

Lab 0 Objectives

- Intro to Labs
- Intro to Operating Systems
- Start Lab #0
 - UNIX/Linux intro
 - Use jEdit (Text Editor)
 - Create Web page
 - Sakai (Forum for “Broader Issues”)

Intro to Labs

- Introduce Student Assistants
 - Collin Glatz '20
 - Rinn Joireman '21
- 3 hours to get started on labs
 - Often will need to finish lab after lab period
 - Lab assignments are the majority of your homework
 - Use this lab (P405), preferably, or P413

What Today Is and Is Not

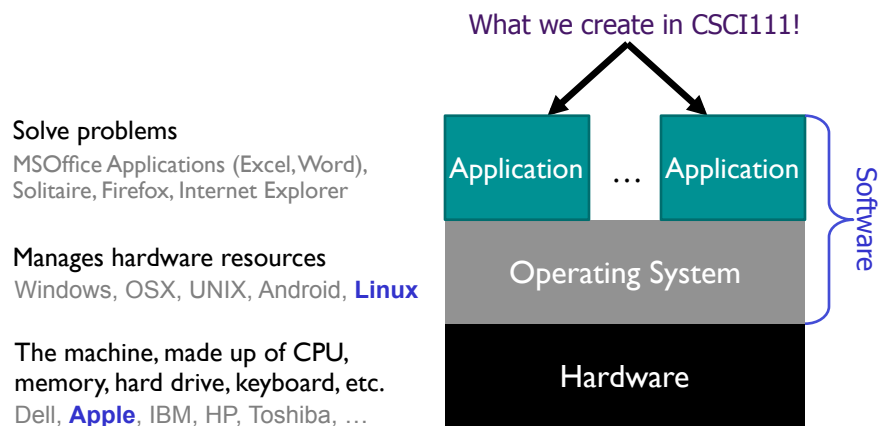
- Not ready for programming
- Set up for the rest of semester
- Develop skills
 - Communicating with computer
 - When we talk to computer, we need to be *precise*
 - Identifying problems and fixing those problems
 - **Pattern recognition**
- Learn Linux

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Basic Computer Architecture



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Parmly 405 Machines

- Run both Linux and OSX
 - If need to switch, restart the machine
 - By default → Linux
- Computer should be in Linux
 - If not, let us know
- Parmly 413: Linux-only

Pause While You Log In

- Open Firefox browser
- Go to course web site
 - Bookmark it
- Navigate to Lab 0, from course's "Schedule" page
 - We're starting on the first objective "Learning to Use the Linux Machines"
 - Return to Web page for rest of lab

What can you do?
How different is the User Interface (UI) from Windows or Mac?

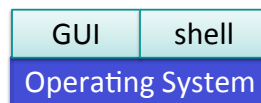
Operating Systems

- Manage hardware resources
- Three popular operating system variations:



- Learn Linux (a UNIX variation) in this class
- Macs are built on UNIX → can use UNIX commands

Intro to UNIX

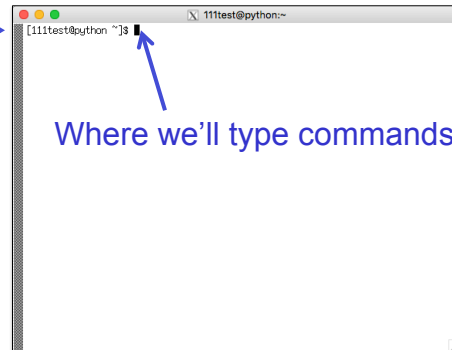


- Execute operations by typing commands in shell or using GUIs (Graphical User Interfaces)
- Command-line tools
 - Pros and cons
 - Faster to use keyboard than mouse
 - Easier to automate
 - Can be intimidating
- We will use terminals much of the time
- Today: learn essential UNIX commands and tricks

Terminal

- Command-line interface to operating system
- Open a terminal

Prompt: →



Where we'll type commands

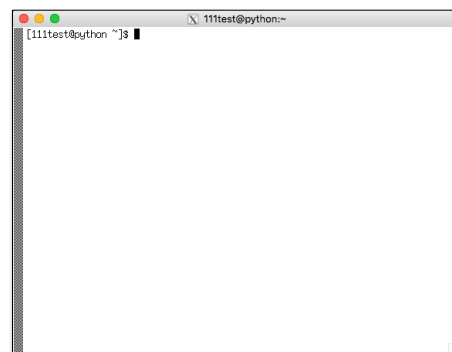
Take a look at your prompt.
Compare with your neighbors.
What do you think it means?

Terminal

- Command-line interface to operating system
- Open a terminal

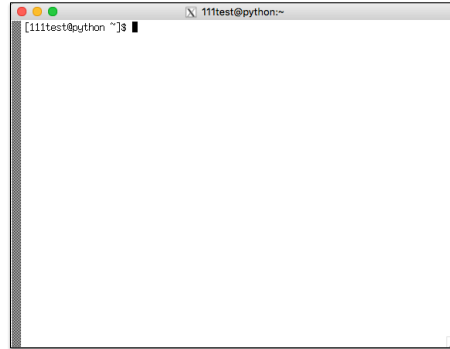
Prompt: [username@machinename directoryIAmIn]\$

- Make a shortcut to the terminal, if doesn't exists



UNIX Shortcuts

- ~ represents your home directory
- When you open a new terminal, you're in your home directory



Challenge: UNIX is a Bad Parent

- Doesn't tell you when you've done something right
- Only tells you when you've done something wrong

```
sprenkle@spartacus Desktop$ mv lab00.pptx.pdf lab00.pdf
sprenkle@spartacus Desktop$
```

Renames file from
lab00.pptx.pdf to lab00.pdf

Since you didn't get an error message,
that's correct!

GUI to Get Help

- Run the script
 - `runHelpClient &`
- `&` means “run in the background” so you can keep using the terminal

Changing Your Password

- Don't think you'll be able to remember that password?
- Let's reset it!
 - `passwd`
- Password characters don't show up when you type—why?

Intro to UNIX: Essential Commands

- Manipulating Files

Command	What it does
<code>ls</code>	list the files, directories in a directory
<code>mkdir dname</code>	make a directory with the name "dname"
<code>cp src dest</code>	copy a src to a dest src and dest can be a file, set of files, or a directory
<code>rm file</code>	remove (delete) a file/directory

- Navigating Directories

<code>pwd</code>	print working directory
<code>cd name</code>	change to directory name

A Trick: Up Arrow

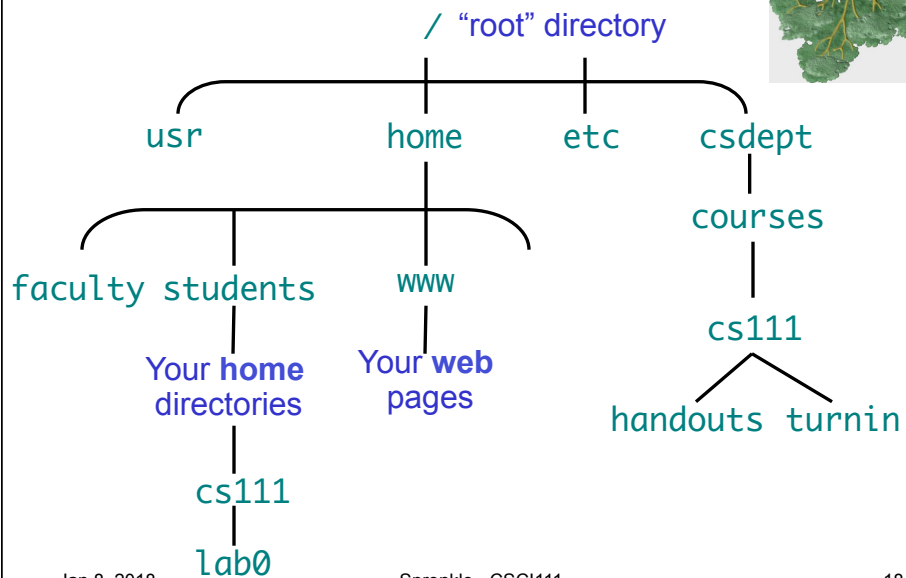
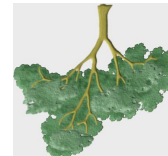
- Hit the up arrow. What happened?
- Hit the up arrow again? What happened?

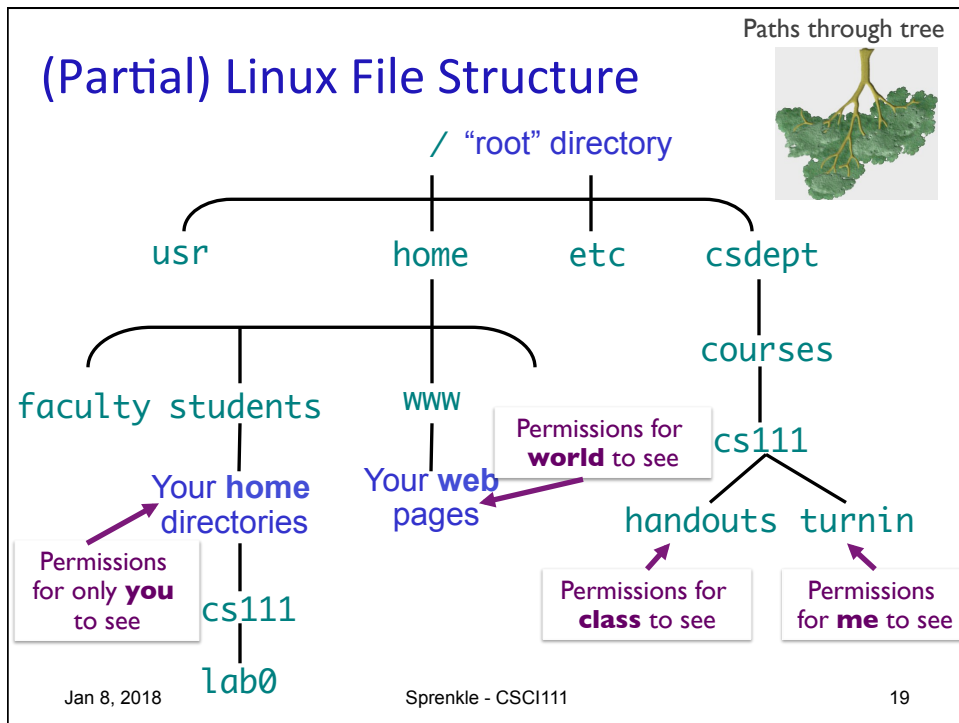
Intro to UNIX: File Structure

- Organize our files
- Hierarchy of *directories* or “folders”

(Partial) Linux File Structure

Paths through tree





What is the Unix command to do the following?

In your rows, come up with these commands

1. Find out what directory you're in
2. View the contents of the directory
3. Create a directory called `cs111`
4. View the contents of your directory (again)
5. Go into the `cs111` directory
6. View the contents of `cs111` directory

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What is the Unix command to do the following?

Now, execute those commands!

1. Find out what directory you're in
 - `pwd` You should be in your home directory
2. View the contents of the directory
 - `ls` What files are in your home directory?
3. Create a directory called cs111
 - `mkdir cs111`
 - View the contents of your directory again
4. Go into the cs111 directory
 - `cd cs111`
5. View the contents of cs111 directory
 - `ls`

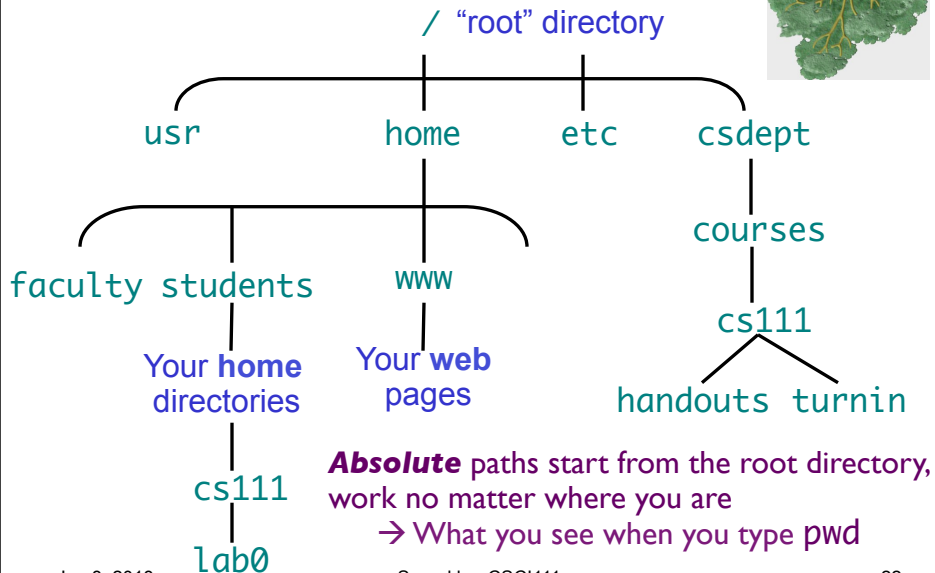
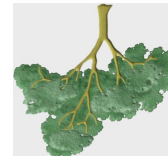
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Absolute vs Relative paths

Paths through tree



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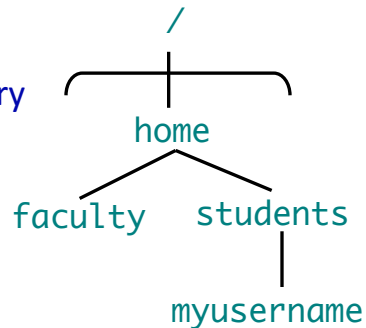
Intro to UNIX: Shortcuts

Shortcut	Meaning
.	Current Directory
..	Parent Directory

➤ Often used with **cp**, **mv**, **cd** commands

- **cd** or **cd ~**

➤ Change to *your* HOME directory



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Practice, with Tab Completion

This is an absolute path

- Goal: go to the directory `/csdept/courses/cs111`
 - You can use **tab completion** to help you complete commands
 - After typing the appropriate command, start to type `/CS` and then press **tab**.
 - What happens?
 - Use tab completion to help you complete the rest of the path
- What are the contents of this directory?
- How can you get to the directory `/csdept/courses`?
- How can you get back to *your* home directory?

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jEdit: A text editor

Check: are you are in
your home directory?
Now, go into your CS111
directory.

- `jedit &`
 - Command to run
- Create a new file, add some text to it
 - e.g., “this is my file”
- Save the file, naming it `test.txt`
- Exit jEdit, from the menu

More on the `cp` command

- `cp src dest`
 - `src`: what you want to copy
 - `dest`: to where you want to copy
 - If `dest` is a directory, copies `src` into that directory
 - If `dest` is a filename, makes a copy of `src` and names it `dest`
- Practice in the terminal:
 - Copy the file you just created and make a backup of it, e.g., named `test.txt.bkup`
 - Create a directory called `lab0`
 - Copy the file you just created into the `lab0` directory

More on the cp command

- Option: copy a whole directory using `-r`
- Syntax: `cp -r src_directory dest_directory`
 - If `dest_directory` already exists, `src_directory` is copied inside of `dest_directory`
 - If `dest_directory` does not exist, `src_directory` is copied and named `dest_directory`
- Notes:
 - `src_directory` and `dest_directory` can be absolute or relative paths

Using the Wildcard: *

- Go into `/csdept/courses/cs111/handouts/lab0`
 - What are the contents of this directory?
- Try executing
 - `ls *.py`
 - `ls example.*`

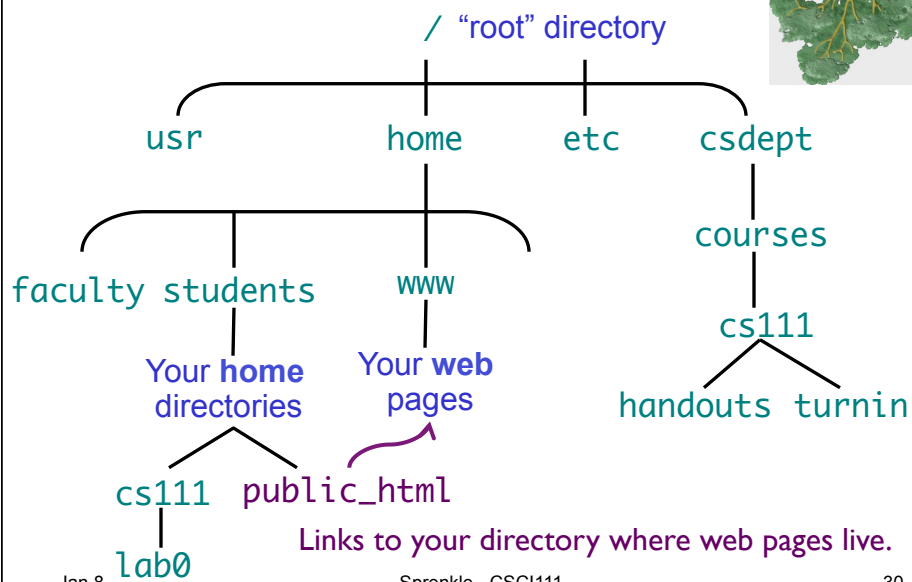
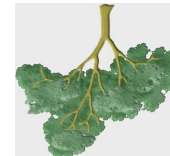
What does the * do?

Wildcard: *

- Match 0 or more characters in filenames
- Used to operate on more than one file

Web Directory: Symbolic Link

Paths through tree



Logging Out

- When you're done, you should log out
 - but not shutdown the machine

How do you log out?

Linux Quiz

- True or False: I should shut down the machine when I am done using it.
- True or False: My CS account is the same as my W&L account.
- True or False: I can give my password to my friend who needs to access my account.

Creating a Web Page

- Practical application of UNIX command skills
 - Practice commands you learned today
- Learning from following examples and adapting
- Learn what's "behind the curtain" of web pages

Lab 0 Checklist

- Linux
- Go to Browser, Lab 0 Page
 - Create your own web page
 - Sakai forum
 - Interactive textbook

Due Friday before class