

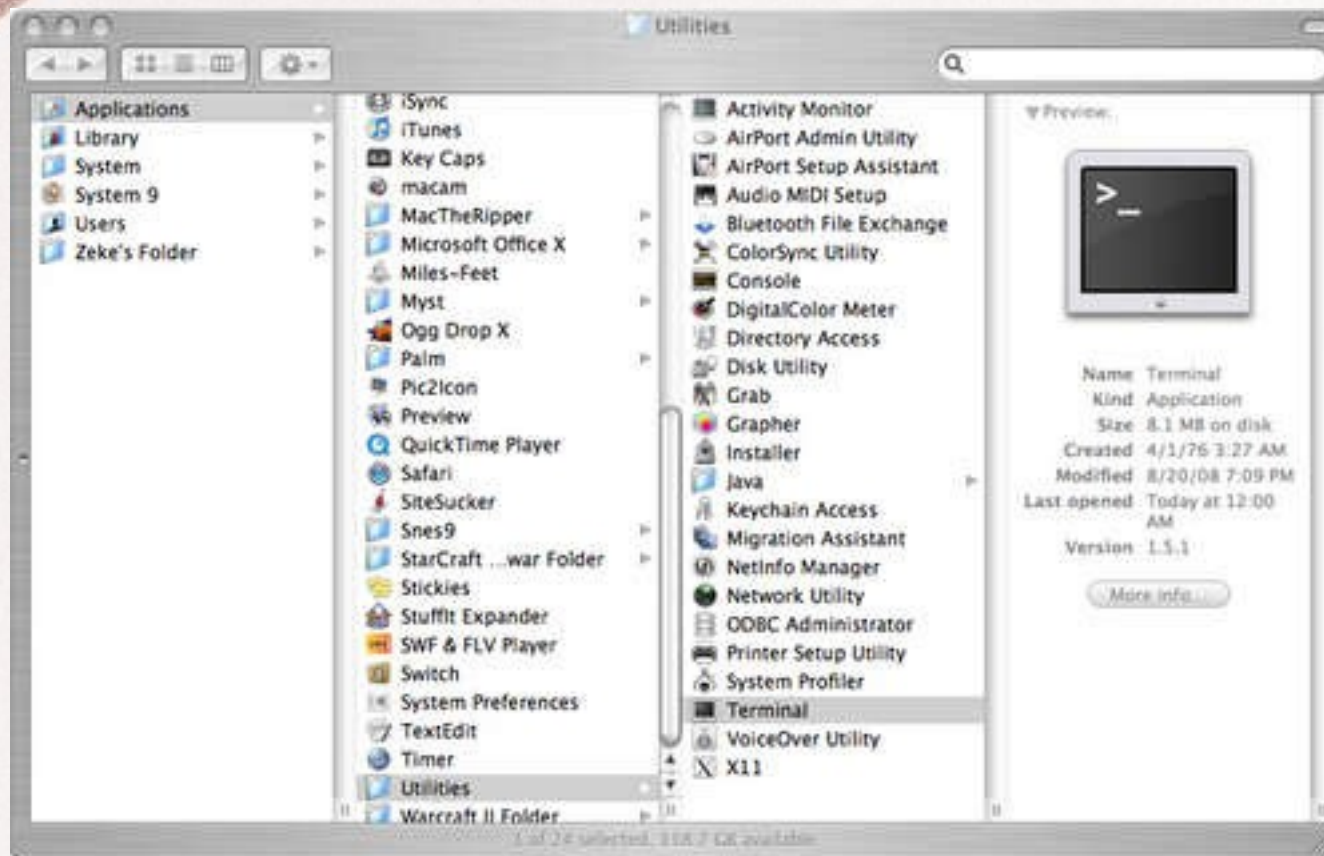
Using Unix on Mac Os

Terri A. Grosso

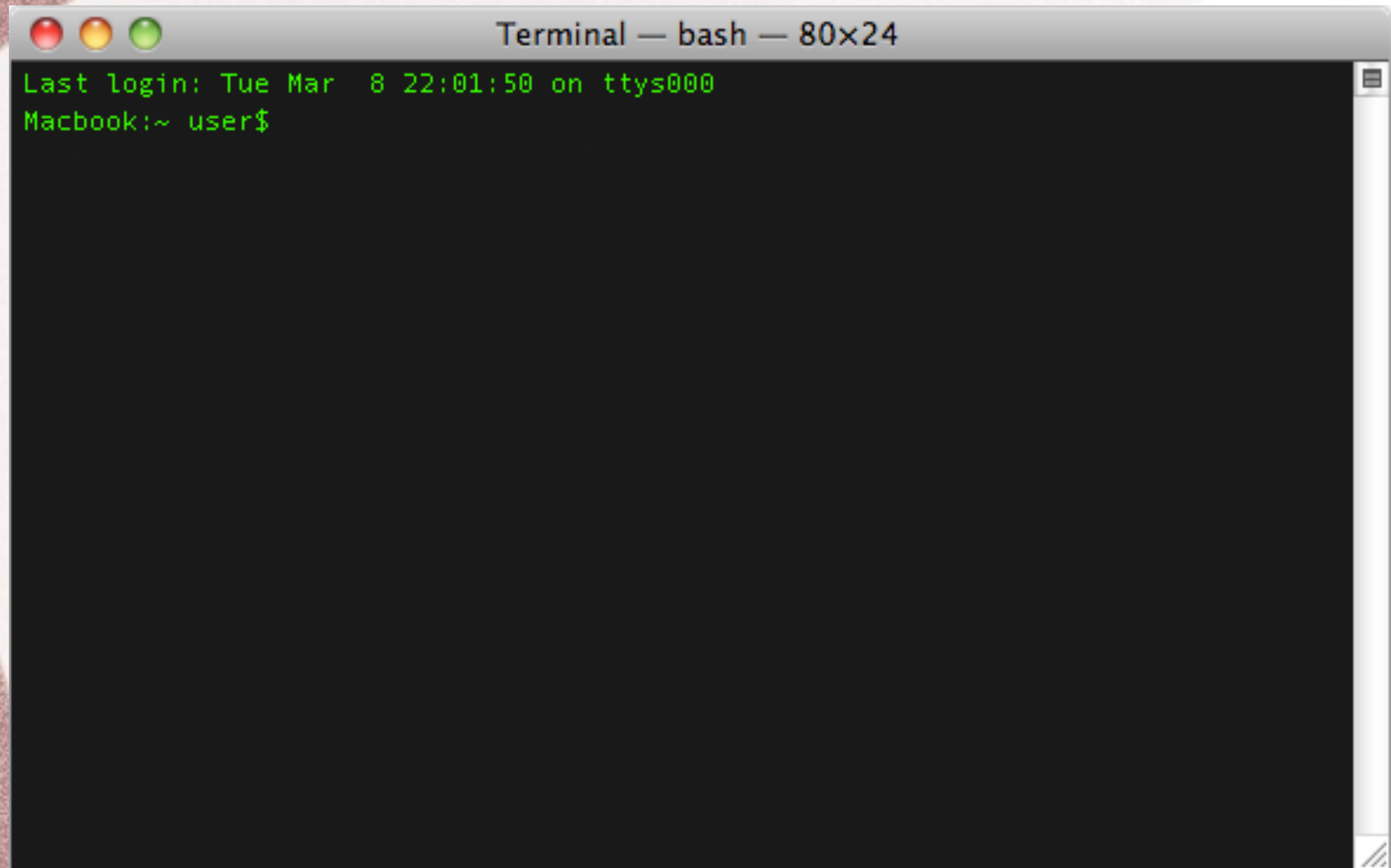
Why bother with Unix?

- 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`

```
File Edit View Terminal Help
tagsit@pica:~$ cd Documents
tagsit@pica:~/Documents$ cd GraduateSchool/
tagsit@pica:~/Documents/GraduateSchool$ cd ..
tagsit@pica:~/Documents$ cd Workshop2012/
tagsit@pica:~/Documents/Workshop2012$ cd
tagsit@pica:~$
```


Try It

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

File Edit View Terminal Help

```
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 -l
```

```
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

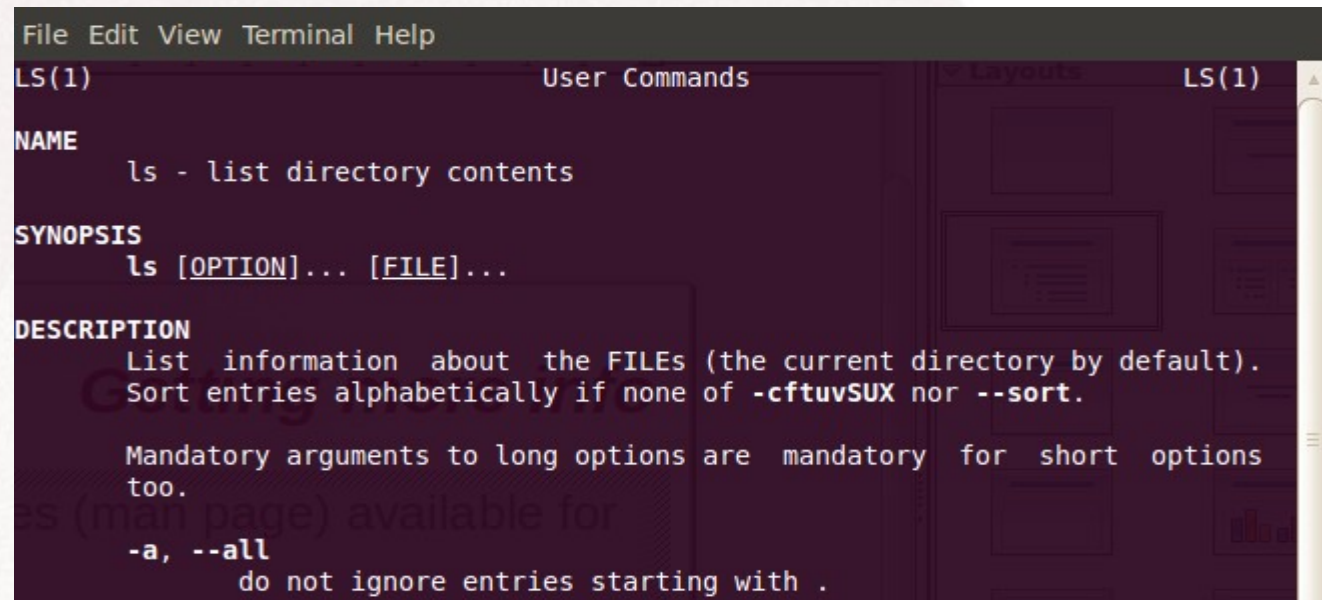
- What files are in the root directory?
- Which files were changed most recently?

Getting more info

- Manual pages (man page) available for commands:

`man <command>`

- Example: `man ls`



The screenshot shows a terminal window with a dark background and light-colored text. The window title is "File Edit View Terminal Help". The main content area displays the manual page for the "ls" command. The page is divided into sections: "NAME", "SYNOPSIS", and "DESCRIPTION". The "NAME" section shows "ls - list directory contents". The "SYNOPSIS" section shows "ls [OPTION]... [FILE]...". The "DESCRIPTION" section contains text about listing information about files and sorting options. The terminal window also shows a "Layouts" sidebar on the right side.

```
File Edit View Terminal Help
LS(1)                                User Commands                                LS(1)
NAME
    ls - list directory contents

SYNOPSIS
    ls [OPTION]... [FILE]...

DESCRIPTION
    List information about the FILES (the current directory by default).
    Sort entries alphabetically if none of -cftuvSUX nor --sort.

    Mandatory arguments to long options are mandatory for short options
    too.

    -a, --all
        do not ignore entries starting with .
```

- '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>

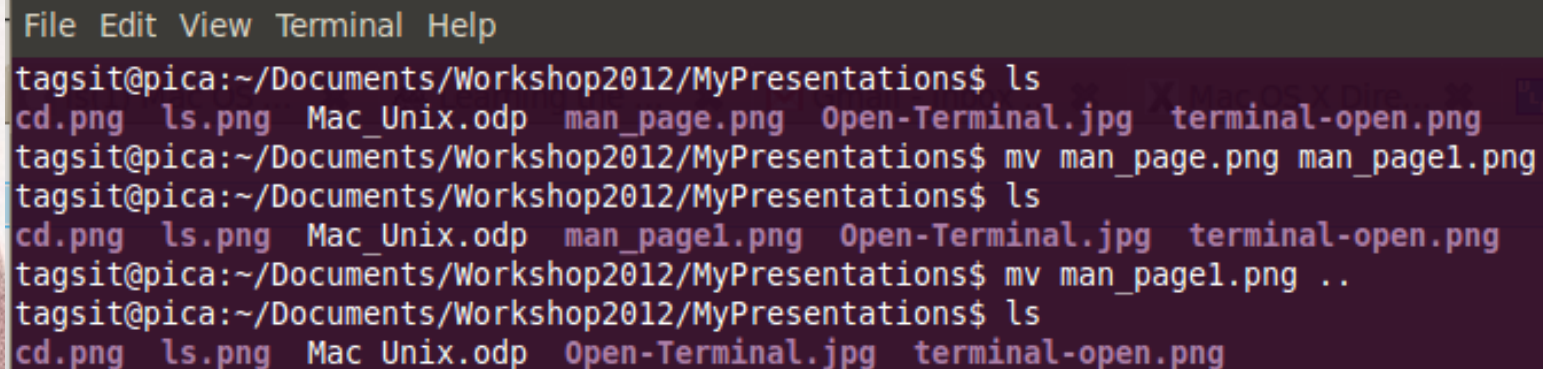
```
File Edit View Terminal Help
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ cp mv.png mv2.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls
cd.png          MathBio.aux    MathBio.tex    Open-Terminal.jpg
create_delete.png MathBio.log    MathBio.toc    SortItems.doc
ls.png          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.snm    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      Exercisel-Responses.lyx~
9ToyLRAK.bngl       MacLinuxPresentationGuidelines.txt
beej-8-R1.pdf       mv.png
BioNetGenChapter.pdf MyPresentations
ClassMaterial        NewRuleBuilder
Draft2012            PartialWiringDiagramToyModel.pdf
Exercisel.bngl       ToyModelExercises.pdf
Exercisel-Responses.lyx WiringDiagrams.pdf
tagsit@pica:~/Documents/Workshop2012$
```

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>`

A screenshot of a macOS Terminal window. The title bar shows 'File Edit View Terminal Help'. The terminal text shows a user named 'tagsit' at a machine named 'pica' in the directory '~/Documents/Workshop2012/MyPresentations'. The user runs 'ls' and lists files: 'cd.png', 'ls.png', 'Mac_Unix.odp', 'man_page.png', 'Open-Terminal.jpg', and 'terminal-open.png'. Then they run 'mv man_page.png man_page1.png'. They run 'ls' again, and the list now includes 'man_page1.png'. Finally, they run 'mv man_page1.png ..' and run 'ls' one more time, showing the file has moved to the parent directory.

```
File Edit View Terminal Help
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls
cd.png  ls.png  Mac_Unix.odp  man_page.png  Open-Terminal.jpg  terminal-open.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ mv man_page.png man_page1.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls
cd.png  ls.png  Mac_Unix.odp  man_page1.png  Open-Terminal.jpg  terminal-open.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ mv man_page1.png ..
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls
cd.png  ls.png  Mac_Unix.odp  Open-Terminal.jpg  terminal-open.png
```

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>`

```
File Edit View Terminal Help
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ mkdir stuff
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls
cd.png  Mac_Unix.odp  mv2.png  Open-Terminal.jpg  terminal-open.png
ls.png  man_page.png  mv.png   stuff
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ cd stuff
tagsit@pica:~/Documents/Workshop2012/MyPresentations/stuff$ touch foo.txt
tagsit@pica:~/Documents/Workshop2012/MyPresentations/stuff$ ls
foo.txt
tagsit@pica:~/Documents/Workshop2012/MyPresentations/stuff$ cd ..
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ rmdir stuff
rmdir: failed to remove `stuff': Directory not empty
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ rm stuff/foo.txt
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ rmdir stuff
tagsit@pica:~/Documents/Workshop2012/MyPresentations$ ls
cd.png  Mac_Unix.odp  mv2.png  Open-Terminal.jpg
ls.png  man_page.png  mv.png   terminal-open.png
tagsit@pica:~/Documents/Workshop2012/MyPresentations$
```

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