



# **A (very) brief introduction to R**

# Today

## Things to talk about

- What
- Why
- How

## Things to play with

- Get started with R
  - Read your data
  - Manipulate them
  - Explore, analyze and plot
- A hint into R for spatial data

# What is R?

*R is a language and environment for statistical computing and graphics*

- **language & environment**
- **statistical computing**
- **graphics**
- It is a Free implementation of the S language created by Ross Ihaka and Robert Gentleman in 1993
- **Cross-platform**: runs on many \*nix (included Linux) systems, Windows and MacOS.
- **It is licensed under GPL, which makes it free...**
  - ... as in **beer**
  - ... as in **speech**

# Why should I care about R?

- Philosophy behind the project
- Convenience (once you get ahead the learning curve)

Some people who care about R:

- Many top universities use R in teaching and research
- Google and Facebook
- New York Times

# The R Philosophy

*...Then sit back, relax, and enjoy being part of something big...* [Tom Preston-Werner]

Being Free Software ("the users have the freedom to run, copy, distribute, study, change and improve the software") has enhanced:

- **Worldwide community of dedicated and enthusiastic users, contributors and developers that:**
  - Lowers the entry barriers (mailing lists, blog posts, online tutorials, workshops...)
  - Continuously expands the capability and functionality
- Becoming an instrument for **democratization** of academic software and technology transfer
- Becoming the **lingua franca** in academia
- Facilitating reproductibility and Open Science

# R as free beer

- The price is right
  - Education
  - Installation across multiple machines
- The *beer selection* is wide (CRAN hosts 3,669 available packages as of March 10th. 2012)
  - Makes R a good one stop-shop and a good investment of your time to learn it
  - No market profitability constraints put it at the cutting edge (research sandbox)
- Linus' Law: *"given enough eyeballs, all bugs are shallow"*
  - More reliable and stable

# How do I get started?

## Look for R info and packages

- Project website: <http://r-project.org>
- The Comprehensive R Archive Network ([CRAN](#))
- The [R-Journal](#) (and [JoSS](#))
- [R bloggers](#)
- Twitter: the `#rstats` hashtag
- Google (good luck on that)

## Install and load packages

- Windows and MacOS GUIs have installers
- Command line with `install.packages` function
- Command `library` (e.d. `library(maptools)` to load the package `maptools`)

# Help and documentation

- R built-in search capability

Command	Function
<code>?read.csv</code>	Check local documentation for <i>read.csv</i> function
<code>spdep::moran.test</code>	Check local documentation in package <i>spdep</i> for <i>moran.test</i>
<code>help("read.csv")</code>	Check local documentation for <i>read.csv</i> function
<code>help.search("read.csv")</code>	Search for "read.csv" in all help files
<code>RSiteSearch("plot maps")</code>	Search for the term "plot maps" in the RSiteSearch website (requires connectivity)

- StackOverflow: <http://stackoverflow.com/questions/tagged/r>