OS/Shell Introduction

Getting Started

Computer Accounts

- Each student in the School of Engineering and Computer Science should have an ECS account.
  - Go the site: http://www.ecs.csus.edu/
  - Scroll to below the picture.
  - Click on **ECS Quick Links**
  - Choose the option **Get an ECS Account**
  - Follow the directions. You must present a OneCard when you pick up the information.
  - Can also go to RVR-2011

Process needed to deal with a program (1 of 2):

- Log onto **athena** computer
  - Windows machines: Use PuTTY
  - MAC machines: Open up a terminal/console window (ssh)
- Open an editor. (C programmers use **vim**.)
- Write code, compile, save, etc.
- Get the code to a place where you can open your browser and upload it to Canvas (replacement for SacCT)

Process needed to deal with a program (2 of 2):

- Get the code to a place where you can open your browser and upload it to Canvas (replacement for SacCT)
  - Use file transfer software to move the code from **athena** to your own computer. (WinSCP, FileZilla, CyberDuck)
  - Email the file from athena to yourself. (pine)
  - Log onto an ECS computer, click on "My Files On **gaia"** to open your file, open a browser, upload it.
  - Mac: Use **scp** to transfer the file.
  - Use **hydra**

Software for moving files between laptop/home and athena

Transfer Software for home:

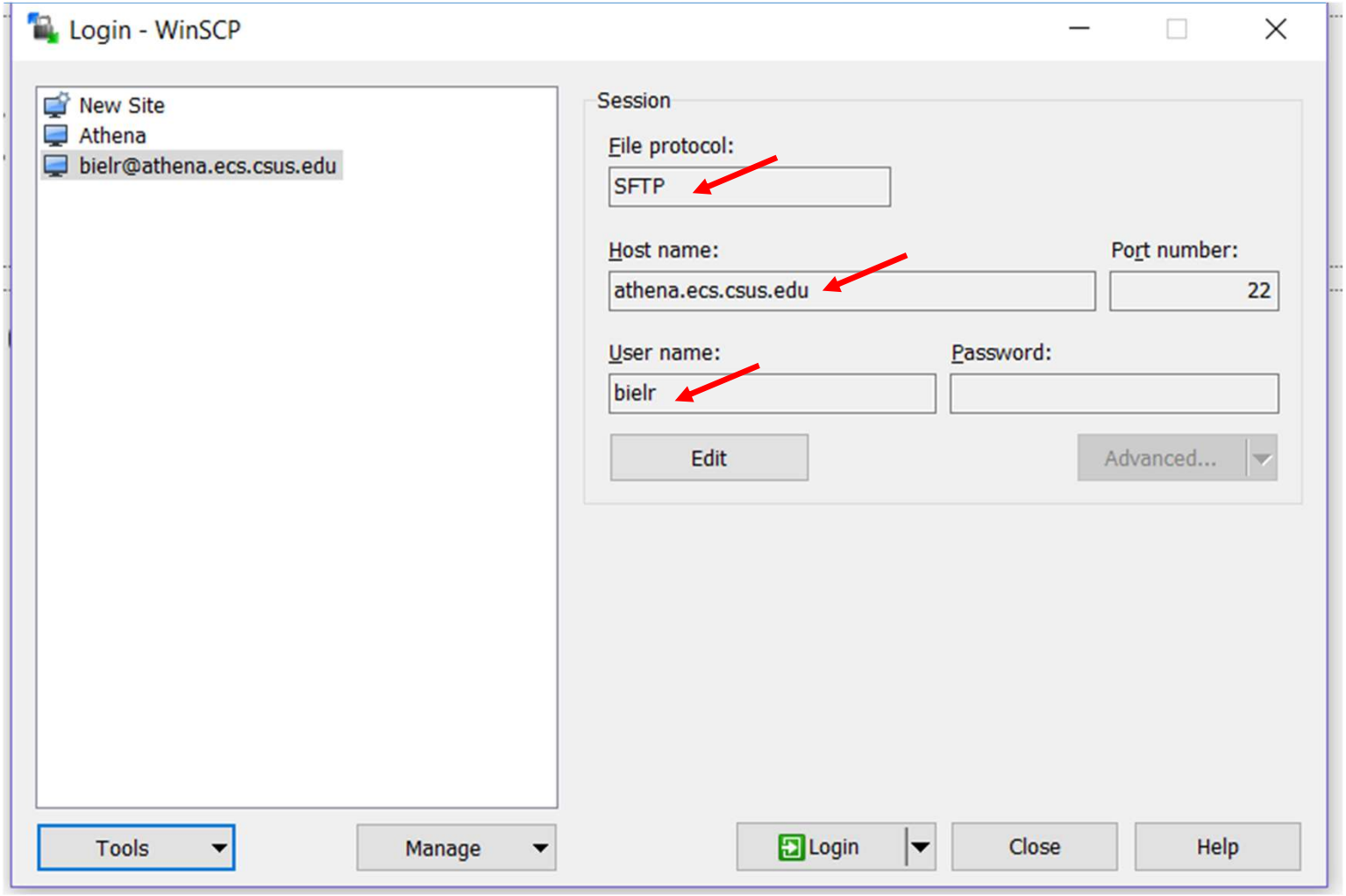
- **Why –** We will be working on a Linux machine to create our code and run it. When you are finished with the assignment, the files are on that Linux machine named “athena”.
- If you are in our lab or another ECS computer, it is easy to check out of Linux and back to Windows, open a browser and upload your files to Canvas.
- But how to do this at home? We use free file transfer software to move the file from athena to your home computer.

Transfer software for home - Windows:

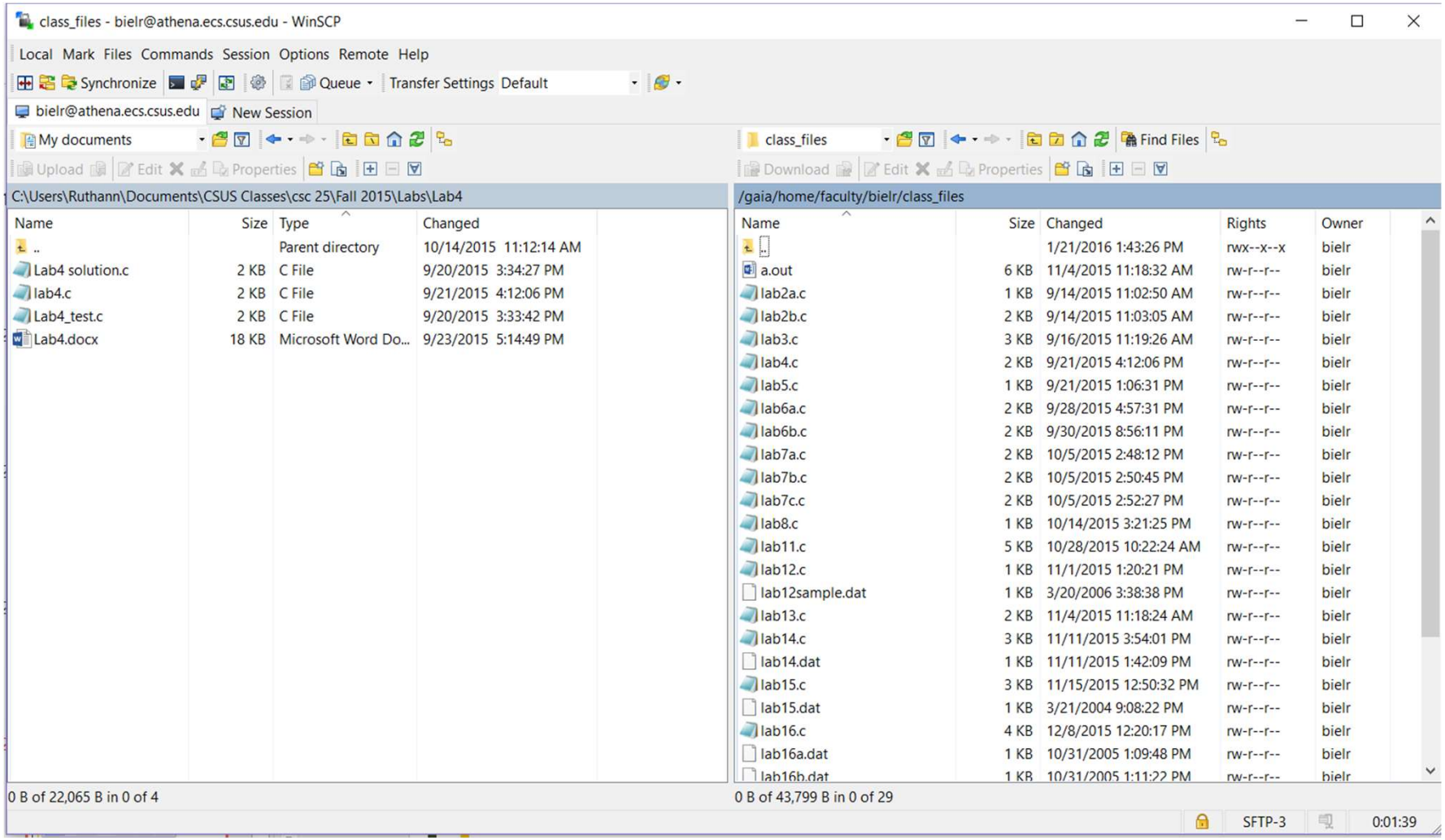
- **WinSCP** – free software that allows one to move files from one site to another, from athena to home, and the reverse.
- At the site: http://winscp.net/
- Next slide shows startup menu with entries for instructor

- The same information will be needed whether you use WinSCP or another product.

WinSCP Log-in Screen with settings



WinSCP Sample screen: ***left*** side is a folder on home computer, ***right*** side is folder on gaia



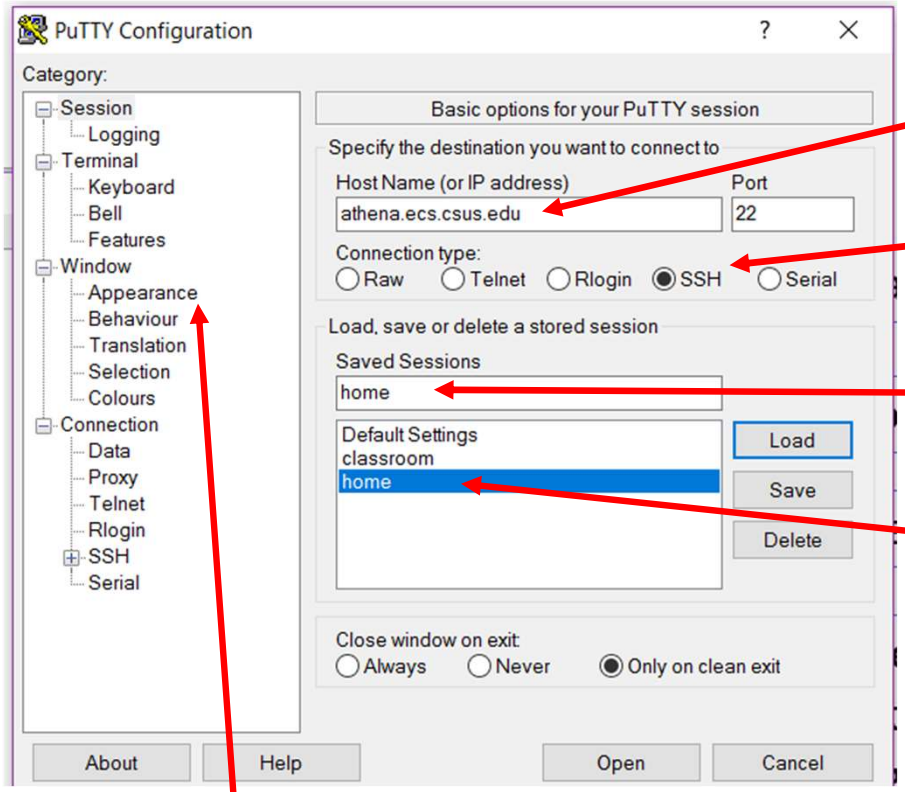
Optional software for home (MAC & Windows):

- Free software that allows one to move files from one site to another, from athena to home, and the reverse.
  - **Filezilla** – https://filezilla-project.org/
  - **Cyberduck** - https://cyberduck.io/?l=en
- Both software packages work on Windows or Mac.
- A search on “cyberduck vs filezilla” will bring up a couple of comparison articles.

Logging onto a UNIX machine

- Sit at a UNIX machine and log in.
- As you enter your password, nothing will show on the screen.
- Do a remote login using SSH
  - Most of us use PuTTY software to accomplish this.
  - The ECS computers all have PuTTY
  - To get PuTTY at home, download it from: http://www.chiark.greenend.org.uk/~sgtatham/putty/

PuTTY Screen



Address of “athena”

Choose the option - SSH

I saved the session, named it “home”

Once the session is saved,
we can just double click on the session name,
and the log-in window will appear

Contains options to change font and font size

MAC Users

- Open up a terminal/console window and type the following:

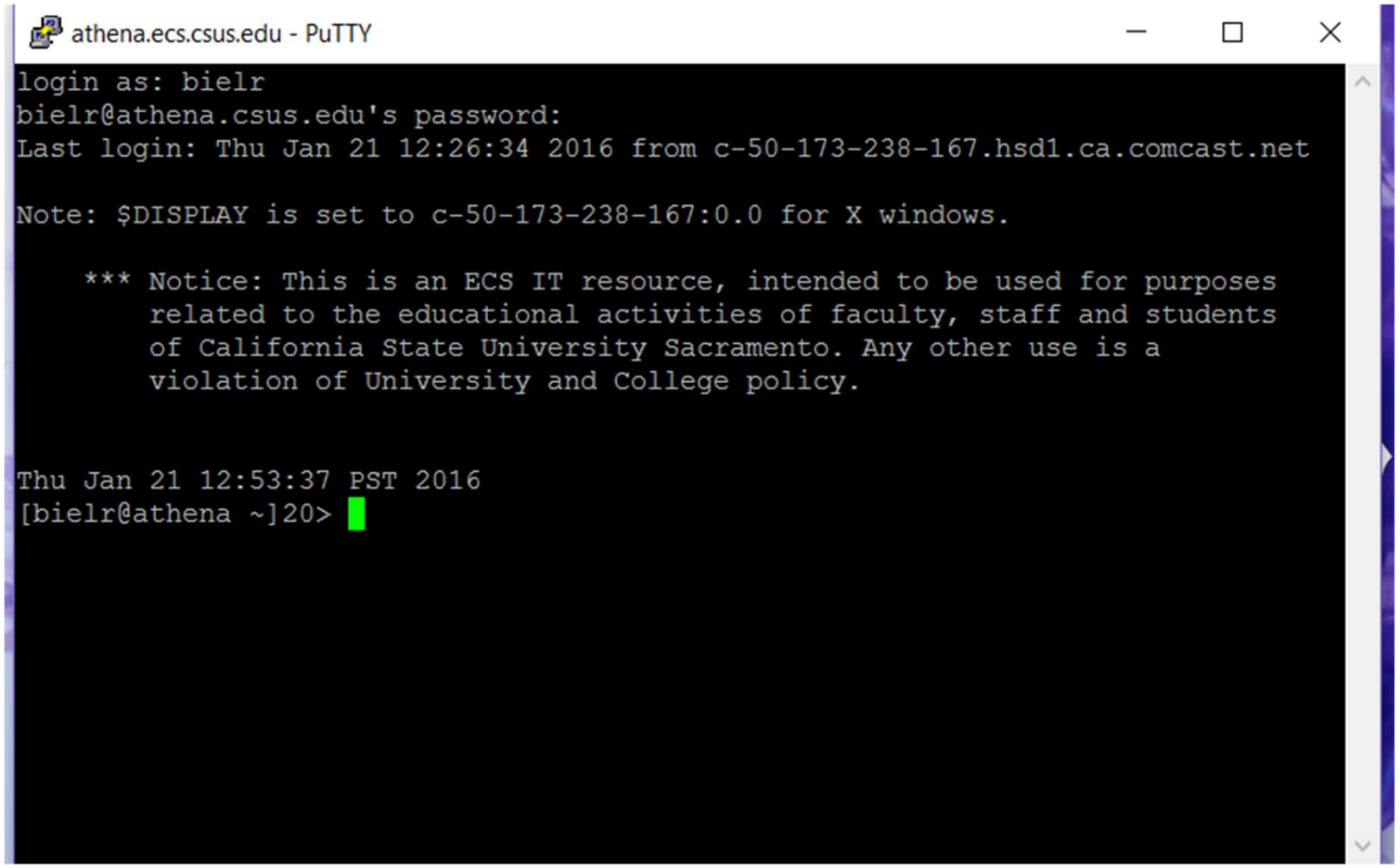
  ssh yourECSname@athena.ecs.csus.edu

Press Enter.

When prompted, type “yes” to accept the server’s key.

Then enter your password.

Login Screen



Shells:

A shell is an interface between you and the kernel of UNIX/Linux.

Kernel. The center, the core.

Shell. A way to communicate with the Kernel.

The default on our system is **csh**, read aloud as ‘C-shell’.

By doing "**cat /etc/shells**", I found that athena has:

- sh (Bourne Shell)
- bash (superset, Born Again Shell. LOL)
- nologin
- tcsh
- **csh** (spoken as C-shell) (**Default** on athena)
- dash
- ksh

It is possible to change the default shell,
using the command "**chsh**".

Shell Verification

To see what Shell you are in, type:

> **echo $SHELL**

Getting help:

"Look at the "man" page." You will hear this.

This means looking at the on-line manual which is extensive.

$ **man** *command*

Examples: **/* will show you… */**

$ man ls /* all the options for listing */

$ man gcc /* options for the compiler */

Maneuvering through a *man* page:

Hit **space bar** to advance thru page.

Hit **Enter** to advance the screen one line.

Hit "**q**" to quit.

Various Commands in UNIX/Linux

Command: ls

Purpose: List files in directory.

Format: **ls** [*options*] [*file-list*]

Some Options:

-a	List all files, including hidden ones.
-d	List directory names only, not ordinary files.
-g	Show group information with listing.
-l	Show long listing with extended information.
-r	List in reverse order.
-s	List in order of increasing size.
-t	List in order of time, most recent first.

Example: ls ls -ra
ls –l ls -ls

Copying and Renaming Files:

Command: cp

Purpose: Copy a file.

Format: **cp** *source-file target-file*

Example: cp my.file file2

Result: There are now two identical files with different names.

Moving or renaming files:

Command: mv

Purpose: Move or rename a file.

Format: **mv** *source-file target-file*

Example: mv my.file file2

Result: One file with the target name exists.

Removing files:

Command: rm

Purpose: Remove a file.

Format: rm [*option*] *file(s)*

Option: **-i** Ask before deleting.
Often the default.

Example: rm file2

Result: The file is no longer listed or available.

The *cat* command:

Command: cat

Purpose: Display or create files.

Format: **cat** [*source-file*] [symbol] [target-file]

Examples:
1. cat this.month
2. cat lab1.c

Result: File displayed on screen, lines echoed on screen

The *pwd* command:

Command: pwd

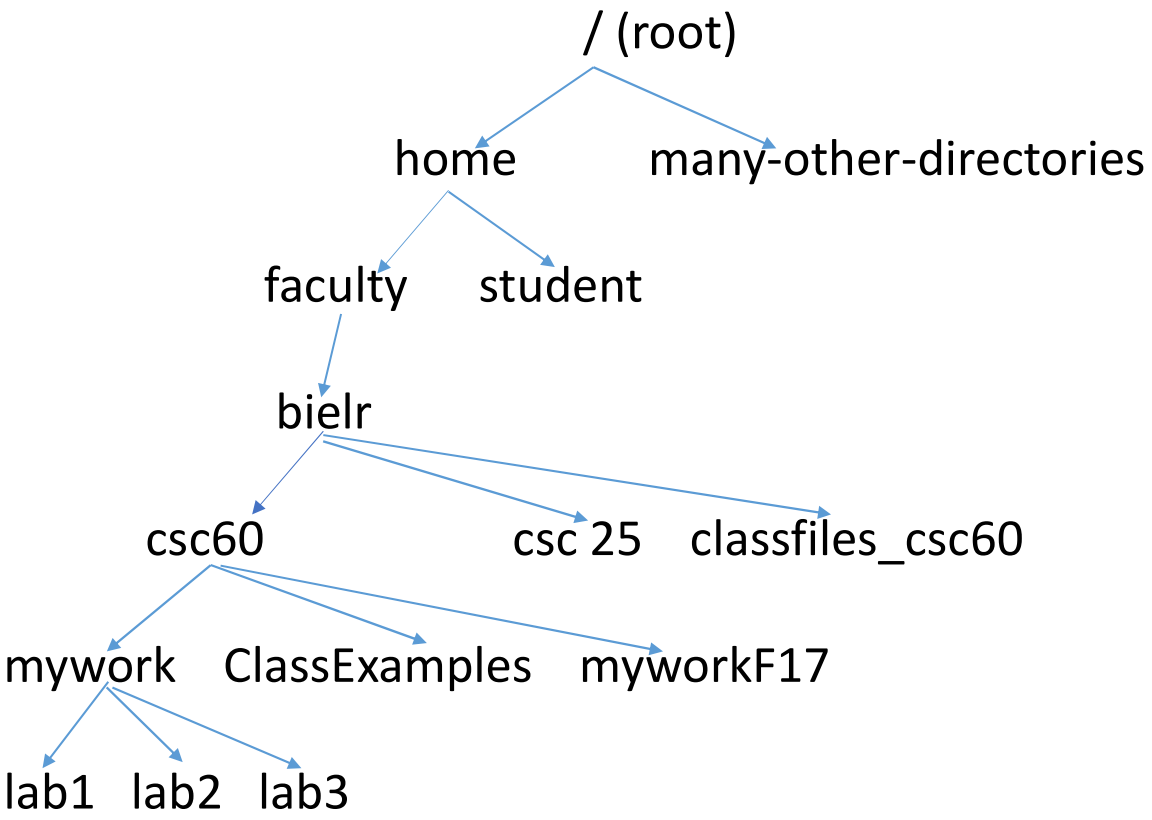
Purpose: print name of current/working directory.

Format: pwd

Example & Result:

```
[bielr@athena csc60]> pwd
/gaia/home/faculty/bielr/csc60
[bielr@athena csc60]>
```

Starting Directory Structure on Linux



The *cd* command:

Command: cd

Purpose: Change directory.

Examples & Results:

1. cd — Takes you to your home directory
2. cd .. — Takes you up to the parent directory
3. cd lab1 — Takes you down to a lower directory
4. cd mywork/lab1 — Takes you down to a lower directory

The *mkdir* command:

Command: mkdir

Purpose: Make directories.

Examples & Results:

1. mkdir csc60 Makes a sub-directory named csc60
2. mkdir lab1 Makes a sub-directory named lab1

Directories can also be moved or renamed (mv), and copied (cp –r)

The *rmdir* command:

Command: rmdir

Purpose: remove empty directories.

Examples & Results:

1. rmdir csc60 Makes a sub-directory named csc60
2. rmdir lab1 Makes a sub-directory named lab1

Note:
To delete an empty directory, you must be in the directory above it or you need to type a full path name.

The *clear* command:

Command: clear

Purpose: clear the terminal screen

Example:

```
> clear
```

Other Assorted Commands

- **less, more** – paging utilities
  - Use the “man” pages to find more

- **od** – **octal dump**. For viewing raw data in octal, hex, control chars, etc.
  - Use the “man” pages to find more
- **ln** – create hard (inode) or soft (symbolic) links to a file

  [On creating a file, UNIX allocates the file an inode number of 4 bytes, an index value for an array on the disk. So every file has a unique inode number.]

Change The Prompt On athena (csh)

Change the prompt to show the folder/directory that you are in.

You need to type a *SPACE* after "**set**" and after the "**m**".

Type in the command: **set prompt='[%n%m %~]!>'**

The **%n** will show your name.
The **%m** will show your current folder.
The **%~** will give you the command number.

REDIRECTION: (1 of 4)

$ **ls** /* lists all files in your directories */

$ **ls | more** /* pipes the output to the *more* program which gives you a screen-full at a time */

The pipe symbol "**|**" redirects the standard output of one command to the standard input of another command or process.

REDIRECTION: (2 of 4)

Use **>** to redirect an output to a file.

So ***cal*** is the calendar command.

$ **cal 2017 > my_calendar**

REDIRECTION: (3 of 4)

Use **>>** to append to a file.

ps means process status.

$ **ps >> my_file**

Whatever was in *my_file* will now have the listing from the *ps* command appended to it.

Just to make things clear on Redirection: (4 of 4)

Use of the pipe “|” sends output to a **process**.

Use of the redirection “>” sends output to a **file**.

NOTE: The details of Redirection vary from shell to shell.

OS/Shell Introduction

Getting Started

The End