CMACS
Computational Modeling and Analysis for Complex Systems

Using Macs and Unix

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January 6, 2010

Outline

- Switch 101: Switching from a PC to a Mac:
- Introduction to Unix

Exercises

- Run Safari
- Run Microsoft Word
- Find a pdf file containing the word “CMACS” and open it
- What program was used to open it?
- Look at all the open windows and activate the Word program
- Put the BioNetGen folder in the Dock

Mac OS X: A Geek with a Pretty (Inter)Face

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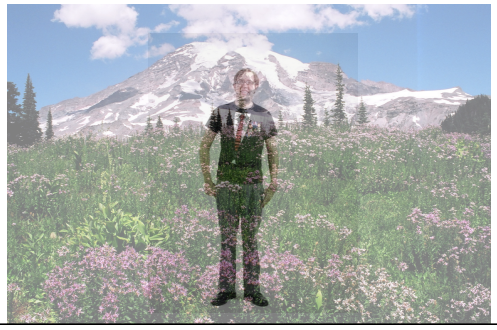


Mac OS X: A Geek with a Pretty (Inter)Face

Introduction to Unix

- Everything is a *file*
- The *file system* is organized into a hierarchy
- A *fully-specified path* specifies all the directories from the root to the file, for example: `/Users/nancyg/Documents/ABBREV.csv`
- The *working directory* or *current directory* is the one you are working in
- A relative path specifies the directories starting with one contained in the working directory: `Documents/ABBREV.csv`

Getting help

- **help**: displays information about builtin commands (a subset of all commands)
- **man** or **info**: display a manual page for a command

The file hierarchy

- The root file is "/"
- Some directories below root are:
  - Applications
  - Developer
  - Library
  - Users
  - bin
  - etc

Manipulating Files

- ls
- pwd
- cd
- mkdir
- rmdir
- mv
- cp
- cat
- rm
- open

Manipulating Files: ls options

- -a: list *all* files (including . and ..)
- -d: print directories as normal files (no contents)
- –G: colorize output
- -l: long format (access options, time, size)
- -t: sort by time modified (most recent first)

Exercises

- Use man to learn about ls, cd, pwd
  - What directories are contained in the root directory ("/")
  - What non-directory files are contained in the root directory?
  - What is your home directory?
  - What directories are contained in your home directory?
- Use man to learn about mkdir, rmdir
  - Create a subdirectory of your home directory
  - Create a subdirectory of the subdirectory

Exercises

- Use man to learn about mv, cp, cat, rm
  - Create a file containing your name in your home directory
  - Create a subdirectory of your home directory
  - Copy the file to the subdirectory
  - Remove the original file
  - Move the copy back to the home directory

Exercises

- Use man to learn about "open"
  - Run Safari by opening the appropriate file

Inspecting and Changing Files

- more
- less
- cat
- Editors
  - nano
  - vi
  - emacs

Exercises

- Use man to learn about more, less, cat
  - Try using more, less, and cat to look at files. What are the differences?
- Use man to learn about nano
  - Create a file containing a brief description of your favorite Unix command and save it in your home directory as <command>.txt

The Shell

- Every Unix system runs a “shell” to interpret your commands
  - Commands can be entered from a terminal or
  - The shell can be directed to read a file containing commands (“. <filename>”)
- Mac OS X uses “bash” (Bourne-again shell) by default

The Shell

- Types of commands:
  - Built-in shell commands (shell programming)
  - Unix programs (e.g., ls, mv, etc.)
  - Scripts (executable user files)
- Shell variables
  - set
  - export
  - echo

The Shell

- Start-up script: .bash_profile
- Sets important variables
- PATH: determines where the shell looks for commands

Exercises

- Type “set” to see variables
  - HOME
  - PATH
- Set the PATH to let you run “BNG2.pl” in /Applications/BioNetGen/Perl2
- Look at BNG2.pl; the first line tells the shell to run perl to interpret the rest
  - Perl is a scripting language

Exercises

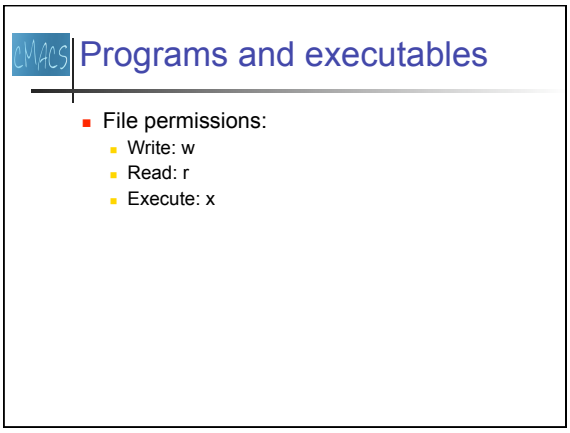
- Run RuleBuilder from a command line:
  - Find RuleBuilder using Spotlight
  - In a terminal window, cd to the directory RuleBuilder
  - Type “java –cp RuleBuilder-beta-1.5.1.jar RuleBuilder”
  - Create a file “runRB” containing the above command and run RuleBuilder by typing “runRB”
  - Hint:you must use chmod to do this

Exercises

- Run RuleBuilder by double-clicking the jar file
- Run BioLab by setting PATH so you can just type BioLab

Keyboard Shortcuts

- Auto-completion: Tab and double Tab
- Command history: Up and down arrows
- Cancel: ^C
- End of input: ^D


EMACS
Programs and executables
File permissions:
Write: w
Read: r
Execute: x