

# R and its History

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November 15, 2017

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# What is R?

- R is a system for data manipulation, statistical and numerical analysis, and graphical display
- freely available under the GNU General Public License (GPL) → open-source
- runs under Windows, MacOS, Unix/Linux, and even on Android! (and with some tricks also on iOS) – but why would you???
- now a bit of history ...



# History of S and R

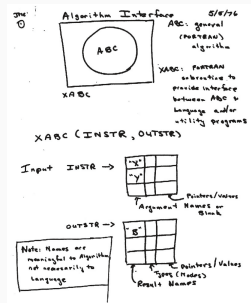
... it began May 5, 1976 at:



Bell Laboratories, Murray Hill, New Jersey

# History of S and R

- informal meeting to discuss development of a new system for statistical computing
- first implementation made by Rick Becker & John Chambers (and a few others)
- called "the system"



sketch of the system design  
made on the first meeting

# History of S and R

- “the system” → “S” (the S language) (also play on name of programming languages, such as C)
- first UNIX version of S in 1979 (version 2)
- distributed outside Bell Labs in 1980
- source code released in 1981, but licensed in 1984 for educational and commercial purposes

# History of S and R

- Becker & Chambers (1984). *S: An Interactive Environment for Data Analysis and Graphics*.
- Becker & Chambers (1985). *Extending the S System*.
- Becker, Chambers, & Wilks (1988): *The New S Language: A Programming Environment for Data Analysis and Graphics*.
- Chambers & Hastie (1991). *Statistical Models in S*.
- Chambers (1998). *Programming with Data: A Guide to the S Language*.

# History of S and R

- **S-PLUS**, a commercial implementation of S, released in 1988 by Statistical Sciences, Inc. (now TIBCO)
- **Ross Ihaka** and **Robert Gentleman** start developing a statistical programming language "not unlike S" at the University of Auckland in the 1990s





# Some R Milestones

- first binary of R released in 1993
- Ihaka, R., & Gentleman, R. (1996). R: A language for data analysis and graphics. *Journal of Computational and Graphical Statistics*, 5(3), 299–314.
- source code released in 1997 ([CRAN](#) is started)
- [R Core group](#) formed in 1997 with 9 members, now 20
- version 1.0.0 (2000), version 2.0.0 (2004)
- first [useR! conference](#) in May 2004 in Vienna, Austria
- version 3.0.0 released April 2013

# MoRe Milestones

- new [website](#) and logo in 2015:



*the old one*



*the new one*

- current version: R 3.4.2 released September 2017

# Other Related Developments

- [Revolution Analytics](#) founded in 2007 (now Microsoft)
- [RStudio](#) founded in 2008
- [New York Times article](#) about R in January 2009
- [R Consortium](#) founded in 2015
- [big data](#) (Oracle, IBM, Intel, Microsoft, ...)
- [data science](#) ('hacking' skills core component)
- web-based interactive graphics/dashboards ([shiny](#), [googleVis](#), [flexdashboard](#), [htmlwidgets](#), [plotly + R](#), ...)
- [open science](#), [reproducible research](#)
- [rmarkdown](#) (easy creation of dynamic documents, presentations, and reports from R)

# Why is it called R?

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- pun/play on the name of the S language
- like computer scientists, statisticians are geeks

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- [Data Scientist: The Sexiest Job of the 21st Century](#)

# Modes of Interacting with R

- *interactively*: type commands into the R console and get immediate feedback
  - to use R as a “calculator on speed”
  - useful for spontaneous exploration of data
  - to test parts of a script file
- *via script files*: type commands into a script file and then do one of the following:
  - copy-paste commands to execute into the R console
  - read in and execute commands with `source()`
  - batch processing (source file from command line)

# Script Files

- promotes:
  - organized programming/analyses
  - code sharing and reuse
- increases replicability
- can write/edit script files with:
  - built-in editor
  - external editor
  - [integrated development environment](#) (IDE)

# RStudio

- [RStudio](#): an IDE for R
- open source (commercial version also available)
- runs on Windows, MacOS, and Linux (also via web)
- some of the useful features:
  - syntax highlighting
  - code completion
  - bracket matching
  - object list and command history
  - organized workspace (editor, console, plots, ...)



# How We Will Proceed ...

- [install R](#) (if you have not done this yet)
- for those new to R, use [RStudio](#) (install this as well)
- hands-on tutorial based on script file on [website](#)
- if you have questions, please ask!