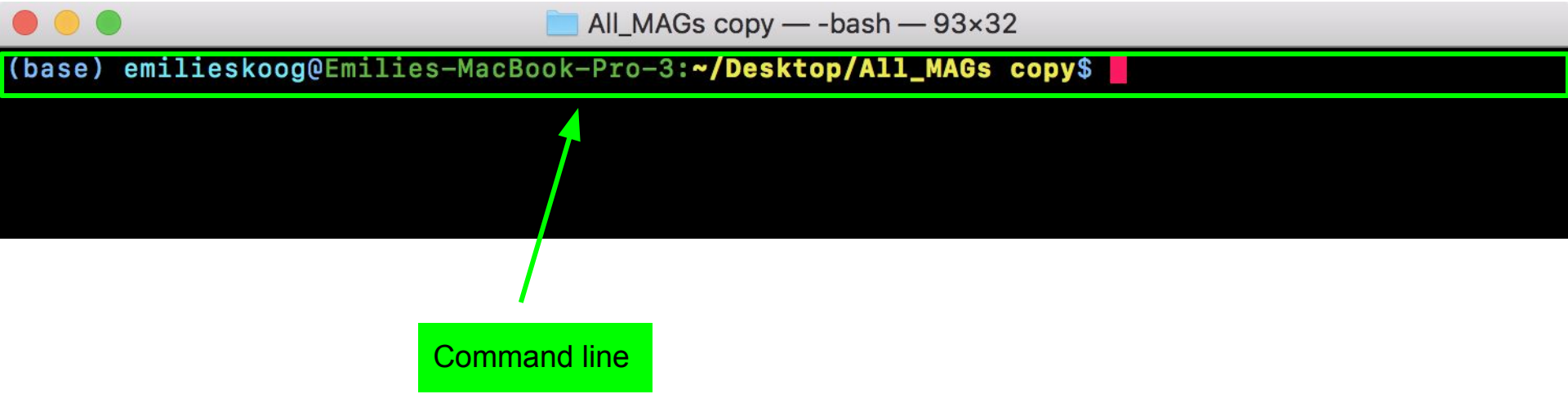
Command line interface (CLI) vs graphical user interface (GUI)



Command line interface (CLI) vs graphical user interface (GUI)



Command line



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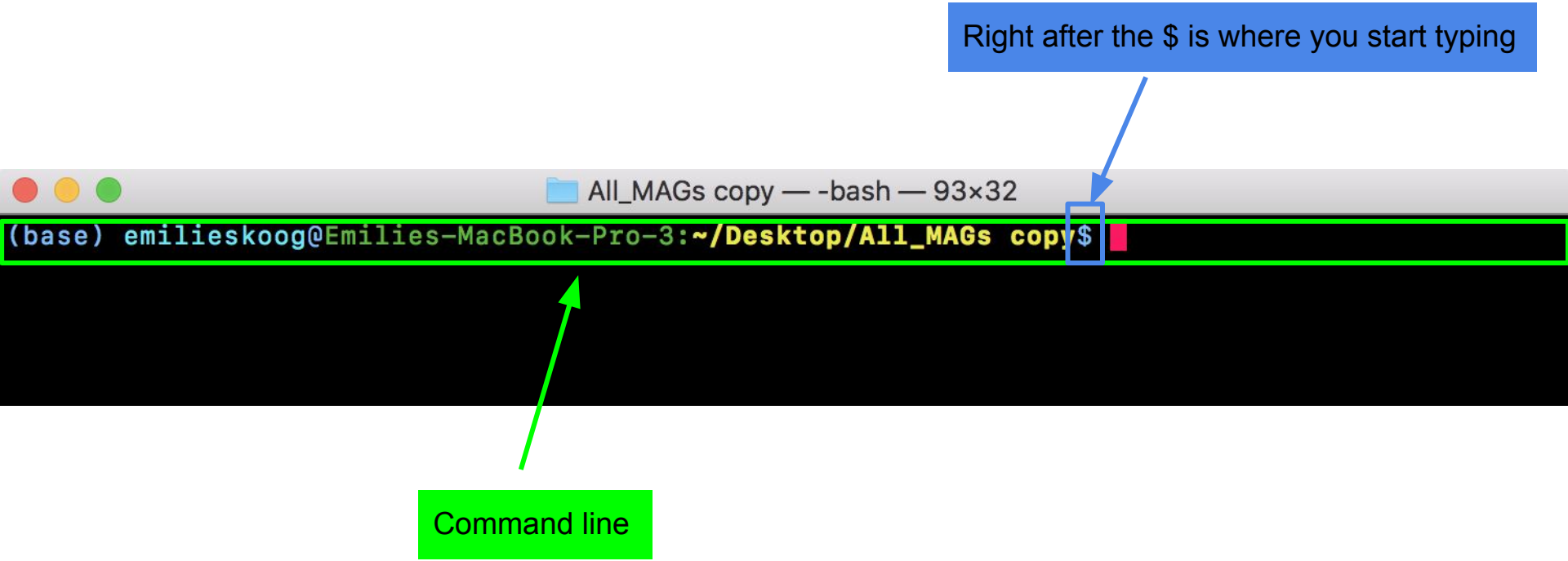

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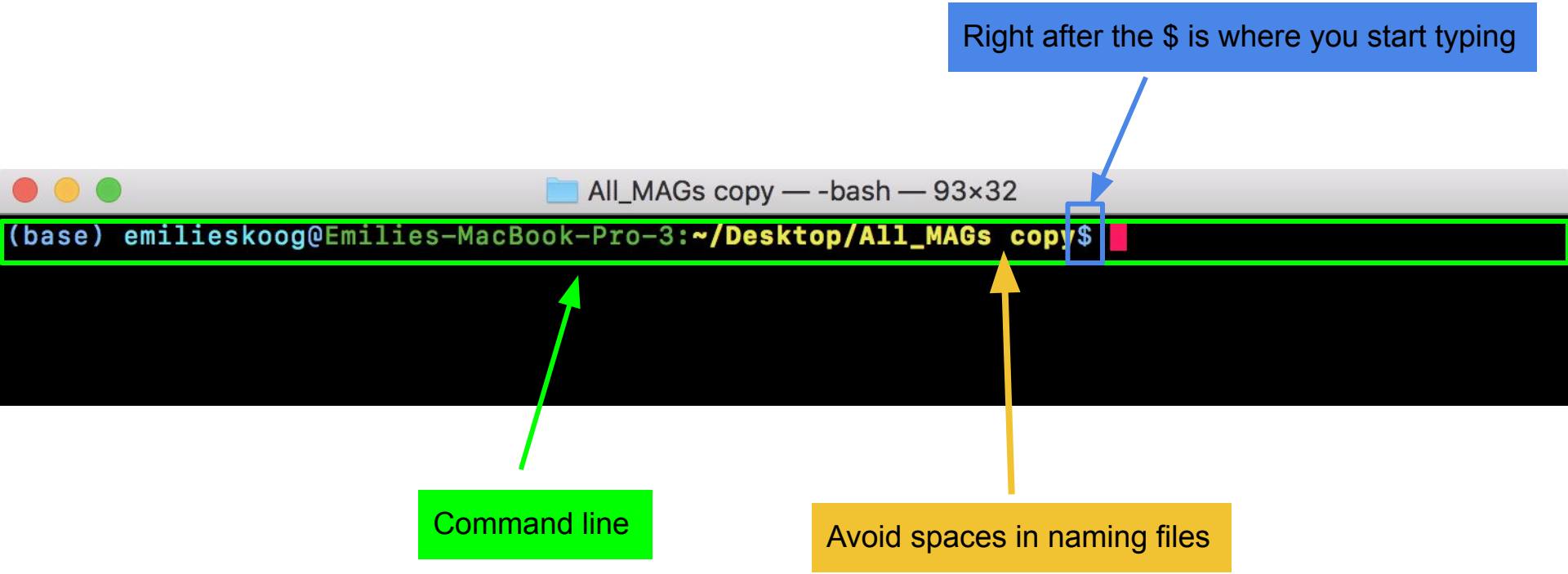
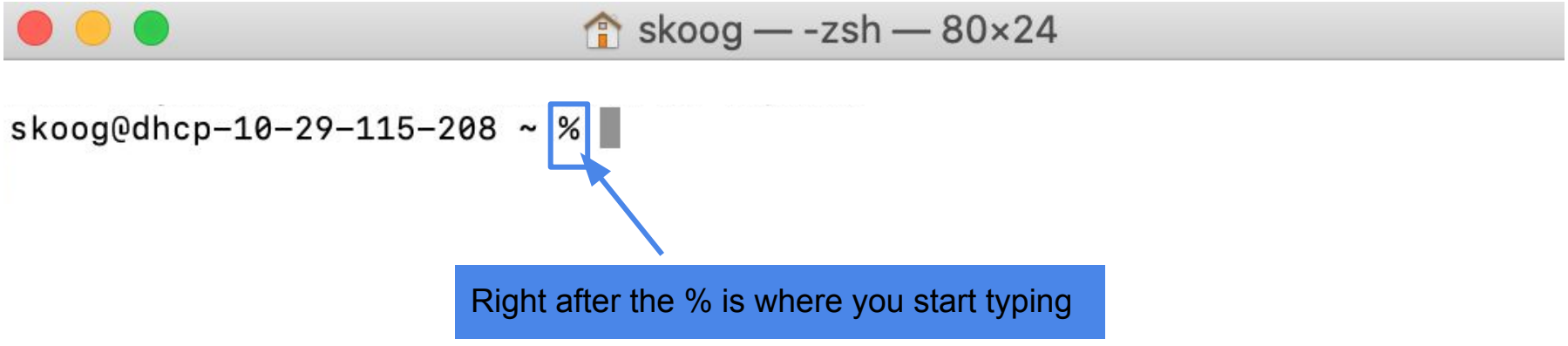


Command line (sidenote)

If you are running macOS Catalina on your computer, you technically have zsh instead of bash which just changes some things. In your command line, you have a % instead of $

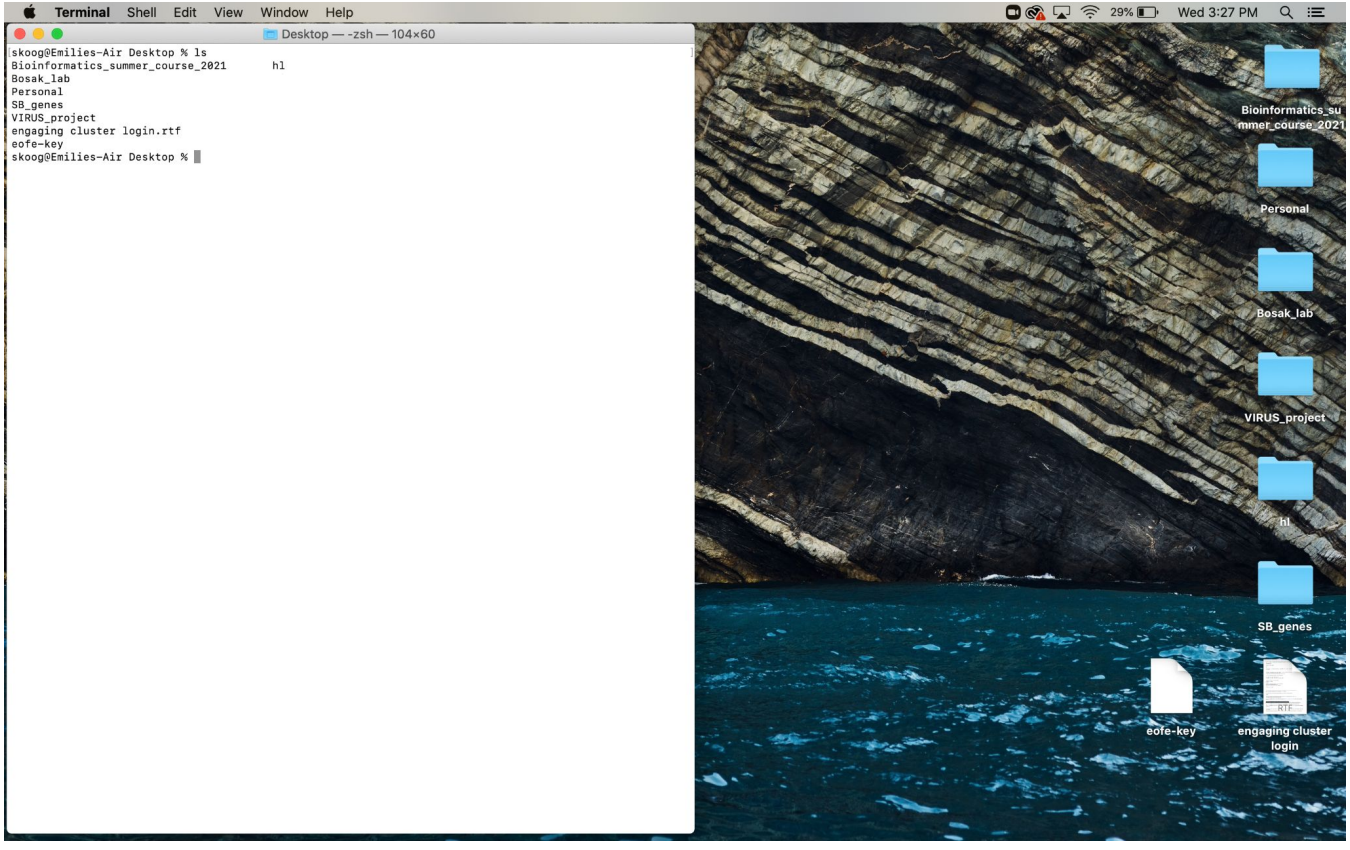


Some terminology recap:

Term	What it is
`shell` (or terminal)	what we use to talk to the computer; anything where you are pointing and clicking with a mouse is a **G**raphical **U**ser **I**nterface (**GUI**) shell; something with text only is a **C**ommand **L**ine **I**nterface (**CLI**) shell
`command line`	a text-based environment capable of taking input and providing output
`Unix`	a family of operating systems (we also use the term "Unix-like" because one of the most popular operating systems derived from Unix is specifically named as *not* being Unix)
`bash`	the most common programming language used at a Unix command-line

What is a directory?

- A **directory** is another word for ‘folder.’



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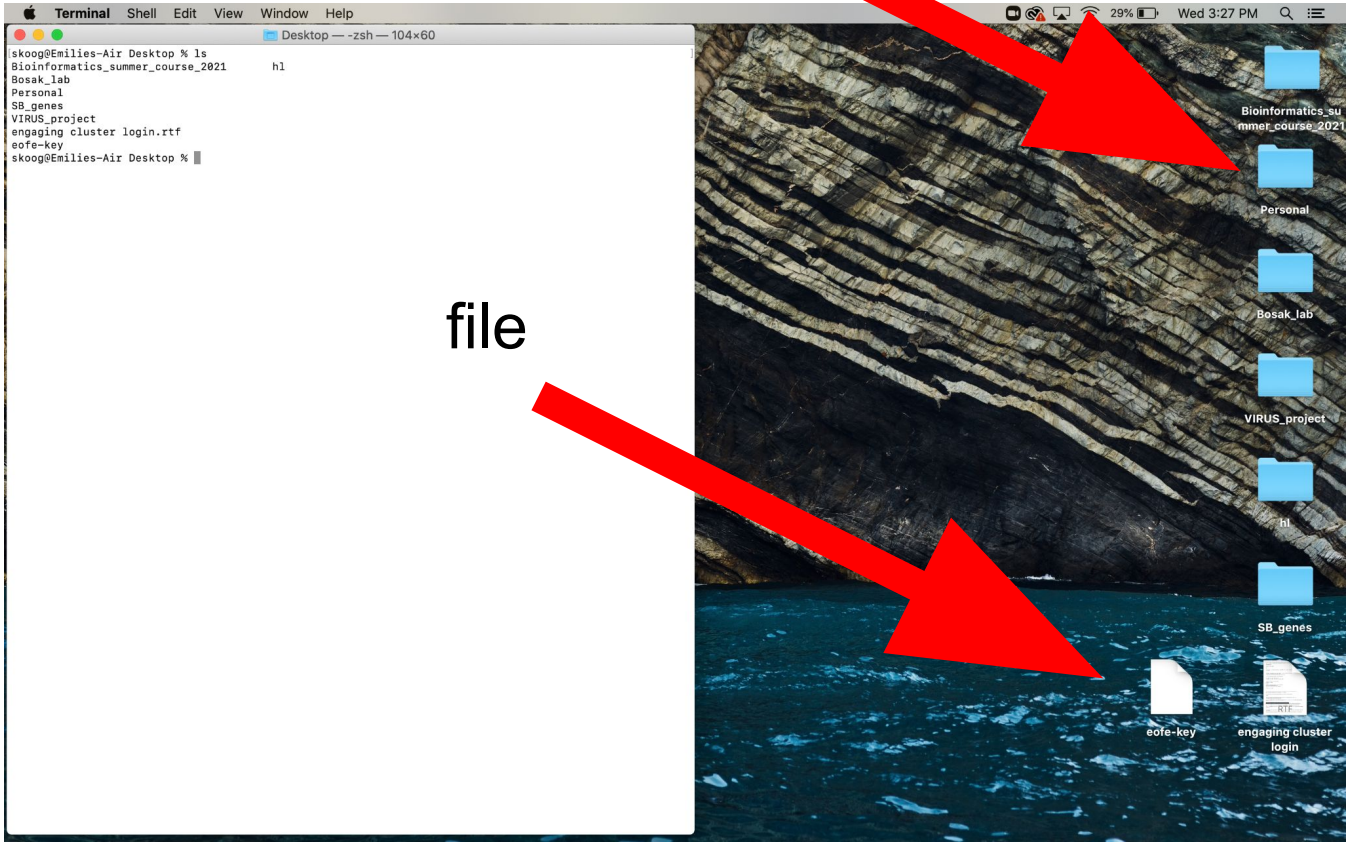
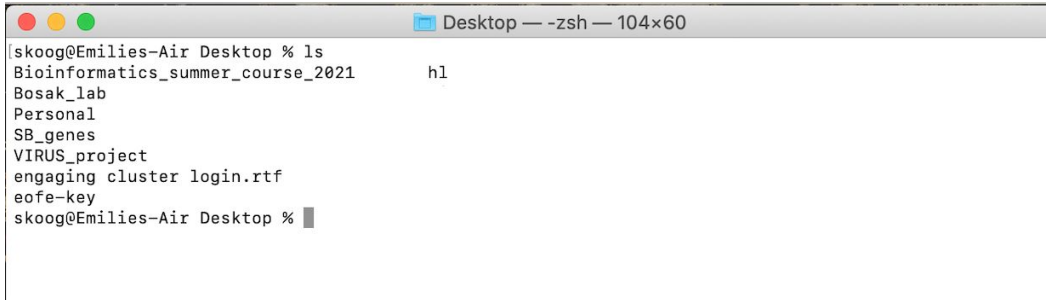
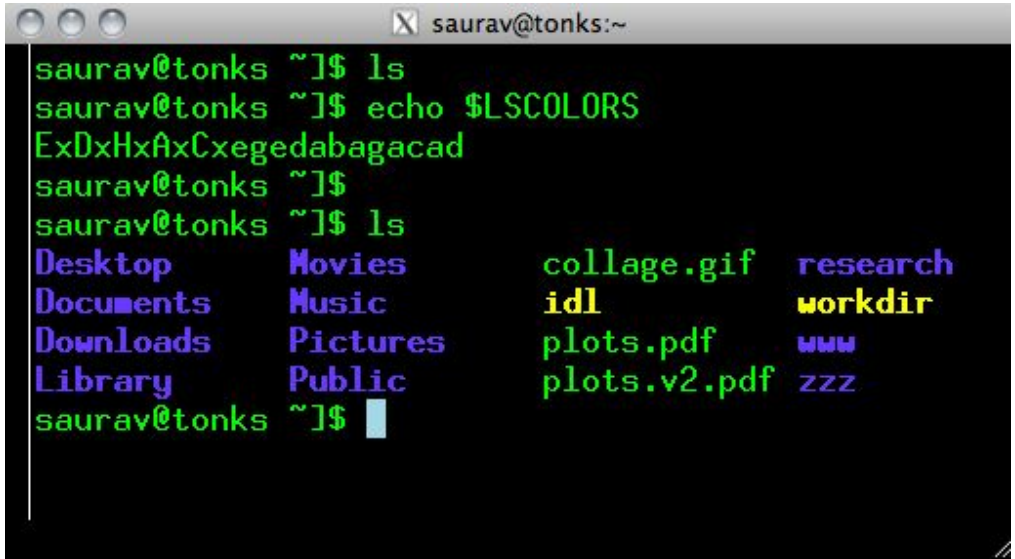


Terminal aesthetics

- Depending on your terminal customizations, your files may or may not (aesthetically) look the same as your directories.
- For example, your directories could be bold and purple and your files could be green. You can customize these.

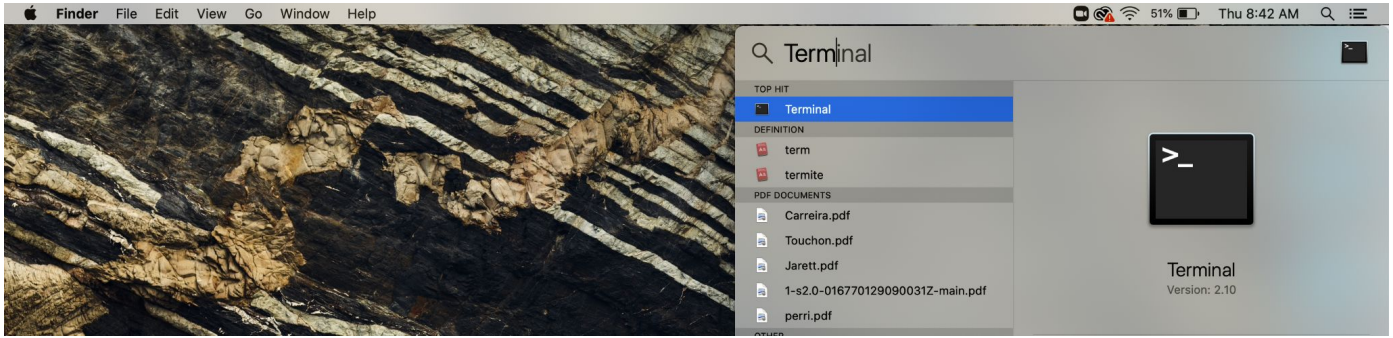


VS



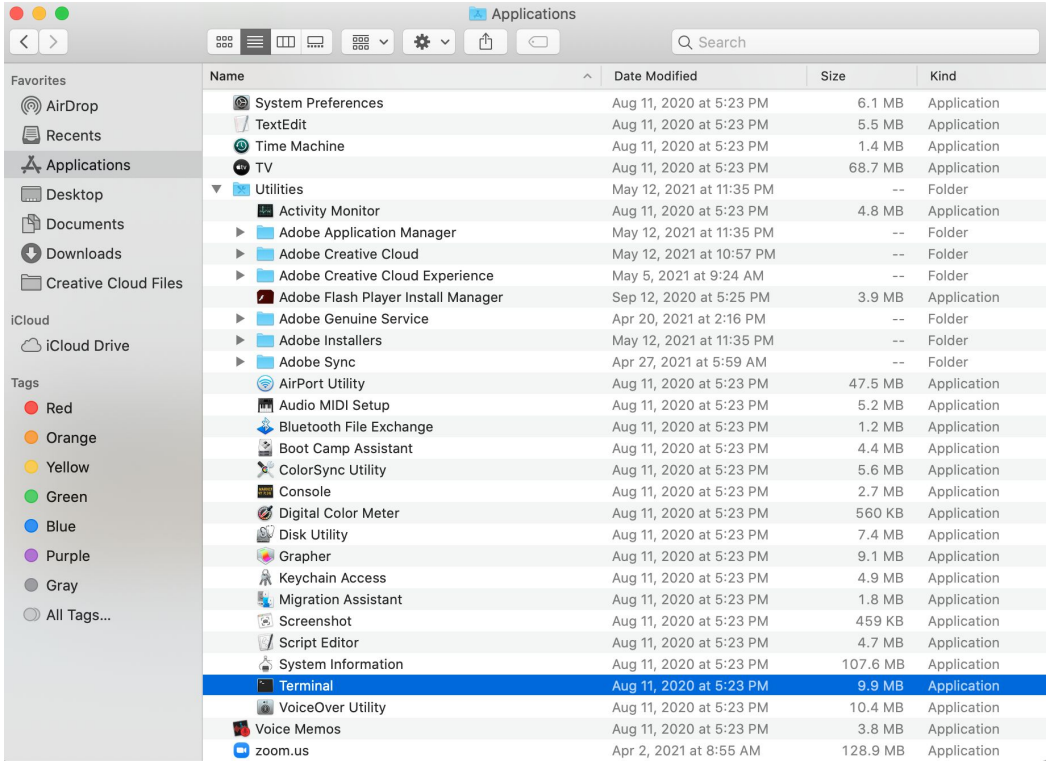
Accessing our terminal to use the command line (mac)

Method #1: Find the Terminal using spotlight search bar



Accessing our terminal to use the command line (mac)

Method #2: Find the Terminal by giong to Applications folder > Utilities > Terminal



Accessing our terminal to use the command line (Windows)

Follow this link (or google) for 10 ways to access your terminal on a Windows computer:

https://www.howtogeek.com/235101/10-ways-to-open-the-command-prompt-in-windows-10/#:~:text=Open%20Command%20Prompt%20from%20the,open%20an%20administrator%20Command%20Prompt.

Let’s use our terminal!

Tasks

1. Check out your current directory (pwd)
2. Create a directory (mkdir unix_practice)
3. Go into this directory (cd unix_practice)
4. Create a file in this directory and write something in it (10 lines) (nano file_1.txt)
5. Print out first 5 lines (head -n 5)
6. Make another directory within this directory (mkdir directory_1)
7. Go into this directory (cd directory_1)
8. Make another file with 10 lines (nano file_2.txt)
9. Take the first 5 lines from this file and put it into another file named file_2a.txt (head -n 5 file_2.txt)
10. Take last 2 lines from this file and put it into another file called file_2b.txt
11. Look at file_2b.txt
12. Now look at all the files in your directory (ls)
13. Go back to the previous directory (cd ..)

Demonstration of the power of Unix

Summary of terms

- **Unix:** computer’s operating system
- **Bash:** programming language used in Unix
- **Terminal (shell):** where you talk to your computer and execute commands
- **Command line:** the line where you write your commands in the terminal
- **CLI vs GUI:** command line interface (terminal) vs graphical user interface
- **Directory:** a folder

Command summary

mkdir - **make a directory**

cd - **change directory**

ls - **list** out what is in your directory

pwd - **print working directory** (to see where you are on your computer, for example)

mv - **move** a file

cp - **copy** a file

rm - **remove** a file or directory

less - view contents of file

head -n 5 file.txt - lists first 5 lines of file.txt

tail -n 5 file.txt - lists last 5 lines of file.txt

nano - create a new file and edit existing files

Tab completion - hit tab after typing out part of a file or directory and it will complete the name if it is unique (avoids typos)

../ Allows you to move between directories