

Lesson 1 Computational Platforms for Bioinformatics

Note: In this document different fonts have different meanings:

Times is used to explain commands and otherwise address the reader directly.

Courier is used to indicate commands and command options.

Courier italics are used to indicate command parameters, for example, filenames.

Courier bold is used to indicate commands that are not displayed.

Courier bold italics are used to indicate computer-generated output.

Helvetica is used to indicate menu items.

Address of the cancercenter machine from the Columbia Network:

cancercenter

or if that doesn't work or from outside the Columbia Network:

cancercenter.columbia.edu

or if that doesn't work:

156.111.5.92

From terminal on Mac OS X:

ssh username@cancercenter.columbia.edu

Summary of commands:

<code>login</code>	gets you onto the system.
<code>passwd</code>	changes your password.
<code>ls</code>	lists the files in the directory. "ls" is short for "LiSt".
<code>ls -a</code>	lists "hidden" files (files whose names begins with a ".").
<code>ls -l</code>	gives a detailed description of each file listed. "ls -l" stands for "LiSt Long".
<code>cd <i>directoryname</i></code>	changes the directory to the directory specified. "cd" is short for "Change Directory".
<code>cd</code>	changes the directory to the user's login directory.
<code>cd -</code>	changes the directory to the directory that the user was in most recently.
<code>cat <i>filename</i></code>	displays the contents of the file on the screen.
<code>cat <i>filename1 filename2</i></code>	displays the contents of the two files

consecutively on the screen ("cat" stands for "conCATenate").

`command filename(s) > outfile` redirects output of command to new outfile.

`ls fly*` lists all file names beginning with "fly."

`wc` gives the number of lines, words, and characters in a file. "wc" stands for "Word Count".

`rm filename` removes a filename. ("rm" stands for "ReMove").

`rm -f filename` removes a filename without asking you if you are sure "-f" stands for forced.

`ls fly* > list; wc list; rm list` Counts the files in the directory in one step.

`ls | wc` Lists the file names beginning with "fly." and then counts the number of words, lines, and characters in that list. Does the same thing as the previous two commands but the file with the list of files ending in 'seq' is never mentioned explicitly. '|' is called a pipe.

`command1 filename(s) | command2` Takes the output of command1 and uses it as the input of command 2.

`lpr filename` prints "filename" on cancercenter's printer ("lpr" is short for "Laser PRinter"). This command currently does not work.

`lpr -Peddie filename` prints "filename" on a printer affectionately known as eddie located in room P&S 1-420C

`more filename` displays the contents of a file a page at a time.

more commands:

- `<space bar>` displays the next page.
- `<return>` displays the next line.
- `b` displays the previous page.
- `q` quits more.

`mkdir directoryname` makes a directory. ("mkdir" stands for "MaKeDIRectory").

`rmdir directoryname` removes an empty directory ("rmdir" stands for "ReMove DIRectory").

`mv oldfilename newfilename` changes the name of a file from oldfilename to newfilename ("mv" stands for "MoVe").

`mv newversion oldversion` replaces the original version of a file with the new version and gives the new version the name of the old version.

`mv filename directoryname` moves the file to a new directory.

`mv directoryname1 directoryname2` moves a directory and everything that's in it to a new directory.

`cp filename1 filename2` copies a file to a new file with a different name (“cp” stands for “CoPy”).

`cp filename directoryname` copies a file to a new directory.

`cp -r directoryname1 directoryname2` copies the entire contents of a directory to a new directory. (“cp -r” stands for “Recursive CoPy”).

`.` stands for the directory you are in.

`..` stands for the directory immediately above the one you are in.

`cd ..` goes one directory up.

`cp -r /parnassu/users/playwrights/aeschylus/oresteia /parnassu/users/playwrights/euripides/` copies the directory:

`‘parnassu/users/playwrights/aeschylus/oresteia’` to the directory:

`‘parnassu/users/playwrights/euripides/’`

`cp -r /parnassu/users/playwrights/aeschylus/oresteia .` does the same thing as the above command.

`cp -r ../aeschylus/oresteia .` does the same thing as the above two commands.

`pico` starts the pico text editing program.

pico menu commands:

- `^O (ctrl O)` saves message.
- `^X` quits pine session.
- `^G` pico Help.

`pico filename` edits “filename” with pico. “filename can be either a new or a preexisting file.

`grep GAATTC sample.tfa` displays all lines containing ‘GAATTC’ that occur in the file ‘sample.tfa’.

`grep ‘like me’ fly2` grep stands for ‘**g**lobal **r**egular **e**xpression **p**arser’. displays all lines containing ‘like me’ that occur in the file fly2.

`more ba<TAB>cchae` the machine completes the filename after the escape key is pressed.

`more ip<TAB>higenia_in_a<TAB>ulis` if there are two files in the directory that fit the specification, upon typing escape the machine will fill in the file names up until the point at which the filenames disagree. Then type another letter to resolve the ambiguity followed by escape. The machine fills the desired filename in.

`tof<TAB>asta` completes the "tofasta" command.

`↑` scrolls up through command sequence.

`↓` scrolls down through command sequence.

`logout` gets you off the system.

Lab:

1. Login.

2. Change your password. Your new password should be at least 6 characters long and have at least one nonalphabetic character and at least one uppercase character. Do not share your password with anyone else or let anyone else use the machine logged on with your password. To do so is a violation of both University policy and Federal law (I'm not kidding the relevant law is HIPAA – the Health Insurance Portability and Accountability Act). Please bring your password to class for the rest of the semester.

3. Copy the files *tyger1* and *tyger2* from the directory `/usr/seq/seqclass/lab1/` to the directory that you are in.

4. Combine *tyger1* and *tyger2* into a file called *tyger*.

5. Make a directory called *stars* and go to it.

6. Type a file called *prologue*. The text of the file should be:

This was a Golden Age, a time of high adventure rich living and hard dying...but nobody thought so. This was a future of fortune and theft, pillage and rapine, culture and vice...but nobody admitted it. This was a century of extremes, a fascinating century of freaks...but nobody loved it.

Save the file.

7. Place the line from the file that contains the word “pillage” in a file called *pillage*.

8. Change the name of *prologue* to *introduction*.

9. Copy the file called *introduction* to *prologue*.

10. Make a new directory, a subdirectory to your home directory, called *gully*.

11. Copy the file *prologue* to the directory *gully*.

12. Move the file *introduction* to the directory *gully*.

13. Ask the teacher to check your work. After he okays it, erase your files and directories.

14. Logout.

Recommended book for learning more about Unix:

Unix Primer Plus, 3rd Ed. Martin, et al. (The second edition is even better if you can find a copy).

Credits for texts used as examples in this lessons:

Alfred Bester for Prologue to *The Stars My Destination*.

William Blake for *The Fly* and *The Tyger* from *Songs of Experience*.

Euripides for *The Bacchae*, *Iphigenia in Aulis*, and *Iphigenia in Tauris*.

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