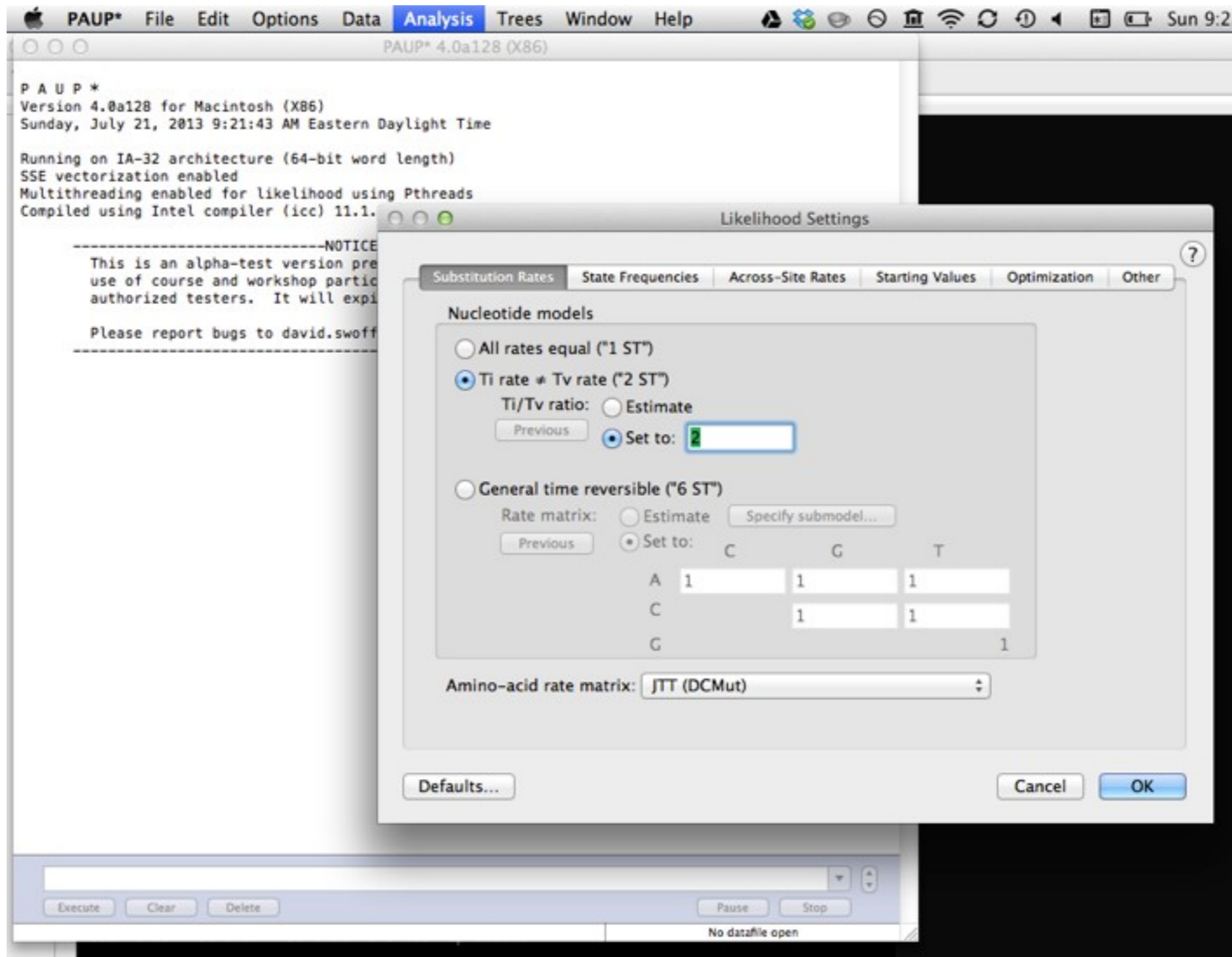


# Computer lab introduction

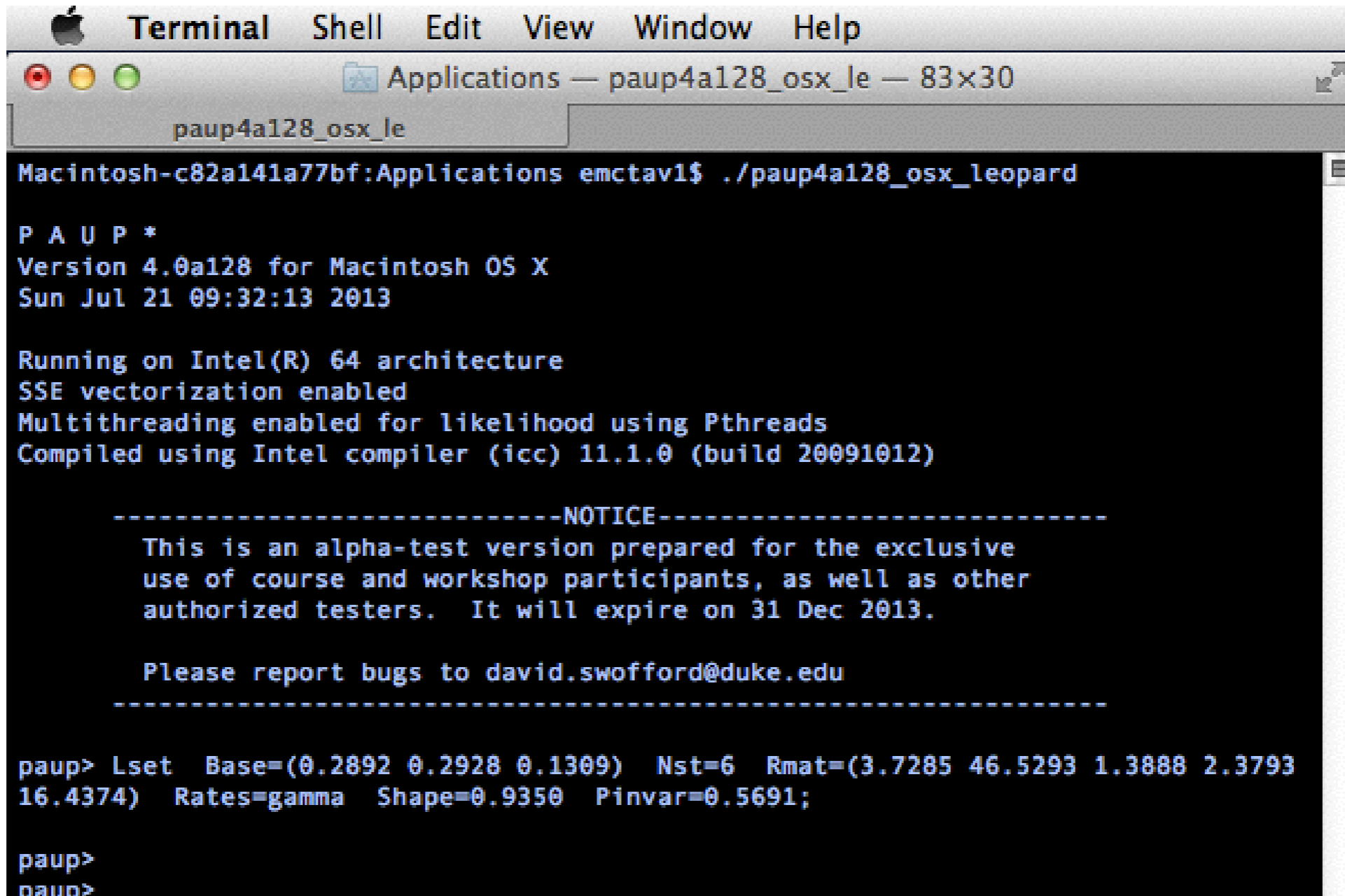
There are many ways to interact with your computer



# 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;

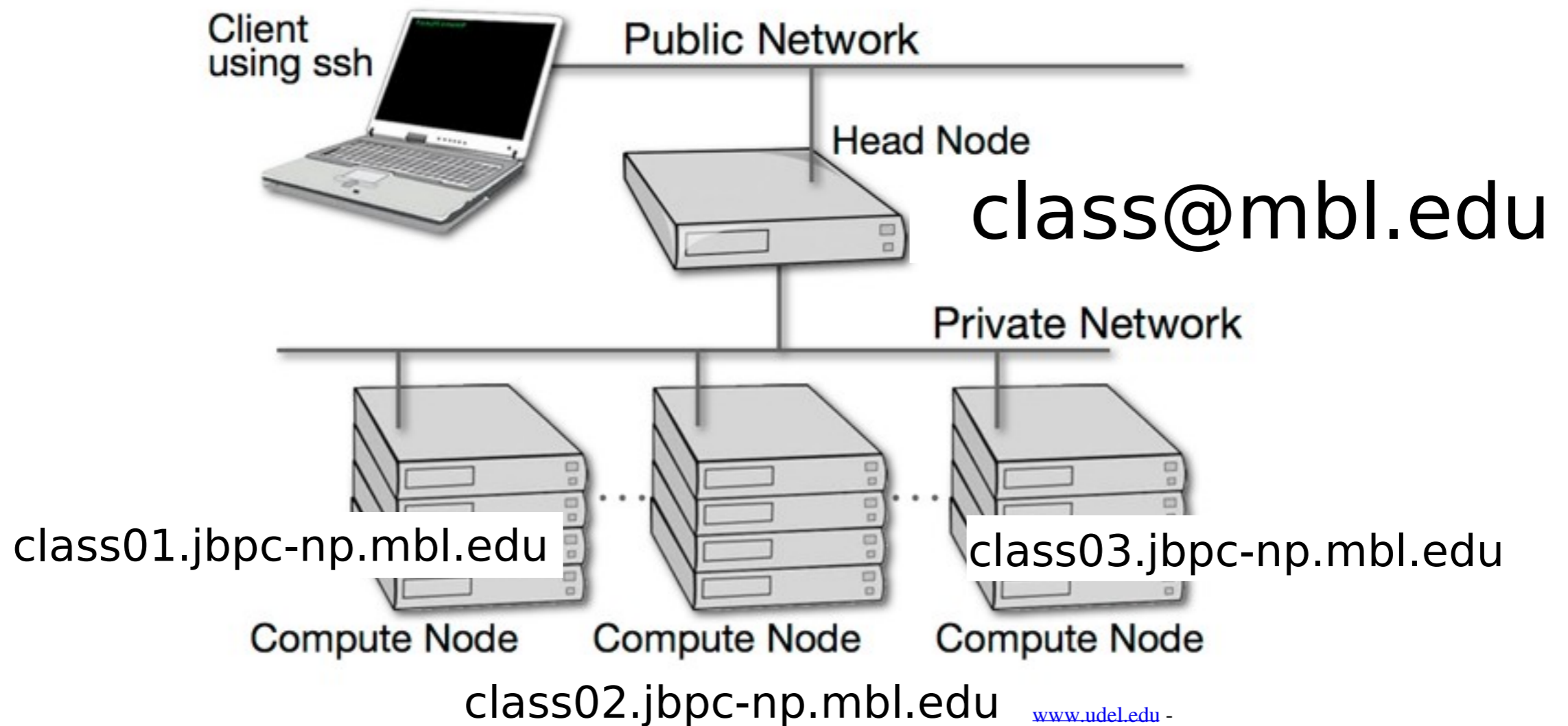
paup>
paup>
```

Why do things  
the hard way?

# Advantages of command line

- Ease of repetition
- Batch processing
- Cluster computing
- Makes you a hacker.
- 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
```

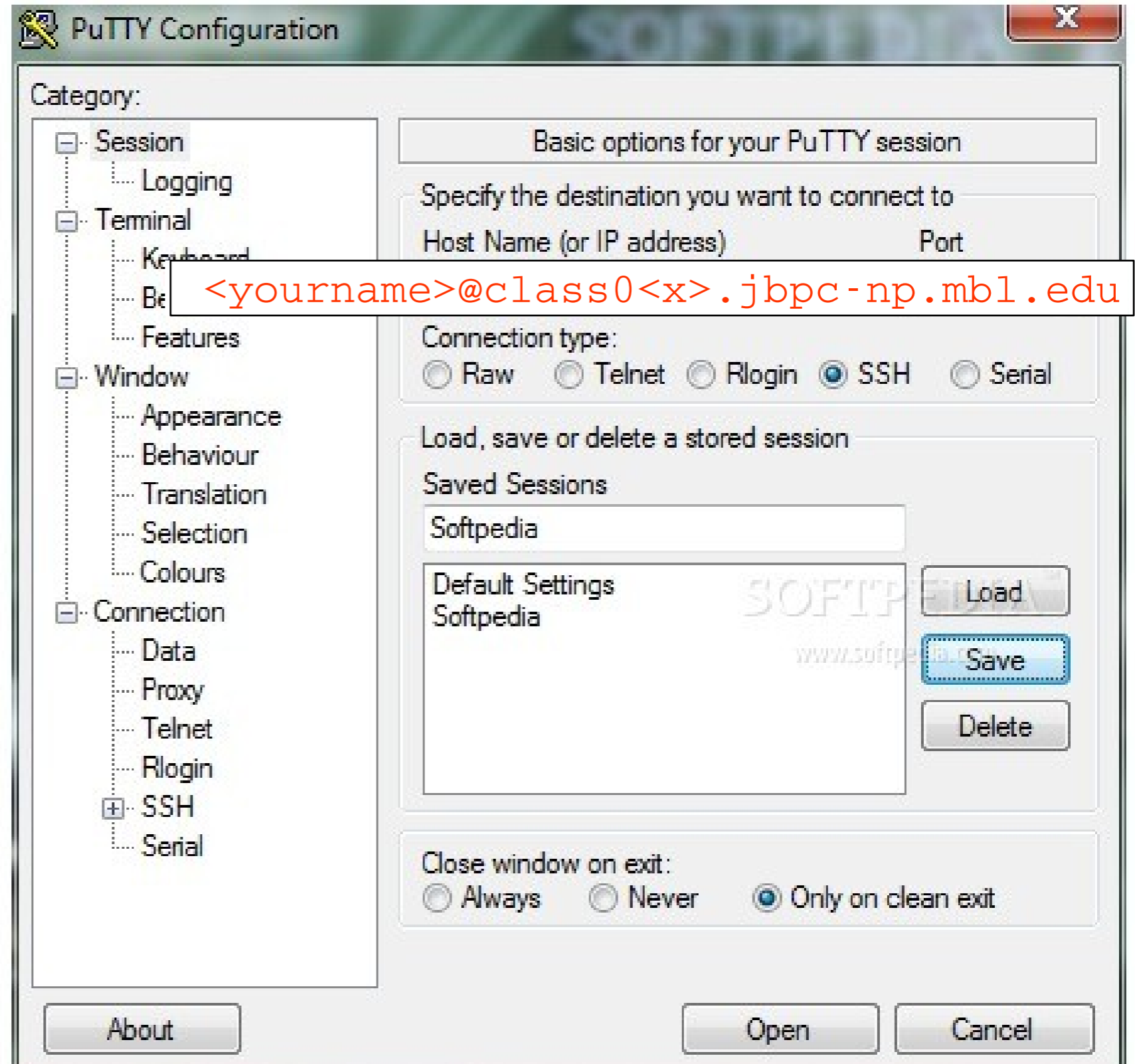
e.g.

```
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



# 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 ~]$ █
```

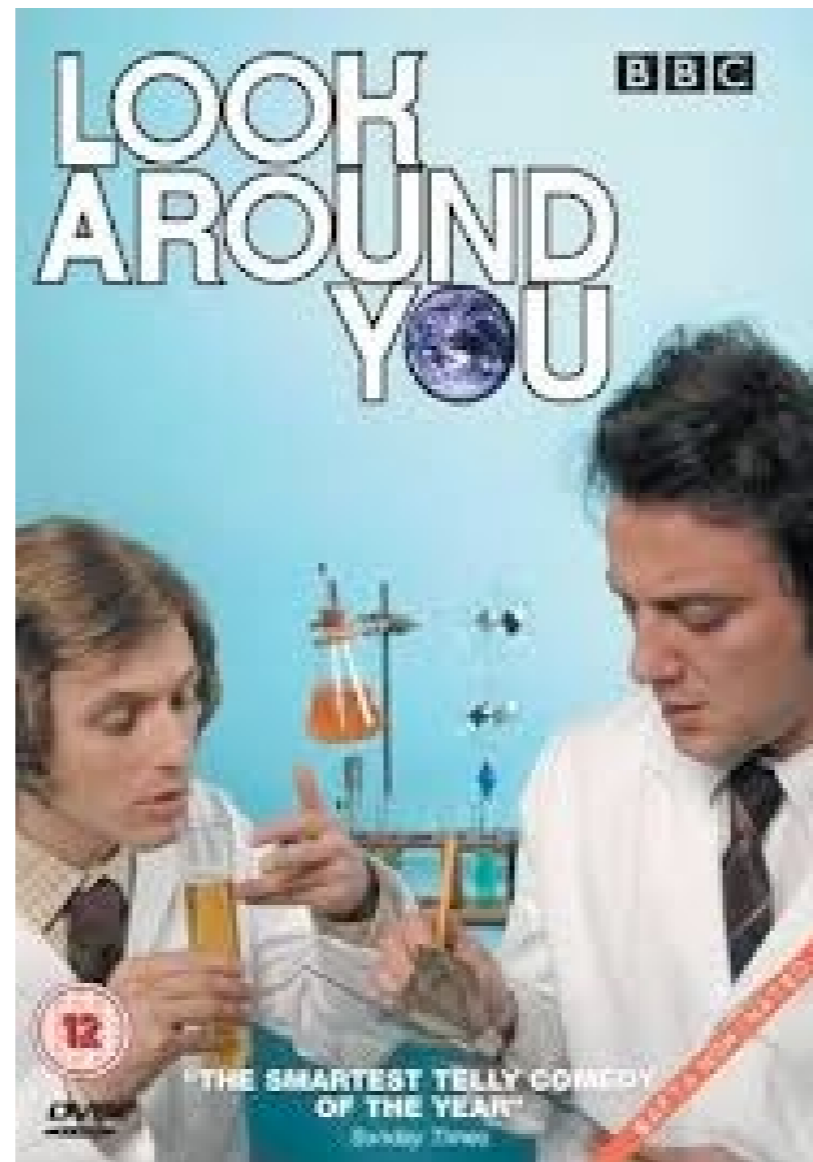
# Everyone!

>passwd

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

choose a new password

# Welcome to the command line!



# Directory Structure

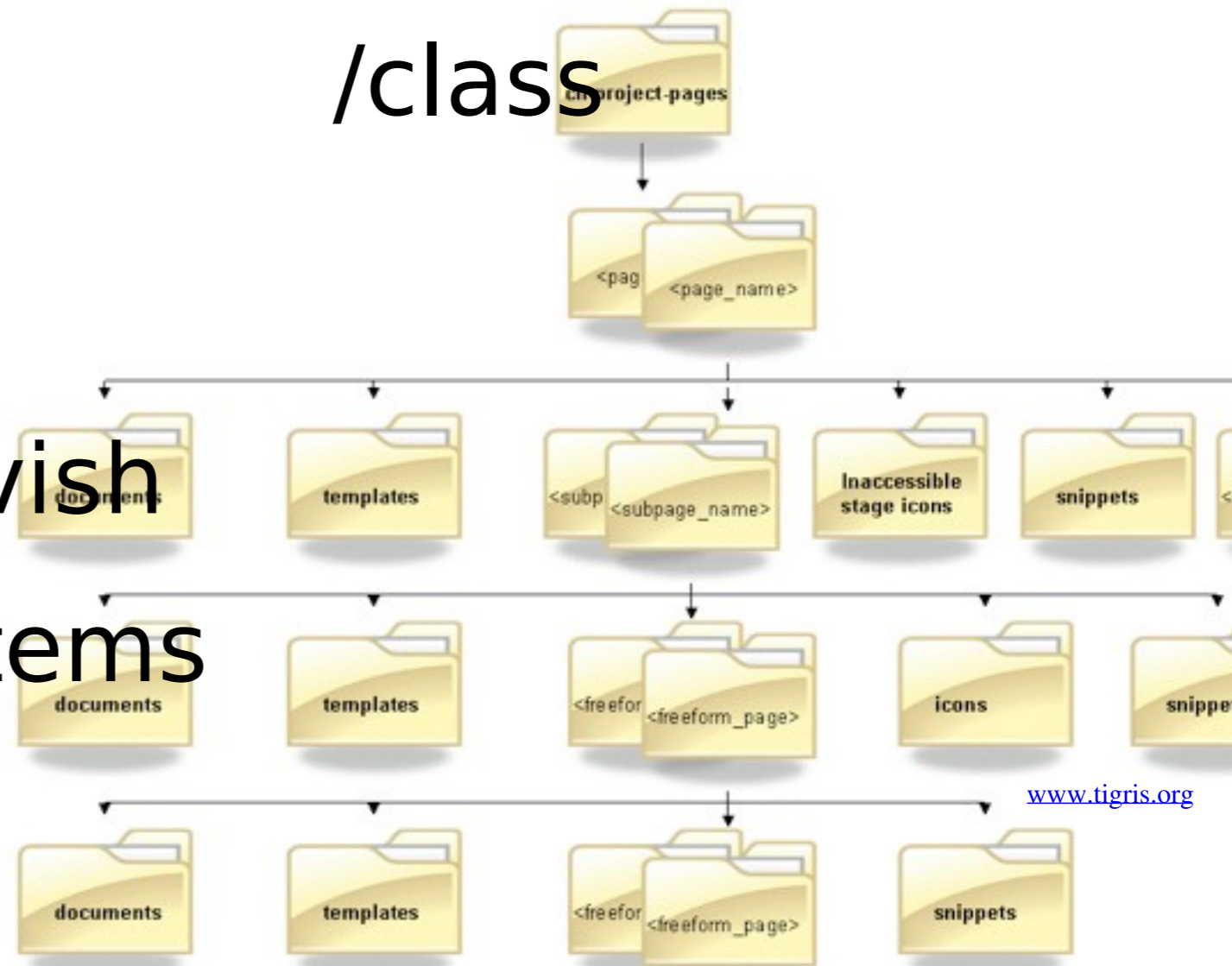
`cd` to move around

`mkdir` to make a new directory

`/class`

`/class/emctavish`

`/class/emctavish/items`



# Directory Structure

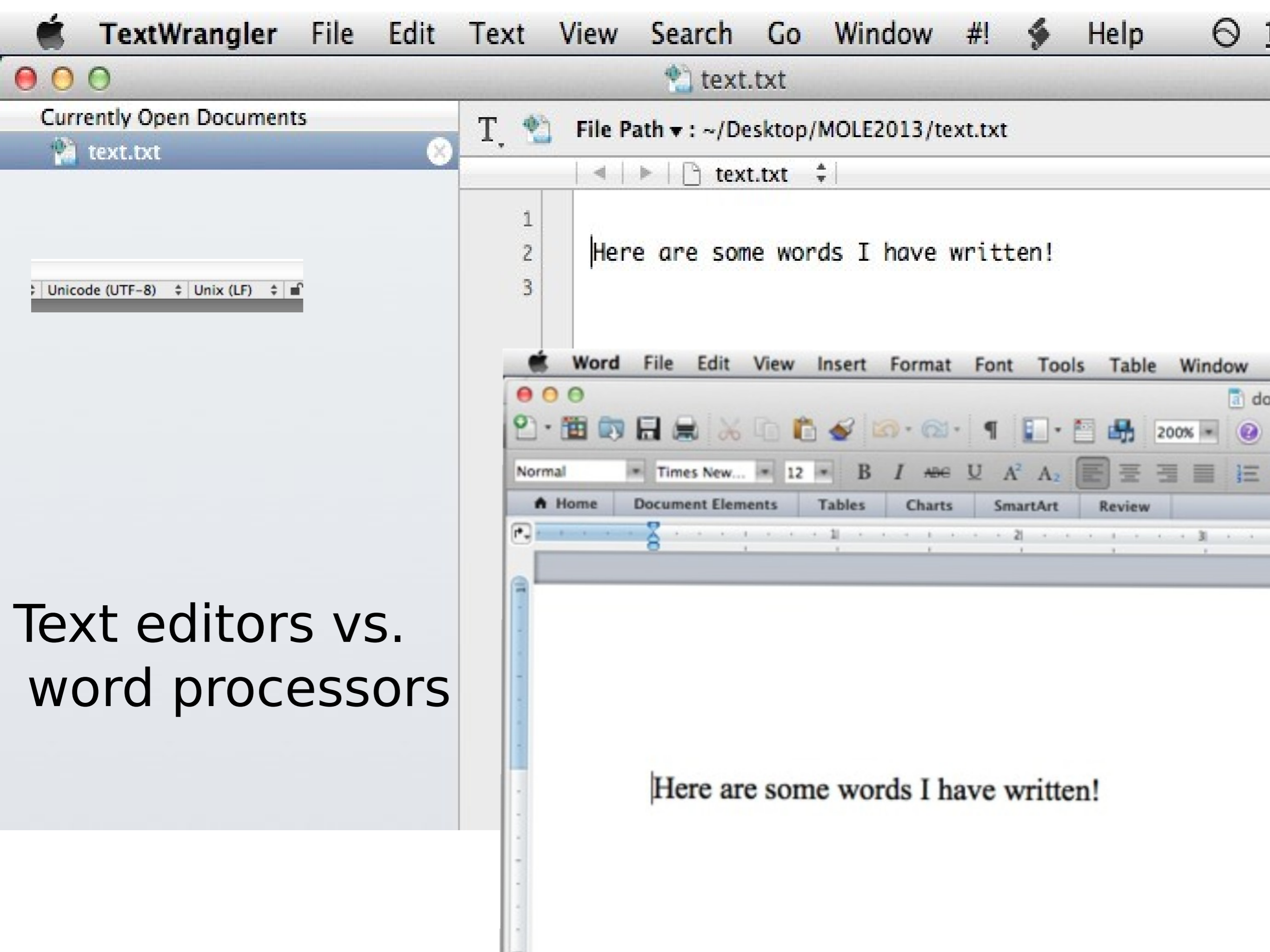
absolute paths start with '/'

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)



TextWrangler File Edit Text View Search Go Window #! Help

text.txt

Currently Open Documents

text.txt

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

1  
2  
3

Here are some words I have written!

Unicode (UTF-8) Unix (LF)

Word File Edit View Insert Format Font Tools Table Window

Normal Times New... 12 B I U A<sup>2</sup> A<sub>2</sub>

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

```

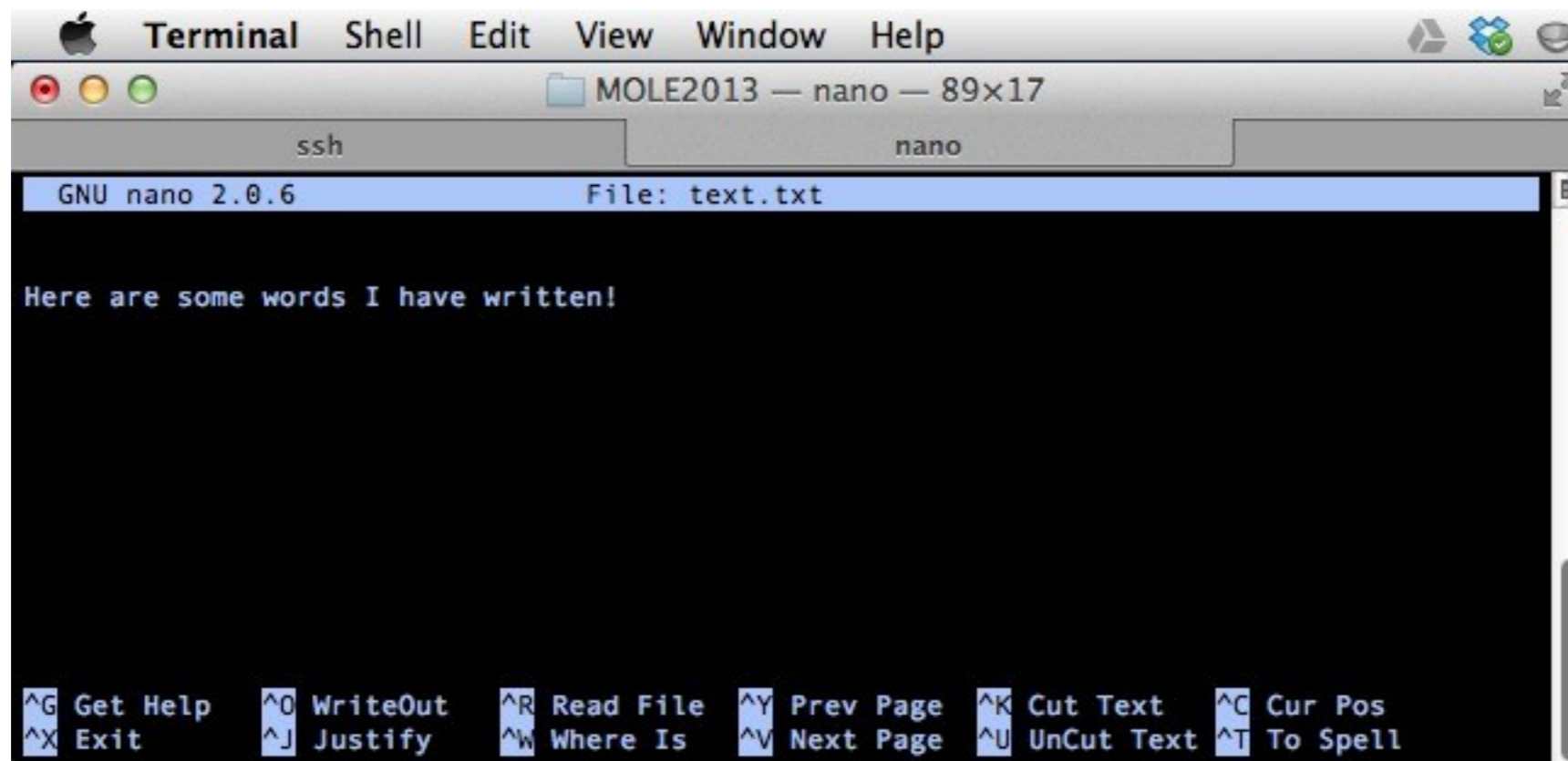
??;B?????l?(??X???B???f:MOLE2013 emctav1$ head doc.docx
?"M??5h>?$??S?)/))?6:?????|7`??M0?@??&??f??]?`??pP<*????v
"?|h?5)????6Sf?????c??`?↵?I?(zi?N??}f??_,?
?l????????:0T[?"9?p'隊??tn??&?   QS?X?????.???,?_?WF?L8W()??
??}'????F?????G????? ?Y,κ??c??? ?sB`
                ?????Ih??/YfS
                        ?3?Y9??wr??F??JB?/??;?"?+Z(?e?daU?=????????<I?H?<4?e??:bG©
0???n?#?W?????H:#o???h{?JuLG?   ?&?????_ao?? .8??t?????0q?????Uc??H<2??l???o??P!?'Jc?word
4?Is?L??\e[???H?????lL??vHr???{O?????,?=7V?Z?x??+?P????~;???:?RZ??
                ?
                        r??\/?WI
l'?rB(?T?-H?N?b?Kj?R027d C?2?xX?I?QG??6????X?3U{j?N?eh??xE?PR?:?sF??B?I????1?lwz?
:U>'A?^??b??s13?gH6)??5???   ????'^??--??   ??H?C???n ???]??0????$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



```
Terminal  Shell  Edit  View  Window  Help
MOLE2013 — nano — 89x17
ssh  nano
GNU nano 2.0.6  File: text.txt
Here are some words I have written!

^G Get Help  ^O WriteOut  ^R Read File  ^Y Prev Page  ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page  ^U UnCut Text ^T To Spell
```

```
[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!

# Moving files to and from the cluster

Command line: `scp`

GUI: Cyberduck

# Cyberduck





# Moving files to and from the cluster

You can move files back and forth using `scp` (secure copy)

just like `cp`, the format is `scp <from> <to>`

but you need to use the full address

```
scp text.txt emctavish@class01.jbpc-np.mbl.edu:/class/emctavish
```

```
scp emctavish@class01.jbpc-np.mbl.edu:/class/emctavish/testfile.txt
```

If the files are on the internet:

```
wget https://molevol.mbl.edu/wiki/index.php/Main_Page
```

# Tasks!

- Navigate around the cluster- work through the commands on the wiki.
- Make a file on your laptop and move to the cluster using scp or Cyberduck.
- Make a file on the cluster using nano move it on to your local computer.
- Put up your hand if you are having any trouble, we're here to help!