Day #2
Terminal Jockeying & Pythonian Programming

John Simpson
DHSI-2014
Fundamentals of Programming/Coding for Human(s|ists)

The Cathedral

The Bazaar

Eric S. Raymond.

UNIX was written in C. C was written to write UNIX. (Not entirely true but a good way to think about it).

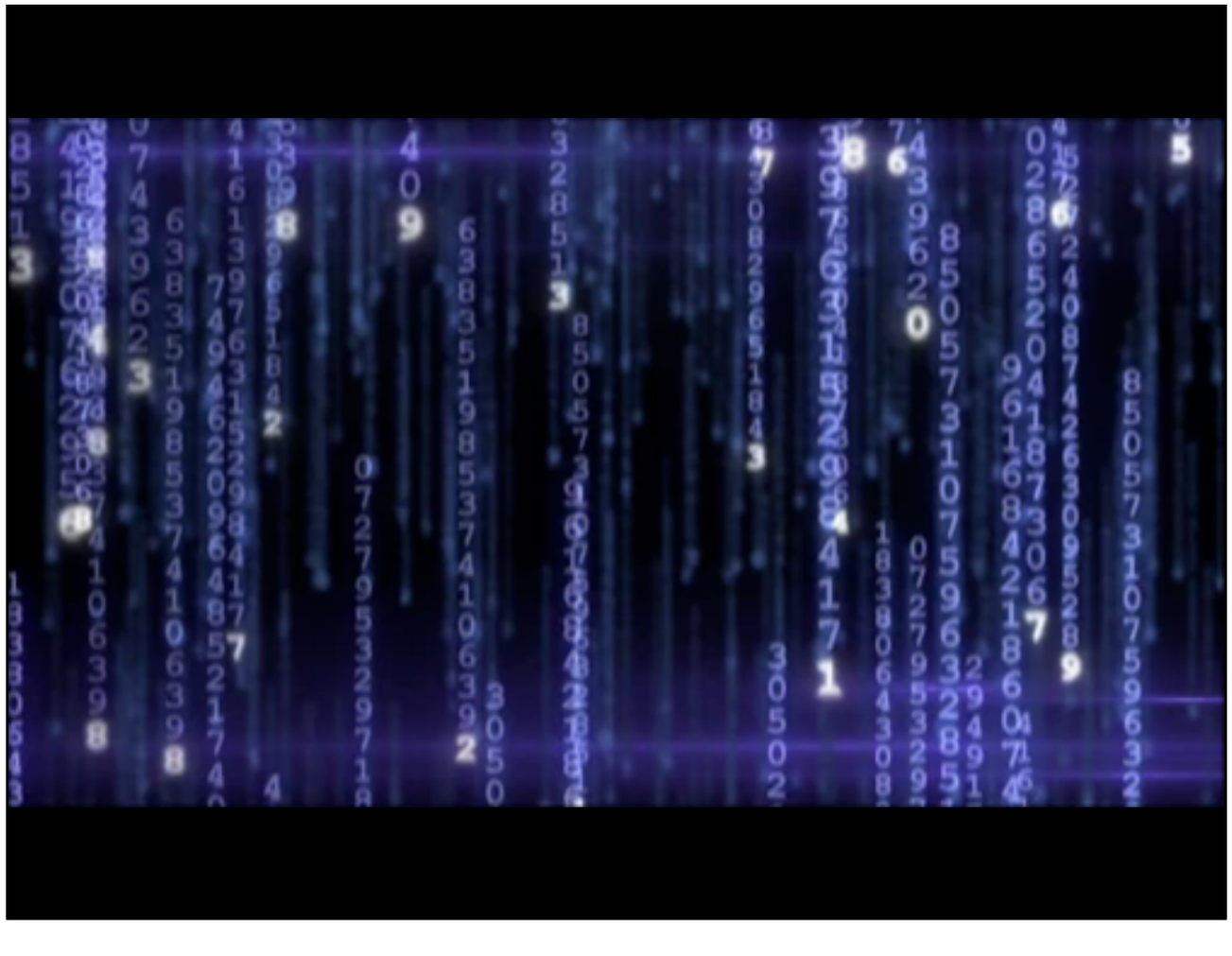
“Not only is UNIX dead, it’s starting to smell really bad.”

–Rob Pike circa 1991

Not only is it not dead, but Linux and OSX have further embedded it in computer culture. It may not be perfect, but it’s powerful and here to stay.

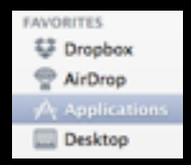
Some of the major flavours of GNU/Linux available today.
It is unfortunate for the history of the free software movement that “GNU” is so often dropped from the name (possibly because it is too hard to say--why is there no free marketing movement to prevent such things from happening?).
Want to see *all* the flavours in distribution? Look HERE.

Richard Stallman started the GNU project by quitting his job at the MIT lab when he could no longer have access to UNIX to create code for his printer. Built lots of stuff but didn’t have a kernel for the operating system until Linus Torvalds built one.

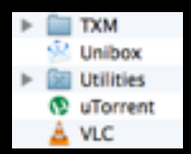


1. Open Finder from the Dock

2. Click “Applications” under “Favorites”

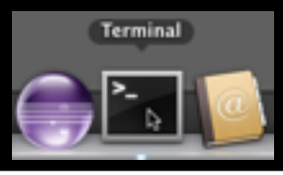


3. Find “Terminal” in “Utilities” Folder



4. Drag “Terminal” to Dock

5. Click on “Terminal”



Spend 10 minutes or so with the cheat sheet to get a general feel for how things work.

Once everyone has played some we'll move on and do some challenges.

Basic UNIX Cheat Sheet

Navigating the tree-based file system

Find out where you are in the tree	Type [illegible] (print working directory) to see where you are in the directory structure.
Find out what is around you	Use the [illegible] command to list all the files and directories in the working directory. [illegible] will list more details. [illegible] will provide the long list of additional details. [illegible] will do both.
Move around	You move around using one of three variants of the [illegible] (change directory) command: [illegible] will move you to the parent folder of your current location (notice you are in [illegible] will move you to a new directory from the root of the directory tree (note the slash at the beginning). [illegible] will move you into a child directory of your current directory (note the lack of a slash at the beginning.

File Control

See file contents	Type [illegible] to see the full contents of a file on screen. [illegible] will show the first 100 lines of a file. [illegible] will show the last 100.
Edit a file	[illegible] is an easy and powerful option. The nano window lists commands at the bottom of the screen. A "^" means the control key so hold down control and press "X" to exit.
Copy a file	[illegible] will do this for you. You can include directory information with the file name to copy from and to directories other than the current one.
Move a file	[illegible] behaves like copy but without the duplication.
Create a link	[illegible] will create a soft pointer to <originalFile> from <link>.
Create a directory	[illegible] will build a new directory.
Delete a file or directory	[illegible] will permanently delete <file name>. Sometimes you might have to get tough and use [illegible] to force it. To delete a directory use [illegible]. If you want to delete everything in a directory use [illegible] to recursively force removal of all contents, including child directories.
Expand a zipfile	Most downloads will come as tarballs that have been (g)zipped (extension .tar.gz). Extract them using [illegible].

Powerusr Tricks

Act as the Superuser	The superuser is able to do pretty much anything in the system so only do this when necessary. Put [illegible] at the start of any command. You will be asked for the root password before the command will execute.
Type faster	Use the tab key to auto-complete filenames.
Type less	Use the up/down arrows to recall commands. Can also use Control-R.
Slow scrolling	Type in [illegible] to stop rapid scrolling.

Stop something from running	Control-C will cancel a process in the current window (like [illegible]). For others use [illegible] to get the process id and then use [illegible].
Download a file	[illegible] will resume a stopped download.
Surf the web	If installed, use [illegible] to browse web text!
Use wildcards	* will stand in for any combination of zero or more characters. ? stands for any single character and [xyz] will swap between x, y, and z.

Junk For Fun search the web for "funny Linux commands"

Challenge #1

Create a new directory called “Gutenberg” and download this file into it:

http://www.gutenberg.org/cache/epub/2701/pg2701.txt

mkdir

cd

wget

Challenge #2

Rename the file something meaningful and then make a copy to work with.

cat, head, or nano

mv (to copy)

cp

Challenge #3

Create a file with the Gutenberg preamble and postscript removed.

wc to find number of lines

grep with the -n flag to get the line numbers for START: grep -n START melville.txt

head (END OF THIS line) | tail (total - END OF THIS line - START OF THIS line) >> newFile

or nano and hold down delete and scroll a lot

Challenge #4

Do it all again with this file.

http://www.gutenberg.org/cache/epub/2489/pg2489.txt

Challenge #5

Figure out whether each text has the same number of lines, words, and bytes.

wc

tr to replace all spaces with \n

ctrl V + ctrl M

then sort

Challenge #6

Write a script that does this comparison for you.

NOPE. Not going to do this. It is time for a real programming language. It is time for Python.

“

When I am working on a problem I never think about beauty. I think only how to solve the problem. But when I have finished, if the solution is not beautiful, I know it is wrong.

”

–R. Buckminster Fuller

Programming & Python

What sort of programming?

Up-scale guerrilla programming. Automate tasks that would otherwise take a long time. Programming to prepare data for other tools and/or tasks. From here you can move on to do many things, including NLTK, game development, HPC, etc.

Why Python?

Features of the language: Portable, powerful, phriendly.

Interactive vs. Script

Start with interactive to get a feel for syntax and the like. Quickly move to script with a text editor. Then do a full IDE tomorrow for the rest of the week.