

# Intro to Linux

## Basic Terminal

ssh	<ul style="list-style-type: none"><li>• short for <b>secure shell</b></li><li>• <b>usage:</b> ssh [host]@[computer].[otherIPStuff]<ul style="list-style-type: none"><li>◦ for lab computers: ssh [CSID]@[comp].cs.utexas.edu</li><li>◦ can get a list of active computers from the UTCS web page by searching “lab machines”</li></ul></li><li>• works natively for Macs and Linux machines</li><li>• for Windows machines will need to use Putty<ul style="list-style-type: none"><li>◦ WinSCP is also a great program for Windows</li></ul></li><li>• there is also a secure shell extension for Chrome</li></ul>
[ctrl] + [alt] + t	<ul style="list-style-type: none"><li>• this will open up a new terminal window for you</li><li>• is super convenient on the computers in the lab</li></ul>
[up arrow]	<ul style="list-style-type: none"><li>• this is bring up the last command you used in the your terminal<ul style="list-style-type: none"><li>◦ if used multiple times will keep going up in your command history</li></ul></li><li>• can be useful when using long/ repeated commands</li><li>• the down arrow will go back through commands in the other direction</li></ul>
history	<ul style="list-style-type: none"><li>• this will print out a list of your previous terminal commands</li><li>• can be useful if you are trying to remember a complex command you did previously but can't quite remember</li></ul>
clear	<ul style="list-style-type: none"><li>• this will totally clear your terminal screen</li><li>• can be useful when have just run something really complex and would like a clean slate</li></ul>
man	<ul style="list-style-type: none"><li>• short for <b>man</b>ual</li><li>• <b>usage:</b> man [something confusing]<ul style="list-style-type: none"><li>◦ example: man grep</li></ul></li><li>• will give you helpful usage information about certain commands/ system calls<ul style="list-style-type: none"><li>◦ is especially useful to look at the flags for commands</li></ul></li></ul>
echo	<ul style="list-style-type: none"><li>• this will basically just print something to your terminal window</li><li>• <b>usage:</b> echo “hello world”</li><li>• is really useful in bash scripts<ul style="list-style-type: none"><li>◦ <b>NOTE:</b> bash scripts are a way to run a collection of terminal commands as a single command</li></ul></li></ul>
[ctrl] + c	<ul style="list-style-type: none"><li>• this will stop whatever is currently running in your terminal</li><li>• can be especially useful when you accidentally run a program with an infinite loop<ul style="list-style-type: none"><li>◦ Or any other long running program/ script that you want to stop</li></ul></li></ul>

<b>[ctrl] + [shift] + c</b>	<ul style="list-style-type: none"> <li>• this will let you copy something from you terminal</li> <li>• useful if trying to Google what an error means</li> </ul>
<b>[ctrl] + [shift] + v</b>	<ul style="list-style-type: none"> <li>• this will let you paste into the terminal</li> <li>• useful if just Googled a way to do something cool</li> </ul>
<b>sudo</b>	<ul style="list-style-type: none"> <li>• short for <b>s</b>uper <b>u</b>ser <b>d</b>o</li> <li>• will allow you to run commands you normally aren't allowed to</li> <li>• <b>usage:</b> sudo [command] <ul style="list-style-type: none"> <li>◦ <b>NOTE:</b> you cannot run sudo</li> <li>◦ on the lab machines</li> </ul> </li> </ul>
<b>exit</b>	<ul style="list-style-type: none"> <li>• will close out of the terminal window without having the hit the little x in the corner</li> </ul>

## Directories and Files

<b>ls</b>	<ul style="list-style-type: none"> <li>• short for <b>l</b>ist</li> <li>• lists all the files/ directories in the current directory</li> <li>• you might also want to try the sl command on the lab machines</li> </ul>
<b>ls -al</b>	<ul style="list-style-type: none"> <li>• will list all the files in the current directory along with their permissions</li> <li>• permissions: <ul style="list-style-type: none"> <li>◦ read - can view the stuff</li> <li>◦ write - can edit the stuff</li> <li>◦ execute - can run (for scripts and such)</li> </ul> </li> <li>• 3 sets <ul style="list-style-type: none"> <li>◦ (owner) (group) (anyone)</li> </ul> </li> </ul>
<b>pwd</b>	<ul style="list-style-type: none"> <li>• short for <b>p</b>rint <b>w</b>orking <b>d</b>irectory</li> <li>• any easy way to know where you are in the file hierarchy if you forget</li> </ul>
<b>cd</b>	<ul style="list-style-type: none"> <li>• short for <b>c</b>hange <b>d</b>irectory</li> <li>• used to navigate between directories in your file structure</li> <li>• usage: cd [directory] <ul style="list-style-type: none"> <li>◦ can use "cd .." to go back up the directory structure</li> <li>◦ can also put in a full path instead of just a directory name <ul style="list-style-type: none"> <li>■ "/" at front of directory will be an absolute path from your root directory</li> <li>■ no "/" at front of directory will be a relative path</li> <li>■ "." just means current directory so ./hello.txt is the same as hello.txt</li> </ul> </li> </ul> </li> </ul>
<b>[tab]</b>	<ul style="list-style-type: none"> <li>• this will autocomplete whatever you are currently doing in the terminal</li> <li>• ex: cd Doc + [tab] would autocomplete Doc to Documents without you having to type out the whole thing</li> </ul>
<b>mkdir</b>	<ul style="list-style-type: none"> <li>• short for <b>m</b>ake <b>d</b>irectory</li> <li>• will make a new directory for you</li> </ul>

	<ul style="list-style-type: none"><li>● <b>usage:</b> mkdir [directory name]<ul style="list-style-type: none"><li>○ <b>NOTE:</b> can also use relative vs. absolute paths instead of just a directory name</li></ul></li></ul>			
cp	<ul style="list-style-type: none"><li>● short for <b>copy</b></li><li>● a way to make a copy of something in a different directory</li><li>● <b>usage:</b> cp [source/file name] [destination]<ul style="list-style-type: none"><li>○ again can use relative or absolute paths for the source and destination</li><li>○ <b>NOTE:</b> This copies to destinate and keeps the original in source as well</li></ul></li></ul>			
scp	<ul style="list-style-type: none"><li>● short for <b>secure copy</b></li><li>● a way to copy files between computers</li><li>● <b>usage:</b> scp [source] [destination]<ul style="list-style-type: none"><li>○ from other computer: scp [host]:[source/file name] [destination on your computer]</li><li>○ to other computer: scp [source/file name] [host]:[destination on other computer]</li></ul></li></ul>			
mv	<ul style="list-style-type: none"><li>● short for <b>move</b></li><li>● a way to actually move files/directories around on your computer<ul style="list-style-type: none"><li>○ also an easy way to rename directories</li></ul></li><li>● <b>usage:</b> mv [source] [destination]<ul style="list-style-type: none"><li>○ as usual you can use either a relative or absolute path for the source and destination</li></ul></li></ul>			
rm	<ul style="list-style-type: none"><li>● short for <b>remove</b></li><li>● deletes a file</li><li>● <b>usage:</b> rm [file name]</li><li>● helpful things:<ul style="list-style-type: none"><li>○ rm -rf [directory name]<ul style="list-style-type: none"><li>■ will delete a directory and everything inside it</li><li>■ use with caution, if you don't give a destination for this it will delete EVERYTHING from your current directory down</li></ul></li></ul></li></ul>			
touch	<ul style="list-style-type: none"><li>● will either create a new file or update the last modified date on a file to the current date</li><li>● <b>usage:</b> touch [file]</li></ul>			
cat	<ul style="list-style-type: none"><li>● short for <b>catenate</b></li><li>● will print a file's contents to the terminal</li><li>● <b>usage:</b> cat [file]</li></ul>			
chmod	<ul style="list-style-type: none"><li>● used to change permissions</li><li>● <b>usage:</b> chmod [new settings] [file]</li><li>● new setting options</li></ul> <table><tr><td>Reference</td><td>Operator</td><td>Mode</td></tr></table>	Reference	Operator	Mode
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	<table><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>	u - user g - group o - others a - all (everybody)	add remove = set exactly	r - read w - write x - execute
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<b>grep</b>	<ul style="list-style-type: none"><li>• a way to search through file(s)</li><li>• <b>usage:</b> grep [search for] [file]<ul style="list-style-type: none"><li>◦ can search for things using regex</li></ul></li><li>• helpful flags:<ul style="list-style-type: none"><li>◦ -n lists the line number next to matches</li><li>◦ -r search recursively</li><li>◦ * instead of a file name will search the whole directory</li></ul></li></ul>			
<b>find</b>	<ul style="list-style-type: none"><li>• used to find out where a file lives in your file hierarchy</li><li>• <b>usage:</b> find [path] -name [file]<ul style="list-style-type: none"><li>◦ if path is not given then will search the current directory and every directory it contains</li></ul></li></ul>			
<b>diff</b>	<ul style="list-style-type: none"><li>• short for <b>difference</b></li><li>• shows the difference between 2 files</li><li>• <b>usage:</b> diff [file 1] [file 2]</li><li>• helpful flags:<ul style="list-style-type: none"><li>◦ -b ignore white space diffs</li><li>◦ -i ignore case</li><li>◦ --side-by-side - see differences next to each other</li></ul></li></ul>			

## Redirection Input/ Output

	<ul style="list-style-type: none"> <li>• will make the output from command on the left the input for the command on the right</li> <li>• ex: man hello   grep "hello" <ul style="list-style-type: none"> <li>◦ will search for the word hello in the man pages for hello (this will actually work on the lab machines)</li> </ul> </li> </ul>
> <b>and</b> >>	<ul style="list-style-type: none"> <li>• will redirect output on left into the file on the right</li> <li>• single &gt; will replace the contents of the file with the given output and double &gt;&gt; will append to the file</li> <li>• ex: echo "hello" &gt; hello.txt</li> <li>• ex: cat [file1] [file2] &gt; [file3]</li> </ul>
<	<ul style="list-style-type: none"> <li>• will redirect thing on the right to be the input for the thing on the left</li> <li>• ex: ProgramTakesInAge &lt; 12</li> <li>• is really good for testing projects that take in user input</li> </ul>

## Java Specific

<code>java -version</code>	<ul style="list-style-type: none"><li>• will tell you what version of Java is currently installed on your machine</li><li>• will also tell you if java is not installed on your machine at all</li></ul>
<code>javac</code>	<ul style="list-style-type: none"><li>• used to compile a java program</li><li>• <b>usage:</b> <code>javac [file]</code><ul style="list-style-type: none"><li>◦ must have the .java extension</li></ul></li><li>• if successful will create a .class file with the same name as the original Java file</li></ul>
<code>java</code>	<ul style="list-style-type: none"><li>• used to run a compiled Java file</li><li>• <b>usage:</b> <code>java [name of .class file]</code><ul style="list-style-type: none"><li>◦ ex: <code>java Test</code><ul style="list-style-type: none"><li>■ don't put .class at the end of the file name</li><li>■ this would have come from compiling a file called Test.java</li></ul></li></ul></li></ul>

## UTCS Specific

<code>lpq</code>	<ul style="list-style-type: none"><li>• short for <b>l</b>ist <b>p</b>rinter <b>q</b>ueue<ul style="list-style-type: none"><li>◦ or at least that is how I remember it</li></ul></li><li>• will give you a list of pending jobs on a given printer</li><li>• <b>usage:</b> <code>lpq -P[printer name]</code><ul style="list-style-type: none"><li>◦ no space between the -P and the printer's name</li><li>◦ the Linux printer in the 3rd floor lab is lw301</li></ul></li></ul>
<code>lprm</code>	<ul style="list-style-type: none"><li>• can use to remove all your pending jobs from a printer's queue</li><li>• <b>usage:</b> <code>lprm -P[printer name] [CSID]</code></li><li>• very useful if the printer is backed up/ not working and you need to run to class soon without worrying about wasting paper</li></ul>
<code>chkquota</code>	<ul style="list-style-type: none"><li>• short for <b>c</b>heck <b>q</b>uota</li><li>• each UTCS student only gets a certain amount of space so it is important to check how much you are using at any given time</li><li>• if you reach 100% you will stop being able to save files/ do certain things</li><li>• <b>NOTE:</b> caching on certain browsers can cause this quota to fill up quickly, to fix just clear your cache folder</li></ul>
<code>du -sk ~/* ~/.??*   sort -n</code>	<ul style="list-style-type: none"><li>• will basically tell you which files are using the most memory</li><li>• super useful if your disk quota is at 100% and you need to figure out what to delete</li></ul>

## Fun Stuff

<b>cal</b>	<ul style="list-style-type: none"><li>• will give you a little ASCII calendar of the current month with the current day highlighted</li><li>• can be useful when you are having a tired moment and forget what your life looks like</li></ul>
<b>date</b>	<ul style="list-style-type: none"><li>• will give you the current date and time as a string</li><li>• again useful if you are having a tired moment and just need to know time still works properly</li></ul>
<b>yes</b>	<ul style="list-style-type: none"><li>• will print the same phrase repeatedly in your terminal until you hit [ctrl] + c</li><li>• <b>usage:</b> yes [some words]</li></ul>
<b>cowsay</b>	<ul style="list-style-type: none"><li>• will take a phrase and print a little ASCII art cow saying that phrase</li><li>• <b>usage:</b> cowsay "[some words]"</li><li>• can also pipe things into cowsay<ul style="list-style-type: none"><li>◦ you could have a cow tell you your grep output</li></ul></li><li>• there are also many other animals you could do<ul style="list-style-type: none"><li>◦ for a list do cowsay -l</li><li>◦ <b>usage for different animal:</b> cowsay -f [animal file] [some words]<ul style="list-style-type: none"><li>■ ex: cowsay -f dragon-and-cow "hello"</li></ul></li></ul></li></ul>
<b>fortune</b>	<ul style="list-style-type: none"><li>• will print a random fortune to your screen<ul style="list-style-type: none"><li>◦ there are some fun flags for this like, you should man fortune to see what they are</li></ul></li><li>• these are particularly fun to pipe into cowsay</li></ul>
<b>xeyes</b>	<ul style="list-style-type: none"><li>• will pop up a screen with little eyes on your screen that will follow your cursor around</li><li>• can be entertaining when you are super stressed/ tired</li><li>• <b>NOTE:</b> won't work over ssh</li></ul>