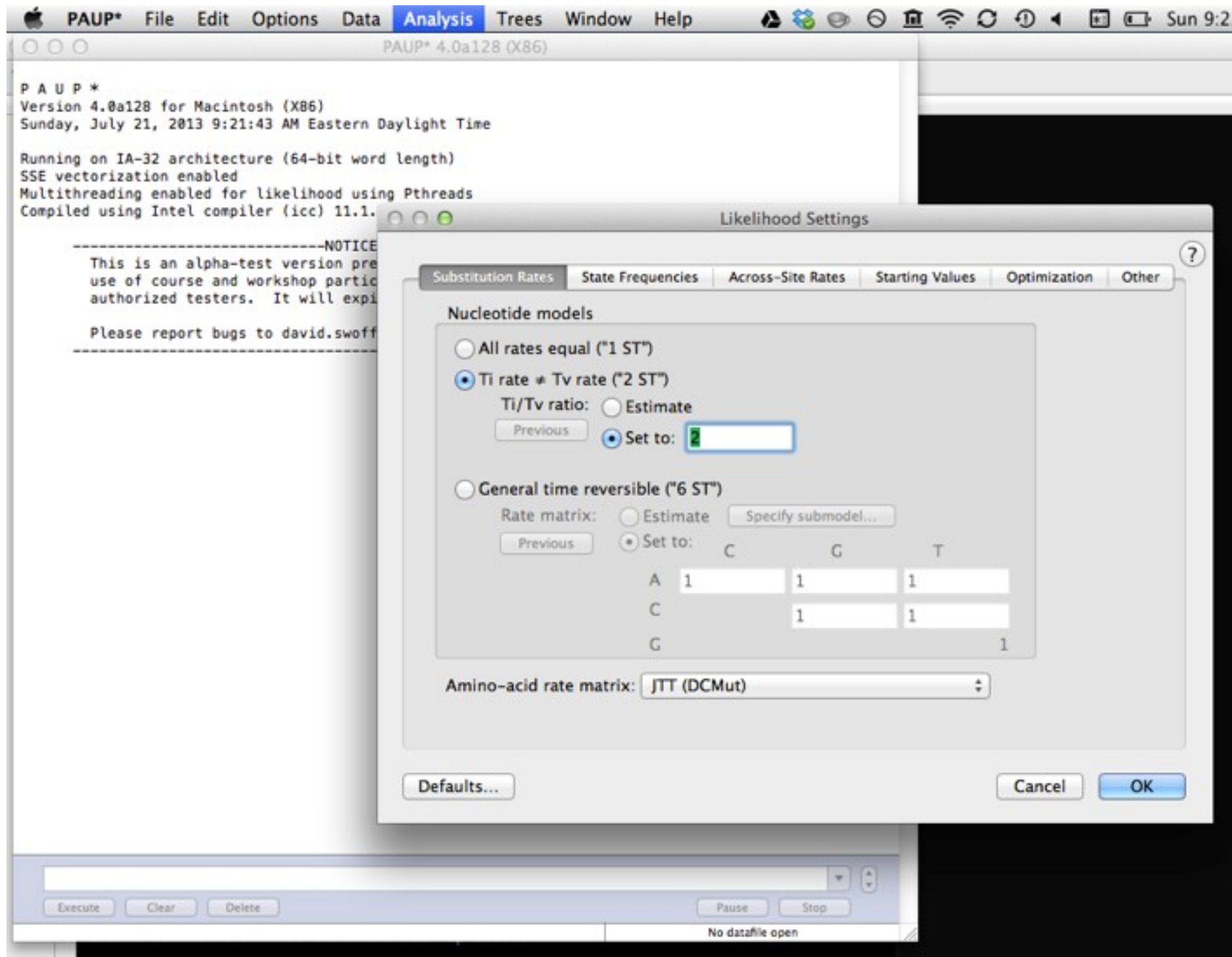


Computer lab introduction

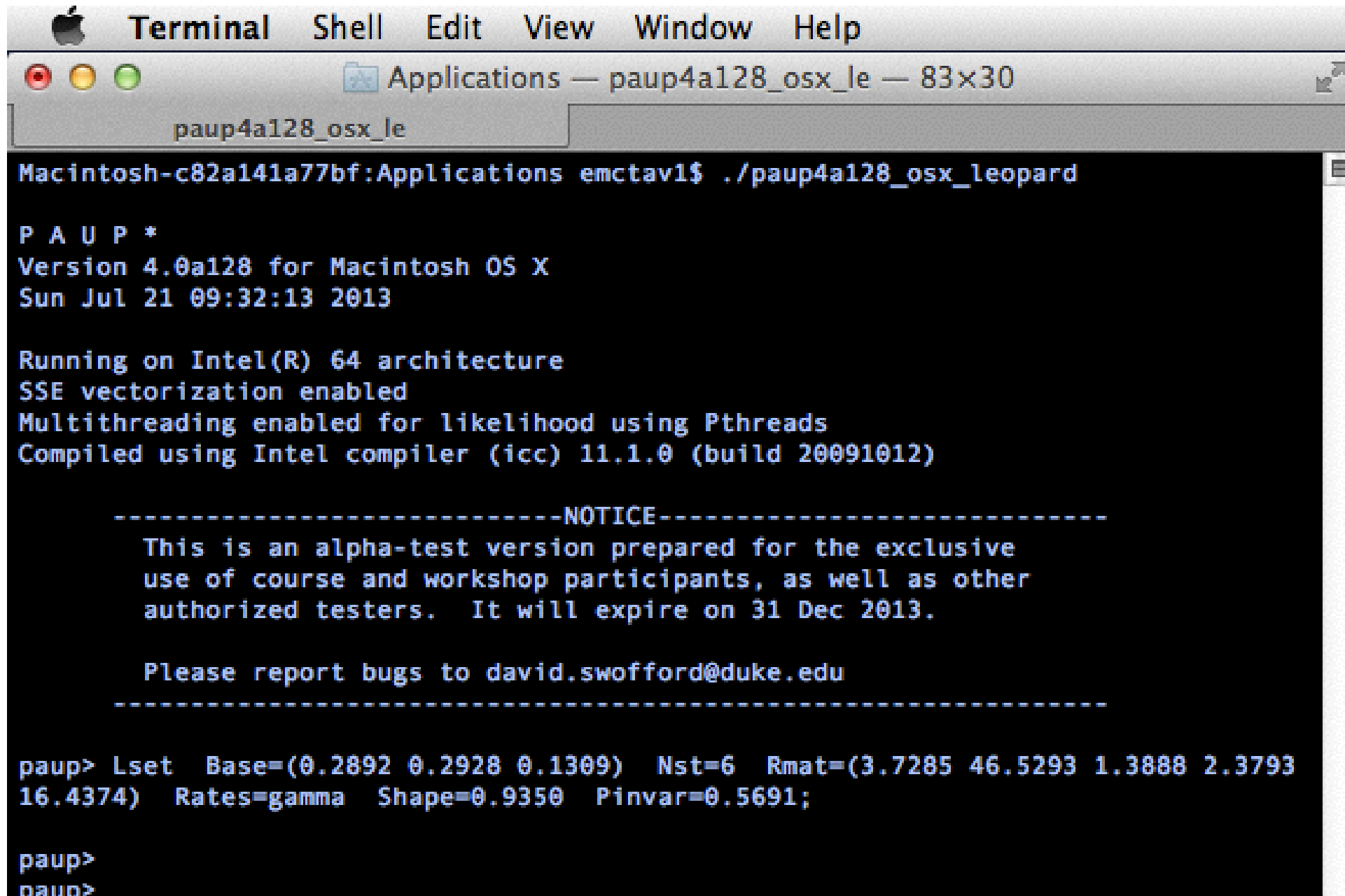
There are many ways to interact with your computer



Graphical User Interface (GUI)



Command line



```
Terminal Shell Edit View Window Help
Applications — paup4a128_osx_le — 83x30
paup4a128_osx_le
Macintosh-c82a141a77bf:Applications emctav1$ ./paup4a128_osx_leopard

P A U P *
Version 4.0a128 for Macintosh OS X
Sun Jul 21 09:32:13 2013

Running on Intel(R) 64 architecture
SSE vectorization enabled
Multithreading enabled for likelihood using Pthreads
Compiled using Intel compiler (icc) 11.1.0 (build 20091012)

-----NOTICE-----
  This is an alpha-test version prepared for the exclusive
  use of course and workshop participants, as well as other
  authorized testers.  It will expire on 31 Dec 2013.

  Please report bugs to david.swofford@duke.edu
-----

paup> Lset Base=(0.2892 0.2928 0.1309) Nst=6 Rmat=(3.7285 46.5293 1.3888 2.3793
16.4374) Rates=gamma Shape=0.9350 Pinvar=0.5691;

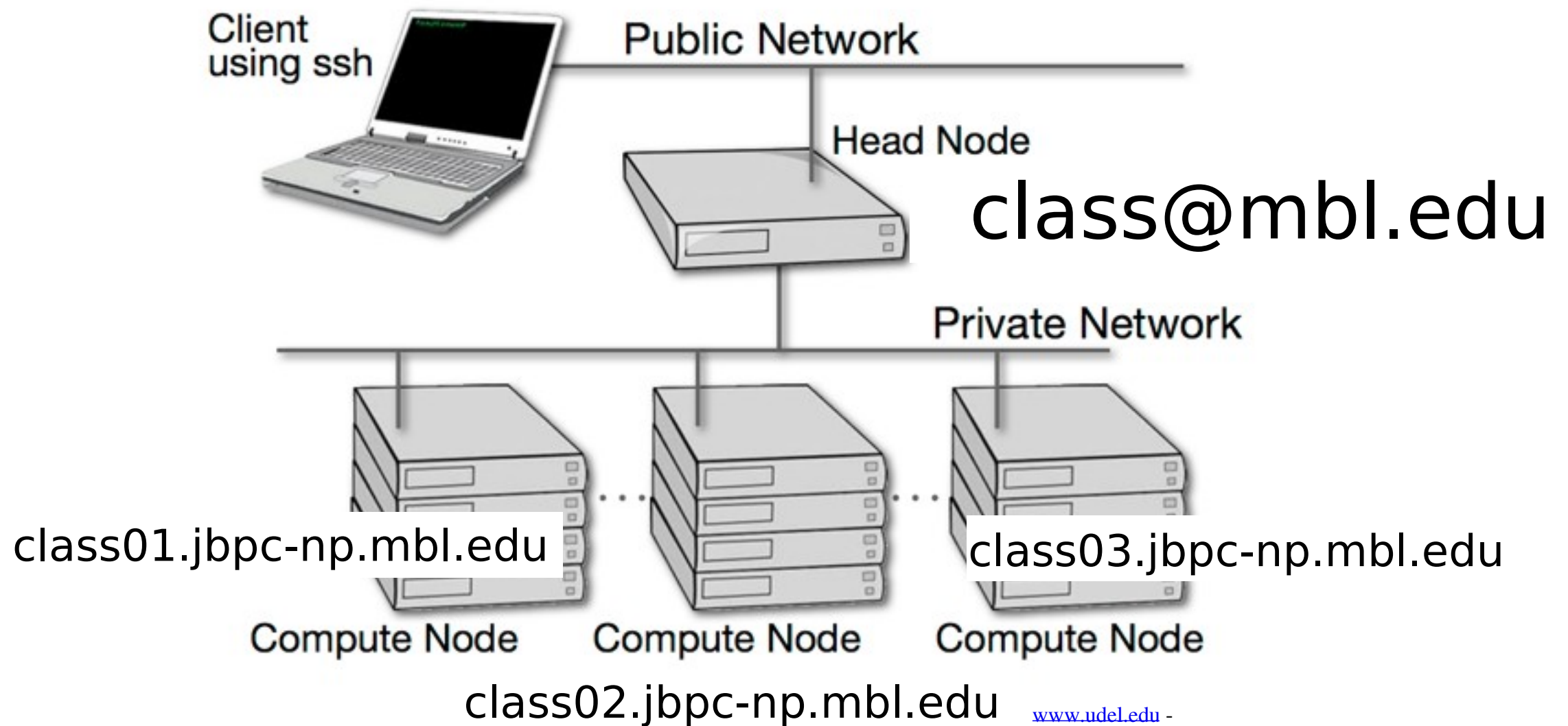
paup>
paup>
```

Why do things
the hard way?

Advantages of command line

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

Cluster computing



On Mac or Linux

Open Terminal

Mac: /Applications/Utilities and
double-click on Terminal.

On Mac or Linux

type

```
ssh <yourname>@class0<x>.jbpc-np.mbl.edu
```

e.g.

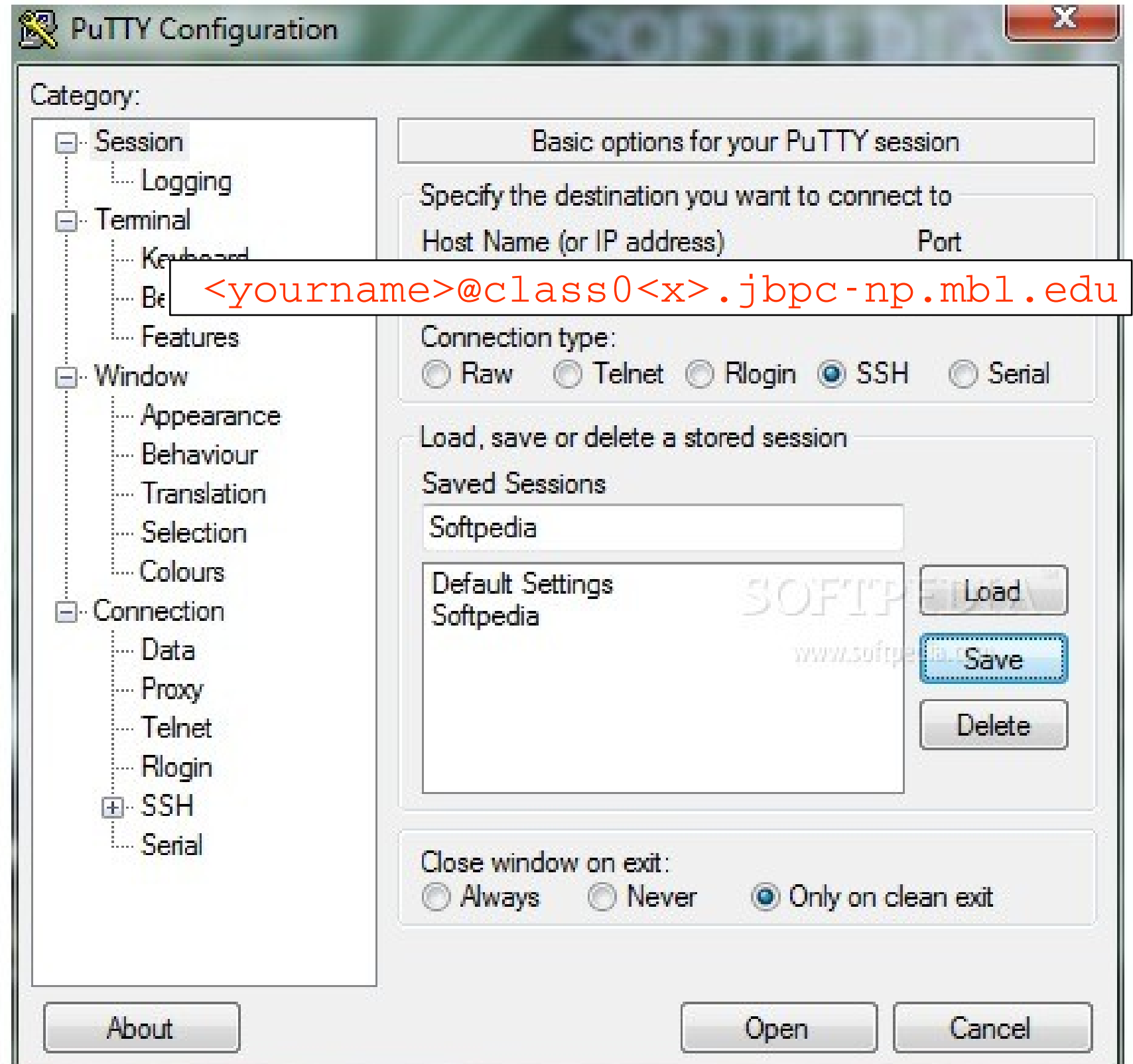
```
ssh emctavish@class01.jbpc-np.mbl.edu
```

Enter the password that is listed
on the slip of paper you got with
your name tag.

(it won't show up when you type it)

On Windows

Open PuTTY



Copy and Paste in PuTTY

Use the left mouse button to select text in the PuTTY window. The act of selection automatically copies the text to the clipboard.

To paste the clipboard contents into a PuTTY window, you click the right mouse button.

Ideally:

```
emctavish@class-01.mbl.edu's password:  
Last login: Sun Jul 21 10:21:22 2013 from 10.202.6.208
```

```
Welcome to the MBL Molecular Evolution Class for 2013
```

```
[emctavish@class-01 ~]$ █
```

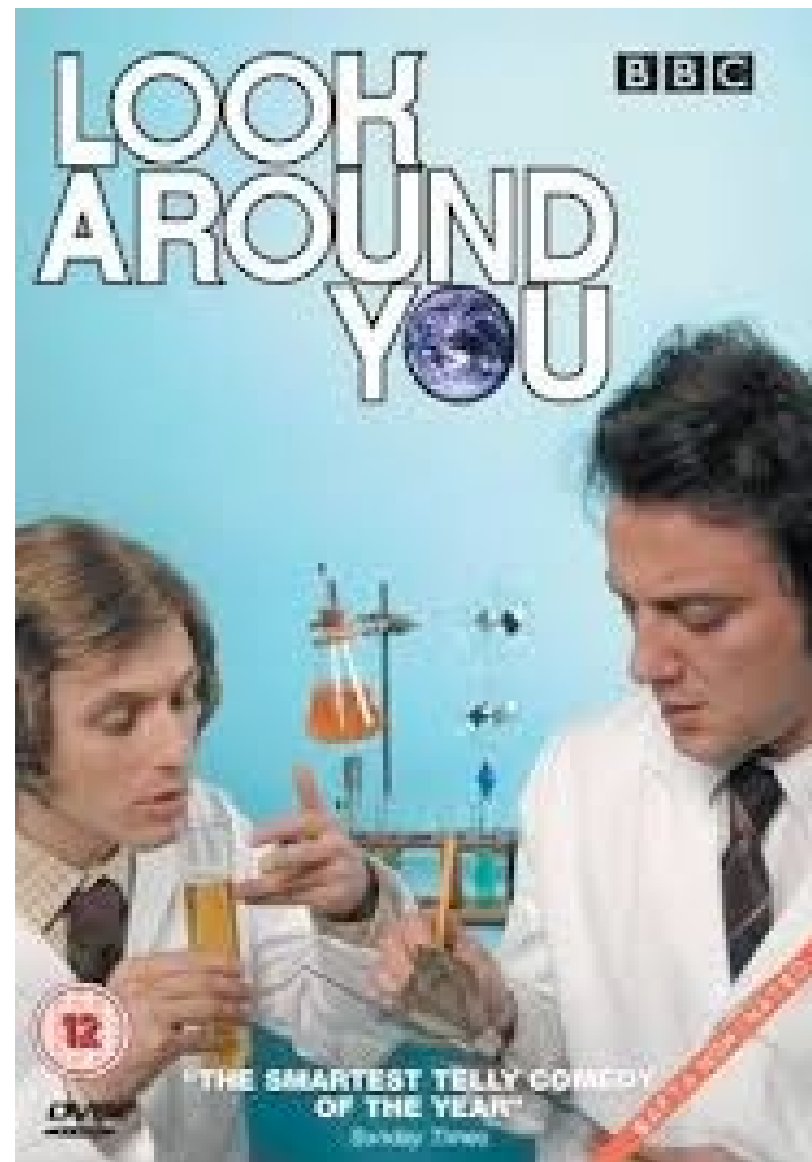
Everyone!

passwd

enter your old password
(you won't see anything)

choose a new password

Welcome to the command line!



Directory Structure

`cd` to move around

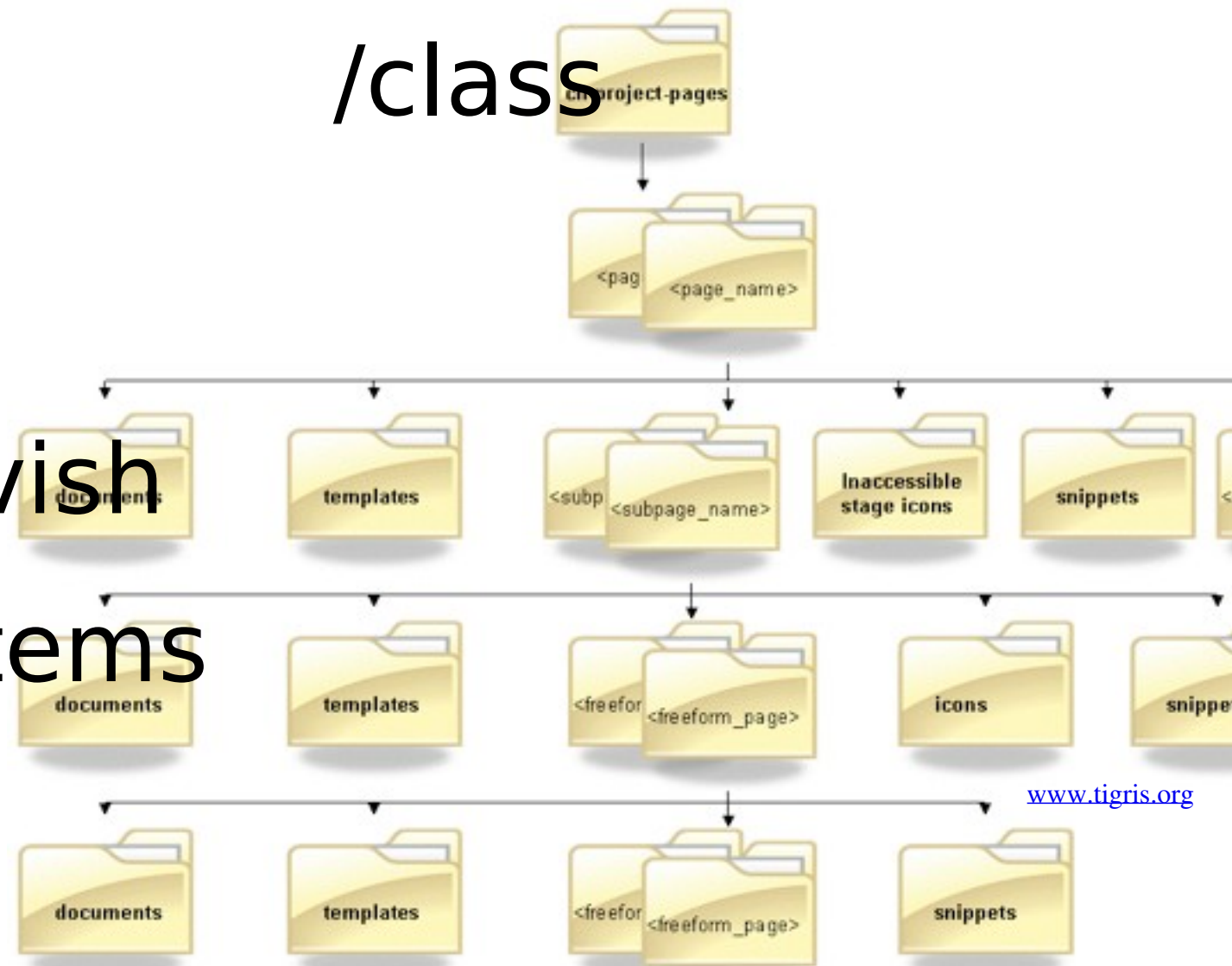
`mkdir` to make a new directory

`pwd` to check where you are

`/class`

`/class/emctavish`

`/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

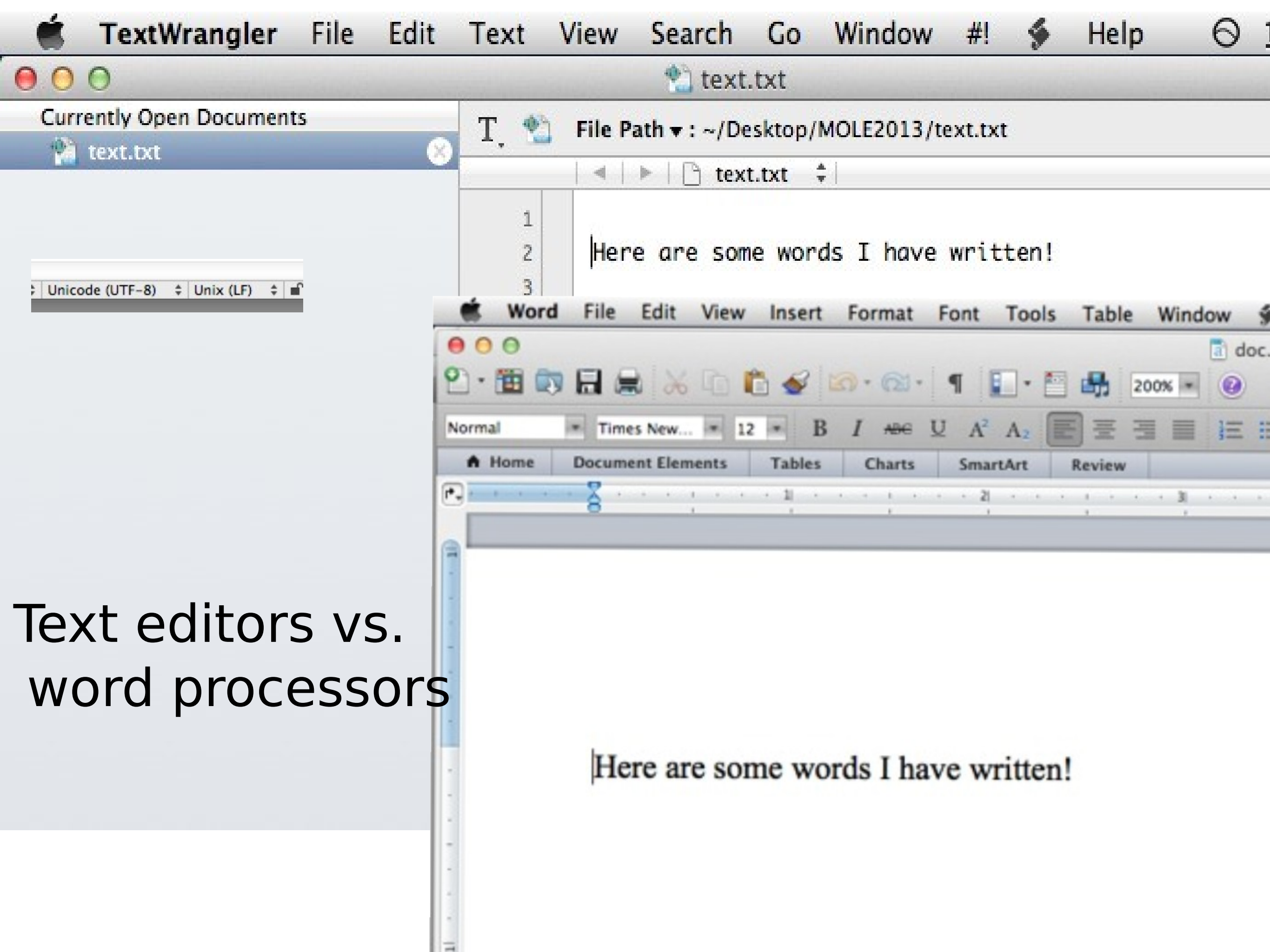
Basic syntax is:

```
command -options arguments
```

e.g.

```
ls -ltr /class/
```

```
cp from to
```



TextWrangler File Edit Text View Search Go Window #! Help

text.txt

Currently Open Documents

text.txt

File Path: ~/Desktop/MOLE2013/text.txt

1
2 Here are some words I have written!
3

Unicode (UTF-8) Unix (LF)

Word File Edit View Insert Format Font Tools Table Window

Normal Times New... 12 B I U A² A₂ 200%

Home Document Elements Tables Charts SmartArt Review

Here are some words I have written!

Text editors vs.
word processors



bash

```

Macintosh-c82a141a77bf:MOLE2013 emctav1$ head text.txt
Here are some words I have written!
Macintosh-c82a141a77bf:MOLE2013 emctav1$ █

```



bash

```

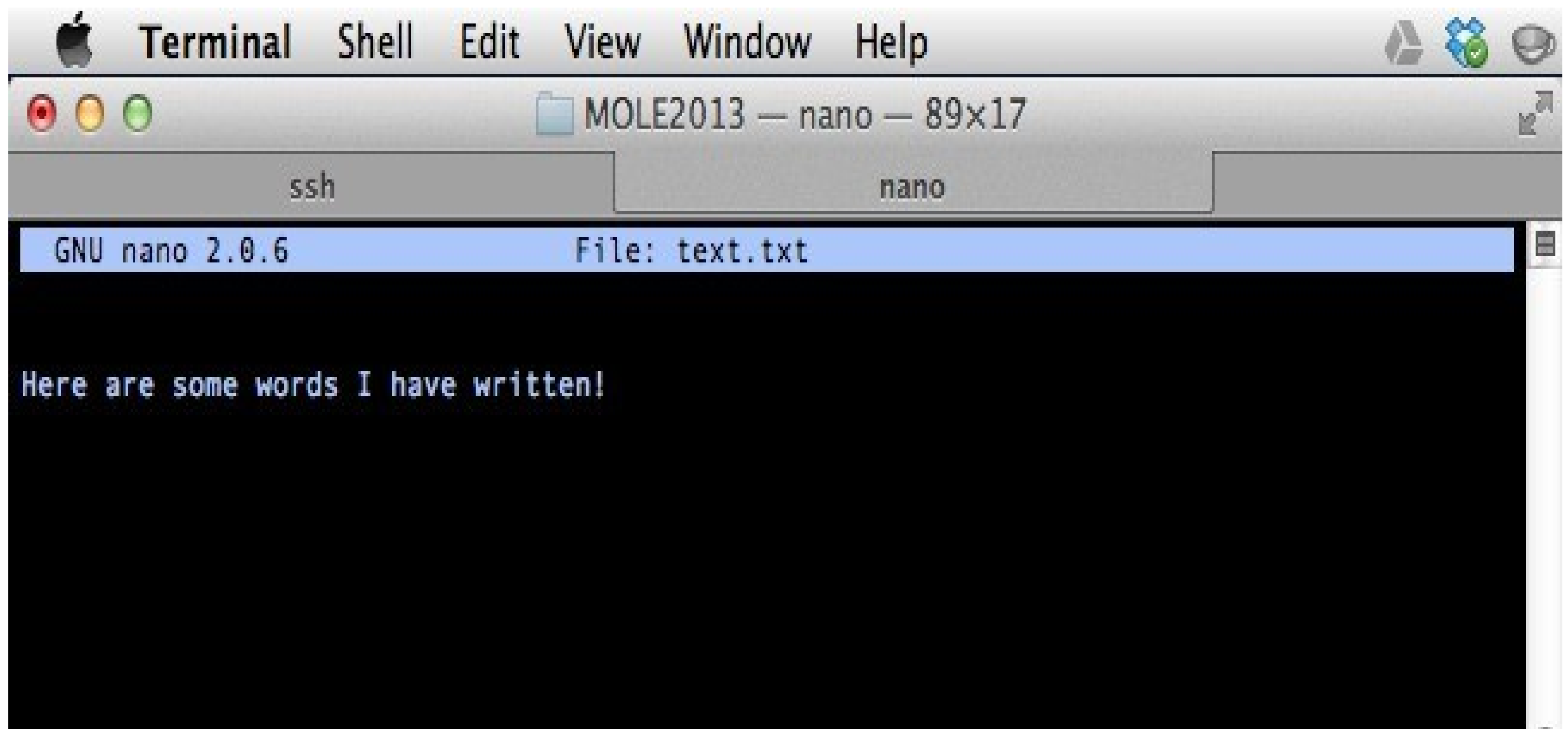
??;B?????l?(??X????B??f:MOLE2013 emctav1$ head doc.docx
?"M??5h>?$??S?)/))?6:?????|7`??M0?@??&??f??]?`??pP<*????v
"?|h?5)????6Sf????c??`?↵?I?(zi?N??}f??_,?
?l????????:0T[?"?p'隊??tn??&?   QS?X?????.???,?_?WF?L8W()??
??}'????F?????G????? ?Y,κ??c??? ?sB`
                ?????Ih??/YfS
                        ?3?Y9??wr??F??JB?/??;?"?+Z(?e?daU?=????????<I?H?<4?e??:bG©
0???n?#?W?????H:#o???h{?JuLG?   ?&?????_ao?? .8??t?????Uq?????Uc??H<2??l???o??P!?'Jc?word
4?Is?L??\e[???H?????lL??vHr???{O?????,?=7V?Z?x??+?P????~;???:?RZ??
                ?
                        r??\/?WI
l'?rB(?T?-H?N?b?Kj?R027d C?2?xX?I?QG??6????X?3U{j?N?eh??xE?PR?:?sF??B?I????1?lwz?
:U>'A?^??b??s13?gH6)??5???   ????'^??--??   ??H?C???n ???]??0????$J<?J?Q5ub#J??/?v0???U?)?
?<>???sh?
?eR&?R?????p??>?{d?I?e?o?S?G?8\B?iI?????Ys?J?|'?3?κ*-?/?`M?_p6+? ?%??C7%2B?i??_uP%8??o?
??   L???P!hu? word/_rels/document.xml.rels ?(????N?0??H???;qR? T?@??8??:????^~???T??Z?%K?+?|
?0??-??ix??0?????I?H?3PT"?wpC??_T?B1???d5?; ?{ok????7BU8?G?q]????
                ??·?????y? 1"/\)?E??v

```

nano

`nano <filename>`

use `Ctrl-X` to exit and save



The screenshot shows a macOS Terminal window with the following elements:

- Menu Bar:** Terminal, Shell, Edit, View, Window, Help. System status icons (trash, settings, volume) are on the right.
- Title Bar:** MOLE2013 — nano — 89x17
- Tab Bar:** ssh, nano
- Editor Header:** GNU nano 2.0.6 File: text.txt
- Editor Content:** Here are some words I have written!

```
[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

```
[emctavish@class02 ~]$ █
```

```
ejmctavish@pym:~$ █
```

Ctrl-C



tab ↑



Work through the
intro to Unix tutorial
on the wiki

Raise your hand or
ask your neighbor for help

Moving files to and from the cluster

Command line: `scp`

GUI: Cyberduck

Cyberduck



Tasks

- Either run through the cyberduck exercise on the wiki, or use scp to accomplish the same tasks
- Put up your hand if you are having any trouble, we're here to help!