



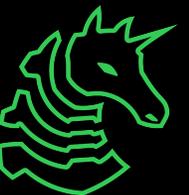
FA2023 Week 01 • 2023-09-03

# Intro to Terminal and Setup

Pete and Emma

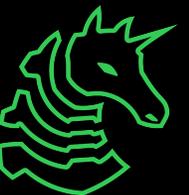
# Announcements

- Fall CTF registration open!
  - [sigpwny.com/register23](https://sigpwny.com/register23)
  - Event on September 23rd 12- 6 PM, register by September 7th for a free t-shirt!
- First group CTF of the year: PatriotCTF!
  - Play collaboratively with everyone (room TBD), get some free pizza, have a blast with us!
  - September 8th 4PM CST - 10th
- ACM Open House
  - Watch our cool demo and learn more about larger ACM (free pizza!)
  - Tuesday, September 5th 6:30PM CST



# Pwny CTF ([ctf.sigpwny.com](https://ctf.sigpwny.com))

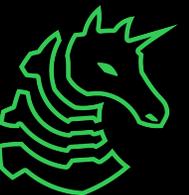
- Create an account right now!
- Where we put our challenges for you to build hands on experience
- Solve challenges, find flags, submit flags on website



# The "Don't Get Arrested" Slide

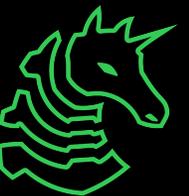
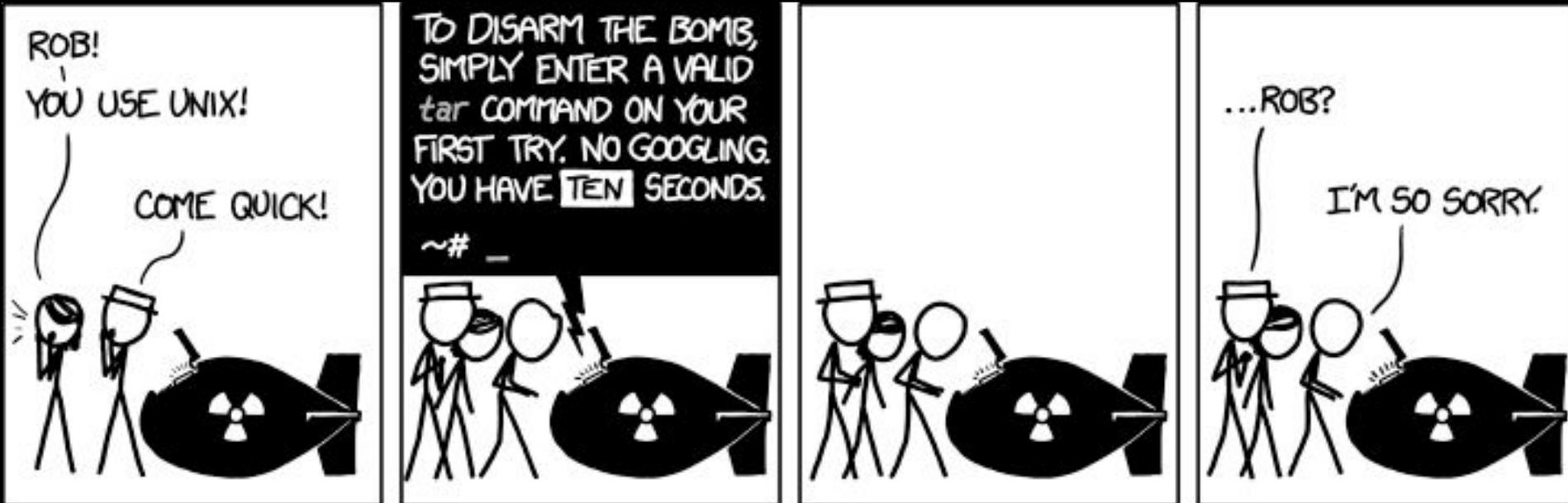
## Computer Fraud and Abuse Act (CFAA)

- Attacking "protected" computers
- Anywhere between a fine and **TWENTY** years in jail.
- If you don't have **EXPLICIT** permission to break into it, **DON'T**



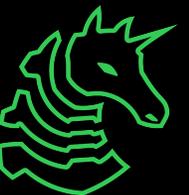
ctf.sigpwny.com

# sigpwny{starting\_off\_strong}



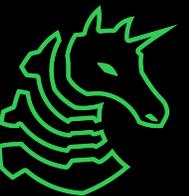
# Table of Contents

- What is a shell
  - I want one
- Getting into the shell
  - OS Differences + Different Shells
  - WSL or Virtual Machines?
  - Installing WSL
- Starter commands
- Tools to install



# > The Terminal

"It's where things happen" - Ravi



```
→ CSAW2020 ls
bard          grid          kui_blox1_sol.png
bard.hop     grid_solve.py libc-2.27.so
ezbreezy     krakme.exe   solve_ezbreezy.py
→ CSAW2020
```

```
mark@linux-desktop: ~
File Edit View Search Terminal Help
mark@linux-desktop:~$
```

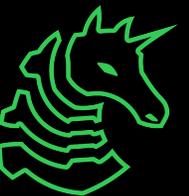
```
tquig@THOMAS-PC: ~
tquig@THOMAS-PC:~$
```



# Linux



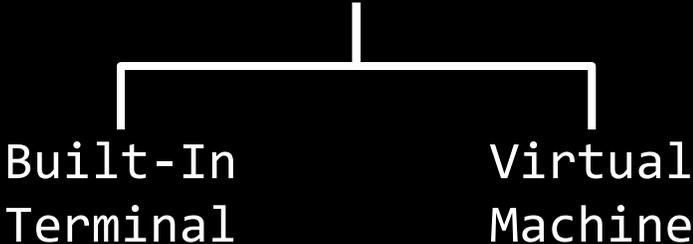
You're good to go!



# Windows

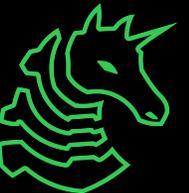


# macOS

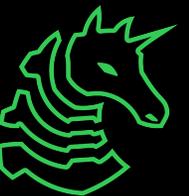


# PowerShell? Command Prompt?

- Those are shells too!
- However, the Windows terminal is built differently than the Mac and Linux terminals (which are both UNIX based)
  - Different command structure/rules
  - Less support for CTF relevant applications



# Windows Subsystem for Linux



# Getting a Terminal

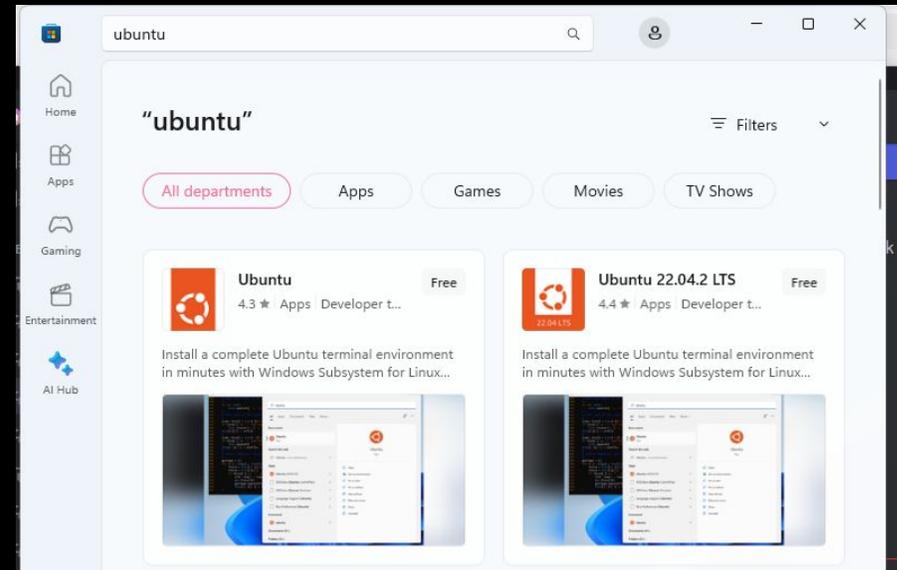
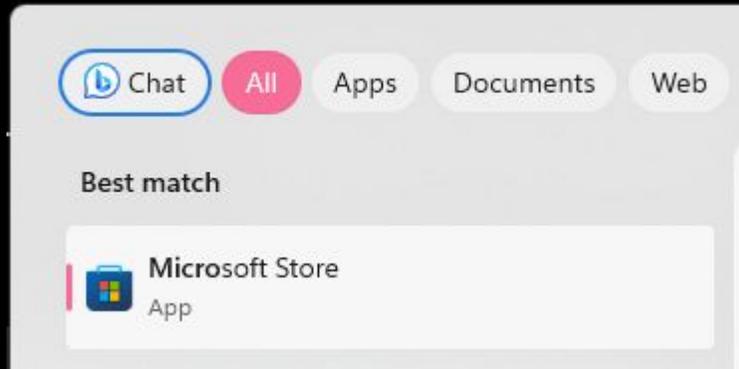
Open the  
Microsoft Store



Search "Ubuntu"



Install "Ubuntu"  
(use the one without  
a version number)



# Getting a Terminal (Older W11/W10)

If you get a "Windows Subsystem for Linux is not installed" error when trying to install Ubuntu from the Microsoft Store, try this.

- Open command prompt as administrator
  - (Start button → type **cmd** → right click → "Run as Administrator")
- Type **wsl --install**
- Restart computer
- You should be able to launch Ubuntu from Microsoft Store

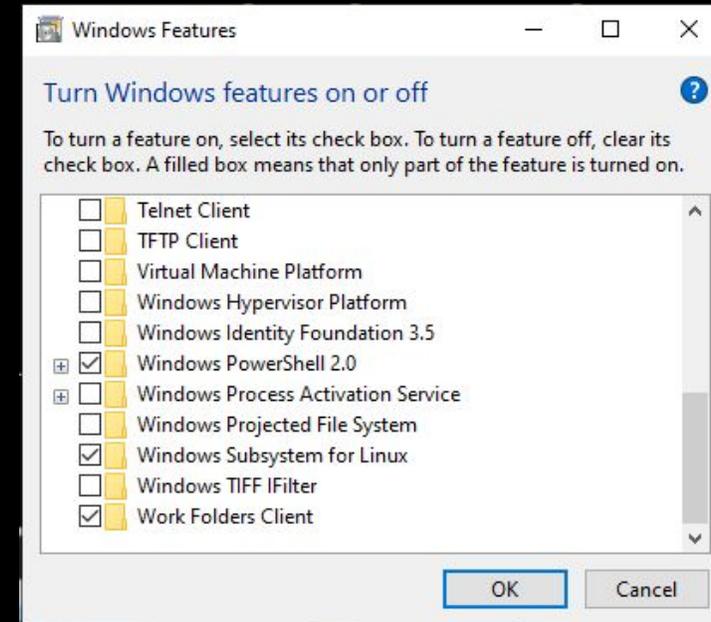
```
Administrator: Windows PowerS  x  +  v  -  □  x
PS C:\Users\chris> wsl --install
Installing: Virtual Machine Platform
Virtual Machine Platform has been installed.
Installing: Windows Subsystem for Linux
Windows Subsystem for Linux has been installed.
Downloading: WSL Kernel
Installing: WSL Kernel
WSL Kernel has been installed.
Downloading: GUI App Support
Installing: GUI App Support
GUI App Support has been installed.
Downloading: Ubuntu
[===== 43.3% ]
```



# Getting a Terminal (Even older W10)

If you get a command not found error when trying to run "wsl --install", try this.

- Go to the Windows search bar
- Search "Turn Windows features on or off"
- Check "Virtual Machine Platform" and "Windows Subsystem for Linux"
- Restart computer



# Set a "root" user

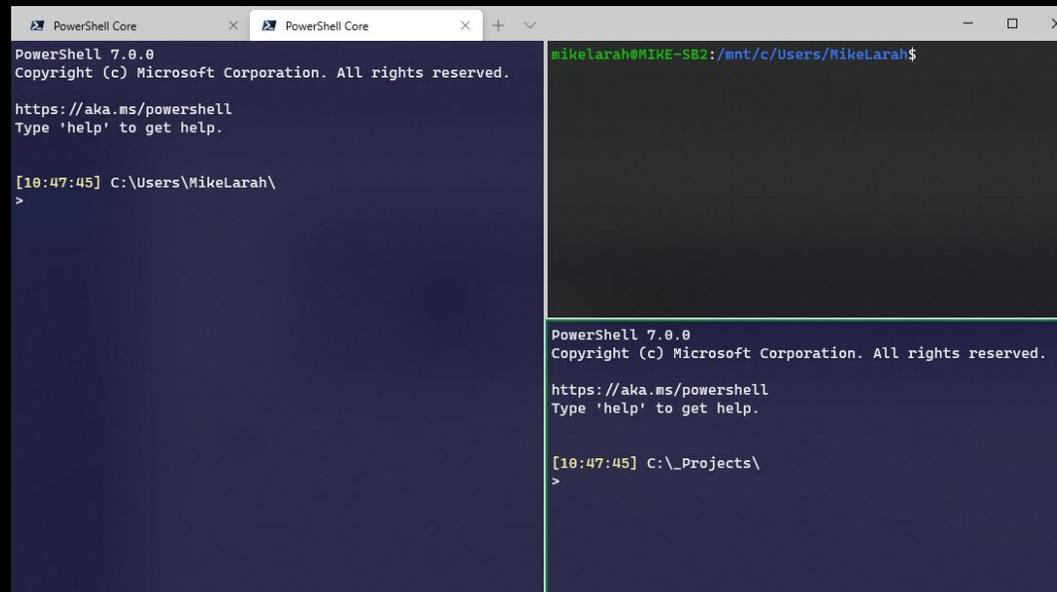
Select a username and password for your administrative user.

```
hayden@T470s ~  
Installing, this may take a few minutes...  
Please create a default UNIX user account. The username does not need to match your Windows username.  
For more information visit: https://aka.ms/wslusers  
Enter new UNIX username: hayden  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
Installation successful!  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
hayden@T470s:~$
```



# Windows Terminal (Optional)

- Nice for managing multiple types of command line on Windows machines
- Download from the Microsoft Store



The screenshot displays the Windows Terminal application with three panes. The top-left pane shows the PowerShell Core 7.0.0 splash screen with the URL <https://aka.ms/powershell> and the prompt `C:\Users\MikeLarah\ >`. The top-right pane shows a terminal window with the prompt `mikelarah@MIKE-SB2:/mnt/c/Users/MikeLarah$`. The bottom-right pane shows another PowerShell Core 7.0.0 splash screen with the prompt `C:\_Projects\ >`.



# macOS Terminal

Command  
+ Space



Search "Terminal"



```
→ CSAW2020 ls
bard          grid          kui_blox1_sol.png
bard.hop     grid_solve.py libc-2.27.so
ezbreezy     krakme.exe   solve_ezbreezy.py
→ CSAW2020
```



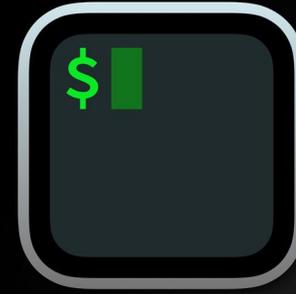
# Homebrew (Optional)



- AKA "brew"
- Popular package installation tool on MacOS
- <https://brew.sh>
- To install tools with brew, use `brew install <package>`
- Example: `brew install wget`



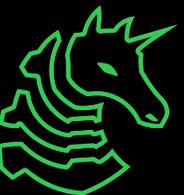
# iTerm2 (Optional)



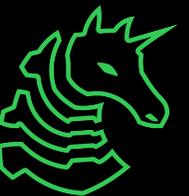
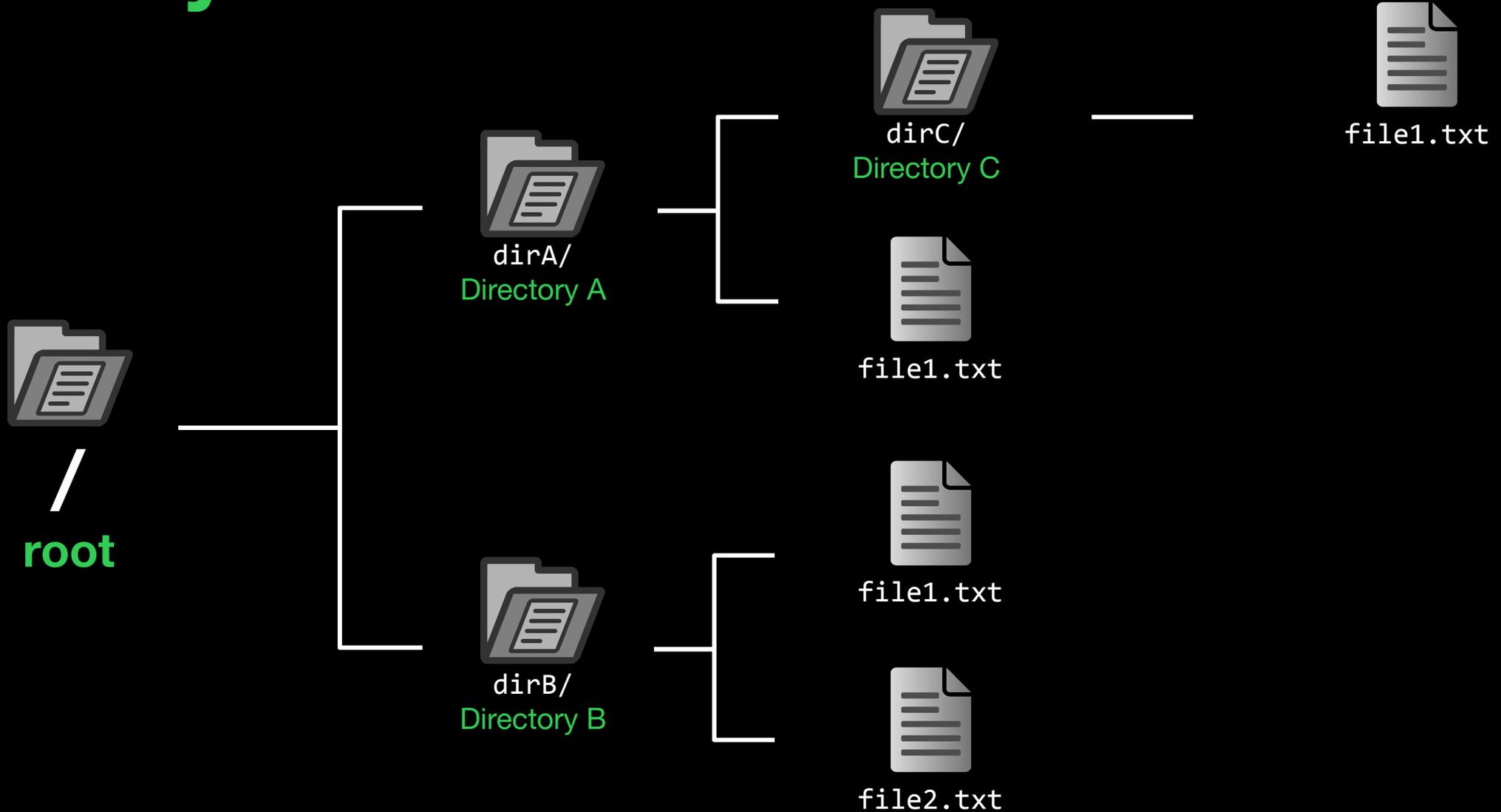
iTerm2

iTerm2 is a terminal emulator for macOS that does amazing things.

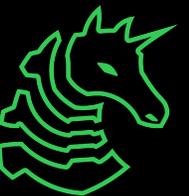
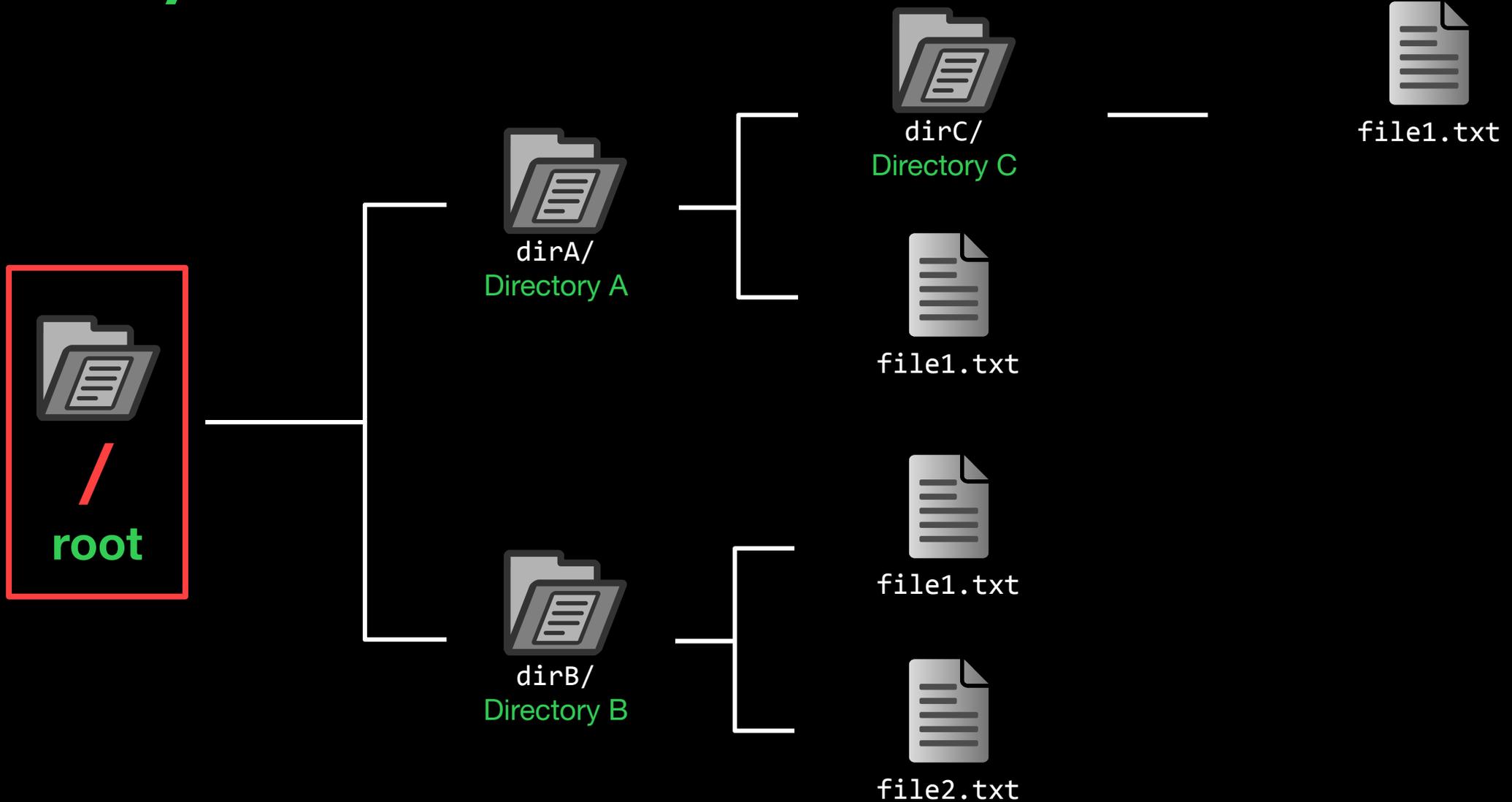
- Modern replacement for the basic macOS Terminal
- <https://iterm2.com>



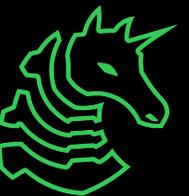
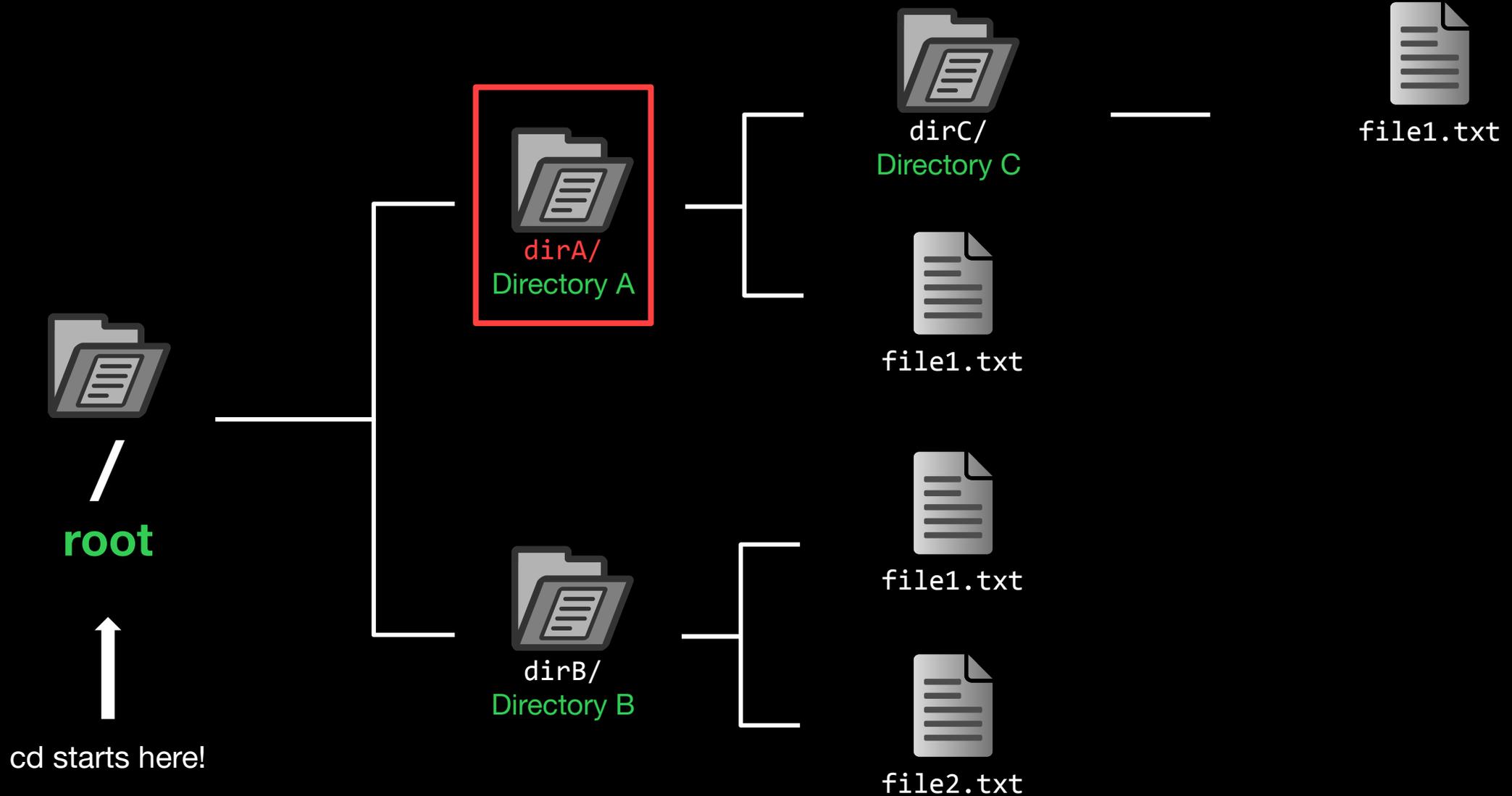
# Filesystems



cd /

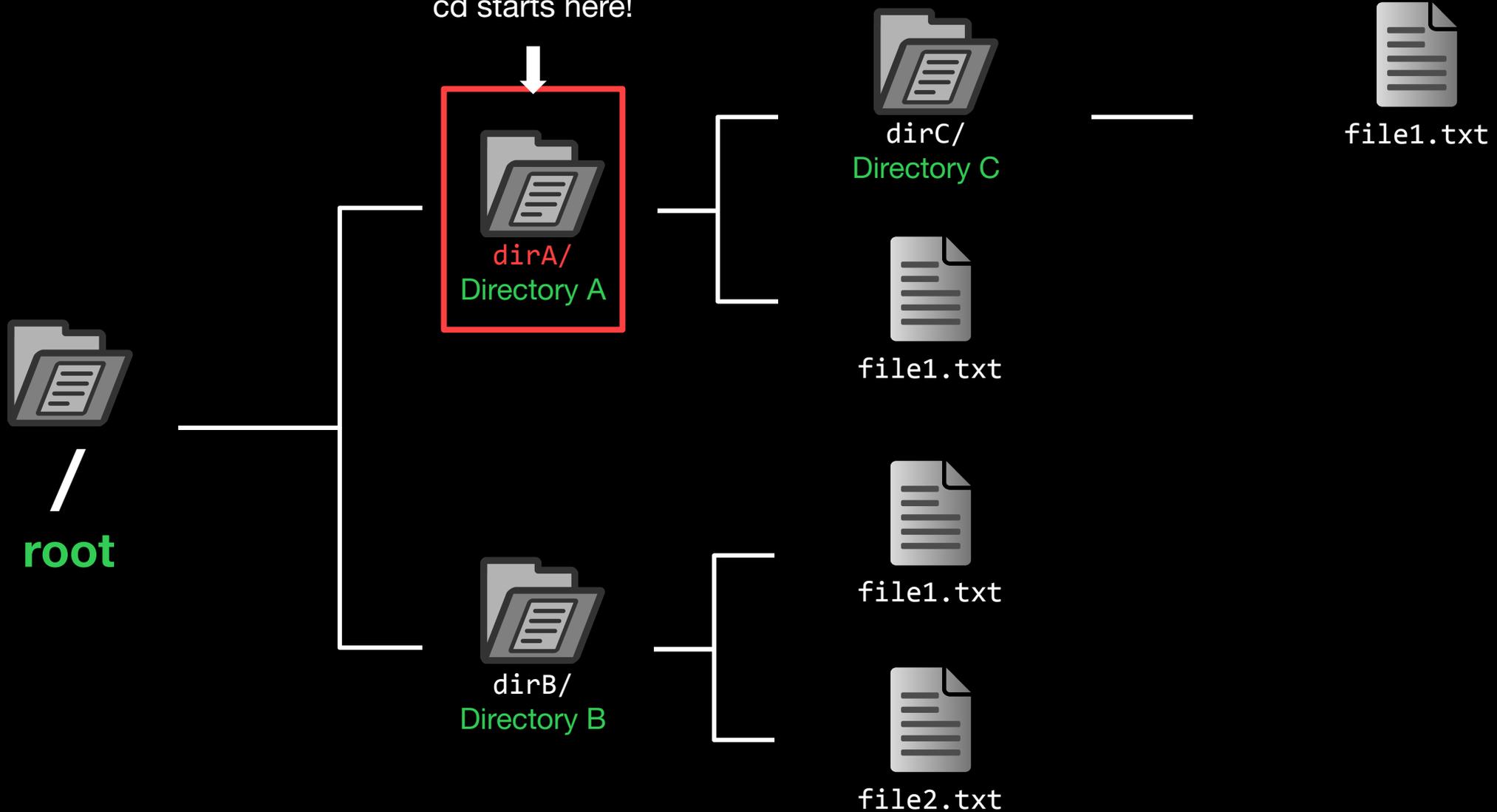


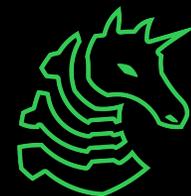
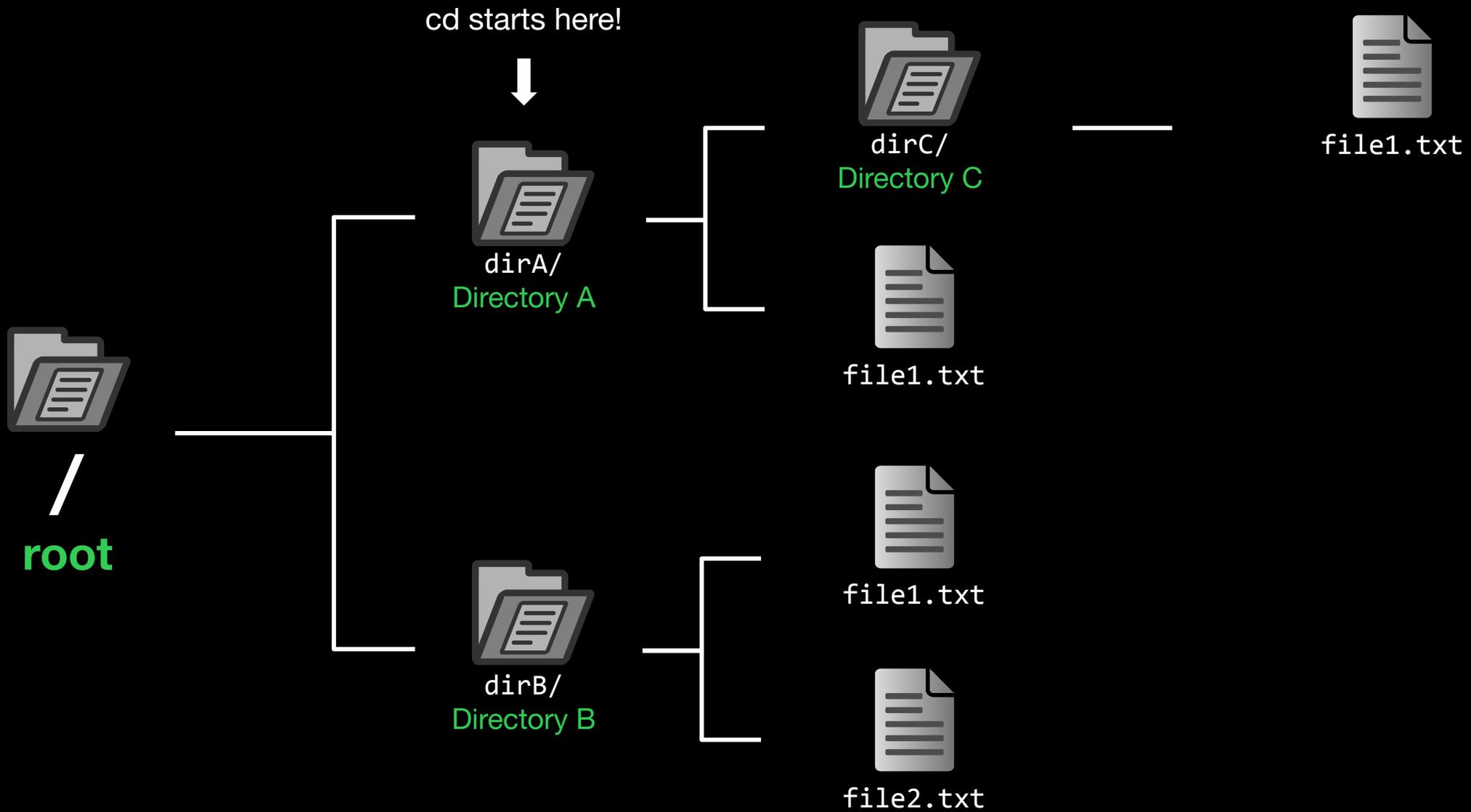
# cd dirA



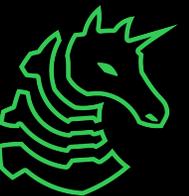
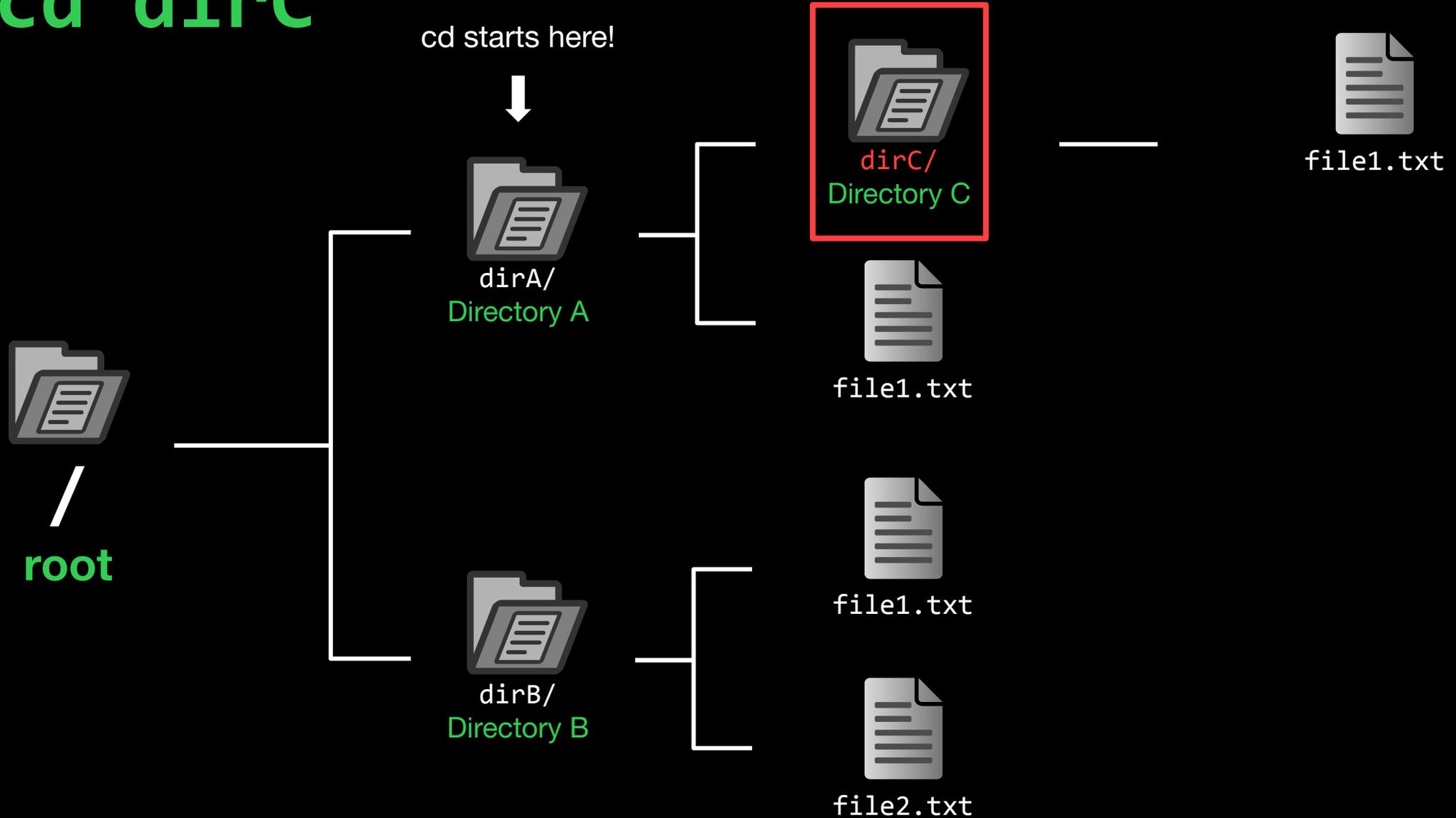
# cd dirA

cd starts here!

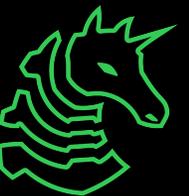
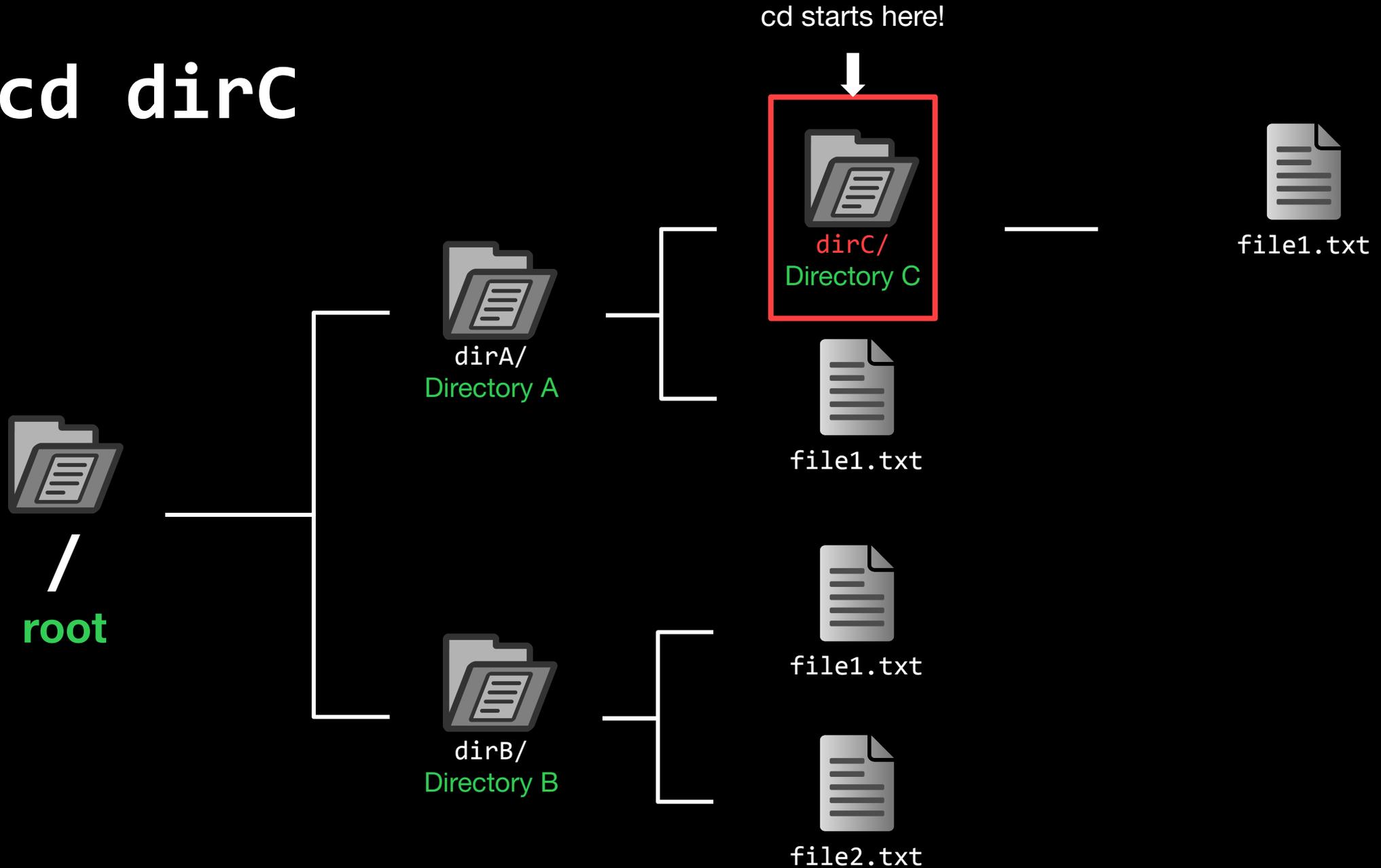


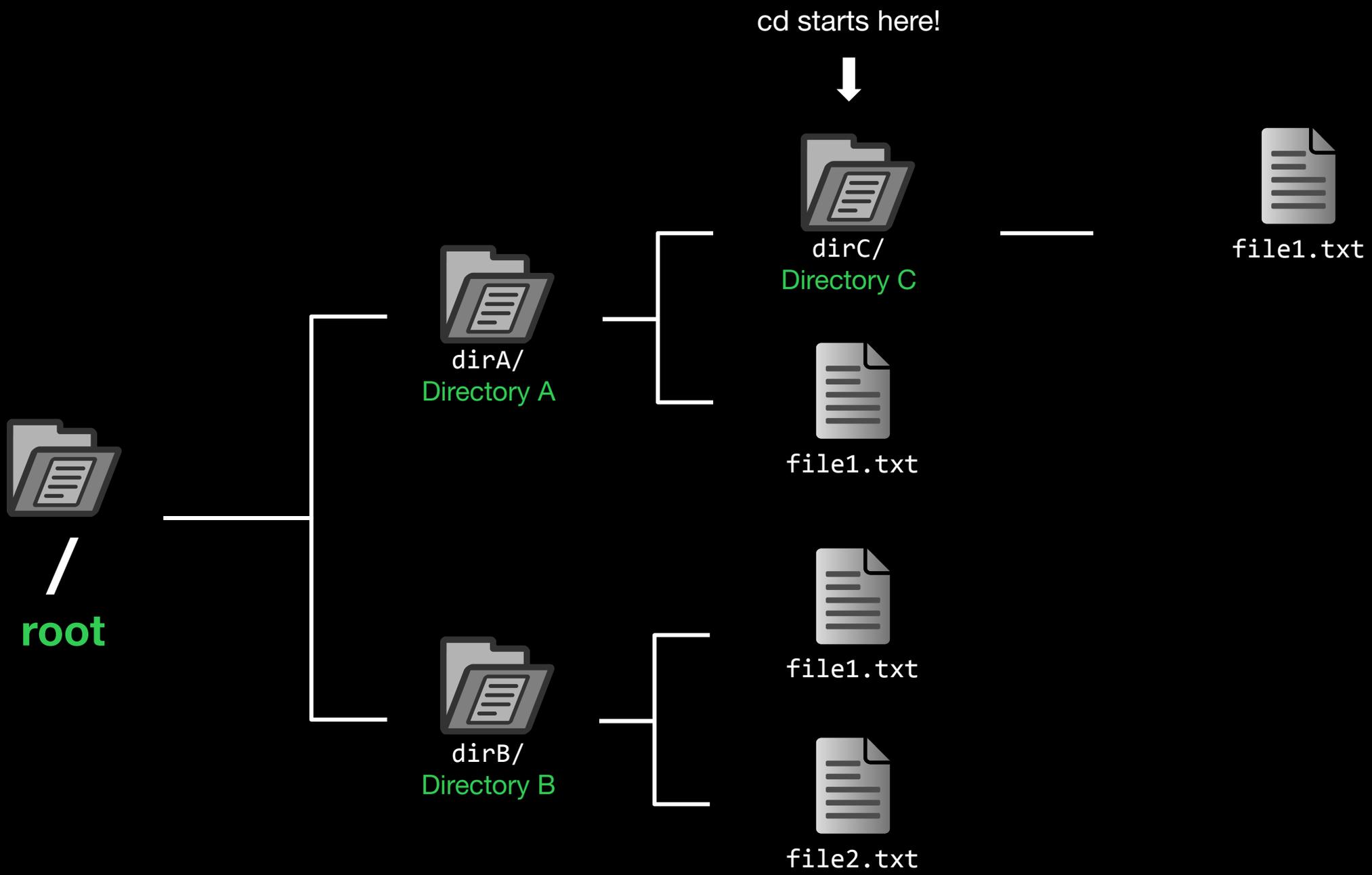


# cd dirC



# cd dirC





# cd dirB

cd starts here!



/  
root



dirA/  
Directory A



dirC/  
Directory C



file1.txt

Error: dirB not found



file1.txt



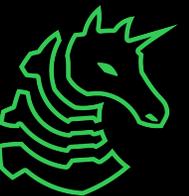
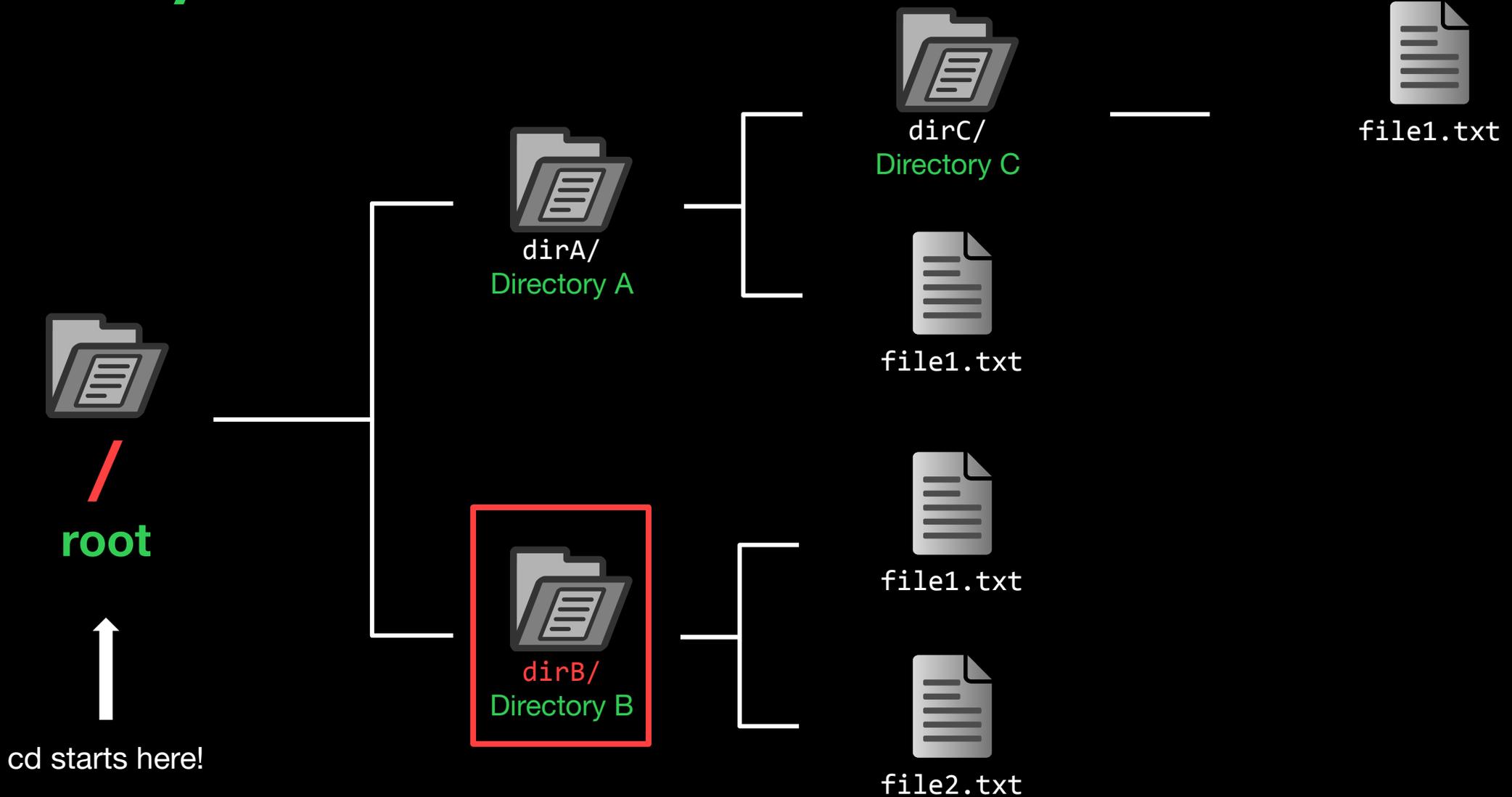
file1.txt



file2.txt

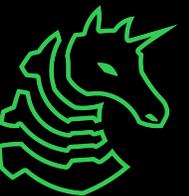
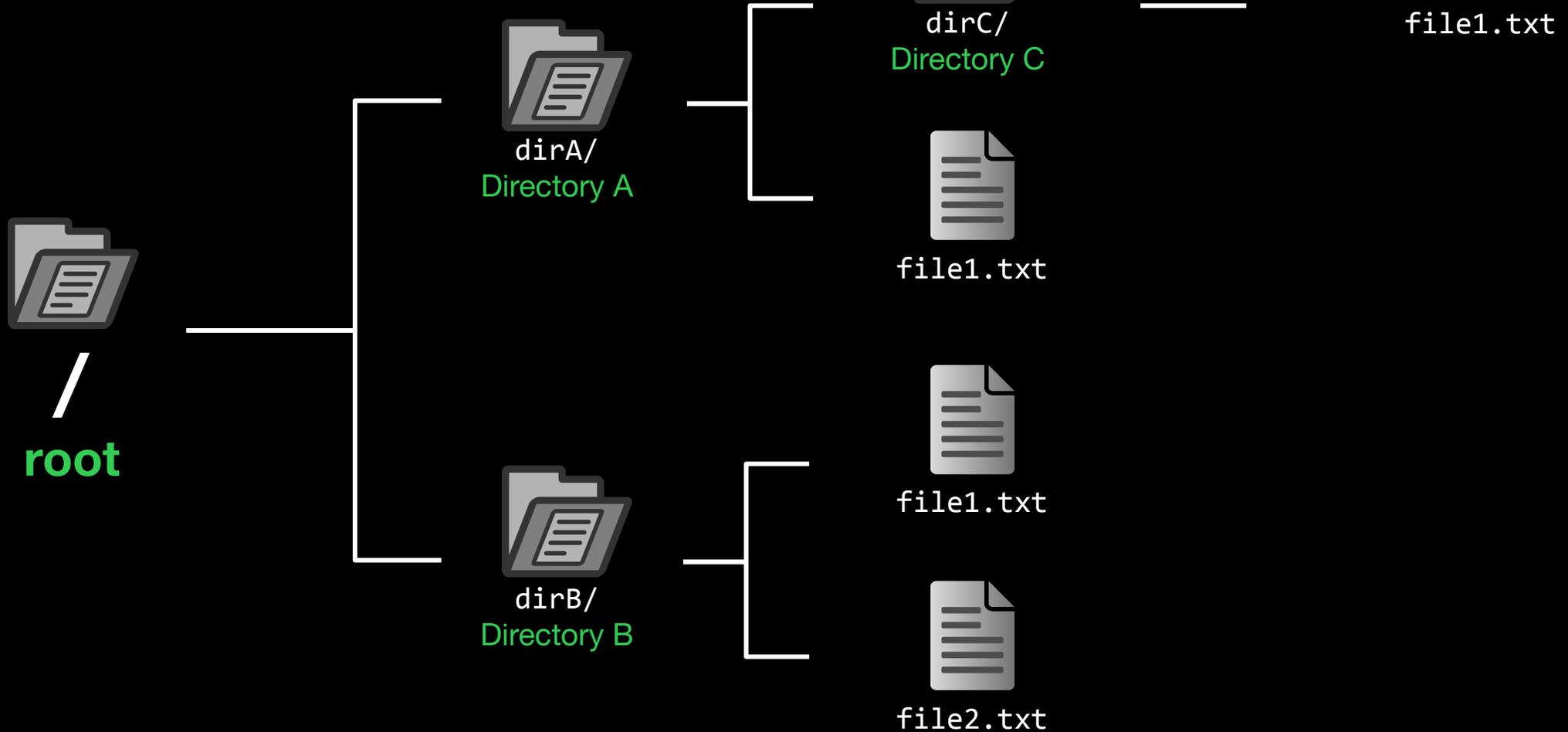


# cd /dirB



```
cd ../../../dirB
```

cd starts here!



`cd ../../dirB`

cd starts here!



root



dirA/  
Directory A



dirB/  
Directory B



dirC/  
Directory C



file1.txt



file1.txt



file2.txt

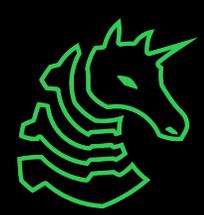
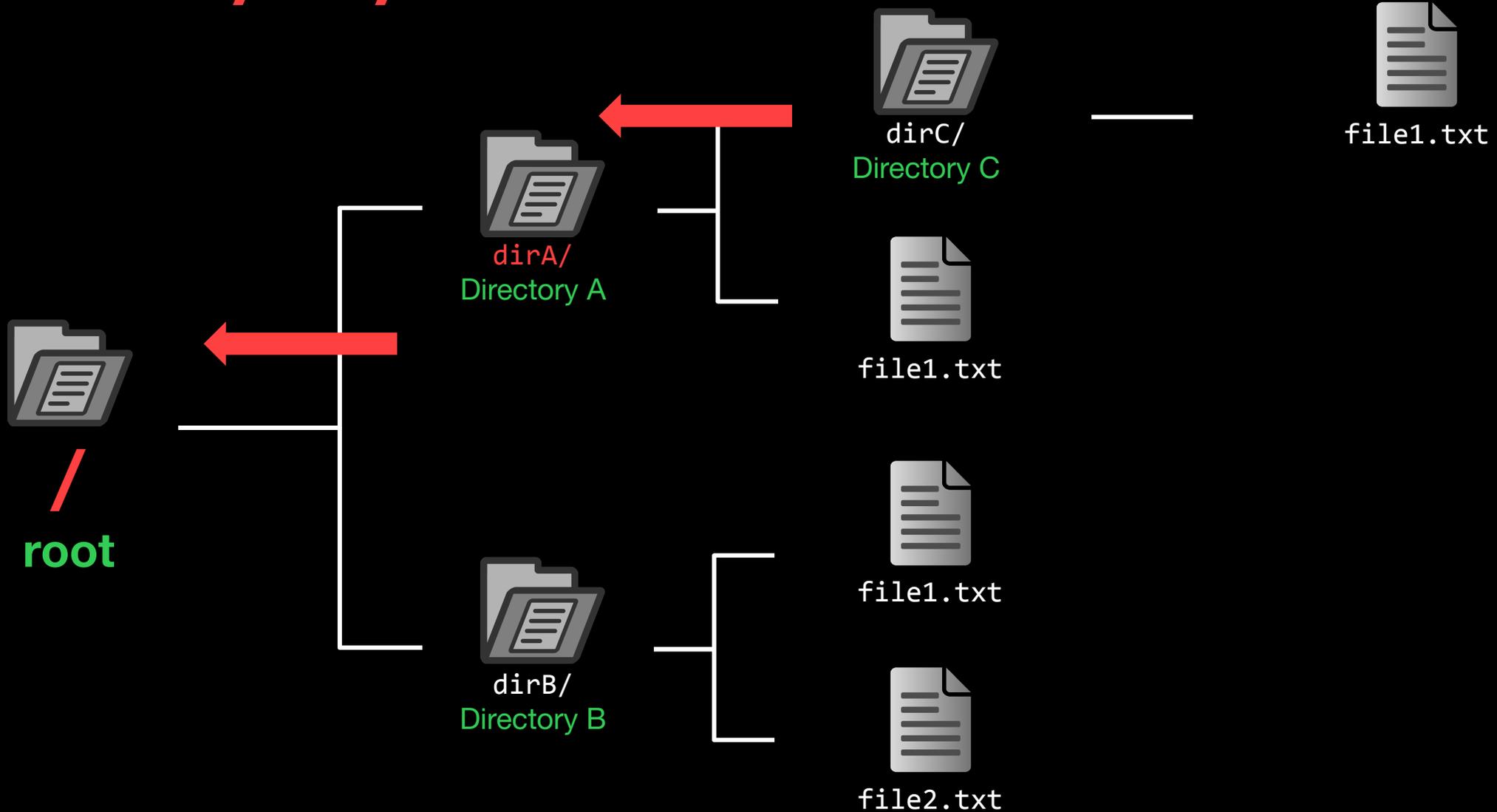


file1.txt



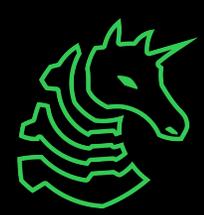
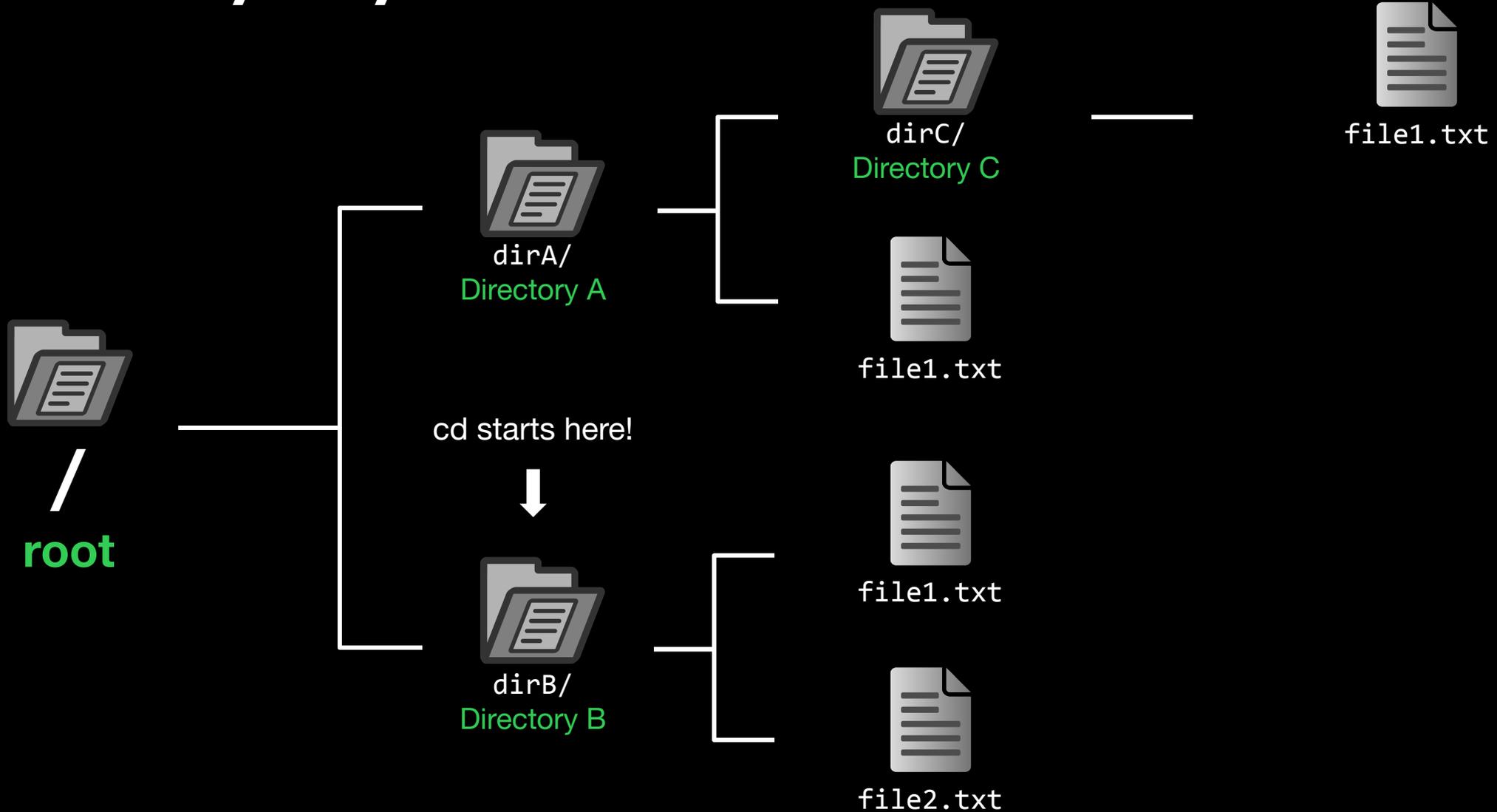
`cd ../.. /dirB`

cd starts here!

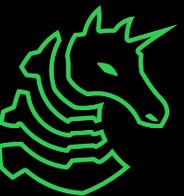
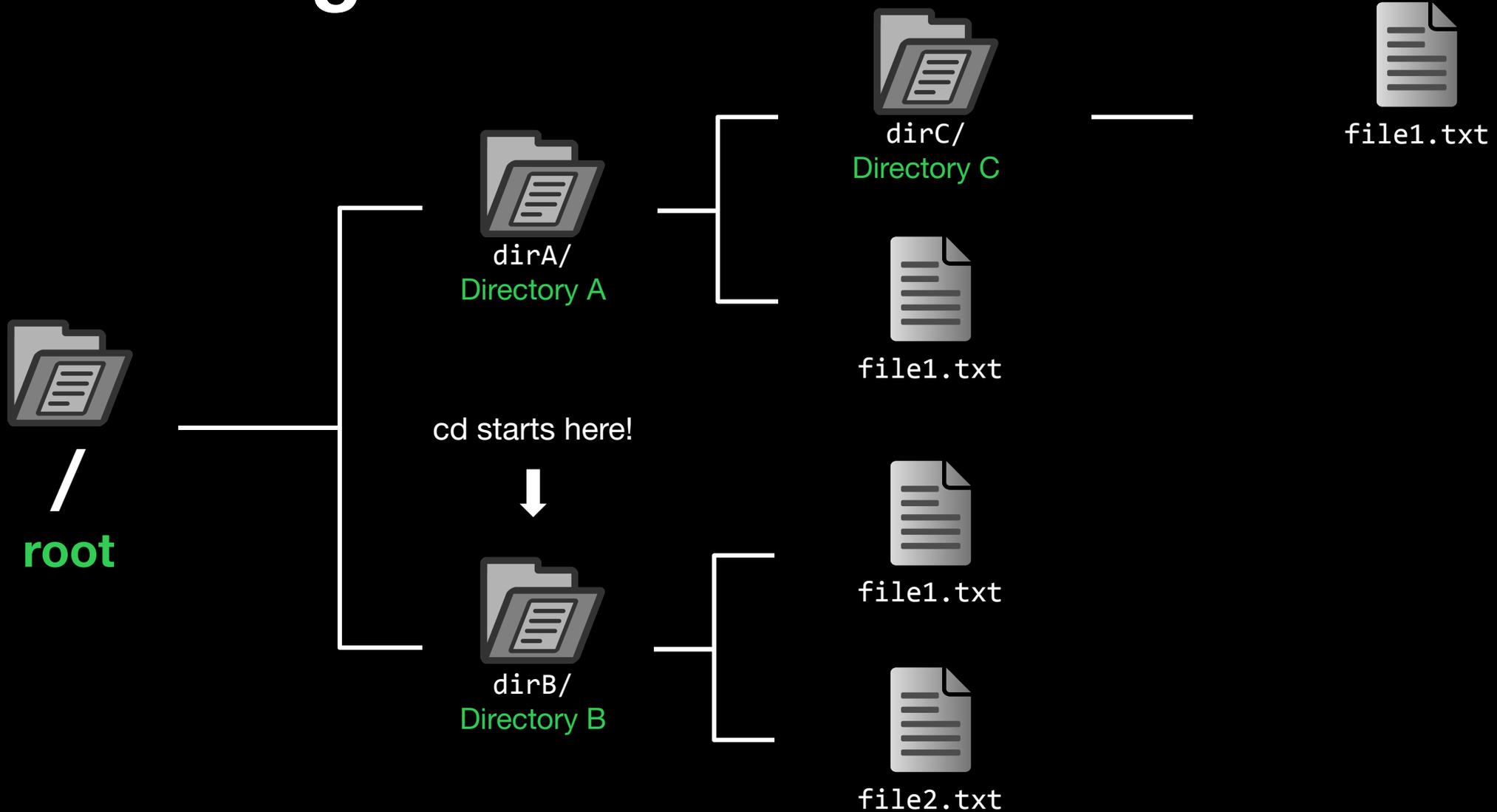




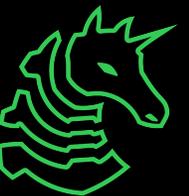
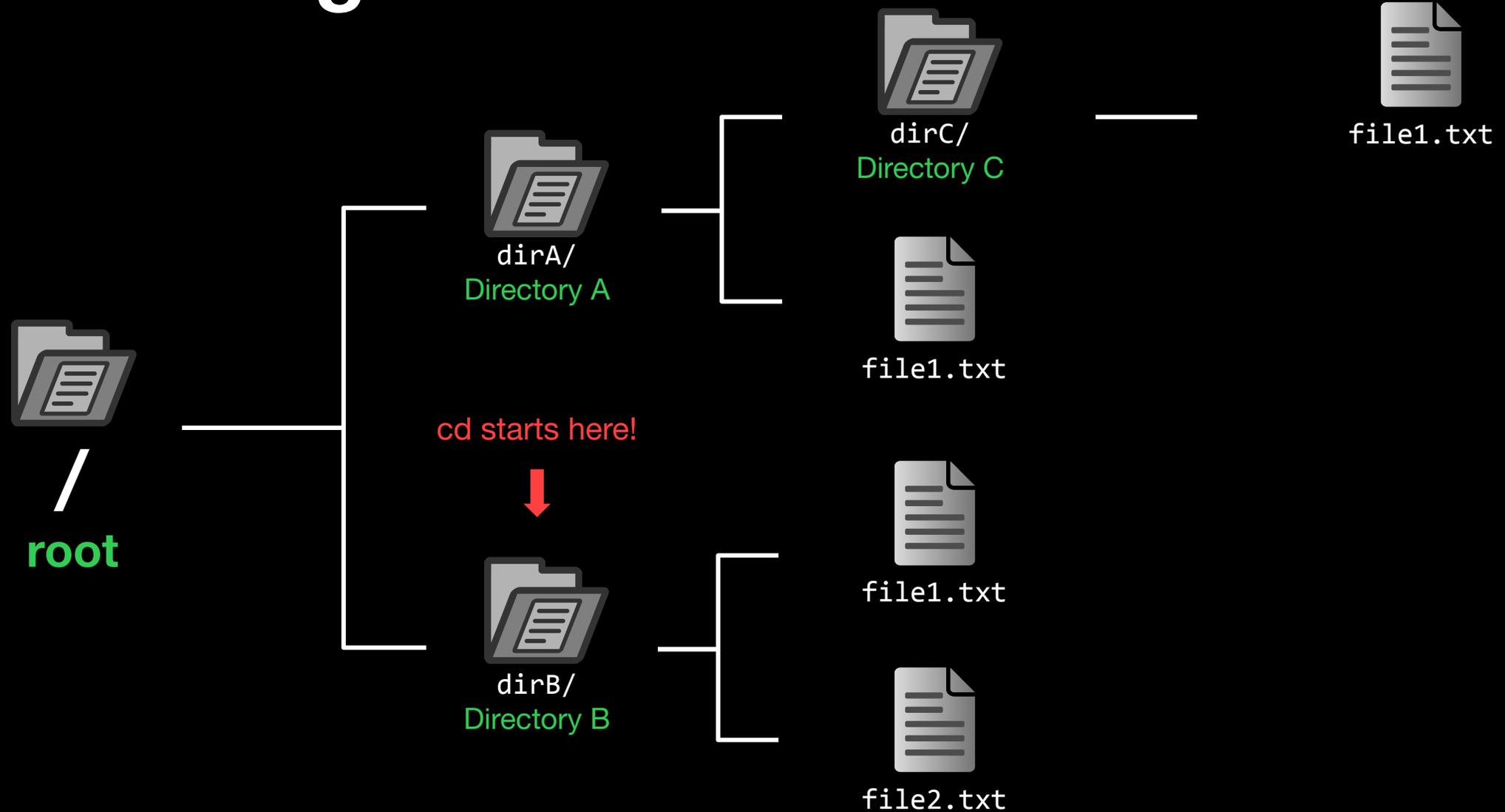
# cd ../../dirB



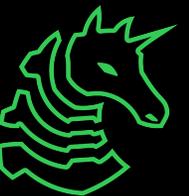
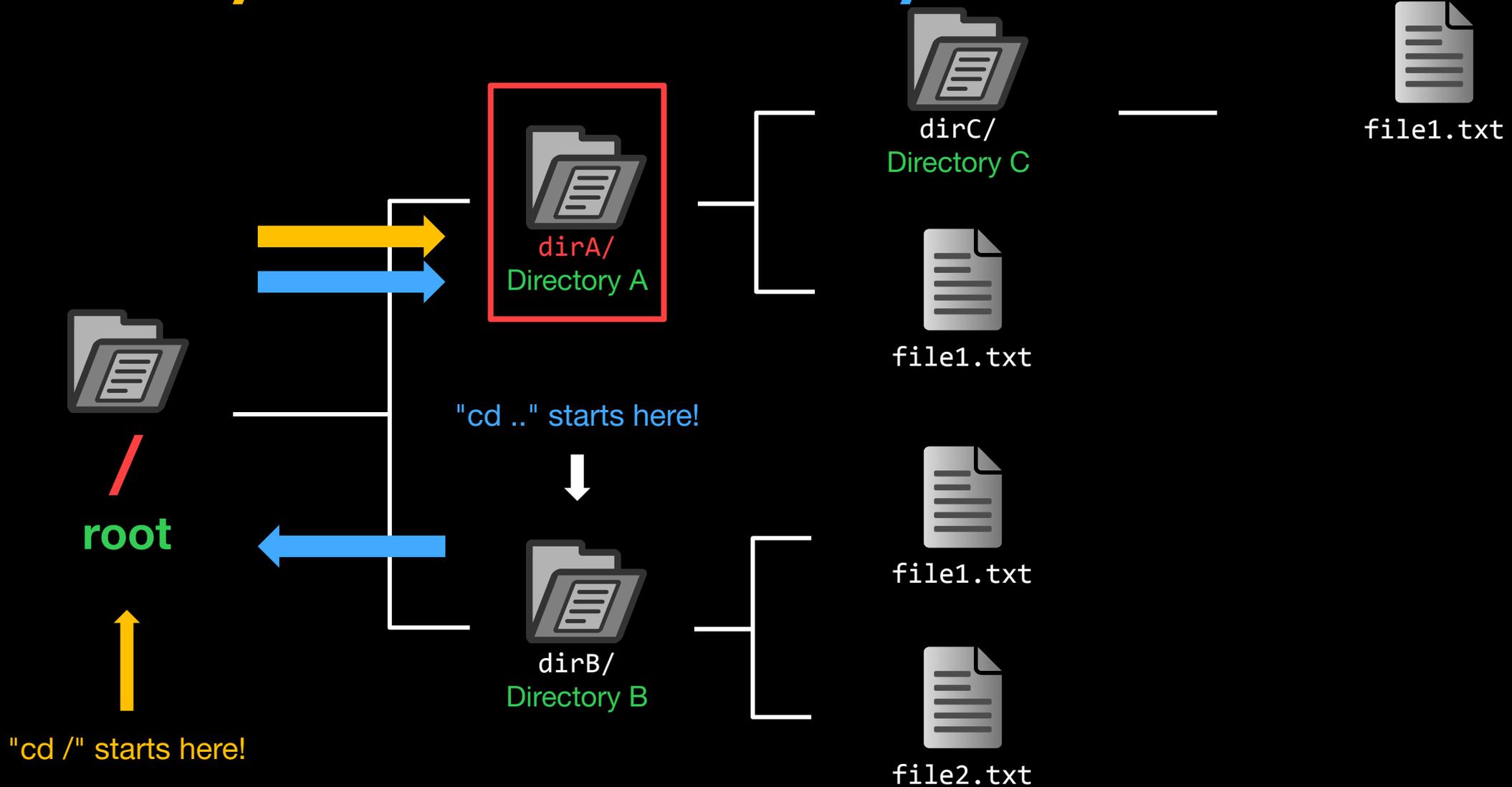
# How to get to dirA?



# How to get to dirA?



# "cd /dirA" or "cd ../dirA"



# Paths

## Absolute Path

The full path that always starts at root (/)

```
/dirA/file1.txt
```

```
/dirA/dirC/file1.txt
```

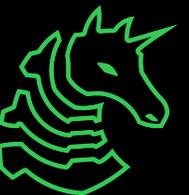
## Relative Path

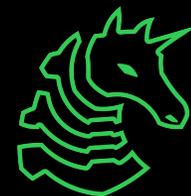
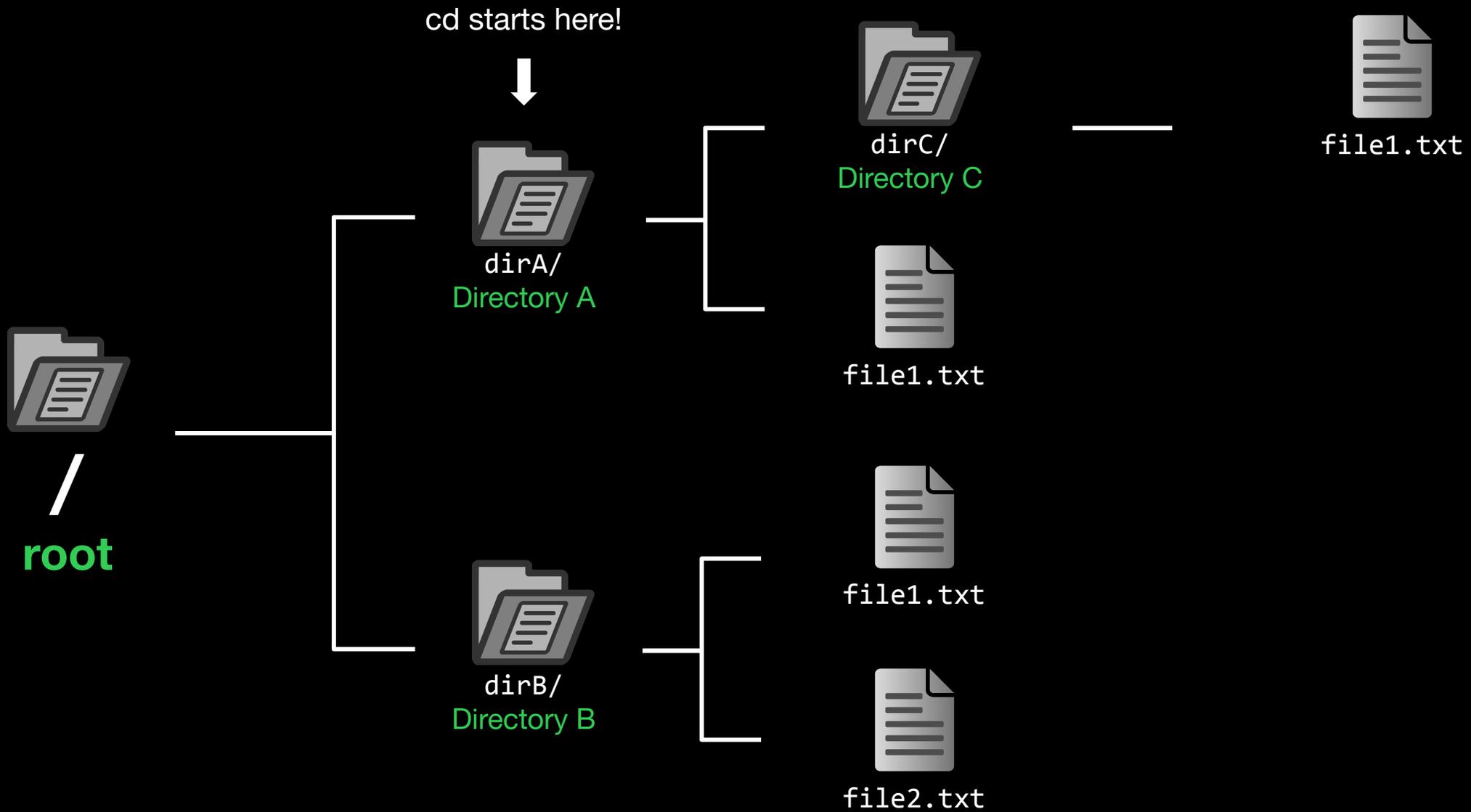
The partial path relative to where you are currently in the terminal

(Relative to dirA)

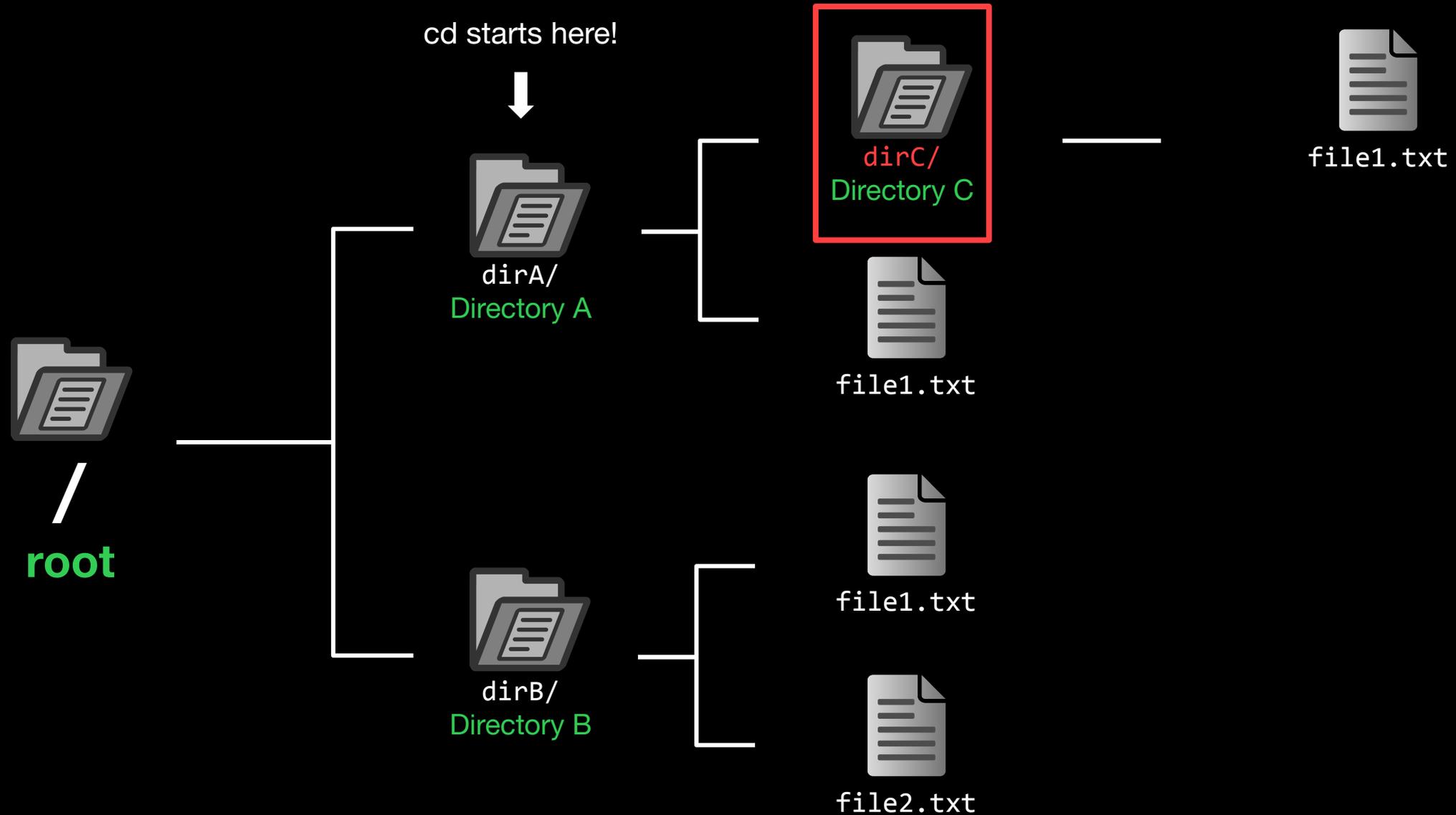
```
file1.txt
```

```
dirC/file1.txt
```





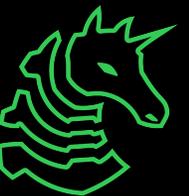
# "cd dirC" or "cd ./dirC" or "cd dirC/"



`./dirC == dirC == dirC/`

Also `../dirC` and `.././dirC` and `../././dirC` and...

These are just conventions!



# Useful Commands - Filesystem

ls `<directory>`: lists files in your current directory or specified directory

cd `<directory>`: changes your current directory to specified directory

mv `<source>` `<dest>`: moves file from source to dest (rename), if dest is a directory, move source

rm `<file>`: removes file (**NOT REVERSIBLE**)

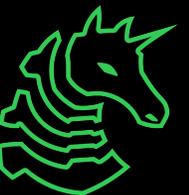
cat `<file>`: prints the contents of file (sometimes it prints gibberish, think why that might happen)

./file: executes whatever is at file

man `<command>`: lets you see info about a command and all of its parameters/options

`<parameter>` means it's a required parameter

`[parameter]` means it's an optional parameter



# Useful Commands - Networking

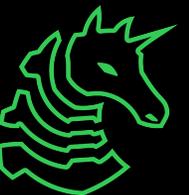
`nc <ip> <port>`: netcat, connect to ip on port port. (first command - netcat)

`ssh <user@ip> [port]`: secure remote shell, run an instance of a shell as user at the IP address

`ping <ip>`: see if an IP address is up using ICMP (usually blocked by firewalls)

`curl <url>`: network access tool that is mainly used to access websites from the terminal

`wget <url>`: Simplified/modern curl that downloads the file with relevant name

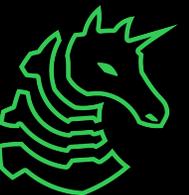


# Networking Fundamentals

`nc -l <port>`: open a network socket to listen on specified port

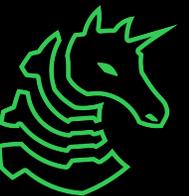
`nc <ip> <port>`: open a connection to the specified IP and port

Ports - communication endpoints on your computer (1-65535)



# Next Steps - Bandit

```
ssh bandit0@bandit.labs.overthewire.org -p 2220
```



# Next Steps - Bandit

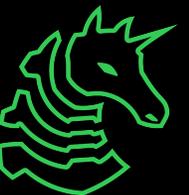
```
ssh bandit0@bandit.labs.overthewire.org -p 2220
```

command

user

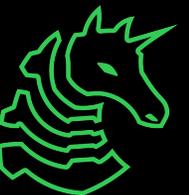
IP

port



# Next Steps - Terminal Challenges

- **netcat**
  - Refer back to the slides!
- **Shell Basics**
  - Learn the ins and outs of using the terminal
- **A Very Special Character**
  - Intro to the ASCII table and Netcat



# Next Meetings

## 2023-09-07 • This Thursday

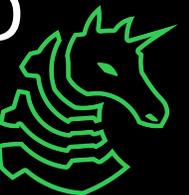
- Web Hacking I with Pomona
- Learn introductory knowledge on web hacking

## 2023-09-10 • Next Sunday

- Terminal Session 2
- Same terminal setup content as today, tell your friends!

## 2023-09-08 • Next Friday 4PM CST - Sunday 4PM CST

- Playing **PatriotCTF** together
- Play our first CTF of the year with us! Free pizza, location TBD



ctf.sigpwny.com

**sigpwny{starting\_off\_strong}**

**Meeting content can be found at**  
**[sigpwny.com/meetings](https://sigpwny.com/meetings).**

