Lab 1
Getting Started with R

BIOL 534
F 2011

What is R?
Why use it?

What is R?

Ellner and Guckenheimer (2006) describe R as follows:

"R is an object-oriented scripting language that combines the programming language S developed by John Chambers (Chambers and Hastie 1988, Chambers 1998).

- a user interface with a few basic menus and extensive help facilities.
- an enormous set of functions for classical and modern statistical data analysis and modeling.
- graphics functions for visualizing data and model output."

We will use R in this class because it is powerful, rapidly developing, and relatively easy to use.

What can R do?

- Math
- Basic statistics
- Publication quality figures
- Simulations
- Database interface
- GIS
- Phylogenetics
- Multivariate Statistics
- Network analysis
- Bayesian statistics
- Animations
- …

R is extensible, so its capabilities are growing with its users

Advantages and Disadvantages

Advantages

- Free
  - No cost
  - Open source
- Very capable software
- Large user base
- Software has few limits (extensible)
- Scripting allows work to be easily re-run, audited, repeated. Faster than point and click

Disadvantages

- More difficult to learn initially.
- No corporation guaranteeing that algorithms are
  - correct or
  - Speed optimized

Installing R and Getting Started

http://cran.r-project.org/

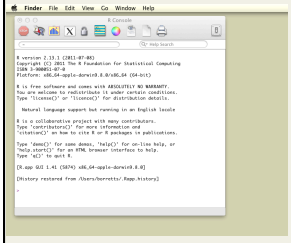
Download and install current version on your machine

- lab machines have it installed.

Basics

Saying Hello

Welcome to the command line



...a fancy calculator

Try adding 2 and 2

May not be how you are used to interacting with your computer, but use your intuition.

Experiment, Try it – you wont break it

Getting Help

- ?, ??, help()
- Internet search (aka google)
- Manuals and Books
- Some useful links

R Homepage
http://www.r-project.org/
Reference Card
http://cran.r-project.org/doc/contrib/Short-refcard.pdf
Kickstarting R
http://cran.r-project.org/doc/contrib/Lemon-kickstart/index.html
Getting Started with R
http://cran.r-project.org/doc/manuals/R-intro.pdf
R Graphics
http://addictedtor.free.fr/
Ecological Models and Data in R
http://www.math.mcmaster.ca/~bolker/emdbook/

Pick up here with Matt Lau's notes

...objects ...

Exercise 1

- Download:
  - Chlorellagrowth.txt
- Download and run:
  - Intro1.R

Run the Intro1.R script. What does it do?

Change the script so that it creates a log-log plot.

Exercise 2

- Download:
  http://people.uncw.edu/borretts/courses/biol366/Rcode/ForestData.txt
- Download:
  http://people.uncw.edu/borretts/courses/biol366/Rcode/ForestAnalysis1.R

Run ForestAnalysis1.R script. What does it do?