Intro to computation

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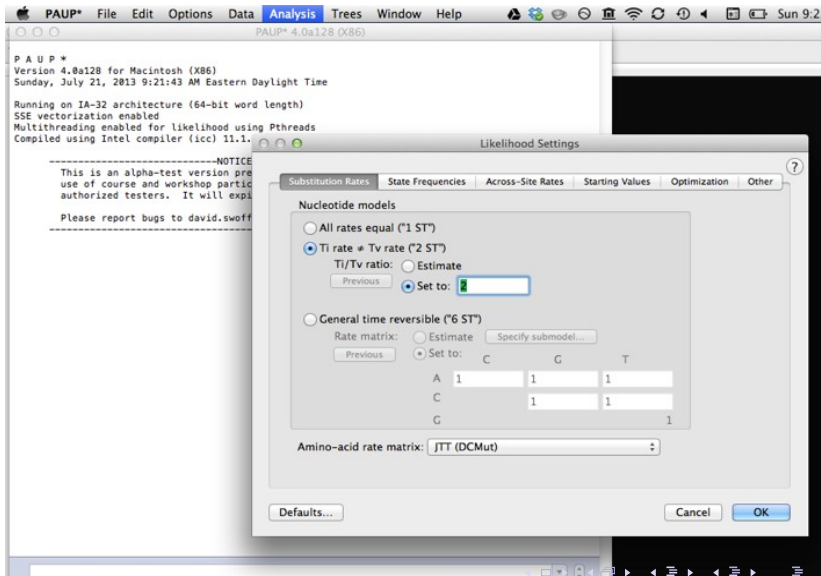ejmctavish@ucmerced.edu, twitter:snacktavish

(With thanks to Jeet Sukumaran for the exercise)

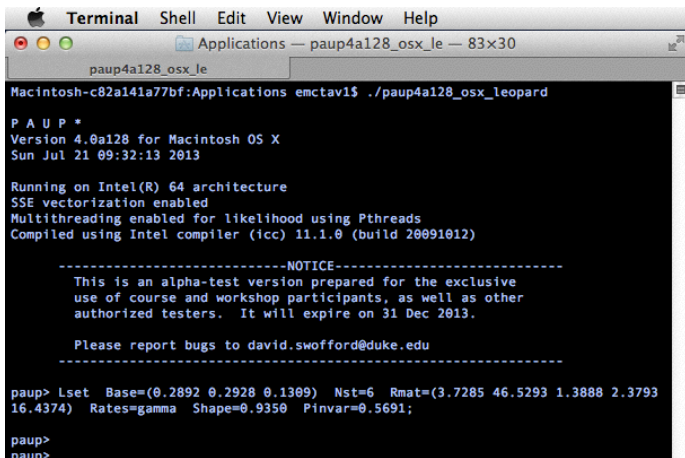There are many ways to interact with your computer

Graphical User Interface (GUI)

Command line
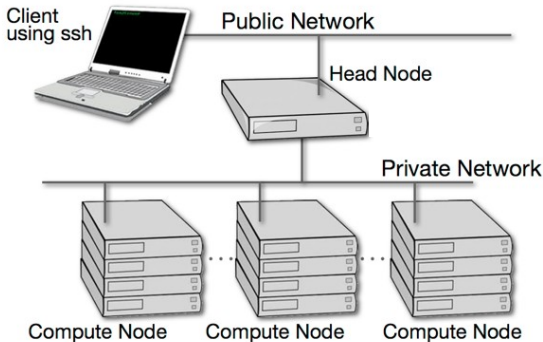
Why do things the hard way?

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!
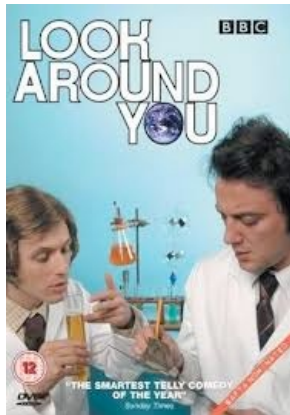
Directory Structure

cd to move around
mkdir to make a new directory
pwd to check where you are
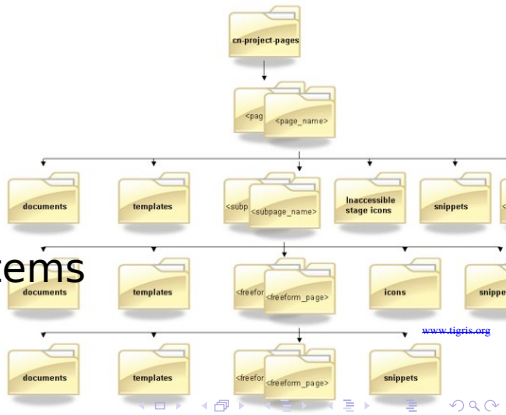
/class/emctavish/items

www.tigris.org

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
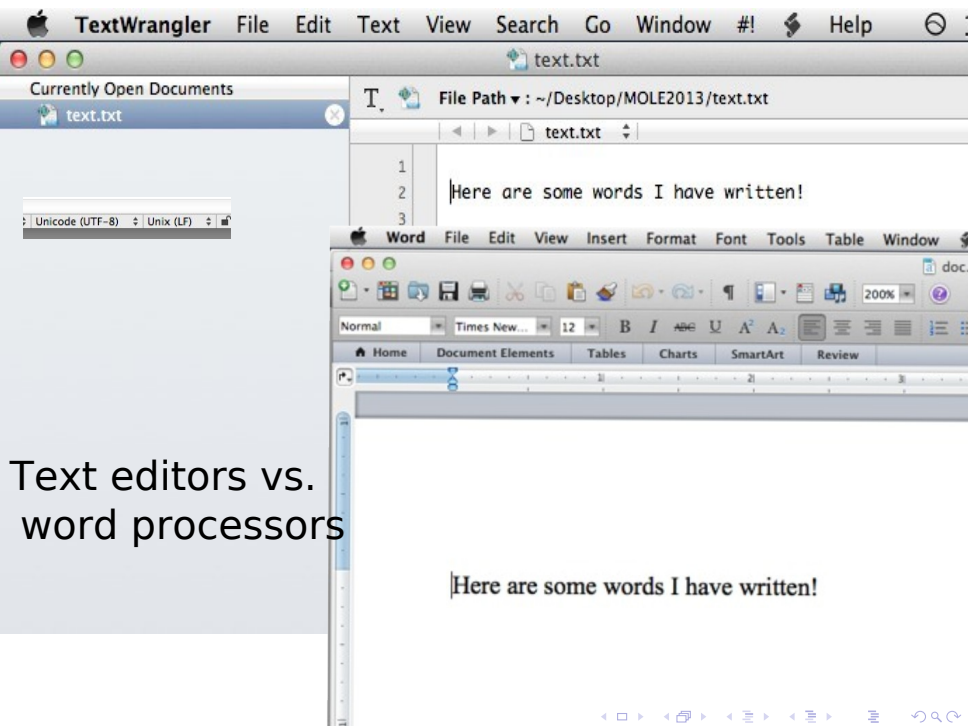
* and ? are wildcard match characters

Basic syntax is:
```
command -options arguments
```
e.g.
```
ls -ltr /class/
cp from to
```

Text editors vs. word processors

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

```
??;6?????1?(??X???B??f:MOLE2013 emctav1$ head doc.docx
?"M??5h>?$??S?)/))?6:?????|7`??MO?@??&??f??]?`??pP<*???v
"?|h?5)???6Sf????c??`?.?I?(zi?N??}f??_,?
?1??????:0T[?"3?p'???tn??&?    QS?X????!.???,?_?WF?L8W()???
??}'????F?????G????? ?Y,K??c??? ?sB`
                     ????Ih??/YfS
                      ?3?Y9??wr??F??JB?/.R?;?"?+Z(?e?QaU?=????????<I?H?<4?e??:bG
0???n?#?W????H:#o???h{?JuLG      ?&??????_?ao??.8??t????Uq????Uc??H<2??1???o??P!?Jc?word
4?Is?L??3\e[???H????1l??vHr???{O?????,?=7V?Z?x??+?P????~;???:?RZ??
                      ?                             r??\/  WI
l'?rB(?T?-H?N?B?Kj?R027d C2??xX?I?QG??6???X?3U{j?N?eh??xE?PR?:?sF??B?I????1?lwz?
:U>'A??b??   si3?p?gH6)???5???   ????'?^??~-??   ??H?C???n ???]??0???$J<?  ?J?Q5ub#J??/?v0???U?)?
  <>???sñ?
?eR&?R?????p??>?{0?I?e?o?S?G& ?8\B?iI????Ys?J?|'?3?%*- ?????/`M? _p6+? ?%??C7%2B? ??i??_uP%8??o
??      L??7P!hu? word/_rels/document.xml.rels ?(????N?0??H???;qR? T?@??8??:????^~???T??Z?%K?+?|
 ???0??-??ix??0????!?H?3PT"?wpC??_T ?Bi???Q5?3?{ok???7BU8?G?q]????
```
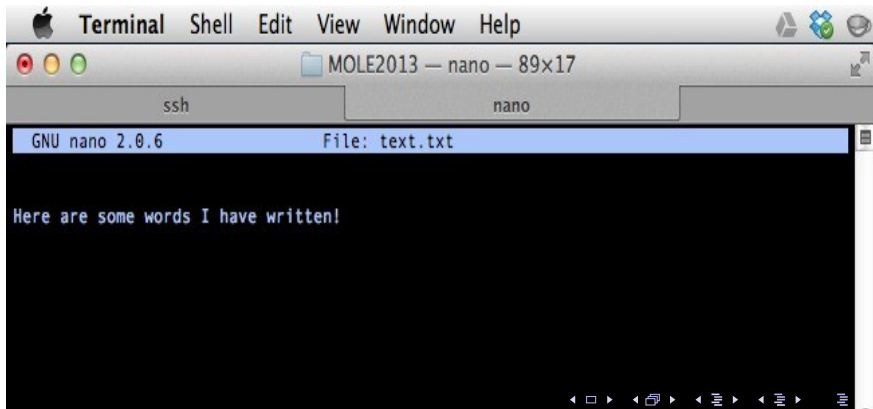
nano

nano < lename>

use Ctrl-X to exit and save

The prompt

```
[emctavish@class02 ~]$ █
```

```
> █
```

```
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 ↑

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 change the tip labels.
9. Visualize it again.