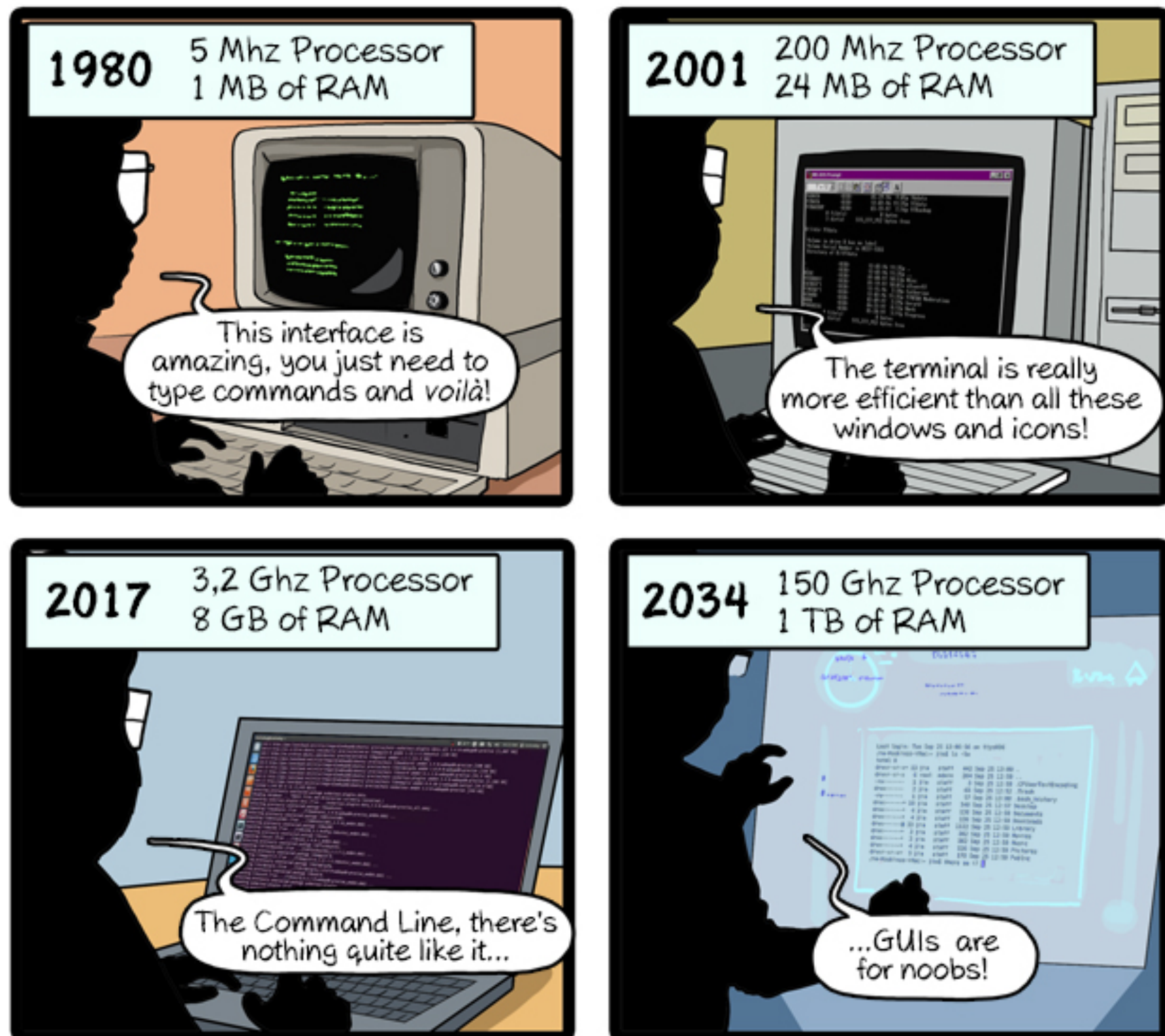


Interacting with the Shell

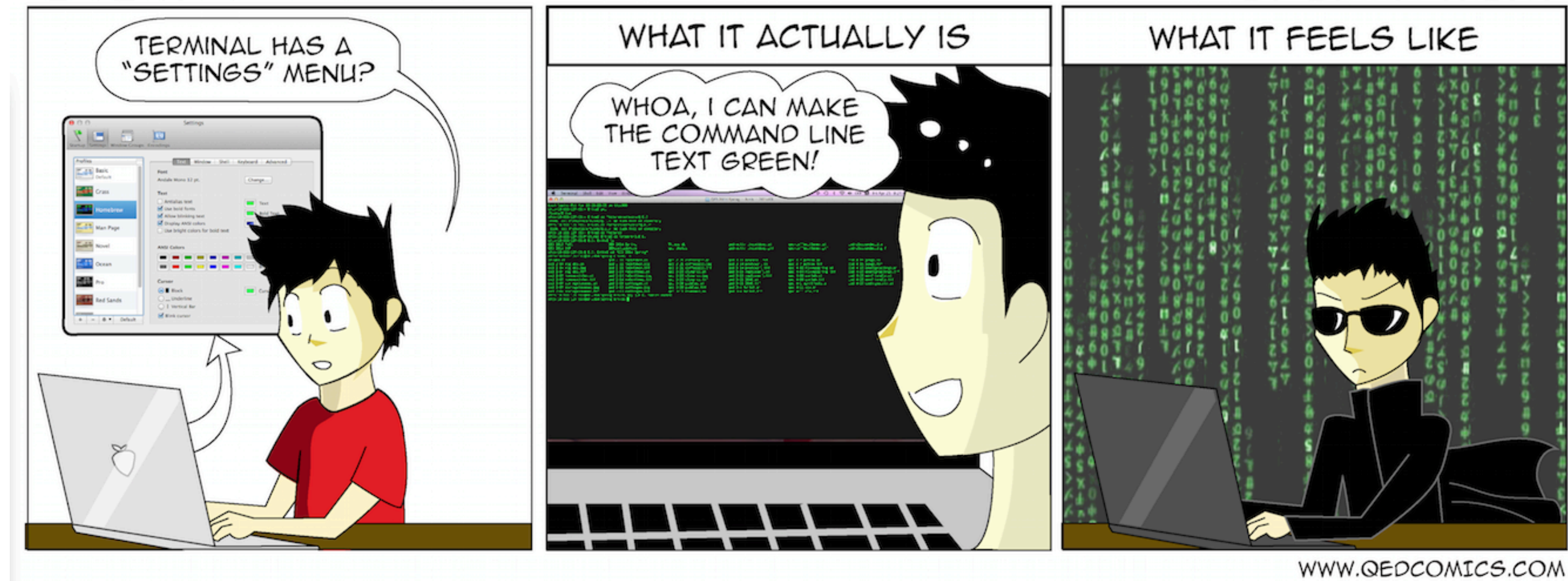
Spring 2021

PCfB Class 2

January 22, 2021



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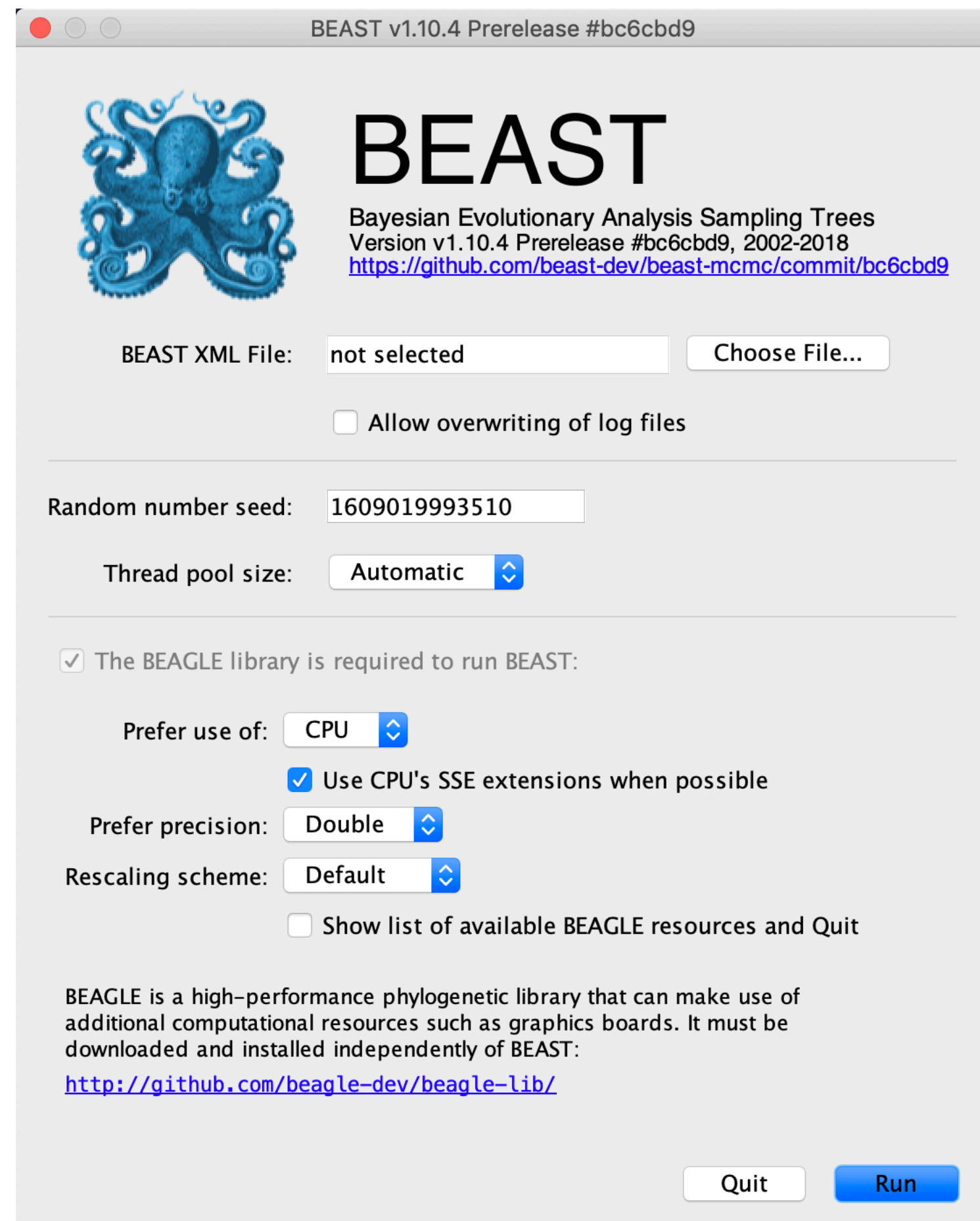
Outline

- Intro to Unix shell
- Configuration files
- Useful commands
- Exercises

Intro to unix shell

GUI vs. Command line

Graphical user interface



Command line/Terminal

```
~ — jtl276@wind:/scratch/jtl276/coronaPepSeq/demux/COVID5 — -bash — 108x21
~ — jtl276@wind:/scratch/jtl276/coronaPepSeq/demux/COVID5 — -bash
(base) JTL-MacBook-Pro:~ jtladner$
(base) JTL-MacBook-Pro:~ jtladner$
(base) JTL-MacBook-Pro:~ jtladner$
(base) JTL-MacBook-Pro:~ jtladner$ ~/programs/bin/beast -help
Failed to load BEAGLE library: no hmsbeagle-jni in java.library.path
Usage: beast [-verbose] [-warnings] [-strict] [-window] [-options] [-working] [-seed] [-prefix <PREFIX>] [
-overwrite] [-errors <i>] [-threads <i>] [-java] [-tests] [-threshold <r>] [-adaptation_off] [-adaptation_ta
rget <r>] [-beagle] [-beagle_info] [-beagle_order <order>] [-beagle_instances <i>] [-beagle_multipartition <
auto|on|off>] [-beagle_CPU] [-beagle_GPU] [-beagle_SSE] [-beagle_SSE_off] [-beagle_threading_off] [-beagle_t
hread_count <i>] [-beagle_cuda] [-beagle_openc1] [-beagle_single] [-beagle_double] [-beagle_async] [-beagle_
scaling <default|dynamic|delayed|always|none>] [-beagle_delay_scaling_off] [-beagle_rescale] [-mpi] [-partic
les <FOLDER>] [-mc3_chains <i>] [-mc3_delta <r>] [-mc3_temperatures] [-mc3_swap <i>] [-load_state <FILENAME>
] [-save_stem <FILENAME>] [-save_at] [-save_every] [-save_state <FILENAME>] [-force_resume] [-citations_file
<FILENAME>] [-version] [-help] [<input-file-name>]
-verbose Give verbose XML parsing messages
-warnings Show warning messages about BEAST XML file
-strict Fail on non-conforming BEAST XML file
-window Provide a console window
-options Display an options dialog
-working Change working directory to input file's directory
-seed Specify a random number generator seed
```

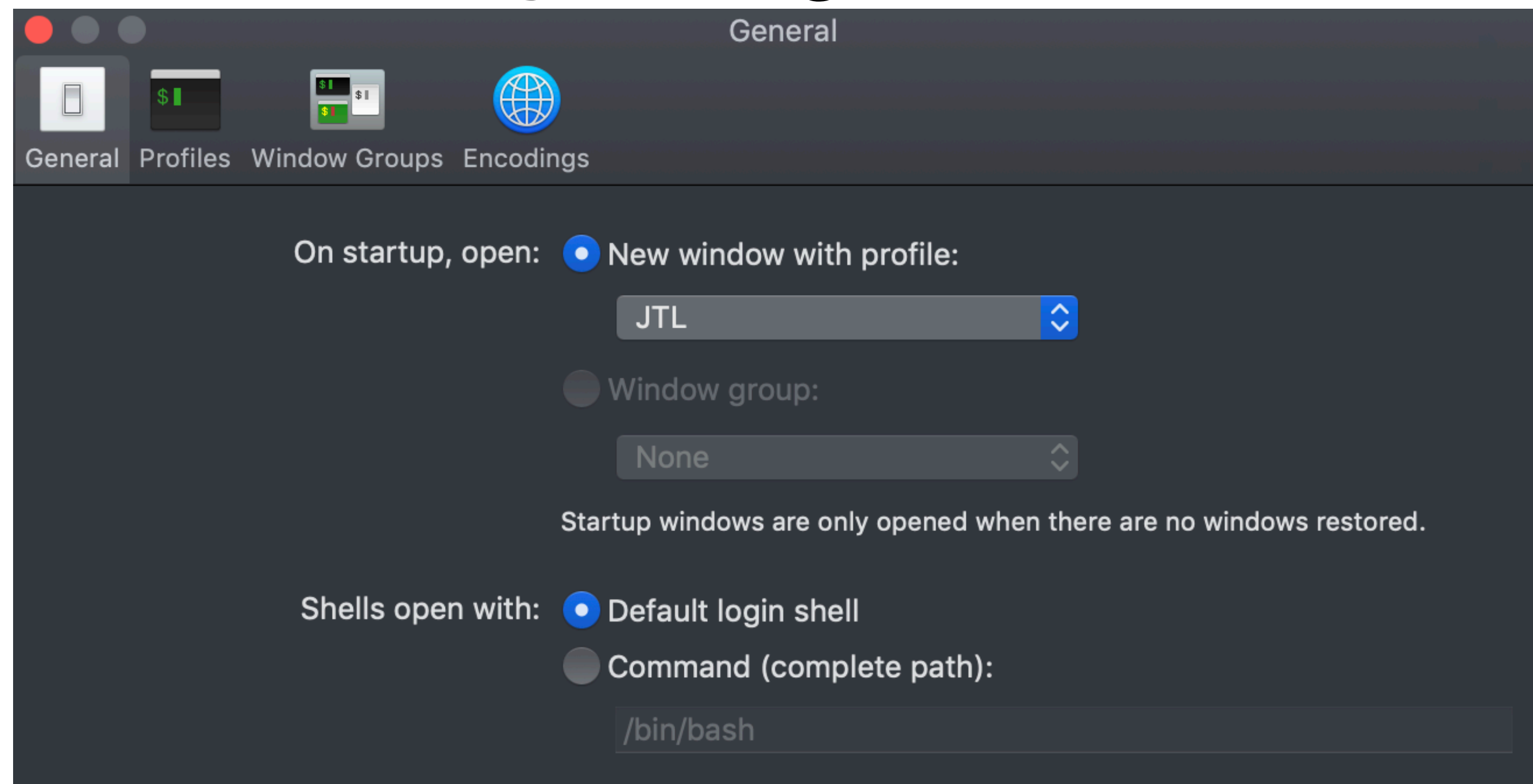
Unix Shell

- Command-line interpreter
- A programming language
- Commands can be entered by a user or read from a file

Available shells on my computer

```
[mggen115:combo jtladner$ ls -l /bin/*sh*  
-r-xr-xr-x  1 root  wheel   618448 Oct 25  2017 /bin/bash  
-rwxr-xr-x  1 root  wheel   380016 Mar 27 21:03 /bin/csh  
-r-xr-xr-x  1 root  wheel  1287040 Oct 25  2017 /bin/ksh  
-r-xr-xr-x  1 root  wheel   618512 Oct 25  2017 /bin/sh  
-rwxr-xr-x  1 root  wheel   380016 Mar 27 21:03 /bin/tcsh  
-rwxr-xr-x  1 root  wheel   610288 Oct 25  2017 /bin/zsh
```

Can easily change default shell

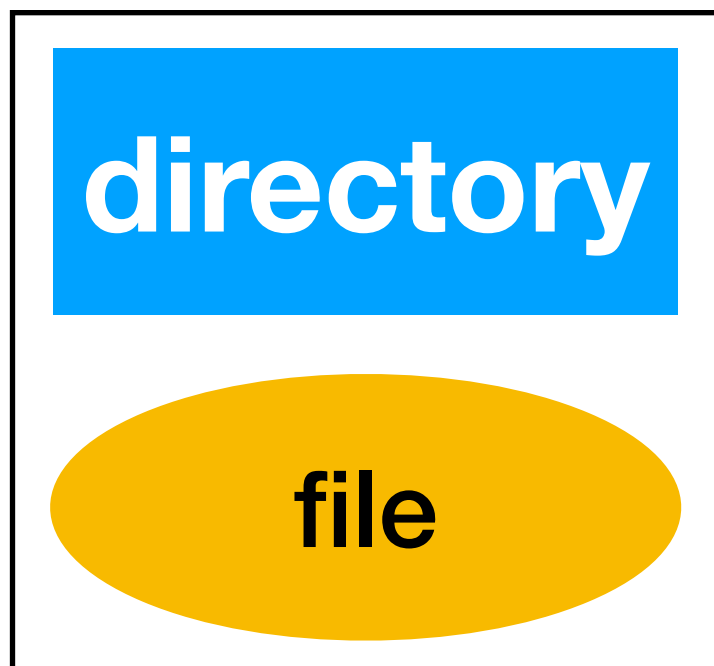
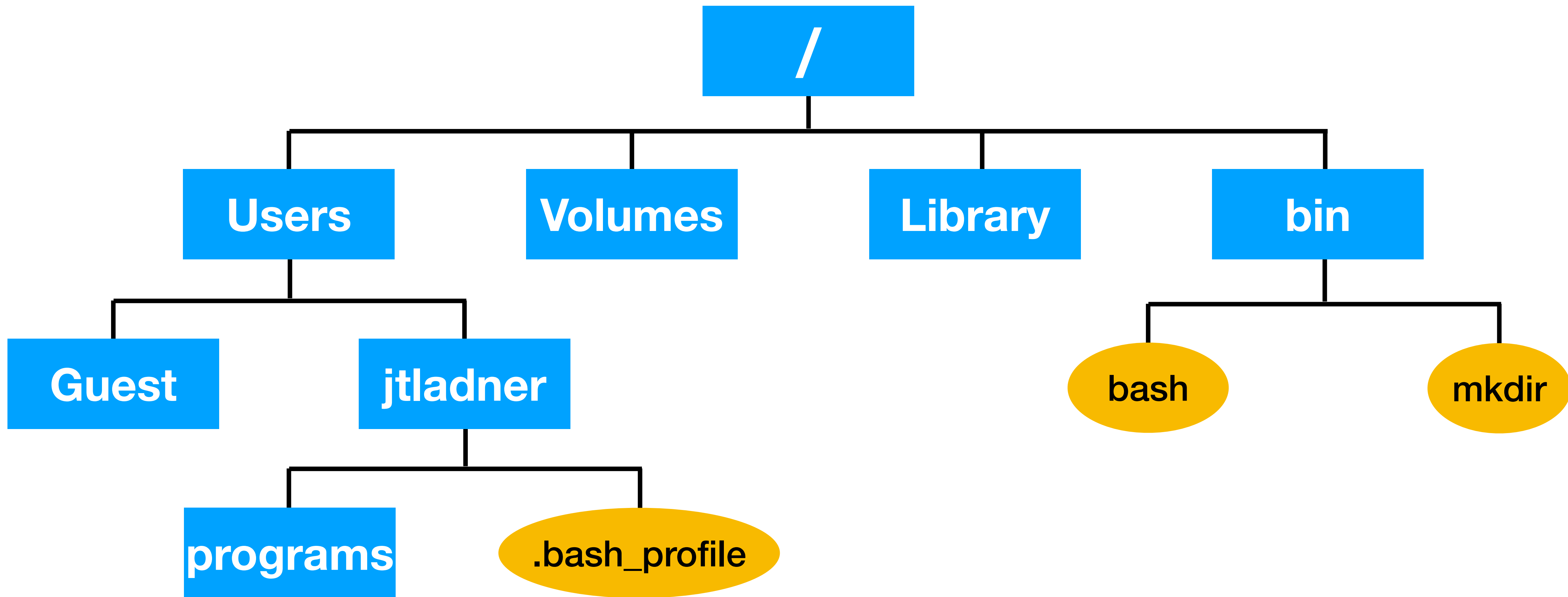


Be careful!

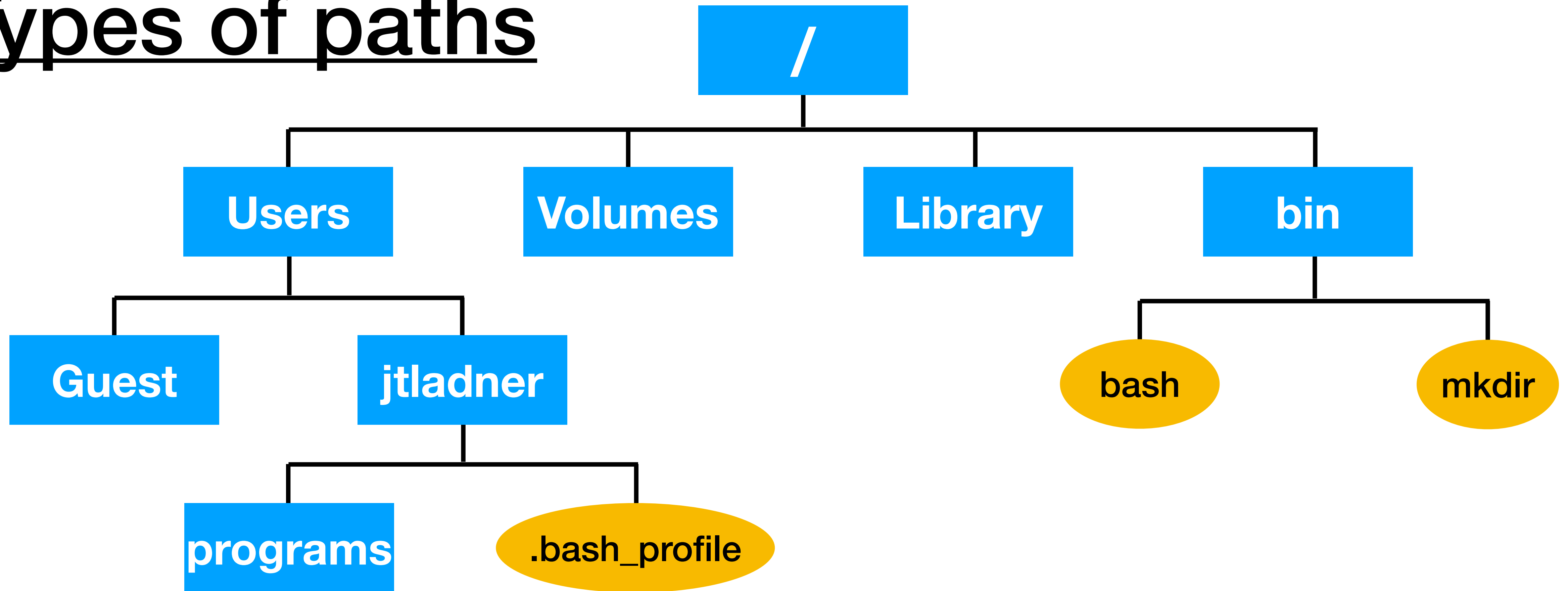


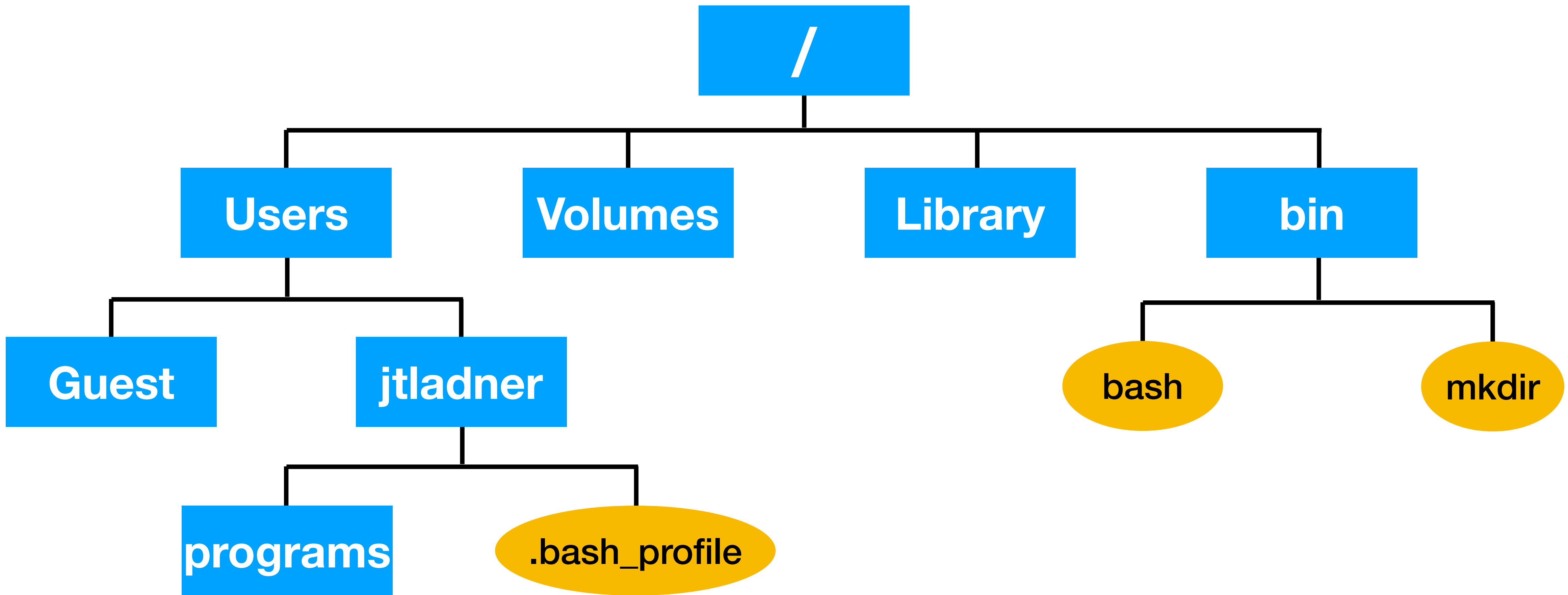
- The shell will not ask for confirmation before permanently deleting files from your computer
- Deleted files are NOT moved to the trash
- No Undo (ctrl-z)

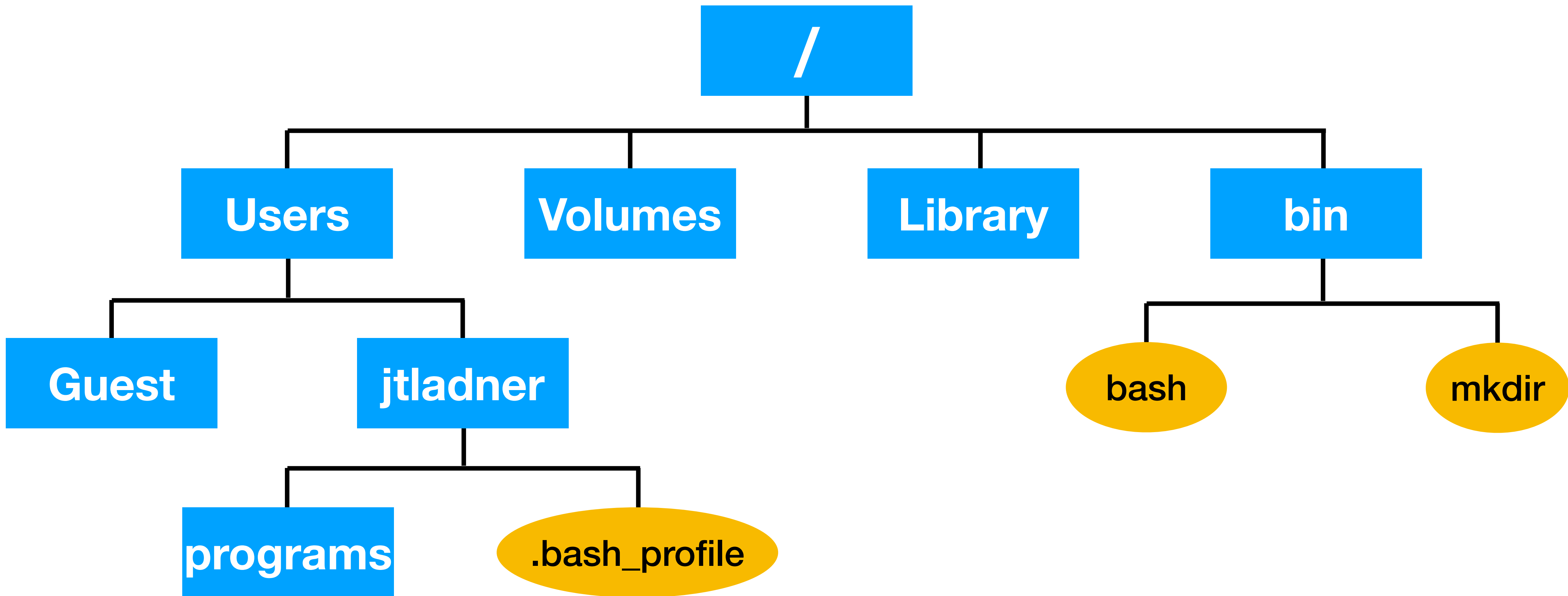
Filesystem structure

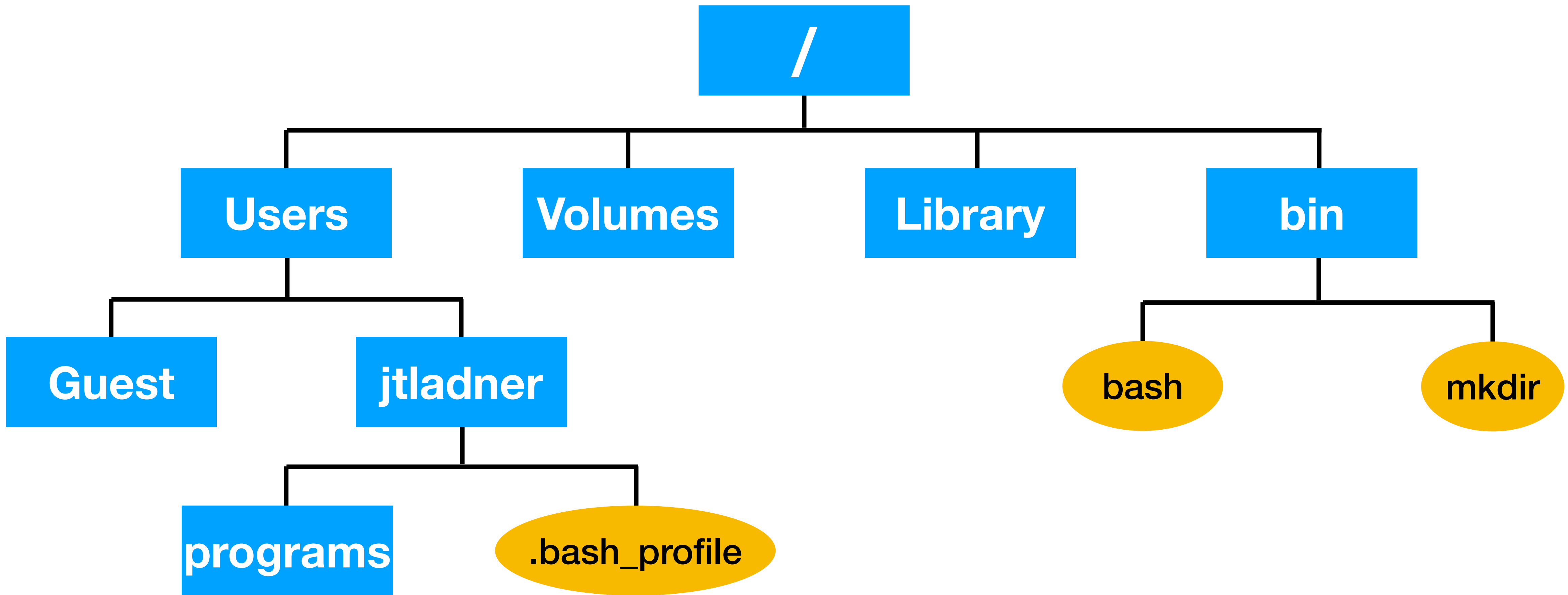


Types of paths









Configuration files

Practically speaking...

- For Mac OSX:
 - You only need `.bash_profile`
 - Terminal.app runs login shell for each new window, by default
- For Linux:
 - Use `.bashrc` for most settings
 - Execute `.bashrc` within `.bash_profile` (instructions on GitHub)

set -o noclobber

- Protects you from accidentally overwriting files that already exist

```
mggen115:~ jtladner$ cd Desktop/  
mggen115:Desktop jtladner$ ls -l >text.txt  
mggen115:Desktop jtladner$ ls -l >text.txt  
-bash: text.txt: cannot overwrite existing file  
mggen115:Desktop jtladner$
```



```
bind '"\e[A": history-search-backward'
```

```
bind '"\e[B": history-search-forward'
```

- Subtle change to behavior of up and down arrow keys
- Still scroll through command history...
 - but now if you start typing a command, you will only scroll through commands that match what you have started typing

HISTTIMEFORMAT="%d/%m/%y %T "

- Adds time stamp to each command from history

```
~/Documents/GitHub/PracticalComputing_Spring2021/Week02_Shell-pt1/Assignment — jtl276@wind:/scratch/jtl276/coronaPepSeq/demux/COVID5 —...
[(base) JTL-MacBook-Pro:Assignment jtladner$ history | tail -n 10
526 26/12/20 16:40:49 cd
527 26/12/20 16:40:51 cd cd ~/Documents/GitHub/PracticalComputing_Spring2021/Week02_Shell-pt1/Assignment
528 26/12/20 16:40:55 cd ~/Documents/GitHub/PracticalComputing_Spring2021/Week02_Shell-pt1/Assignment
529 26/12/20 16:40:58 ls -ltr
530 27/12/20 10:39:01 ls -l /bin/*sh
531 27/12/20 10:39:07 clear
532 27/12/20 10:39:10 ls -l /bin/*sh
533 27/12/20 10:41:12 man set
534 27/12/20 10:51:41 clear
535 27/12/20 10:51:45 history | tail -n 10
```

source command

- Changes to your `.bash_profile/.bashrc` will not automatically take effect within your current session
- 2 options:
 1. Open a new terminal window
 2. `source ~/.bash_profile`

Configuration demo

Useful commands

Getting around

pwd

ls

cd

Create/modify/delete files

cp

mv

rm

Create/delete directories

`mkdir`

`rmdir`

history

| (pipe)

Commands covered in reading

Getting around

- cd
- ls
- pwd

Creating/deleting files

- cp
- mv
- rm
- mkdir
- rmdir

Other

- grep
- cat
- curl
- man (-k)
- history

View/edit text

- less
- nano/pico

Data flow

- >
- >>
- |

Questions?

Other useful
commands

Extracting parts of files

head

tail

Quantify file contents

`wc`

`grep -c`

rename

Keyboard shortcuts

ctrl-a

ctrl-e

ctrl-u

ctrl-k

**Terminal
demos**

Assignment