Objectives

// Use bash commands to perform common operations

// Edit text files using vim

UNIX BASICS

* Many versions, made by different teams and companies (including Apple since 2002)
* Originally a commercial product
* Linux and FreeBSD are *open-source* versions of Unix
* Small, simple commands (like Lego bricks)
* *Everything* is a file

THE SHELL

Command-line interface
- Runs Commands
- Outputs Results

Programming Language
- Runs *shell scripts*

SHELL OPTIONS

* sh (Bourne Shell)
* csh (C shell)
* tcsh
* ksh (Korn Shell)
* **bash (Bourne-again shell)**

* zsh *(popular with web developers)*
Warning: complicates setup of DS tools!
Run `chsh -s /bin/bash` and restart terminal to switch to bash

NAVIGATION COMMANDS

```
* pwd        (display working directory)
* ls         (list directory contents)
* cd         (change directory)
* cp [file] (copy [file])
* mv [file] (move [file])

Names are separated by "/"  (not "\")
```

SPECIAL DIRECTORIES

```
* /    root, the top-level directory
* ~    your home directory
* .    the current directory
* ..   the parent directory
```

NAVIGATING DIRECTORIES

 * Names are paths (addresses)

   → So if you're changing your name, you're moving!

 * **mv** for both moving and renaming

ABSOLUTE AND RELATIVE PATHS

* Absolute: Starting from root (/) or home (~/)

* Relative: Starting from where you are

* Suppose: home
              |-projects
               |-proj1.ipynb
              |-code

    To move from proj1.ipynb to code/:
    EITHER cd ~/code (absolute) OR cd ../../code (relative)

COMMAND LINE OPTIONS

Most commands can take options. Usually.

Single-character options are preceded by `-`
Full-word options are preceded by `--`

 * `python --version`
 * `ls -l`
 * `rm -rf`

TEXT EDITORS

Recommended GUI text editor:
- Visual Studio Code

Recommended CLI text editor:
- vim   (recommended: vim-adventures.com)

//

OPEN GUI EDITOR FROM THE TERMINAL

- `code .`
- `atom .`

//

SURVIVING VIM

- Insert mode (you can type)
- Command mode (each key does something)

The `Esc` key brings you to command mode.

Pressing `i` enters insert mode.
Shift-`A` appends to the end of the line.

//

BASIC VIM COMMANDS

```
* i     (enter insert mode here)
* A     (enter insert mode at end of line)
* dd    (delete a line)
* 10G   (go to line 10)
* :wq   (save and exit)
* :q!   (exit without saving)
```

DEMO!

PROCESSES

Each process has:
* One or more threads
* Memory for stack and heap
* Environment
* Owner and privilege