COSC 3750

Day 1

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About this course

- There is no required text.
- There will be assigned reading from various sources.
- The syllabus is available on the WyoCourses site.

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- The course will use WyoCourses.
- All the assignments will posted AND turned in there.
- The gradebook will be active and you should be able to track your progress.
- I won't use any of the WyoCourses chat/conference type things, but that does not mean you cannot talk together.

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- Assignments will require real effort and maybe even some thought.
- Programming assignments will each have sufficient time for completion, even if you do not think it so.
- You may discuss all of the assignments with fellow students.
- YOU MAY NOT COPY OR SHARE WORK!!!!!!!!!

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- My office hours are posted on WyoCourses and as usual, if the door is open stop by.
- You can always email me. I answer as soon as I can but not evenings or weekends.
- Attendance: In the past if I have had better than 40% attendance it was an exam day. That is not really a good idea on your part.

Programming

- You must start when the assignment is given!
- That way you can ask as soon as there are problems.
- Late assignments, a max of 24 hours only, will be accepted but penalized, see the syllabus.

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- We will only be using Linux. DO NOT write programs on Windows, then submit to me. If the file formatting is incorrect I will not allow you to correct it.
- If it does not compile, it starts with a 50% deduction.

Linux

- Specifically we will use the department's Linux boxes as the standard. Do not say "but it worked on **my** . . . ".
- How many have Linux accounts or use Linux at home?
- Programming language will be **C** or some specified scripting language.
- We will discuss the programming assignments when given.

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- Ask questions about the assignments!
- I do not care what Linux distribution you may use on your personal machines, it is Linux after all.
- BUT, and pay particular attention to this, if your code does not compile and run on the fish/EN4072 machines, then it is **broken** and there are NO excuses.

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- If you want to have Linux at home, Jim Ward has created an "appliance" that will run in Oracle's VirtualBox.
- You will need to go to www.cs.uwyo.edu/~seker and download the link **UWcosc ova file** at the bottom. AND LOOK AT THE NOTES THERE.
- Put that someplace convenient on your home machine, NOT in your Desktop folder.

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- Download may take a LONG time. It is like 5.4 GiB.
- Then when you run VirtualBox you "import" the 'appliance'.
- It can access the network through the computer. And you can transfer files between the appliance and your computer.

Logging in

- Two ways in the department.
  - Directly on a machine in 4072 (once you have an account). The 4 under the windows (cslab[13-16]).
  - Via the ssh from Linux/Mac machine
  - Via some secure shell client on Windows machines.
  - Run a VM on Windows in 4072 and 4059.
- There are issues with each, too many to detail.

Direct connection

- There is little choice on the Linux desktop but it is customizable.
- It is also becoming more Window-ish (UGH!).
- But you do have full access to GUIs.
- There are only the 4 department machines full-time.

Secure shell

- Can use from almost anywhere in the world.
- Is normally the ONLY remote connection supported by ANY current Linux/UNIX system.
- I suggest for most personal installations that you use PuTTy on Windows. I just like it better than others. Linux installs & MAC, have ssh.

More on ssh

- Cannot do GUIs easily, or even reasonably *outside* of the department/campus, too much data over relatively slow connections.
- Occasionally there are problems with host "keys" but that is easily solved.
- **Always** connect to "hive.eecs.uwyo.edu" unless you are inside the department.
- Then once connected to one of the *hive*, **ssh to one of the fish[02-20].**

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- I keep saying “inside the department.”
- By that I mean, currently logged into one of the department computers either in an office, in EN 4059, or EN 4072.
- Any laptop connection you have established is NEVER “inside” the department regardless of the physical location of the machine.

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- You should not have to worry about keyboard settings when using *ssh* but sometimes you have to twiddle with them to make things work, backspace/delete are the biggest culprits.
- You can do graphics, but the bandwidth will overpower you outside the department.
- ALWAYS LOGOUT!! Just type “exit” at the prompt.

XMing

- This is an X windows graphic system that runs on MS Windows.
- It is now installed on the “cslab” machines (4072) and all the 4059 machines.
- Just run XMing. Nothing will happen.
- If you open the notifications you should see the X icon.

SSH

- Like I said, I suggest that you use PuTTy. There is another, SSH Client, that may be installed on campus windows machines.
- It is easiest if you create a profile for the hives that has `hive.eecs.uwyo.edu` as the Hostname and your Linux username name.

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- IF you want graphics, you have to enable "X11 forwarding" (putty) or "X tunneling" (other ssh clients).
- Depending on the client, may have to make other configuration changes.

The interface.

- We will use a terminal and that means understanding the "shell".
- It is a generic term meaning the simple user interface with the operating system.
- Shells do **not** normally support mouse usage but some newer terminals do.
- We will eventually write a simple shell in this course.

Command execution

- Everything typed into the terminal is assumed to be either a shell-specific command or the name of an executable program possibly with arguments. Note that Linux and UNIX are case-sensitive.
- So how is this string executed?

Paths first

- A path is a set of directories that are searched for something, in this case, executables.
- Your “path” is set when you log in and is customizable.
- Depending on the shell, the value is stored in the environment variable “path” or “PATH” or both.

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- Suppose you type something into a terminal and press the enter key.
- The shell program parses the string that you have typed in and determines what to do with it.
- If the first word is a shell-specific command it is executed by the shell and the rest of the string is assumed to be arguments to that command.

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- If the first word is **not** shell-specific, the components of "path" are searched for an executable file by that name.
- If the file is found, it is executed by the shell and the rest of the string is assumed to be arguments to be passed to the program.
- Otherwise an error like "xxxx: Command not found" is printed.

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- There is a little more to the parsing of the input string.
- There are symbols, again shell-specific, that cause the shell to handle that command-line string in special ways.
- Examples of this are I/O redirection, pipes, background, etc.

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- You will hear people (like me) use the terms “command”, “executable”, “program”, and “utility”. These are really synonymous, with only shades of difference.

Invocation of the shell

- How is the shell started?
- First, you get to choose which shell.
- Unlike Windows there are several that are normally available. I believe the department default is *tcsh*.
- When you login to a system, the password file is checked. This file also contains things like your user name, your "real" name, and your choice of shells.

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- The login process makes sure you are allowed to access the system and then executes your shell choice for you.
- You can change your shell using the utility **`ypchsh`** (on the deparment machines) or **`chsh`** on the VirtualBox or your home machine.

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- The change will not become effective until you logout and log back in.
- `chsh -l` (ell) will tell you which shells are available.

Common shells

- sh – the Bourne shell.
- csh – the Berkeley UNIX C shell.
- bash – the GNU Bourne-again shell.
- tcsh – an extended version of csh (department default)
- Others like – zsh, ksh, mksh.

Assignments

- Look at WyoCourses and go to the Module **Introduction**.
- Do/read whatever is currently unlocked.
  - Introduction document
  - Homework 0
  - Homework 1
  - csh_script_harmful

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- Jim Ward is creating Linux accounts.
  - You will be getting an email.
  - Log in and CHANGE YOUR PASSWORD.
- If you KNOW you have an account and cannot log in, EMAIL Jim Ward, seker@uwyo.edu from your UWYO email account about a reset.
- Otherwise, make sure that you can still log into your Linux account. If not see above.