

An introduction to R

mini-lecture 1 Systems Biology course @ D-BSSE

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Outline

- Motivation
- An introduction to the R programming language
- The R basics and the syntax
- Exercise set #1

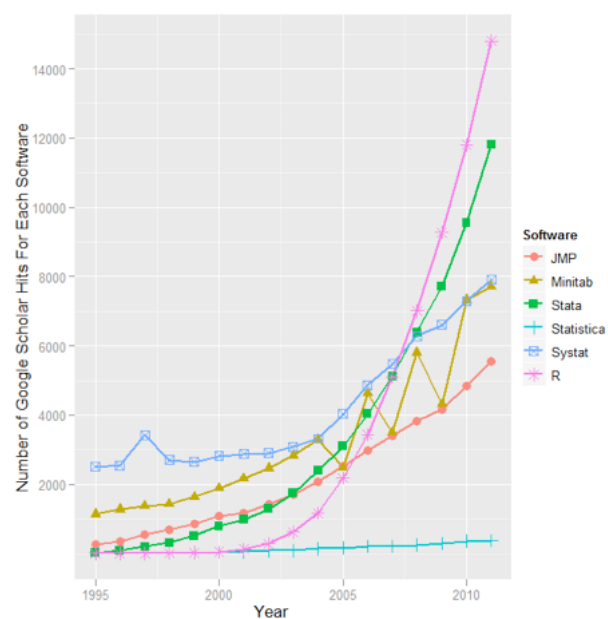
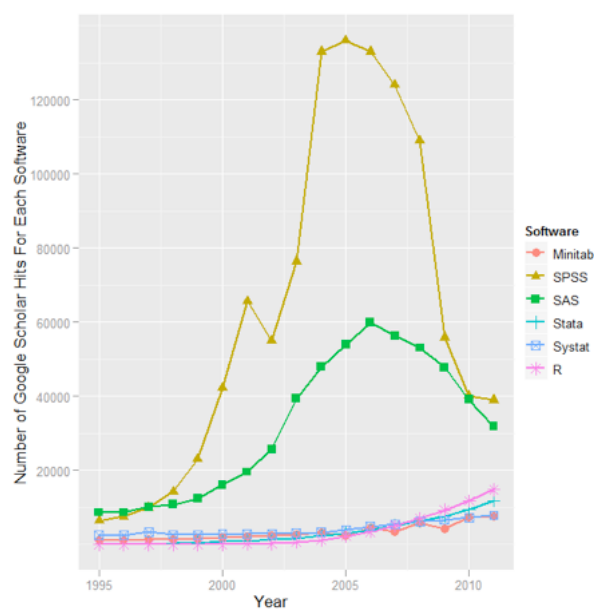
Why should I use R? (I)

- R is free
- R is open (provided you respect the GNU GPL2)
- R is a language. In R, you do data analysis by writing functions and scripts, not by pointing and clicking. A script:
 - documents all your work
 - can instantly be re-run at any time
 - makes it easy to automate a sequence of tasks

Why should I use R? (part 2)

- Graphics and data visualization
- A flexible statistical analysis toolkit
- Access to powerful, cutting-edge analytics
- To date > 2000 packages extending the R language in every domain
- A robust, vibrant community. With thousands of contributors and > 2 million users around the world
- Unlimited possibilities

Need more?



Getting started: the workspace

- what variables are defined therein?
- how to remove a variable?
- how to save a workspace?
- how to load it afterwards?

The R help

- Online text and HTML help
- General and specific help pages
- I somehow have a clue on what I want to do but I do not quite recall the name of the function I need to use

The basics

- Basic interaction mode: type an expression, R evaluates it
- R prints the result on the console
- Expressions work on objects: anything that can be assigned to a variable

Syntax (I)

- Getting and setting my working directory
- Arithmetic operations
- Logical operations
- Constants
- Assigning values to a variable
- Data types:
 - Vectors
 - Matrices
 - Factors
 - Lists
 - Data frames
- Graphics with R

Syntax (II)

- Conditionals and loops
 - if/else
 - ifelse
 - for
 - while
 - apply/lapply
- Writing and calling functions
- Reading and writing files from external resources

Done.

Packages

- Additional packages (outside base release) can be downloaded from CRAN
- You can contribute your own package
- How to download a package?
- How to load it afterwards?

Datasets

- R and many of its packages provide (interesting) data sets
- Let's look at some of them
- Attaching a dataset
- Parsing variables in a dataset to a function