

## 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”)

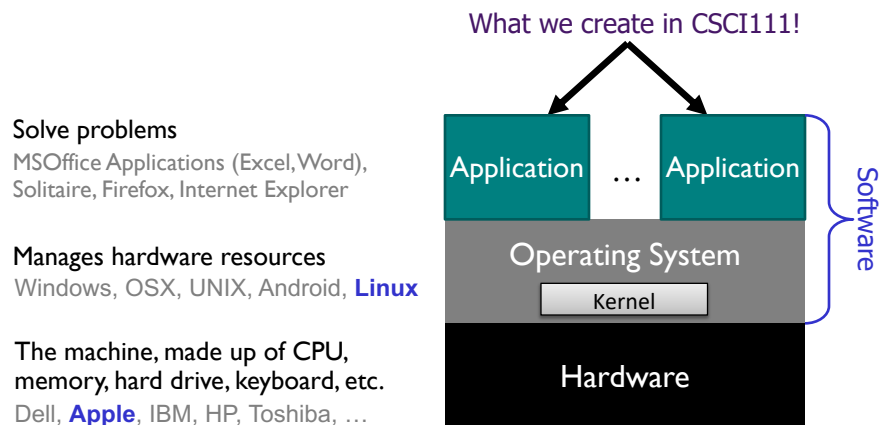
## Intro to Labs

- Introduce Student Assistants
  - Hammad Ahmad '19
  - Rinn Joireman '21
  - Alyssa Vu '22
- 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 solving those problems
  - Pattern recognition
- Learn Linux

## Basic Computer Architecture



## 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"
  - We'll return to the web page later

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

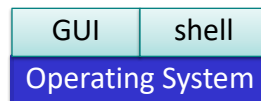
## Operating Systems

- Manage hardware resources
- Three popular operating system variations:

<b>Mac</b>	<b>Windows</b>	<b>UNIX</b>
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- Learn Linux (a UNIX variation) in this class
- [Macs are built on UNIX](#) → can use UNIX commands

## Intro to UNIX



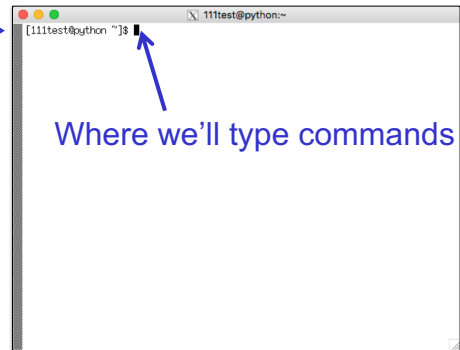
- Execute operations by typing commands in shell or using GUIs (Graphical User Interfaces)
- Command-line tools
  - [Pros and cons](#)
    - Faster to use keyboard than mouse
    - Easier to automate
    - Can be intimidating
- We will use terminals much of the time
- Today: learn essential UNIX commands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

## Terminal

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

Prompt: →

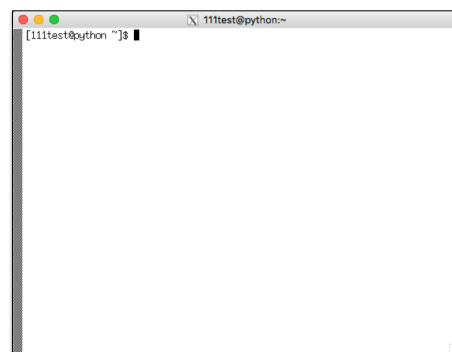
Take a look at your prompt.  
Compare with your neighbors.  
What do you think it means?



## Terminal

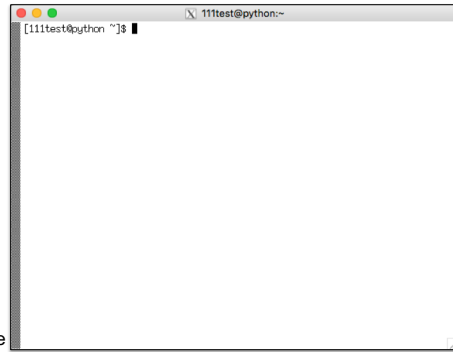
- Command-line interface to operating system
- Open a terminal

Prompt: [username@machinename directoryIAmIn]\$



## UNIX Shortcuts: ~

- ~ represents your home directory
  - *Not \*the\* home directory*
  - Always with respect to the user
- When you open a new terminal, you're in your home directory



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Sprenkle

## GUI to Get Help

- At the prompt, run the command
  - `runHelpClient &`
- `&` means “run in the background” so you can keep using the terminal

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12

## 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!

## 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
ls	<b>l</b> ist the files, directories in a directory
mkdir dname	<b>m</b> ake a <b>d</b> irectory with the name "dname"
cp src dest	<b>c</b> opy a src to a dest src and dest can be a file, set of files, or a directory
rm file	<b>r</b> emove (delete) a file/directory

- Navigating Directories

pwd	<b>p</b> rint <b>w</b> orking <b>d</b> irectory
cd name	<b>c</b> hange to <b>d</b> irectory name

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15

## Useful Trick: Up Arrow

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

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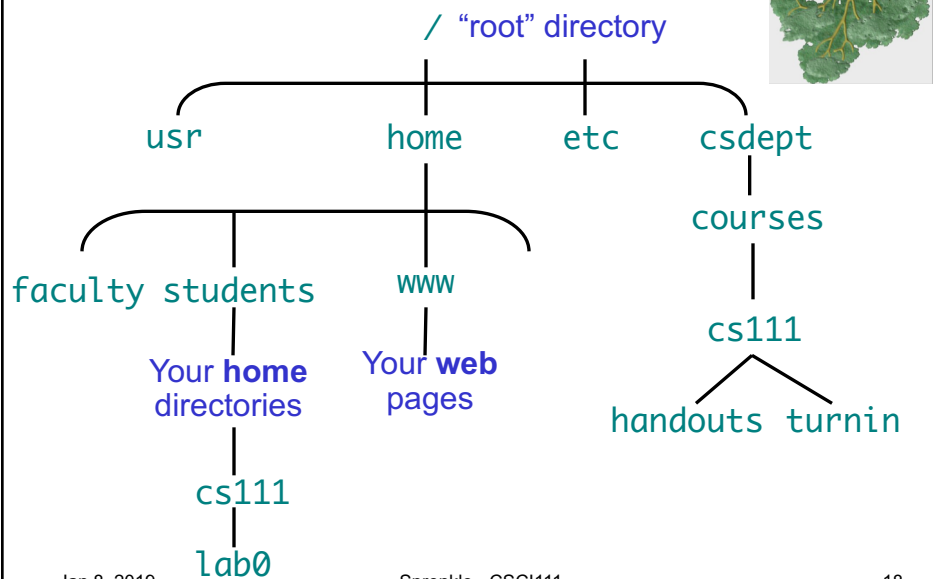
16



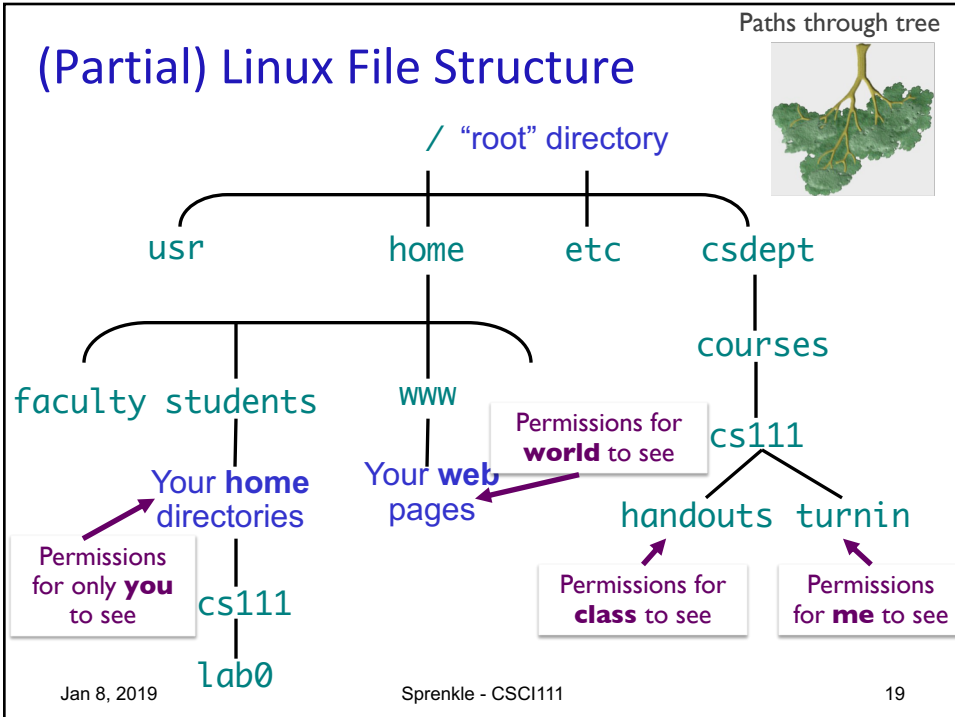
## Intro to UNIX: File Structure

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

## (Partial) Linux File Structure



## (Partial) Linux File Structure



## 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

## 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`

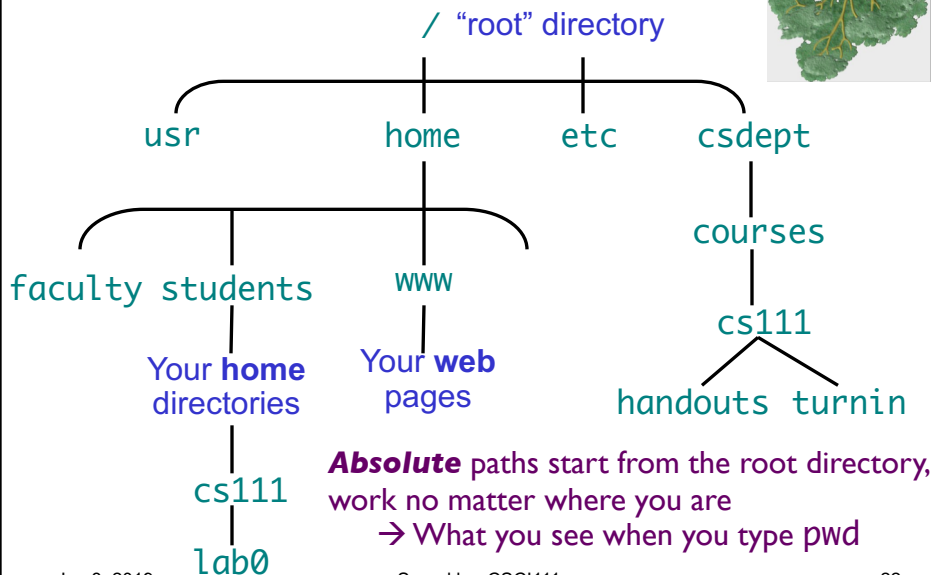
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21

## Absolute vs Relative paths

Paths through tree



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22

## Intro to UNIX: Shortcuts

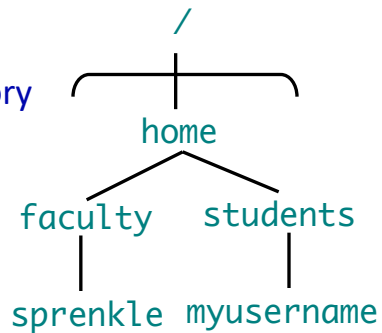
Shortcut	Meaning
.	Current Directory
..	Parent Directory

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

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

➤ Change to *your* HOME directory

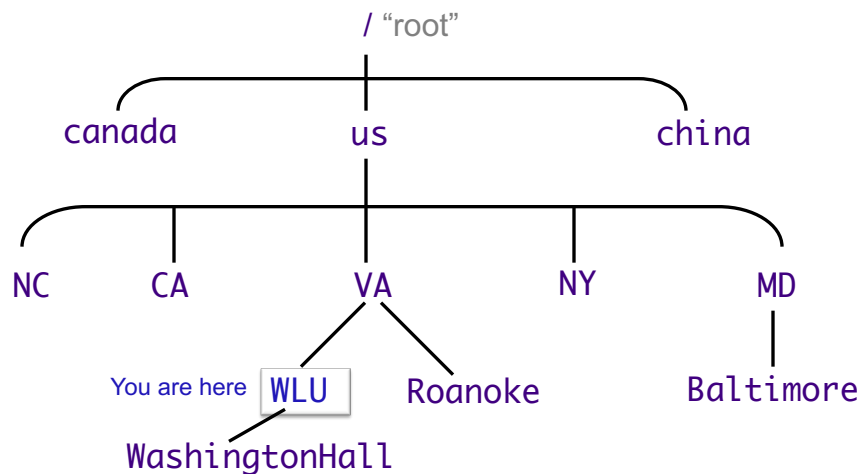
Example: /home/faculty  
is the parent directory of  
/home/faculty/sprenkle



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## Relative Paths vs Absolute Paths



- Given that you're at **WLU**, how would you get to Washington Hall? To Roanoke? To Baltimore?

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24

## 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?

## 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

## Using the Wildcard: `*`

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

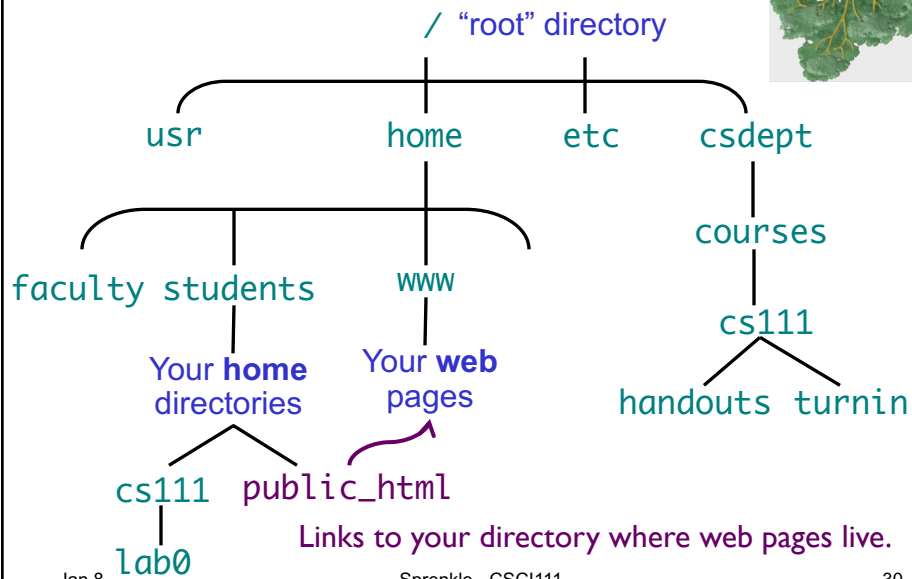
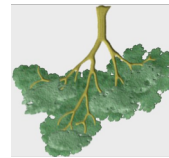
What does the `*` do?

## 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**

## More on the `cp` command

Not needed yet

- 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