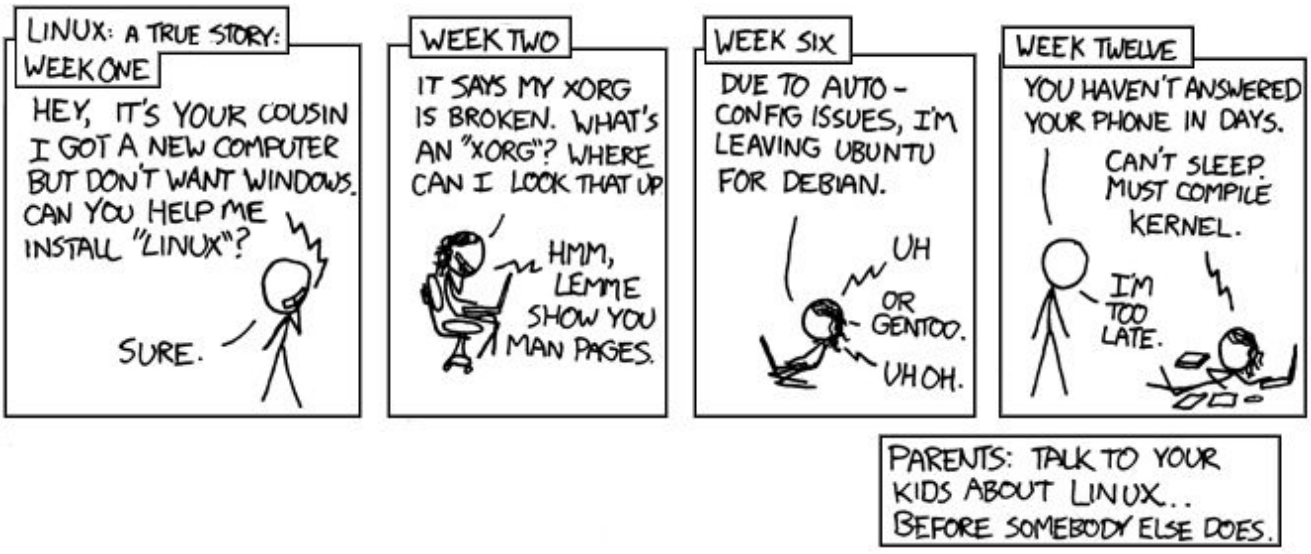
Intro to Linux Command Line



Basic Terminal

ssh	• short for **s**ecure **sh**ell • **usage:** `ssh [host]@[computer].[otherIPStuff]` • works natively for Macs and Linux machines • for Windows machines will need to use Putty ○ WinSCP is also a great program for Windows • there is also a secure shell extension for Chrome
[ctrl] + [alt] + t	• this will open up a new terminal window for you • is super convenient on the computers in the lab
[up arrow]	• this will bring up the last command you used in the your terminal ○ if used multiple times will keep going up in your command history • can be useful when using long/ repeated commands • the down arrow will go back through commands in the other direction
history	• this will print out a list of your previous terminal commands • can be useful if you are trying to remember a complex command you did previously but can't quite remember
clear	• this will totally clear your terminal screen • can be useful when have just run something really complex and would like a clean slate

man	• short for **man**ual
	• **usage:** `man [something confusing]`
	  ○ example: `man grep`
	• will give you helpful usage information about certain commands/ system calls
	  ○ is especially useful to look at the flags for commands

echo	• this will basically just print something to your terminal window • **usage:** `echo "hello world"` • is really useful in bash scripts ○ **NOTE**: bash scripts are a way to run a collection of terminal commands as a single command
[ctrl] + c	• this will stop whatever is currently running in your terminal • can be especially useful when you accidently run a program with an infinite loop ○ Or any other long running program/ script that you want to stop
[ctrl] + [shift] + c	• this will let you copy something from you terminal • useful if trying to Google what an error means
[ctrl] + [shift] + v	• this will let you paste into the terminal • useful if just Googled a way to do something cool
sudo	• short for **s**uper **u**ser **do** • will allow you to run commands you normally aren't allowed to • **usage:** `sudo [command]` ○ **NOTE:** you cannot run sudo on the lab machines
exit	• will close out of the terminal window without having the hit the little x in the corner

Directories and Files

ls	• short for **l**i**s**t • lists all the files/ directories in the current directory • you might also want to try the sl command on the lab machines

ls -al	• will list all the files in the current directory along with their permissions
	• permissions:
	  ○ read - can view the stuff
	  ○ write - can edit the stuff
	  ○ execute - can run (for scripts and such)
	• 3 sets
	  ○ (owner) (group) (anyone)

pwd	• short for **p**rint **w**orking **d**irectory • any easy way to know where you are in the file hierarchy if you forget
cd	• short for **c**hange **d**irectory • used to navigate between directories in your file structure • **usage:** `cd [directory]` ○ can use "cd .." to go back up the directory structure

	○ can also put in a full path instead of just a directory name ■ "/" at front of directory will be an absolute path from your root directory ■ no "/" at front of directory will be a relative path ■ "." just means current directory so ./hello.txt is the same as hello.txt
[tab]	• this will autocomplete whatever you are currently doing in the terminal • ex: `cd Doc + [tab]` would autocomplete Doc to Documents without you having to type out the whole thing
mkdir	• short for **m**a**k**e **dir**ectory • will make a new directory for you • **usage:** `mkdir [directory name]` ○ **NOTE:** can also use relative vs. absolute paths instead of just a directory name
cp	• short for **c**o**p**y • a way to make a copy of something in a different directory • **usage:** `cp [source/file name] [destination]` ○ again can use relative or absolute paths for the source and destination ○ **NOTE:** This copies to destinate and keeps the original in source as well
scp	• short for **s**ecure **c**o**p**y • a way to copy files between computers • **usage:** `scp [source] [destination]` ○ from other computer: `scp [host]:[source/file name] [destination on your computer]` ○ to other computer: `scp [source/file name] [host]:[destination on other computer]`
mv	• short for **m**o**v**e • a way to actually move files/directories around on your computer ○ also an easy way to rename directories • **usage:** `mv [source] [destination]` ○ as usual you can use either a relative or absolute path for the source and destination
rm	• short for re**m**ove • deletes a file • **usage:** `rm [file name]` • helpful things: ○ `rm -rf [directory name]` ■ will delete a directory and everything inside it ■ use with caution, if you don't give a destination for this it will delete EVERYTHING from your current directory down

<table>
<tr><td>touch</td><td>

will either create a new file or update the last modified date on a file to the current date
usage: <code>touch [file]</code>

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<tr><td>cat</td><td>

short for catenate
will print a file’s contents to the terminal
usage: <code>cat [file]</code>

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<tr><td>chmod</td><td>

used to change permissions
usage: <code>chmod [new settings] [file]</code>
new setting options

<table>
<tr><td>Reference</td><td>Operator</td><td>Mode</td></tr>
<tr><td>u - user
g - group
o - others
a - all (everybody)</td><td>add
remove
= set exactly</td><td>r - read
w - write
x - execute</td></tr>
</table>
</td></tr>
<tr><td>grep</td><td>

a way to search through file(s)
usage: <code>grep [search for] [file]</code>

can search for things using regex

helpful flags:

-n lists the line number next to matches
-r search recursively
* instead of a file name will search the whole directory

</td></tr>
<tr><td>find</td><td>

used to find out where a file lives in your file hierarchy
usage: <code>find [path] -name [file]</code>

if path is not given then will search the current directory and every directory it contains

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<tr><td>diff</td><td>

short for difference
shows the difference between 2 files
usage: <code>diff [file 1] [file 2]</code>
helpful flags:

-b ignore white space diffs
-i ignore case
--side-by-side - see differences next to each other

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Redirection Input/ Output

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will make the output from command on the left the input for the command on the right
ex: <code>man hello | grep “hello”</code>

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	○ will search for the word hello in the man pages for hello (this will actually work on the lab machines)
> and >>	● will redirect output on left into the file on the right ● single > will will replace the contents of the file with the given output and double >> will append to the file ● ex: `echo "hello" > hello.txt` ● ex: `cat [file1] [file2] > [file3]`
<	● will redirect thing on the right to be the input for the thing on the left ● ex: `ProgramTakesInAge < 12` ● is really good for testing projects that take in user input

Java Specific

java -version	● will tell you what version of Java is currently installed on your machine ● will also tell you if java is not installed on your machine at all
javac	● used to compile a java program ● **usage:** `javac [file]` ○ must have the .java extension ● if successful will create a .class file with the same name as the original Java file
java	● used to run a compiled Java file ● **usage:** `java [name of .class file]` ○ ex: java Test ■ don't put .class at the end of the file name ■ this would have come from compiling a file called Test.java

Fun Stuff

cal	● will give you a little ASCII calendar of the current month with the current day highlighted ● can be useful when you are having a tired moment and forget what your life looks like
date	● will give you the current date and time as a string ● again useful if you are having a tired moment and just need to know time still works properly
yes	● will print the same phrase repeatedly in your terminal until you hit `[ctrl] + c` ● **usage:** `yes [some words]`
cowsay	● will take a phrase and print a little ASCII art cow saying that phrase ● **usage:** `cowsay "[some words]"`

	• can also pipe things into cowsay
	  ◦ you could have a cow tell you your grep output
	• there are also many other animals you could do
	  ◦ for a list do cowsay -l
	  ◦ **usage for different animal:** `cowsay -f [animal file] [some words]`
	  ▪ ex: `cowsay -f dragon-and-cow "hello"`