Introduction to the UNIX command line

Getting stuff done like it’s 1971

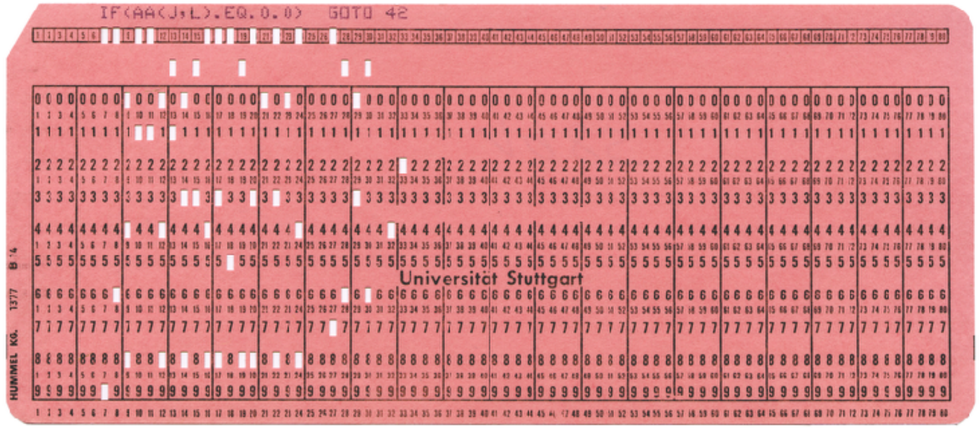
Overview

- Why a command line?
- Command Line Basics
- Read the manual stupid!
- Connecting to other computers
- Messing around

Why a command line?

Why a command line?

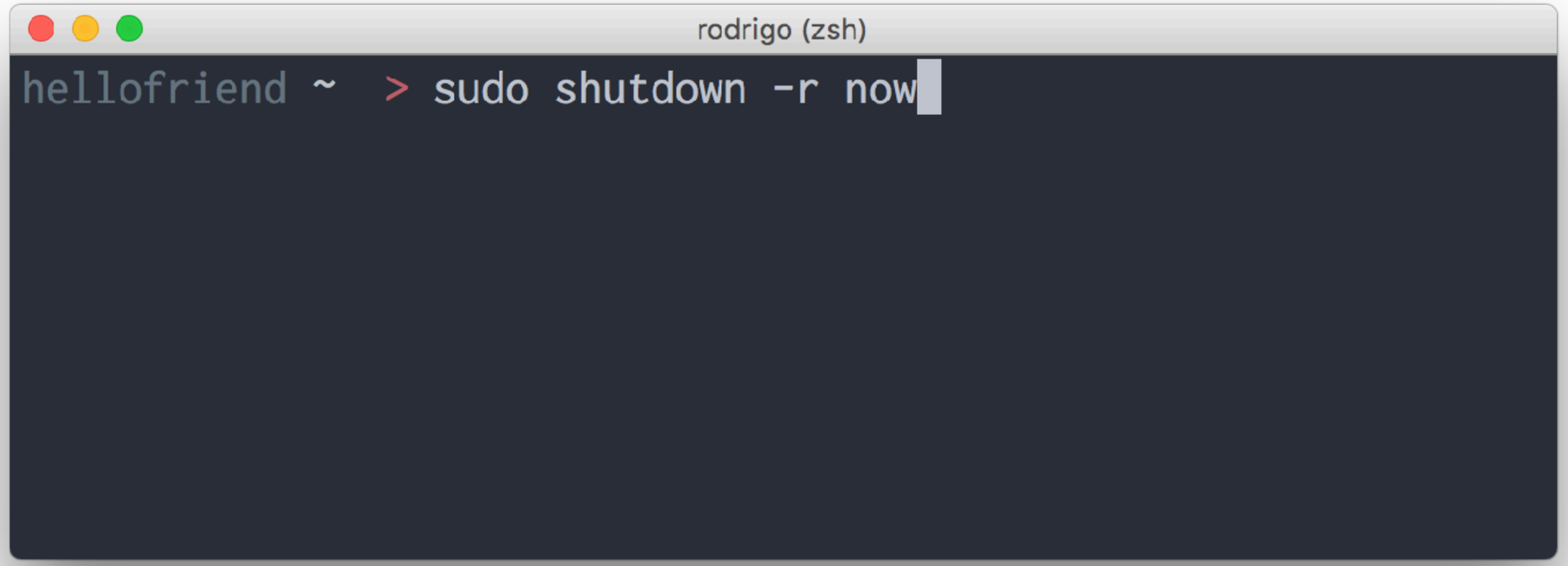
- The command line was the first “User Interface” that allowed us to interact directly with a computer using the keyboard.
- Before that we had to use something called a “Punch Card”.
- This was all before we had Graphical User Interfaces
- It’s also known under the acronym: **CLI** (Command Line Interface)



PUNCH CARD

Tell the computer what to do!

The **CLI** allows us to type in commands, the computer in turn will execute those once we hit enter.



Be precise in your speech.

The computer only recognizes specific commands, we have to be very exact in what we want to tell the computer to do otherwise it won't understand it.

```
mrmeeseeks ~  > "Please help me computer"
zsh: command not found: Please help me computer
mrmeeseeks ~  >
```

Why learn it?

- The GUI might be more user friendly, but the command line is much more powerful if you know how to use it.
- It’s much easier to automate certain tasks so that they can be re-used later on.
- Is the most common way to work with Servers to which you don’t have physical access to.
- Some programs can only be run in the command line! Not all applications have a GUI.
- A lot of free commands for all sort of tasks.
- It makes you look cool! 😎

Basics 

Print something on screen (echo)

SHELL

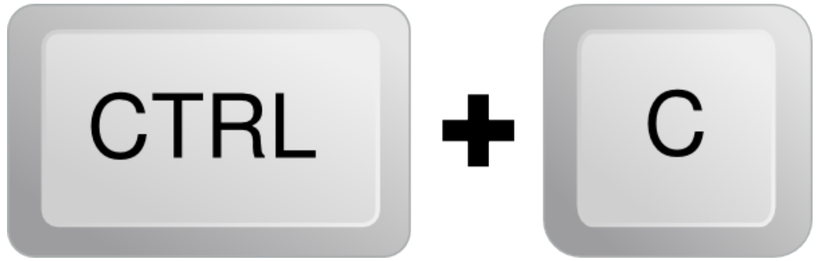
```
echo “Hello, from the command line”
```

```
mrmeeseeks ~  > echo "Hello, from the command line"
Hello, from the command line
```

When you are stuck

SHELL

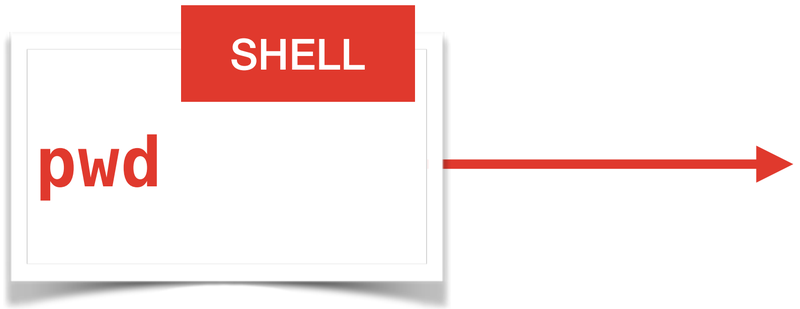
```
echo “Hello, from the command line
```




```
mrmeeseeks ~  > echo "Hello, from the command line
dquote> sdfjhsfjksldlfjk
```

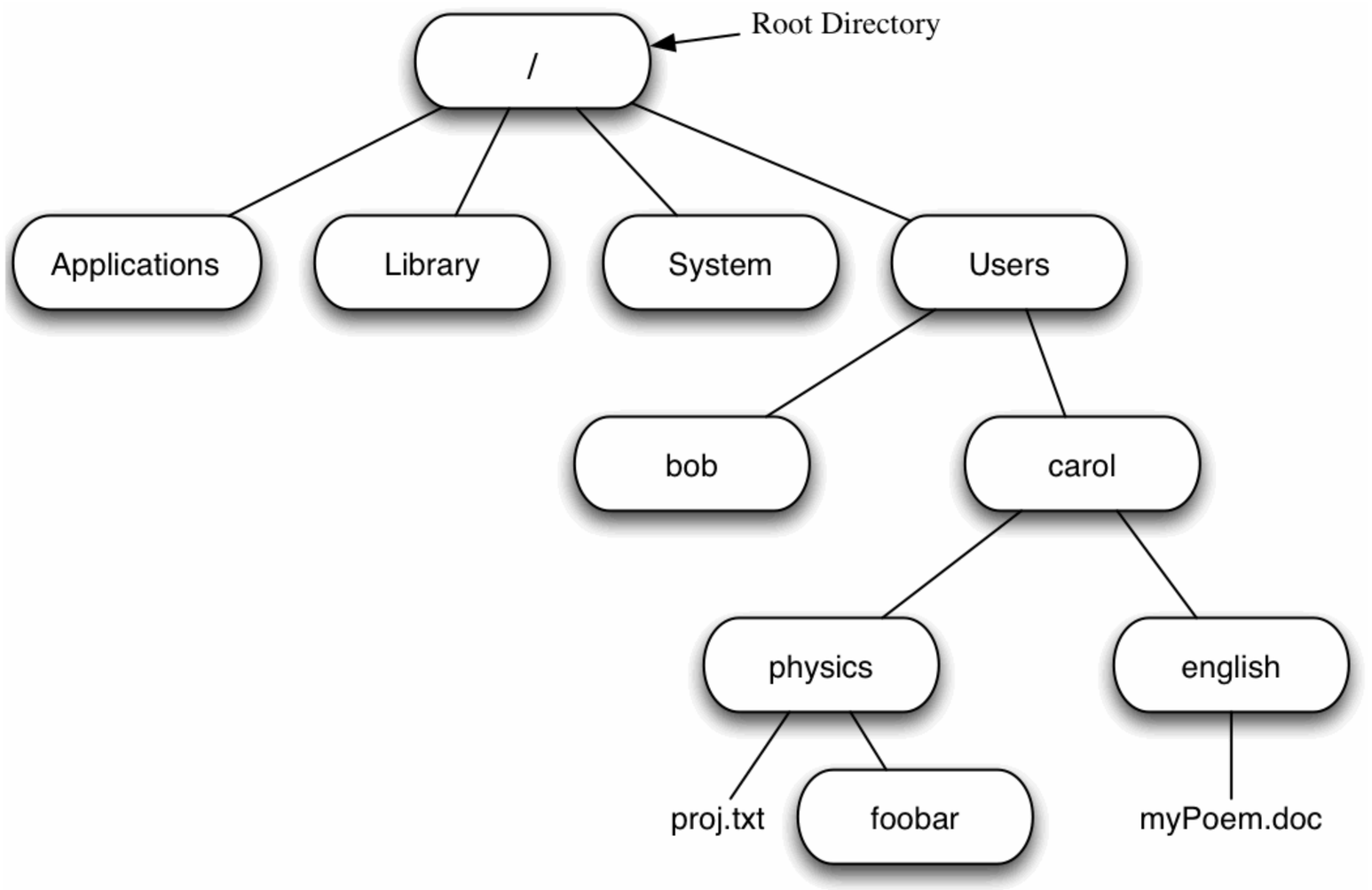
Press the combination **CTRL + C** when you are stuck to get out of trouble!

Print the working directory (pwd)

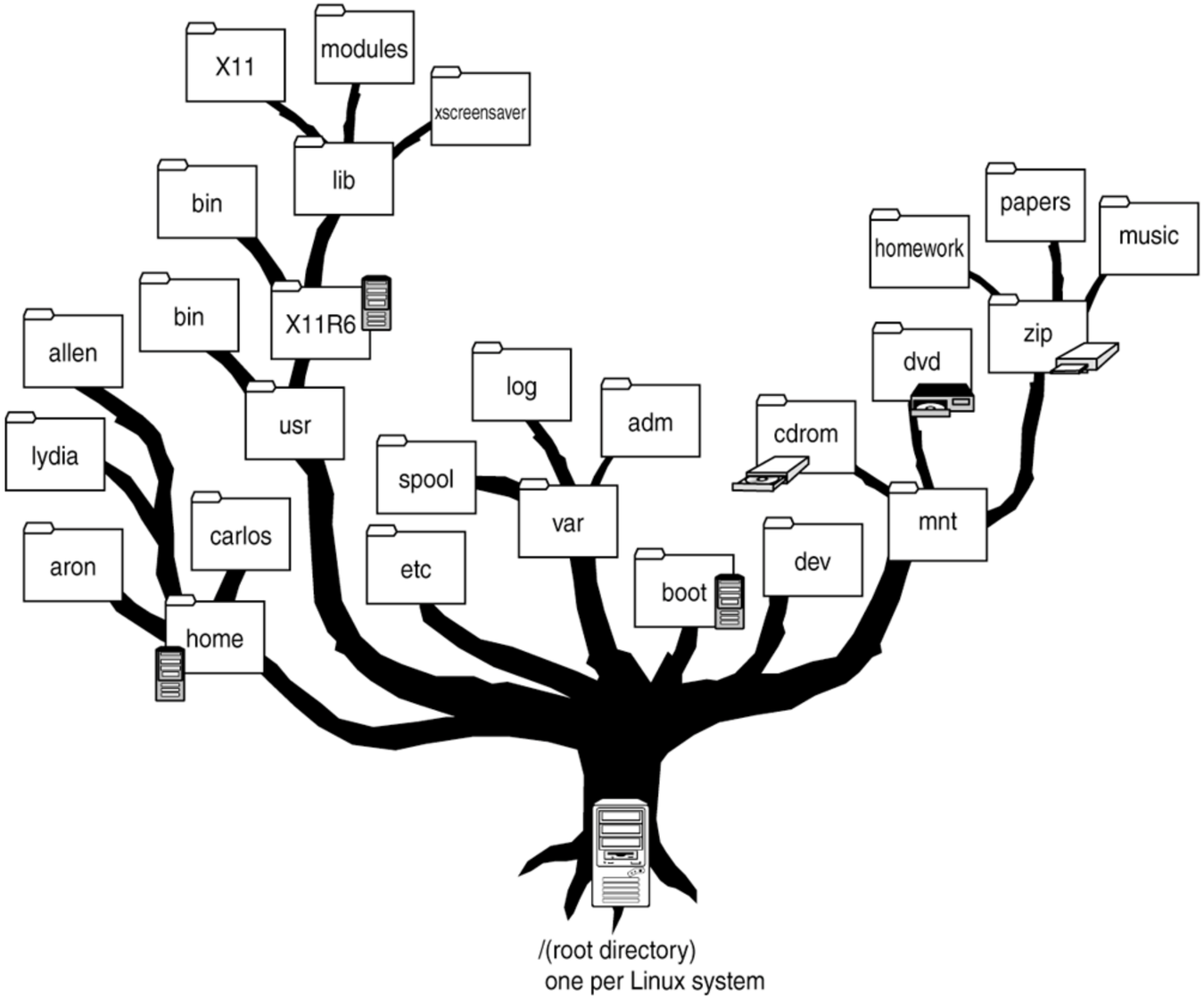



```
mrmeeseeks ~  > pwd
/Users/rodrigo
```

The unix tree structure (macOS)



The unix tree structure (Linux)



Change the working directory (cd)

SHELL

```
cd ..
```

```
mrmeeseeks /Users   > pwd
/Users
```

SHELL

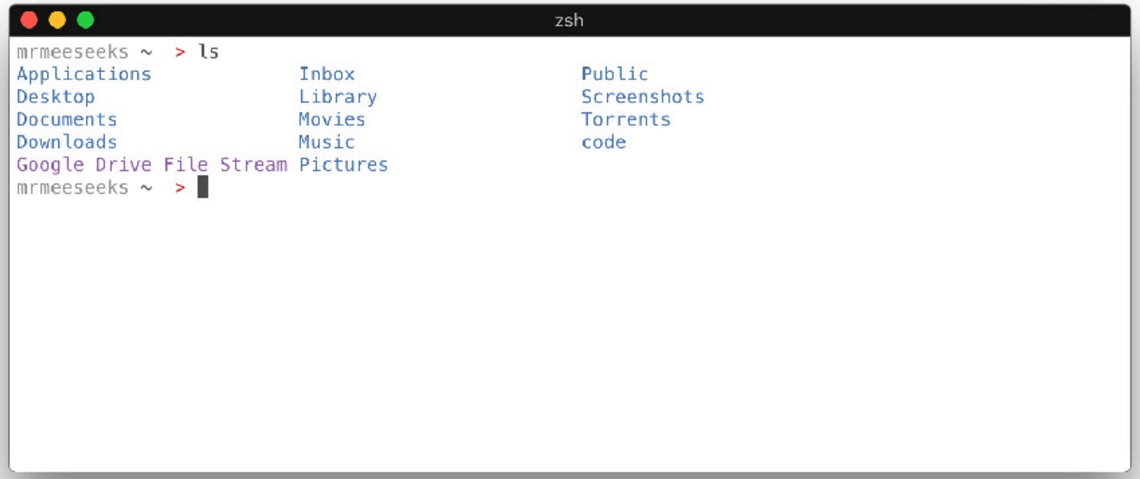
```
cd Inbox/Scans
```

```
mrmeeseeks ~/Inbox/Scans   > pwd
/Users/rodrigo/Inbox/Scans
```

List Files (ls)

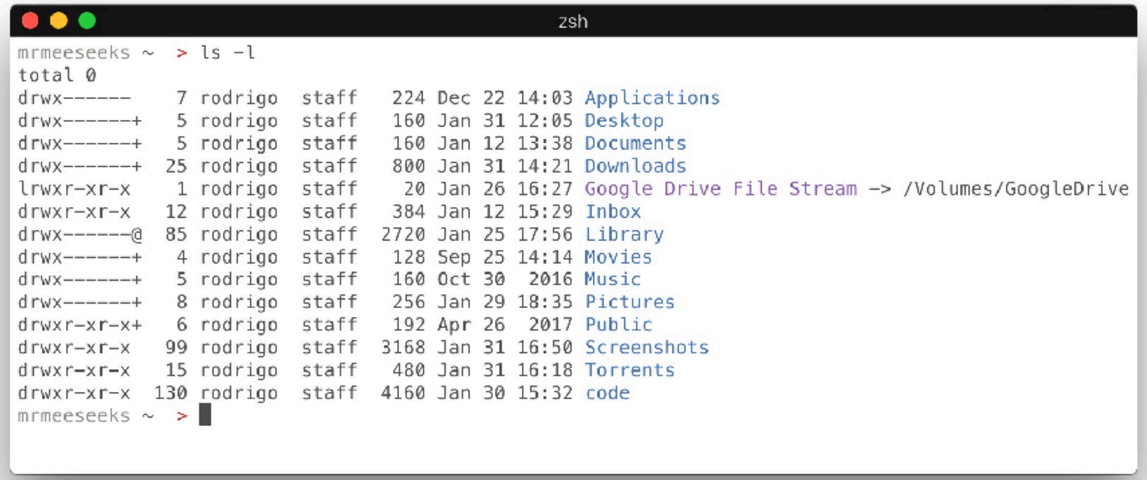
SHELL

```
ls
```

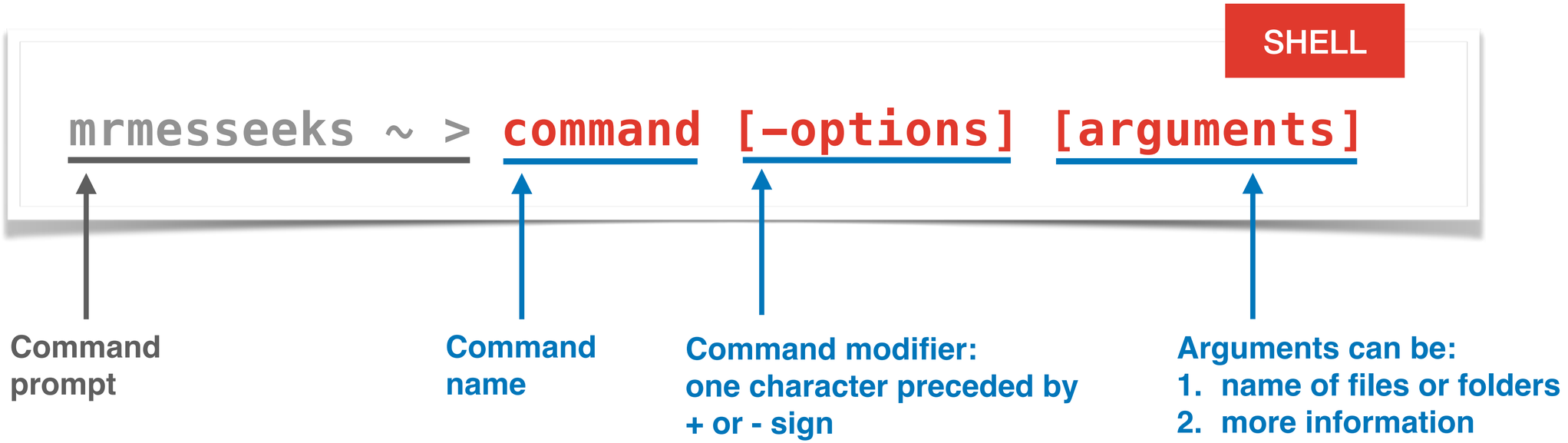


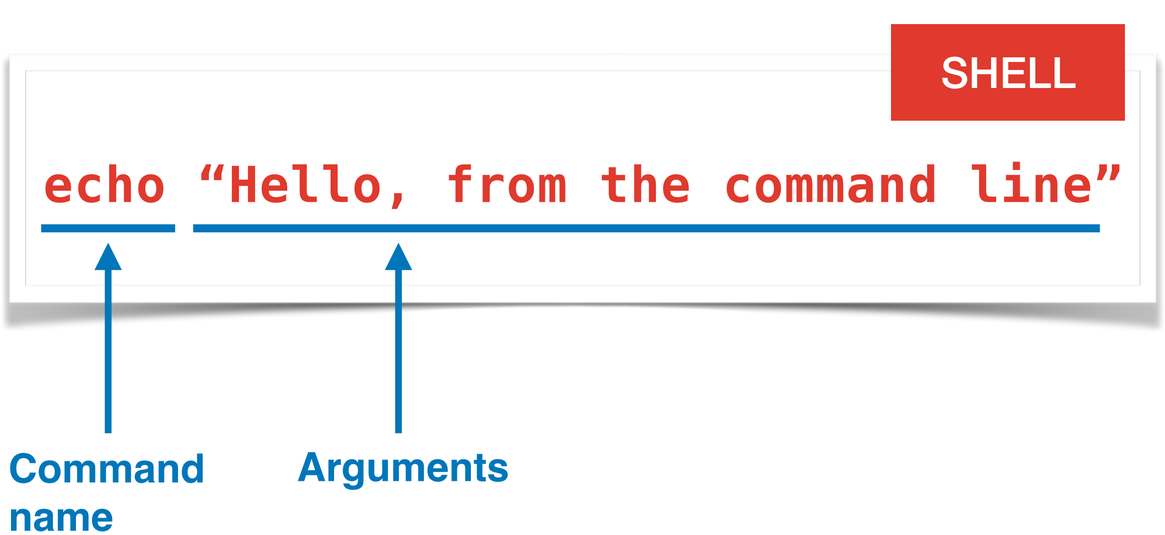
SHELL

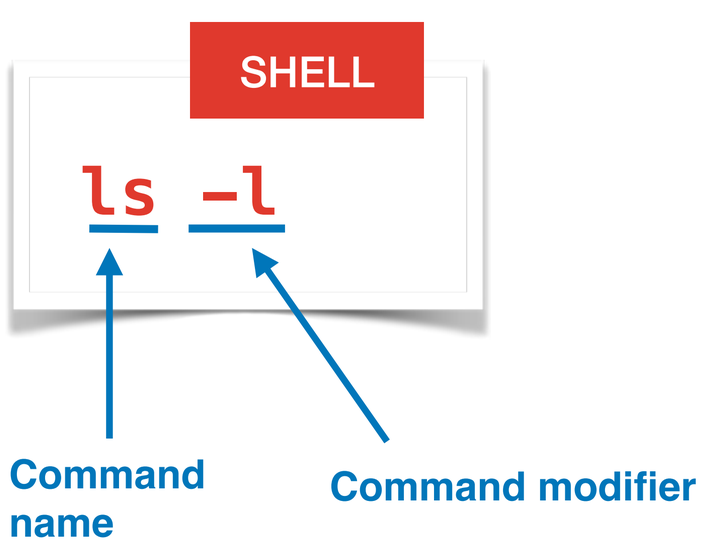
```
ls -l
```



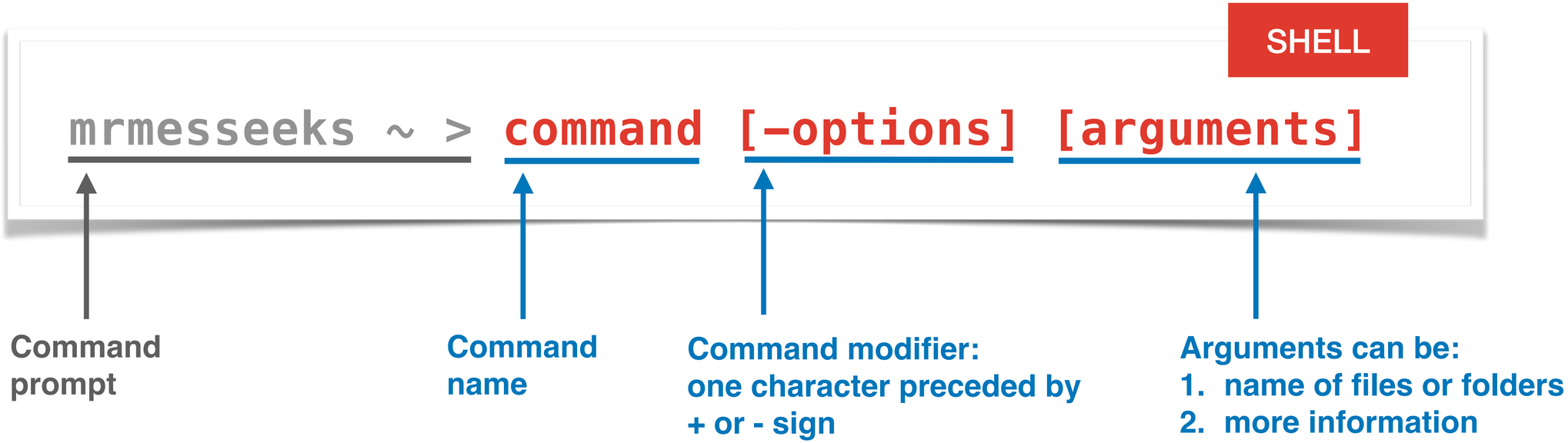
Structure of a command







Structure of a command



- **UNIX is case sensitive**
- There is always a **SPACE** between command, options and arguments.
- There is **NO SPACE** between the plus or minus sign and option letter
- The command prompt can look different on every computer and **DOES NOT** have to be typed in.

Create a new directory (mkdir)

SHELL

```
mkdir test
```

```
mrmeeseeks ~/Desktop  > ls
test
```

Create a new empty file (touch)

SHELL

```
touch homepage.html
```

```
mrmeeseeks ~/Desktop  > ls
homepage.html
```

Make a copy (cp)

SHELL

```
cp homepage.html copy.html
```

Delete a file (rm)

SHELL

```
rm homepage.html
```

```
mrmeeseeks ~/Desktop  > ls
copy.html
```

ATTENTION: The **rm** command DOES NOT put the file into the trash. It deletes it immediately from the disk.

Other commands

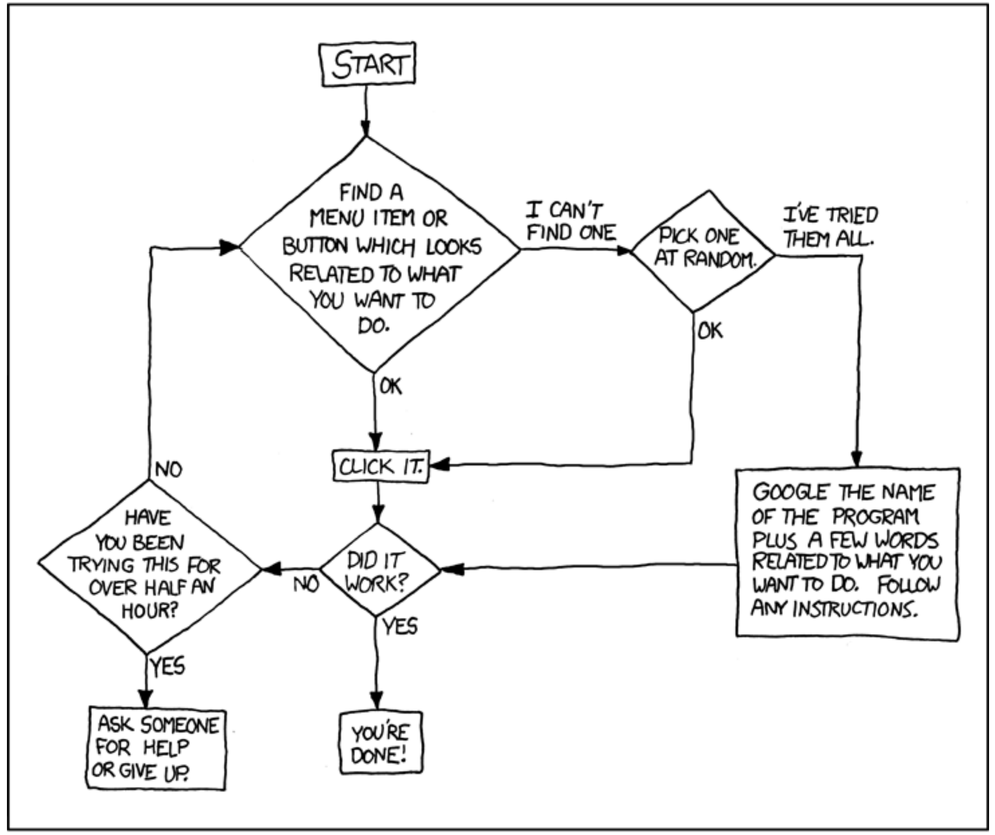
Command	Example	Description
`clear`	`clear`	Clears the screen
`exit`	`exit`	Closes the current terminal session
`cat`	`cat homepage.html`	Prints the content of a file out on screen
`mv`	`mv homepage.html index.html`	Rename the file homepage.html to index.html. This can also be used to move files between directories.
`curl`	`curl -o master21.html https://master21.academy`	Download the HTML from master21 and save it locally as master21.html
`wc`	`wc poem.txt`	Count the number of words in a Textfile.
`say`	`say “I like the smells of flowers”`	Make your computer speak (macOS only)!
`ping`	`ping twitter.com`	Check if a webserver is online. (Press ctrl + c to cancel)

Basics - Demo 🤓

Number 1 Skill

DEAR VARIOUS PARENTS, GRANDPARENTS, CO-WORKERS, AND OTHER "NOT COMPUTER PEOPLE."

WE DON'T MAGICALLY KNOW HOW TO DO EVERYTHING IN EVERY PROGRAM. WHEN WE HELP YOU, WE'RE USUALLY JUST DOING THIS:



PLEASE PRINT THIS FLOWCHART OUT AND TAPE IT NEAR YOUR SCREEN. CONGRATULATIONS; YOU'RE NOW THE LOCAL COMPUTER EXPERT!

Cheating encouraged

Linux Bash Shell Cheat Sheet

Basic Commands

Basic Terminal Shortcuts

CTRL L = Clear the terminal
CTRL D = Logout
SHIFT Page Up/Down = Go up/down the terminal
CTRL A = Cursor to start of line
CTRL E = Cursor the end of line
CTRL U = Delete left of the cursor
CTRL K = Delete right of the cursor
CTRL W = Delete word on the left
CTRL Y = Paste (after CTRL U,K or W)
TAB = auto completion of file or command
CTRL R = reverse search history
!! = repeat last command
CTRL Z = stops the current command (resume with fg in foreground or bg in background)

Basic Terminal Navigation

ls -a = list all files and folders
ls <folderName> = list files in folder
ls -lh = Detailed list, Human readable
ls -l *.jpg = list jpeg files only
ls -lh <fileName> = Result for file only

cd <folderName> = change directory
if folder name has spaces use “ “
cd / = go to root
cd .. = go up one folder, tip: ../../../

du -h: Disk usage of folders, human readable
du -ah: “ “ “ files & folders, Human readable
du -sh: only show disc usage of folders

pwd = print working directory

man <command> = shows manual (RTFM)

Basic file manipulation

cat <fileName> = show content of file
(less, more)
head = from the top
-n <#oflines> <fileName>

tail = from the bottom
-n <#oflines> <fileName>

mkdir = create new folder
mkdir myStuff ..
mkdir myStuff/pictures/ ..

cp image.jpg newimage.jpg = copy and rename a file
cp image.jpg <folderName>/ = copy to folder
cp image.jpg folder/sameImageNewName.jpg
cp -R stuff otherStuff = copy and rename a folder
cp *.txt stuff/ = copy all of *<file type> to folder

mv file.txt Documents/ = move file to a folder
mv <folderName> <folderName2> = move folder in folder
mv filename.txt filename2.txt = rename file
mv <fileName> stuff/newfileName
mv <folderName>/ .. = move folder up in hierarchy

rm <fileName> .. = delete file (s)
rm -i <fileName> .. = ask for confirmation each file
rm -f <fileName> = force deletion of a file
rm -r <foldername>/ = delete folder

touch <fileName> = create or update a file

ln file1 file2 = physical link
ln -s file1 file2 = symbolic link

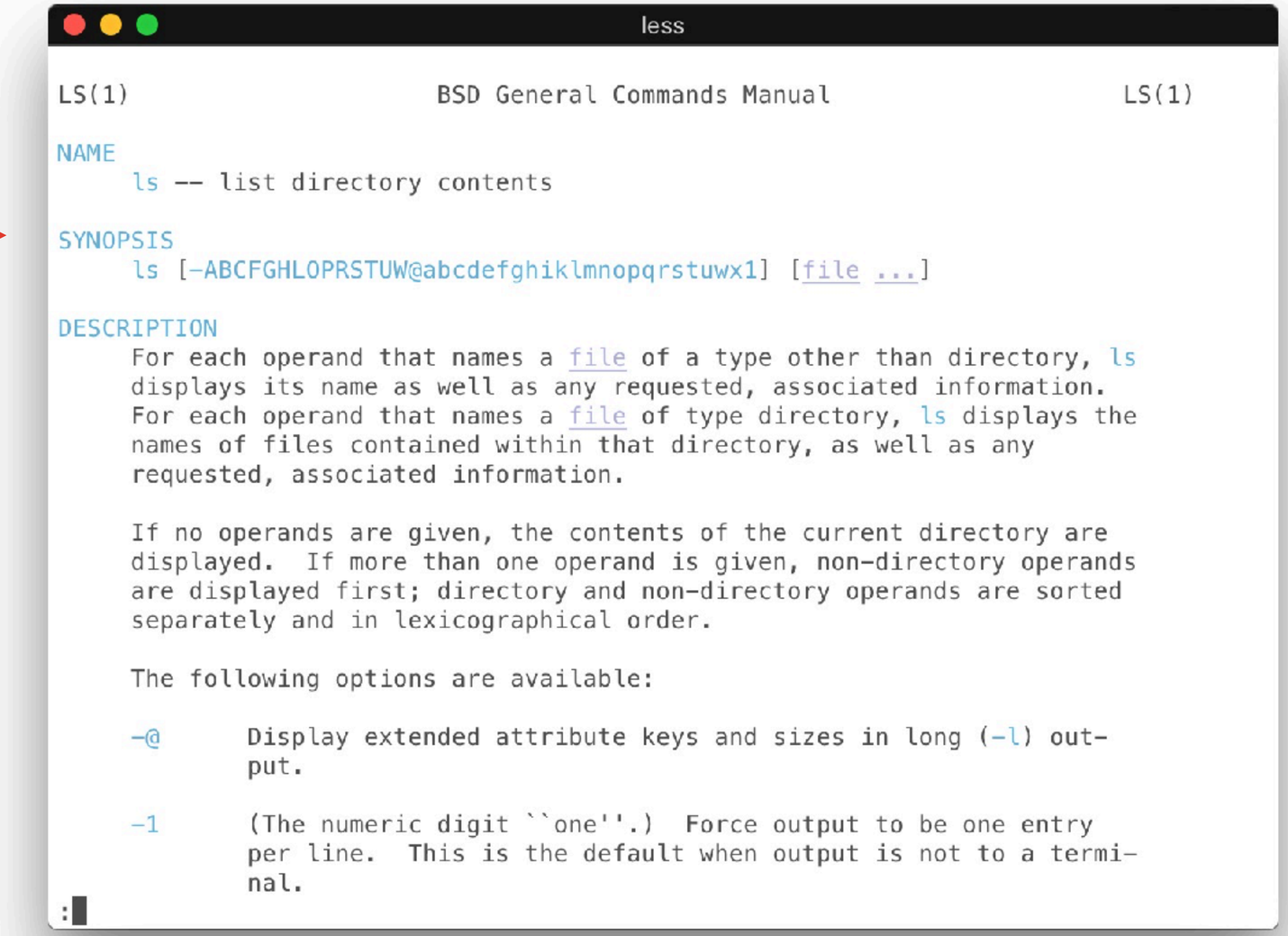
Basics - Your turn 

Read the Manual 

Read the Manual

SHELL

```
man ls
```

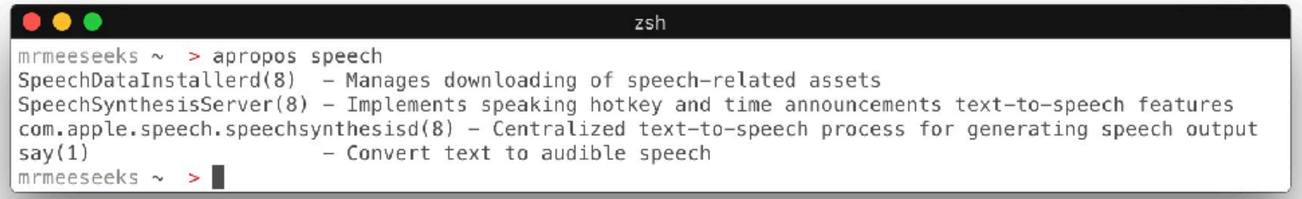


- Use the Arrow keys to scroll up and down.
- Press **Q** to exit the Manual.

Apropos Manual

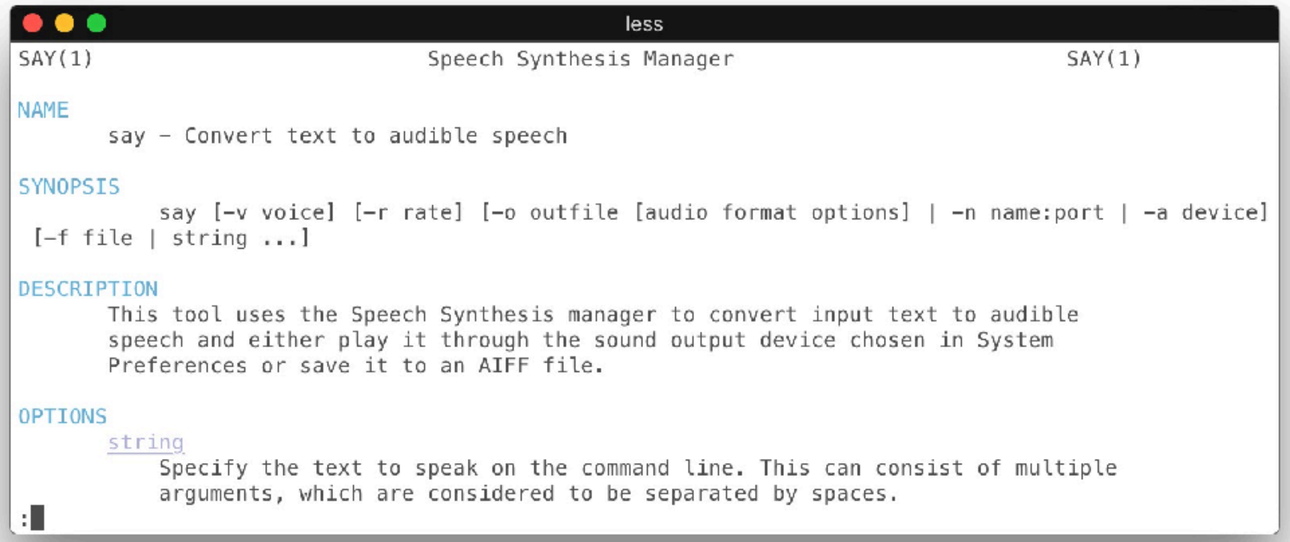
SHELL

```
apropos speech
```



SHELL

```
man say
```

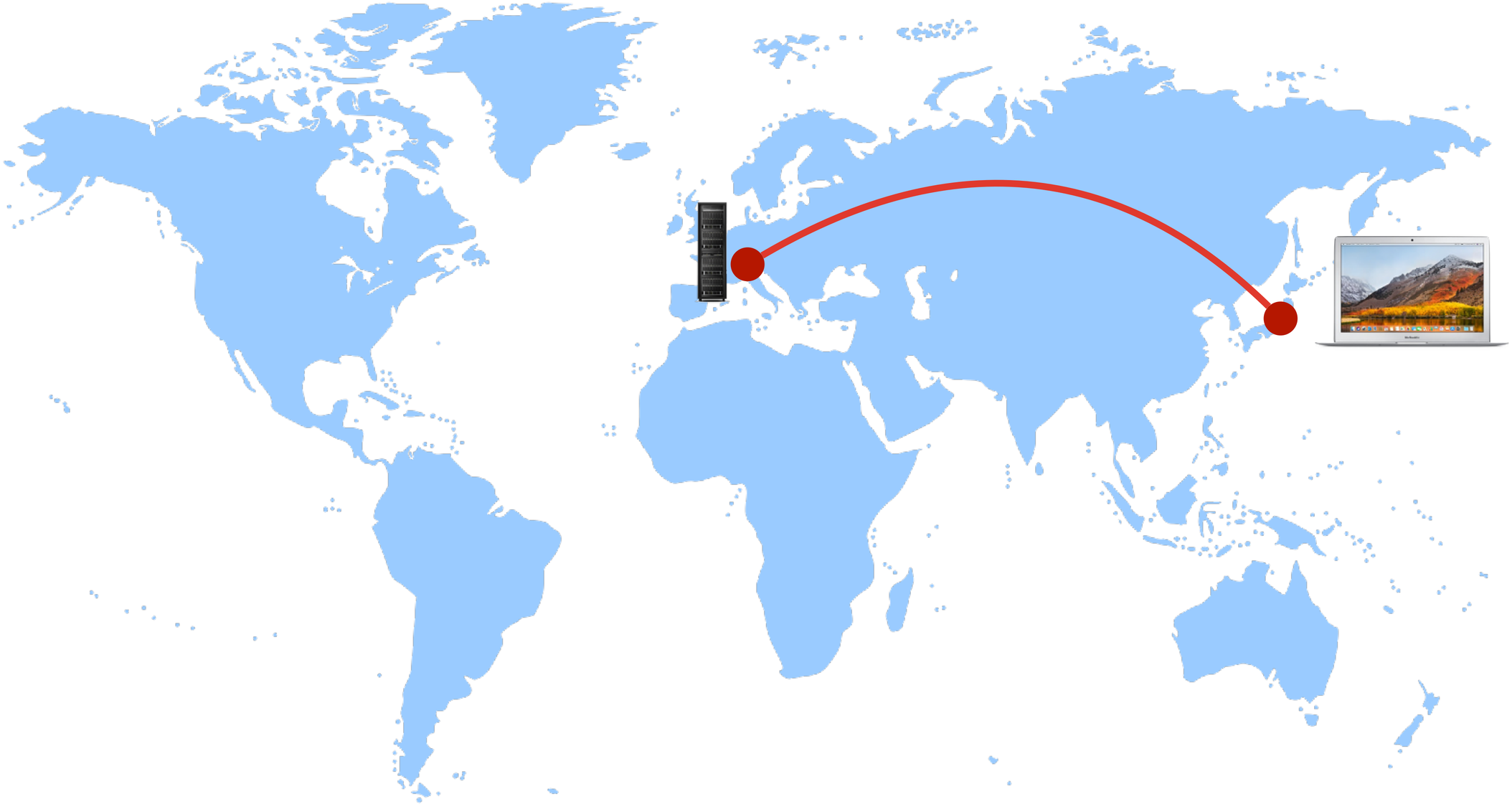


Read the Manual - Demo 🤓

Read the Manual - Your turn 

Connecting to other Computers

Around the world in 200 milliseconds

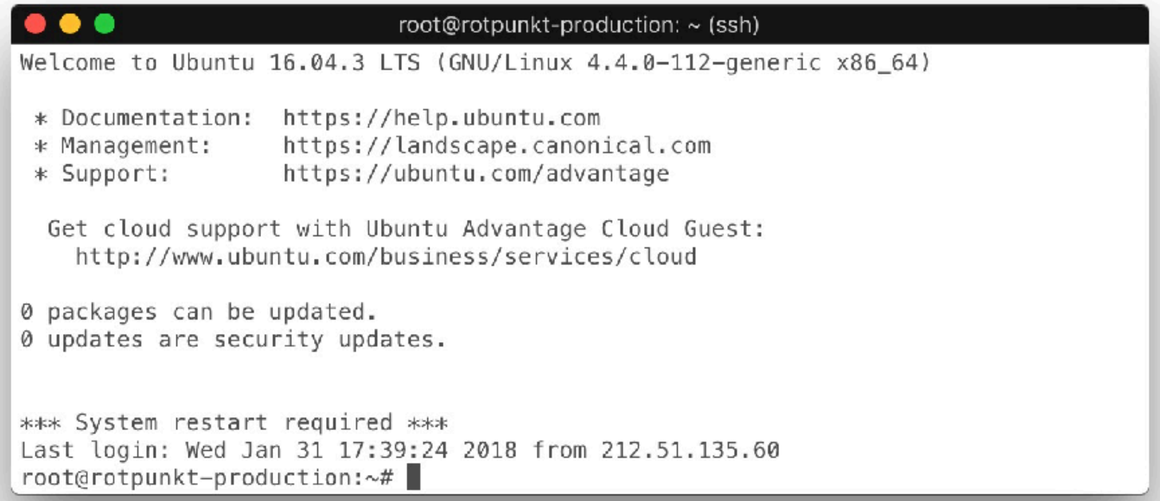


Introducing the Secure Socket Shell (SSH)

SSH is a **network protocol** that provides us with a **secure way to access a remote computer**. SSH is widely used by network administrators for managing systems and applications remotely, allowing them to log in to another computer over a network, execute commands and move files from one computer to another. No GUI required!

SHELL

```
ssh username@rotpunktverlag.ch
```



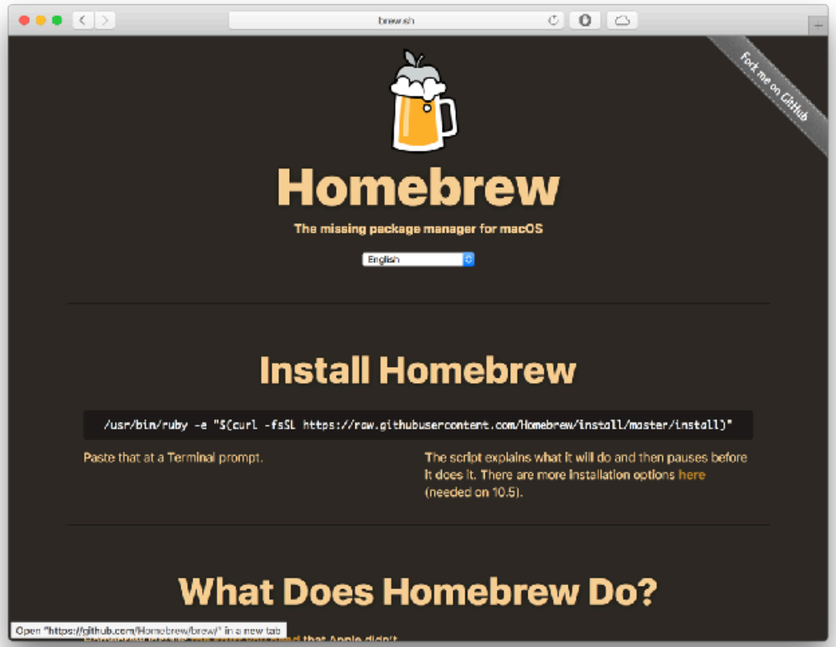
SSH - Demo 🤓

Messing around 

Installing additional tools

Package Managers

- Allow easy installation of CLI tools.
- Take care of dependency management.
- **brew** command on macos
- **apt** command on ubuntu / windows



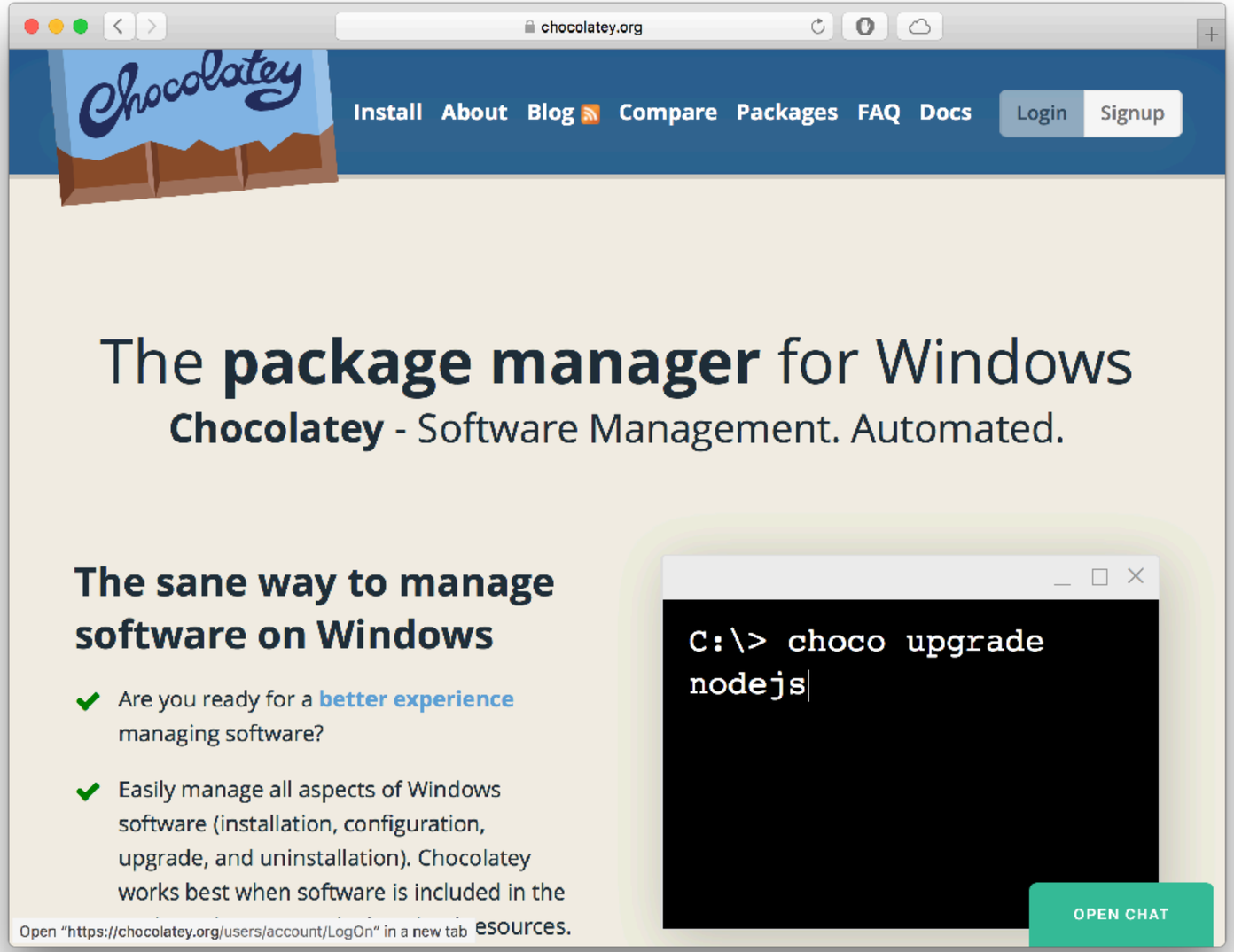
SHELL

```
brew info html2text

brew install html2text
```

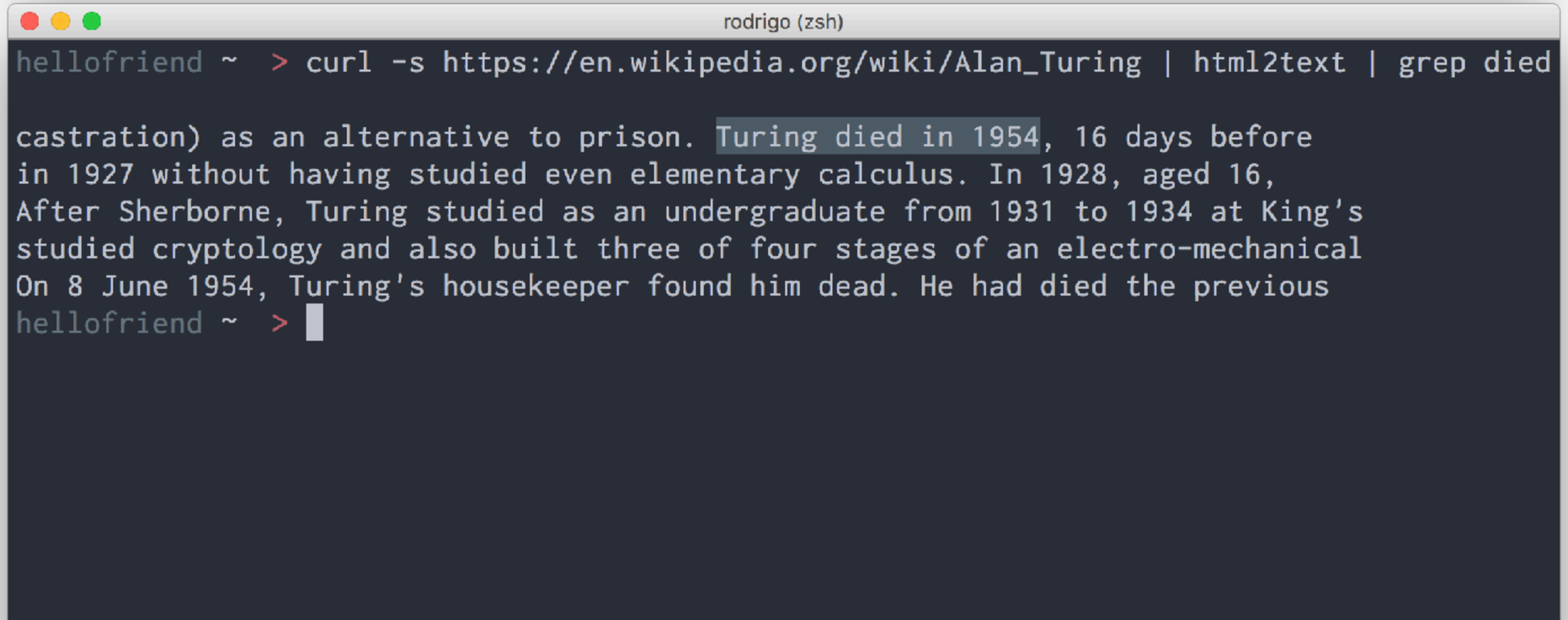
https://www.digitalocean.com/community/tutorials/how-to-manage-packages-in-ubuntu-and-debian-with-apt-get-apt-cache

Windows?


chocolatey.org
Chocolatey
Install About Blog Compare Packages FAQ Docs
Login Signup
The package manager for Windows
Chocolatey - Software Management. Automated.
The sane way to manage software on Windows
Are you ready for a better experience managing software?
Easily manage all aspects of Windows software (installation, configuration, upgrade, and uninstallation). Chocolatey works best when software is included in the
C:\> choco upgrade nodejs
OPEN CHAT
Open "https://chocolatey.org/users/account/LogOn" in a new tab
esources.

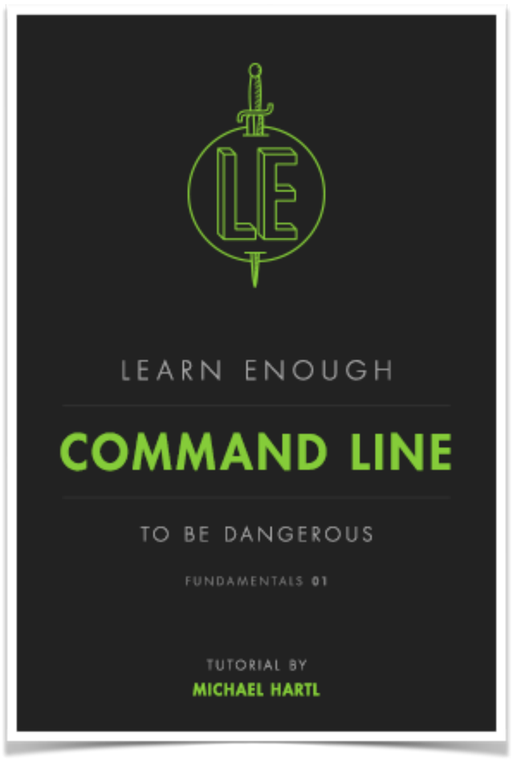
Let’s talk about pipes

Chaining commands together



Messing around - Demo 🤓

Books.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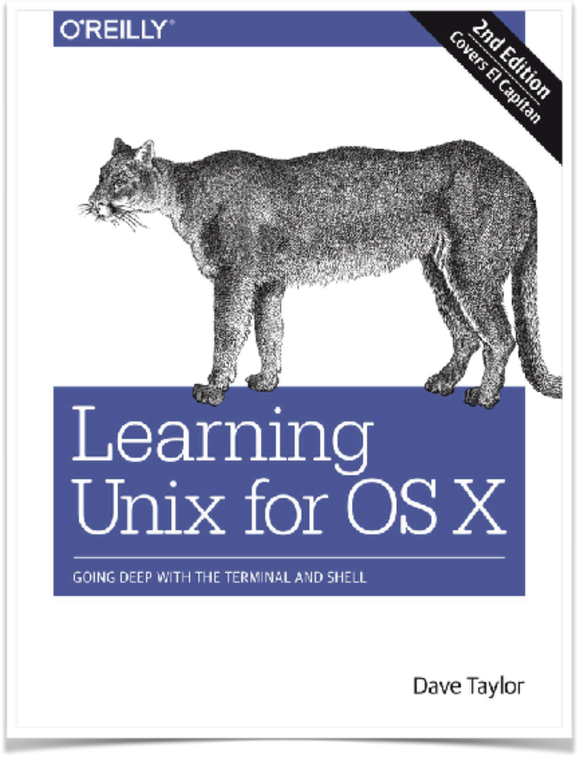
LEARN ENOUGH
COMMAND LINE
TO BE DANGEROUS
FUNDAMENTALS 01
TUTORIAL BY
MICHAEL HARTL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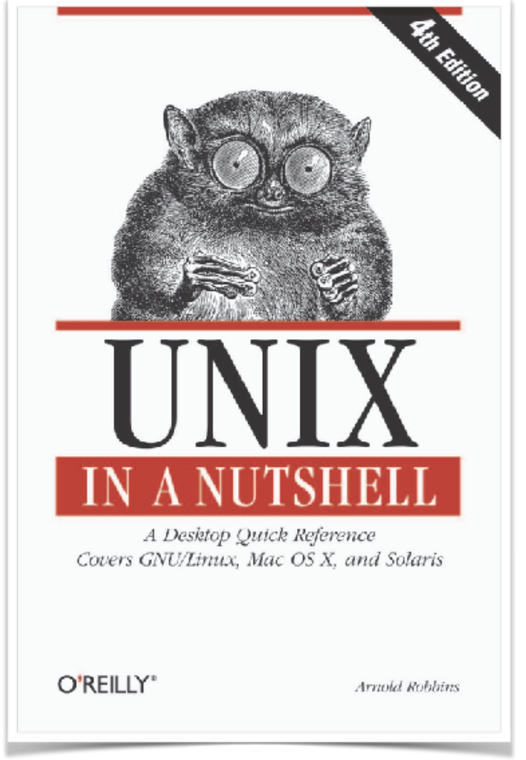
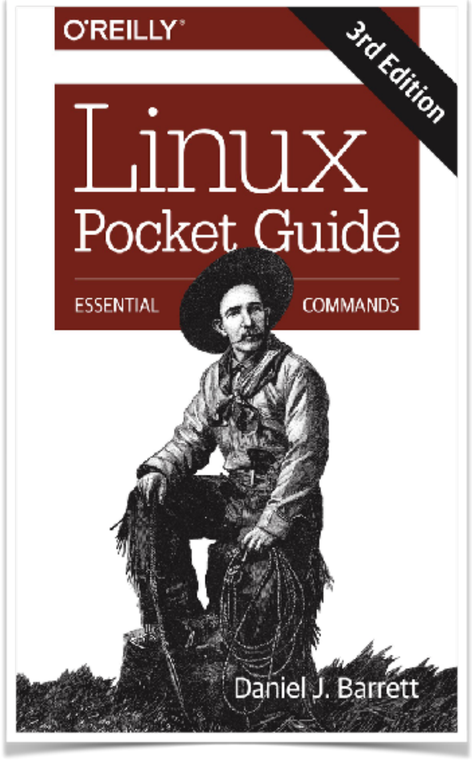
Covers El Capitan
Learning
Unix for OS X
GOING DEEP WITH THE TERMINAL AND SHELL
Dave Taylor


4th Edition
UNIX
IN A NUTSHELL
A Desktop Quick Reference
Covers GNU/Linux, Mac OS X, and Solaris
O'REILLY
Arnold Robbins


O'REILLY
3rd Edition
Linux
Pocket Guide
ESSENTIAL
COMMANDS
Daniel J. Barrett