Intro to computation

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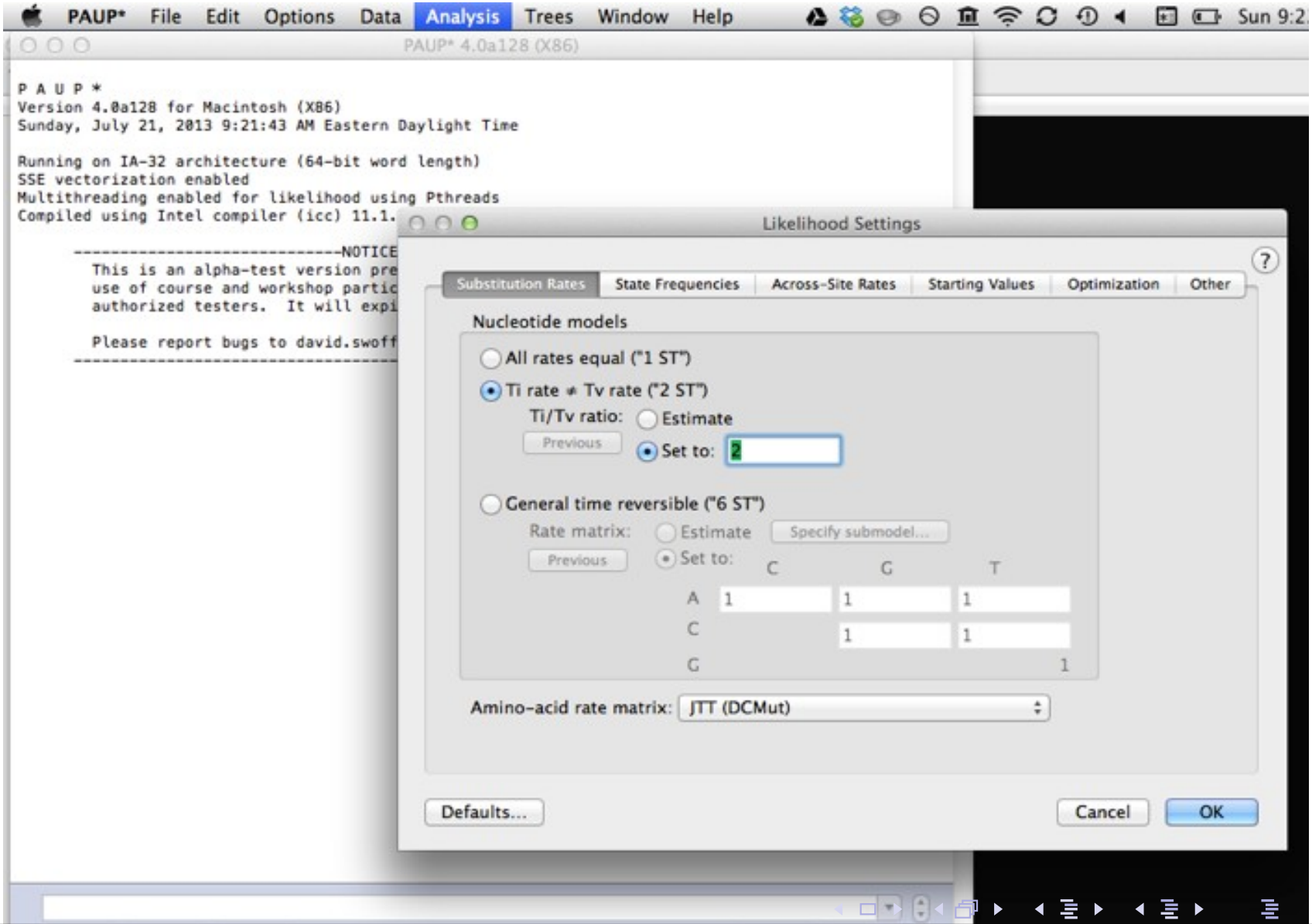
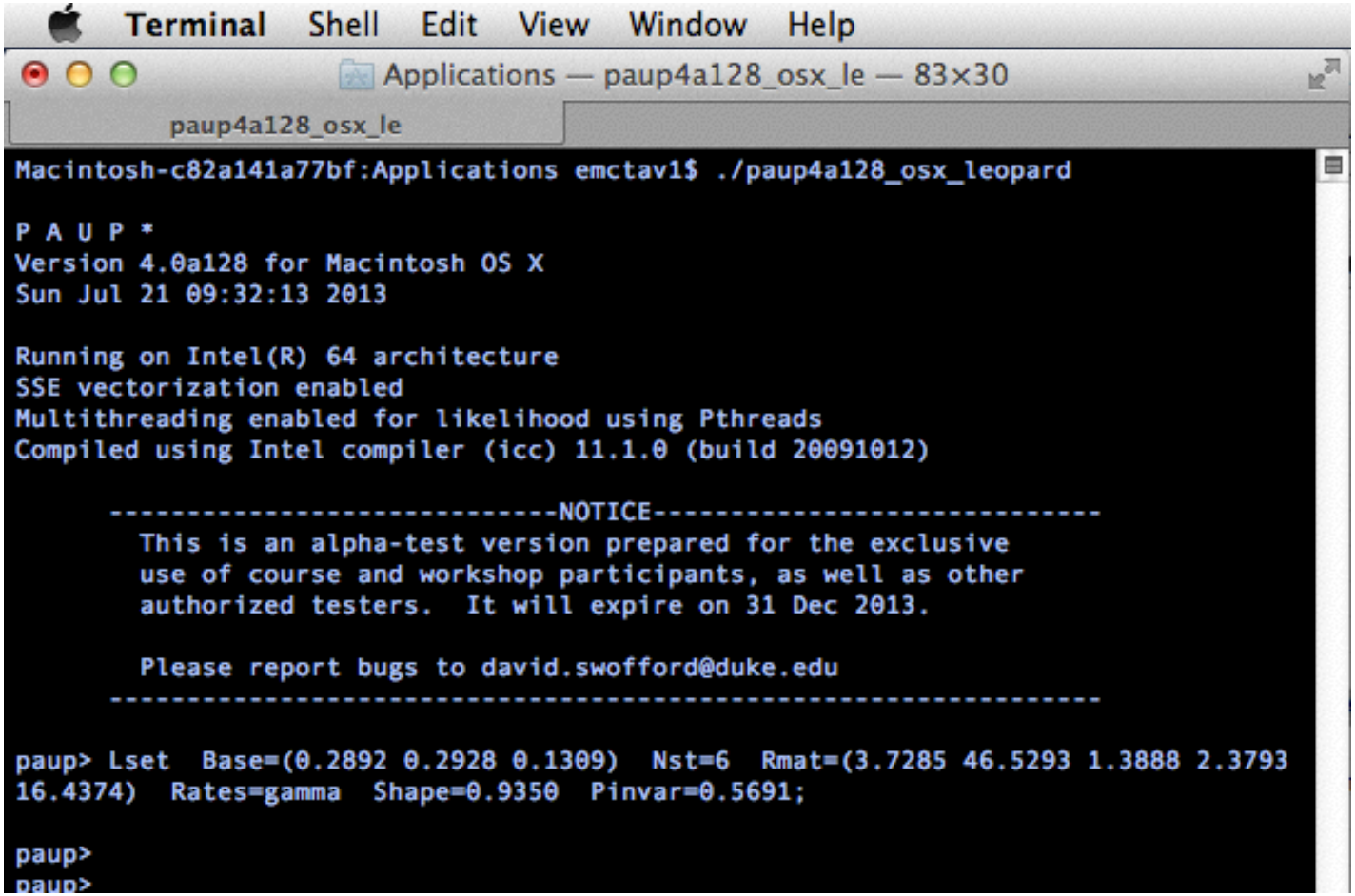
(With thanks to Jeet Sukumaran for the exercise)

There are many ways to interact with your computer

Graphical User Interface (GUI)



Command line

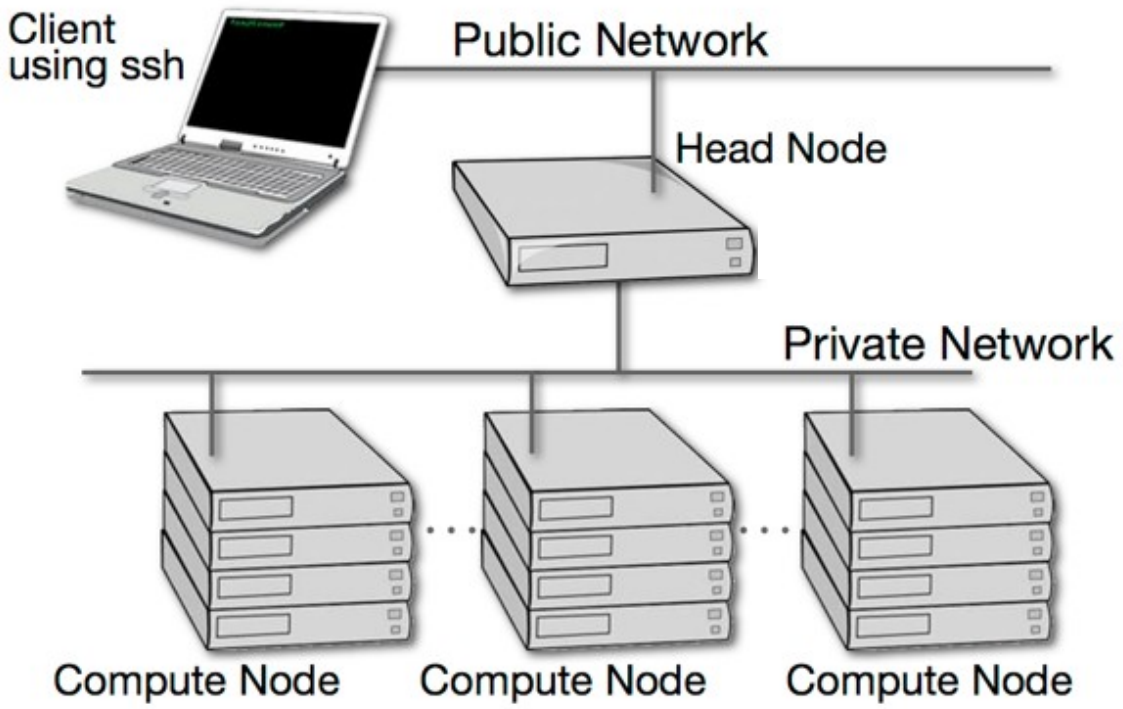


Why do things the hard way?

Advantages of command line

- Ease of repetition
- Batch processing
- Cluster computing
- Sometimes you just have to!

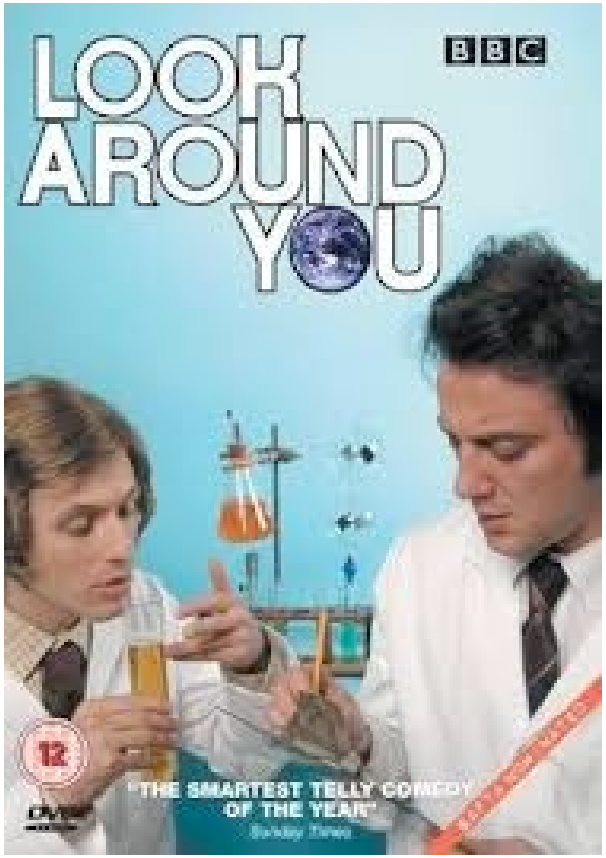
Cluster computing



www.udel.edu -

Open Terminal

Welcome to the command line!



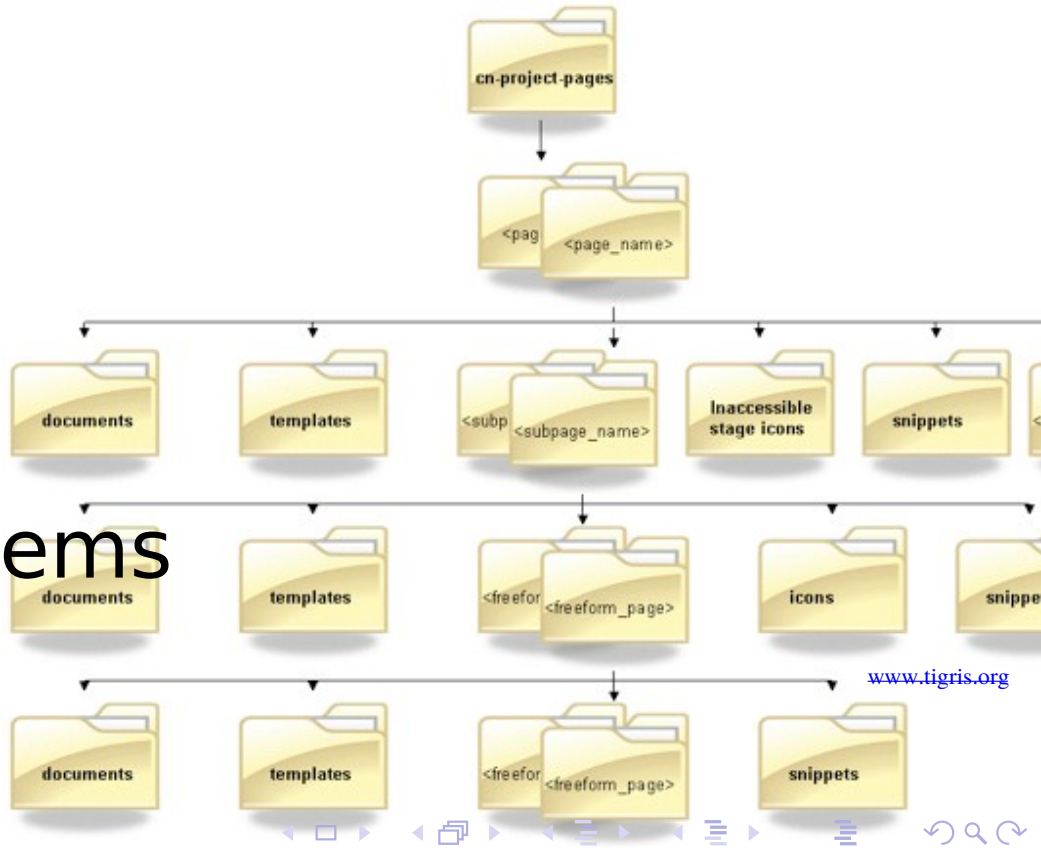
Directory Structure

`cd` to move around

`mkdir` to make a new directory

`pwd` to check where you are

/class/emctavish/items



Directory Structure

absolute paths start with ‘/’

relative paths are relative to your current working directory.

. refers to the directory you are in

.. is the directory above

Running programs: need to tell the computer where they are! (i.e /Applications/paup)

Special Characters

A space in bash denotes a new argument, so don't use it in filenames

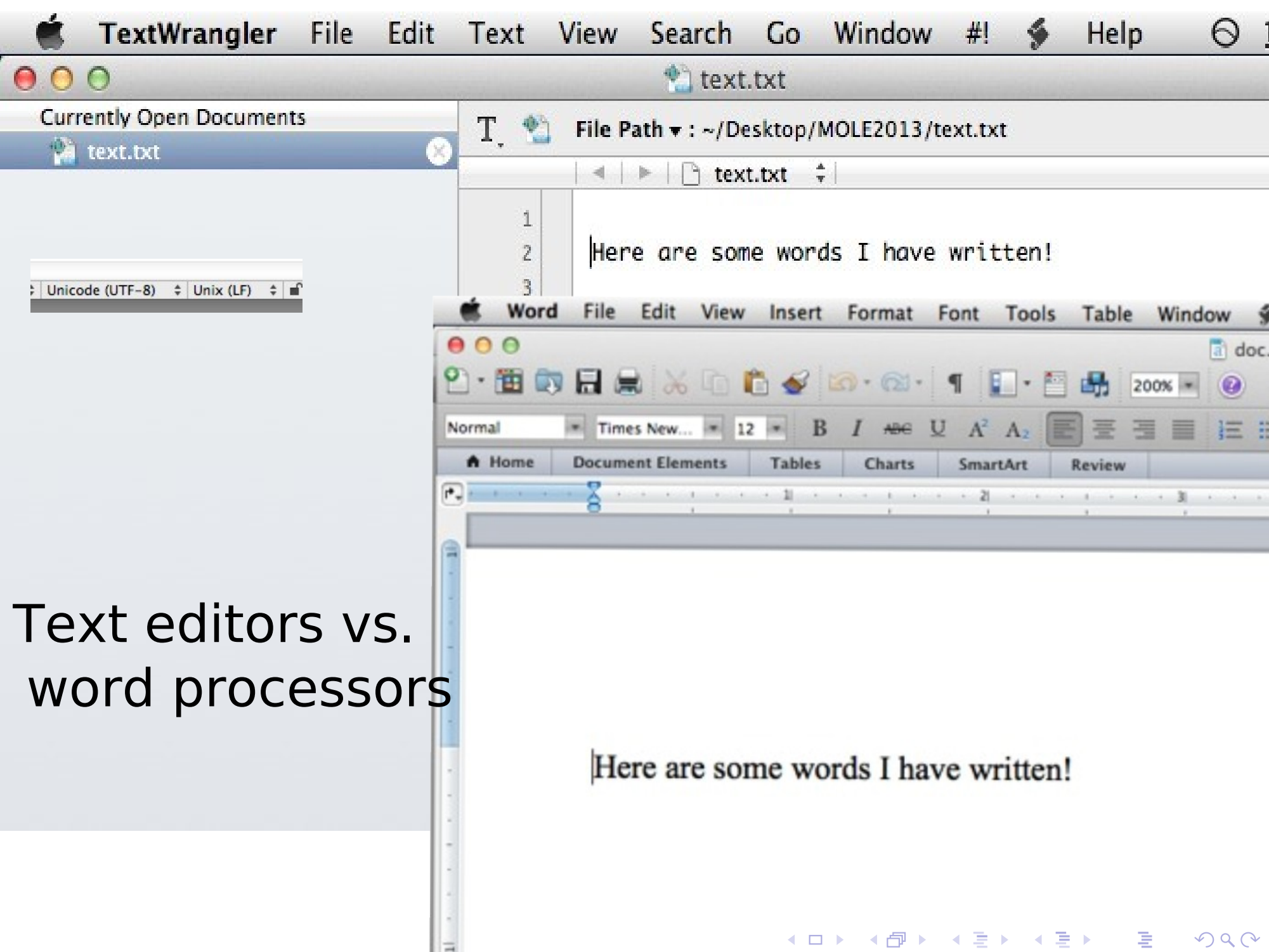
* and ? are wildcard match characters

Basic syntax is:

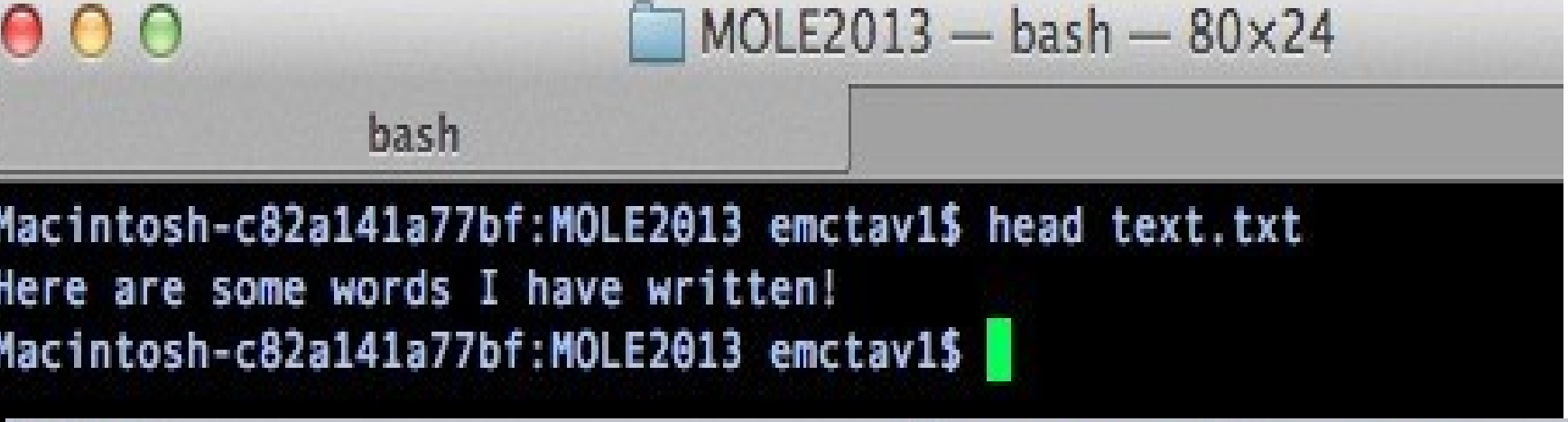
```
  command -options arguments
```

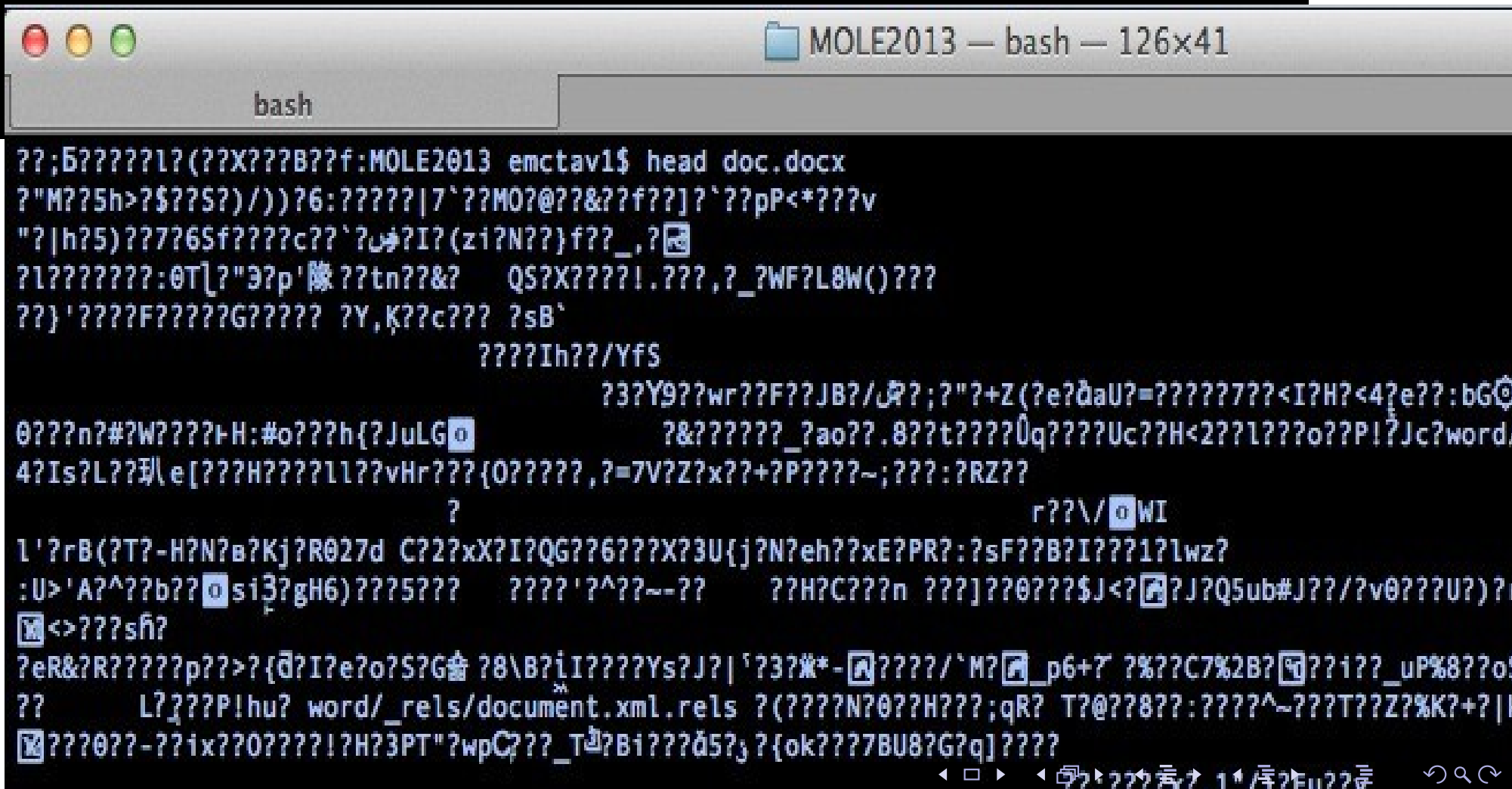
e.g.

```
  ls -ltr /class/
  cp from to
```



Text editors vs. word processors


MOLE2013 — bash — 80×24
bash
Macintosh-c82a141a77bf:MOLE2013 emctav1$ head text.txt
Here are some words I have written!
Macintosh-c82a141a77bf:MOLE2013 emctav1$


MOLE2013 — bash — 126×41
bash
??;Б?????l?(??X???B??f:MOLE2013 emctav1$ head doc.docx
?"M??5h>?$??S?)/))?6:?????|7`??MO?@??&??f??]?`??pP<*???v
"?|h?5)????6Sf????c??`?↵?I?(zi?N??}f??_,?
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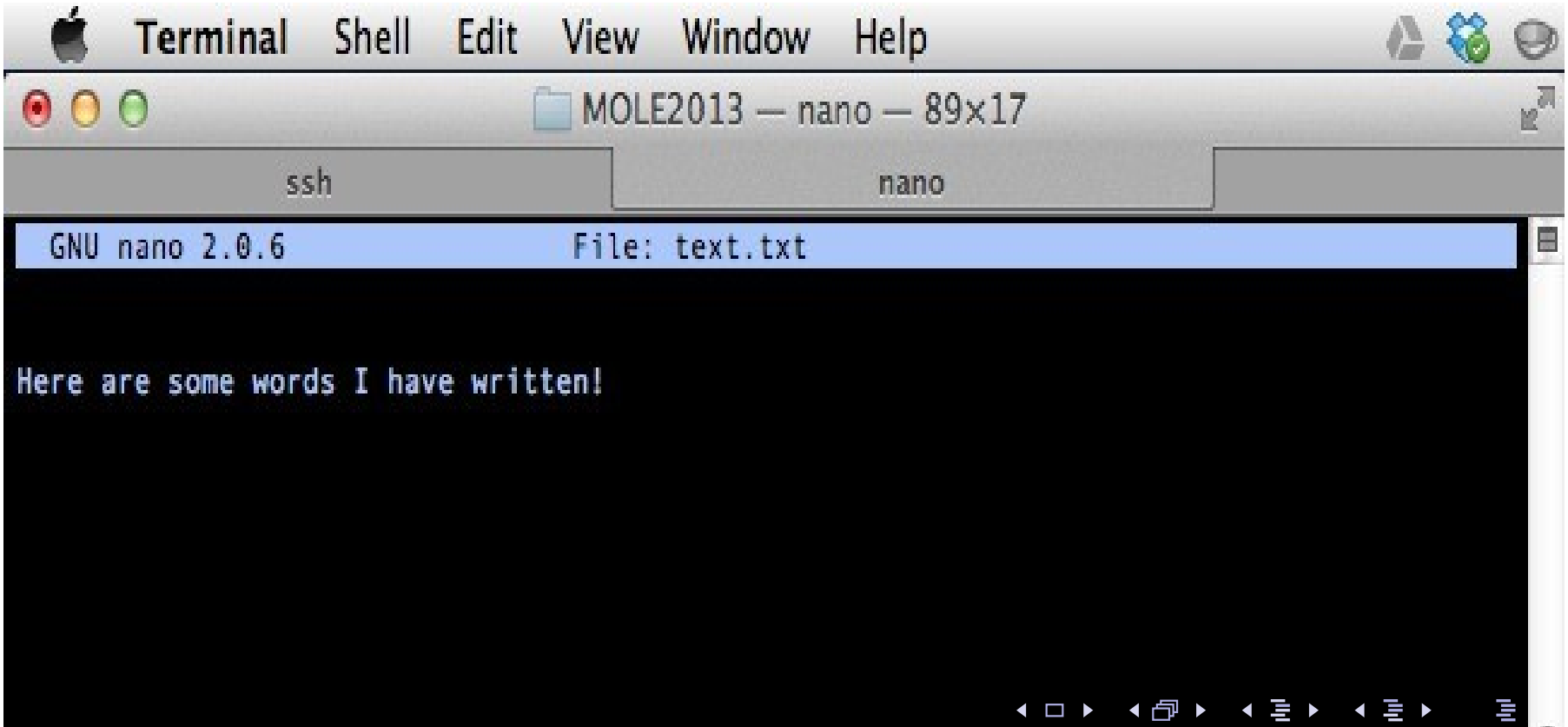
nano

nano < lename>

use Ctrl-X to exit and save



```
[emctavish@class02 ~]$
```

```
>
```

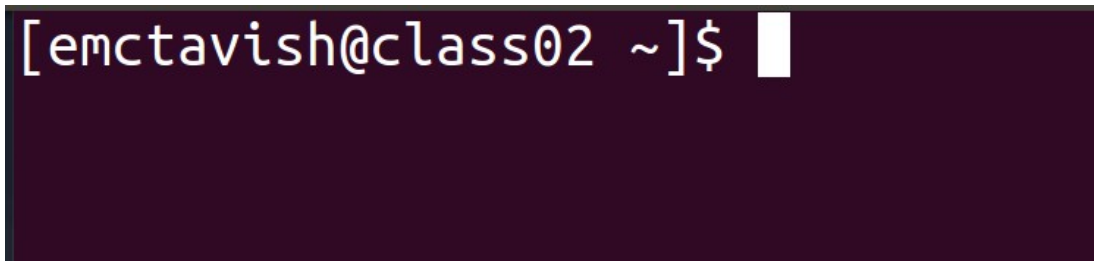
The prompt

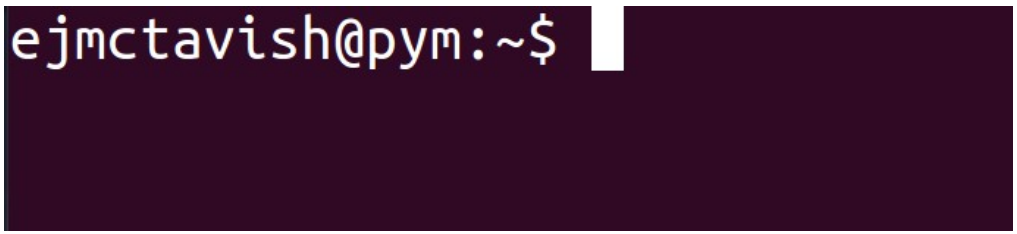
```
P A U P *
Portable version 4.0b10 for Unix
Sun Jul 27 13:52:25 2014

      ----------------------------NOTICE---------------------------
        This is a beta-test version.  Please report any crashes,
        apparent calculation errors, or other anomalous results.
        There are no restrictions on publication of results obtained
        with this version, but you should check the WWW site
        frequently for bug announcements and/or updated versions.
        See the README file on the distribution media for details.
      -------------------------------------------------------------

paup>
```

Local vs. remote





Ctrl-C

tab ↑

An Exercise: Writing and Viewing a Tree by Hand

1. Make sure you have:
   - A *good* text editor installed.
   - *FigTree* (or some other tree visualizer of choice).
2. Create a subdirectory for all our labs, e.g. "`$HOME/projects/GradPhylo`".
3. Create a work subdirectory within this directory for this particular lab, e.g. "`lab-01`".
4. Using a command line text editor (nano or or personal favorite) create a simple Newick tree file using a text editor, e.g. "simple.newick".
5. This tree should reflect the real topological relationships of at least 4 species.
6. Visualize it in *FigTree*.
7. Export as a NEXUS file.
8. Open this second file in a text editor and edit the tip labels.
9. Visualize it again.

HPC Assignment:
Write and submit a job submission script for the cluster that will run on the fastq queue.
It should have the job name, 'test244' followed by the job id, print output to a file test244.log, and it should
run whoami, and concatenate the contents of the file 'hello_tree.txt' in the in the qsb244 directory into the output.
Upload your submission script and the output log file to catcourses.