Why bother with Unix?

- Mac OS X is built on top of Unix
- Programs written for Unix or Linux can usually be compiled to run in OS X
- Many open-source programs run on Unix
- In science and computer science you will eventually run into it
- Working with a command line is a useful skill
Opening the shell
The opened shell
Some tips

- Directories, not folders
- Use the tab key to autocomplete
- Files and directories are case-sensitive
- Current directory: .
- Parent directory: ..
- Root directory: /
- Absolute paths: /<pathname>
- Relative paths: <pathname>
- Repeat command(s): up arrow
Moving around directories

- Change directory to new_dir:
  `cd new_dir`
- Move one level up:
  `cd ..`
- Change to root directory:
  `cd`

![Terminal output](image)
Try It

- Find the directory above the one that you are in. What is it called?
- Try changing to another directory
- Go to the root directory
Seeing files in the directory

- List directory contents alphabetically: `ls`
- **Lots** of options. A few...
  - List all files (including hidden): `ls -a`
  - List one per line: `ls -1`
  - List in columns: `ls -C`
  - You can combine options: `ls -1ta`
  - Order by last file change time: `ls -t`
Seeing files in the directory

tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls
cd.png  man_page.png  terminal-open.png
Mac_Unix.odp  Open-Terminal.jpg
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls -1
cd.png
Mac_Unix.odp
man_page.png
Open-Terminal.jpg
terminal-open.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls -tC
cd.png  Mac_Unix.odp  Open-Terminal.jpg
man_page.png  terminal-open.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls -aC
.  cd.png  Mac_Unix.odp  Open-Terminal.jpg
..  ~lock.Mac_Unix.odp#  man_page.png  terminal-open.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$
Try It

- What files are in the root directory?
- Which files were changed most recently?
Getting more info

- Manual pages (man page) available for commands:
  
  \texttt{man \textless \textit{command}\textgreater}

- Example: \texttt{man ls}

- 'q' to leave man page
Try It

- Skim over the man page for man to see what you can find and look at some examples:
  ```
  man man
  ```
- Try man ls
- Find all of the man pages with the word “copy” in them:
  ```
  man -k copy
  ```
Copying Files

• Copy a file:
  
cp <old_name> <new_name>
  or cp <old_name> <new_path>

```
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ cp mv.png mv2.png

tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls

cd.png  MathBio.aux  MathBio.tex  Open-Terminal.jpg
create_delete.png  MathBio.log  MathBio.toc  SortItems.doc
ls.png  MathBio.nav  MobyDick.txt  terminal-open.png
Mac Unix.odp  MathBio.out  ModelSort.doc  x.log
Mac Unix.pdf  MathBio.pdf  mv2.png
man_page.png  MathBio.snmm  mv.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ cp mv.png ../mv.png

tagsit@pica:~/Documents/Workshop2012/MyPresentations$ cd ..

tagsit@pica:~/Documents/Workshop2012$ ls

30169.full.pdf  Exercise1-Responses.lyx
9ToyLRAK.bngl  MaclinuxPresentationGuidelines.txt
beej-8-R1.pdf  mv.png
BioNetGenChapter.pdf  MyPresentations
ClassMaterial  NewRuleBuilder
Draft2012  PartialWiringDiagramToyModel.pdf
Exercise1.bngl  ToyModelExercises.pdf
Exercise1-Responses.lyx  WiringDiagrams.pdf
```
Try It

- Find a file in root directory and copy it into your home directory.
- Use `cp -r <old_dir> <new_dir>` to copy a directory into your home directory. (Make sure there's not too much in it!)
Moving/Renaming Files

- Move a file to a new directory:
  `mv <old_name> <new_path>`
- Rename a file and don't move it:
  `mv <old_name> <new_name>`
Try It

- Using some of the files that you have copied, rename them and move them around.
Creating/deleting files and directories

- Create directory: mkdir <directory>
- Create an empty file: touch <name>
- Deleting file: rm <name>
- Deleting empty directory: rmdir <directory>
Try It

• Create directory to hold your work from this workshop.

• Remove the directory that you copied from “root”.
  – Make sure you are working with the copy!
  – You will have to delete all file contents before you remove the directory
  – Deleting all files in a directory: `rm *`
Some concerns...

- You can delete all of your files more easily than when using the GUI
- The shell will not ask “Are you sure?”
- It is possible to affect the system

BUT

- If you are just a little careful, you will be fine