

Introduction to

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What you'll learn about

- What is R?
- What's possible with R?
- R basics
 - ▶ Installation
 - ▶ Command-line interface
 - ▶ Coding basics
- Help!

Interactive!

What is ?

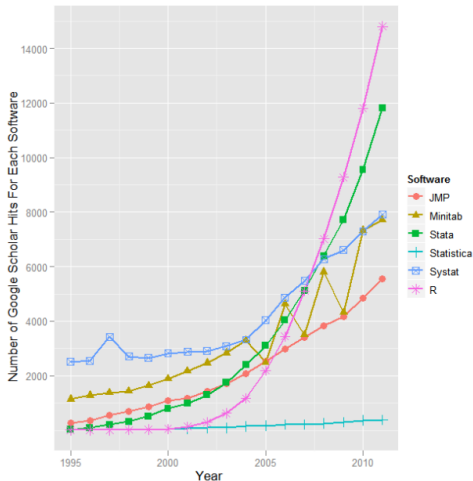
R is a computer language that allows the user to program algorithms and use tools that have been programmed by others [Zuur et al. 2009]

Different from other statistics software because it is also a programming language...

What is R?

R is becoming the statistical software of choice

Plot of Google scholar hits over time for different software packages
[r4stats.com]



What's possible with ?

R is incredibly flexible, if you want something done, someone else has written the code...

R is open-source software, which mean it's free and is supported by a large network of contributors - the Comprehensive R Network [[CRAN](#)]

Basically an online repository of R utilities that others have written

Installation - visit r-project.org and follow directions

The Comprehensive R Archive Network

Download and Install R

Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:

- [Download R for Linux](#)
- [Download R for \(Mac\) OS X](#)
- [Download R for Windows](#)

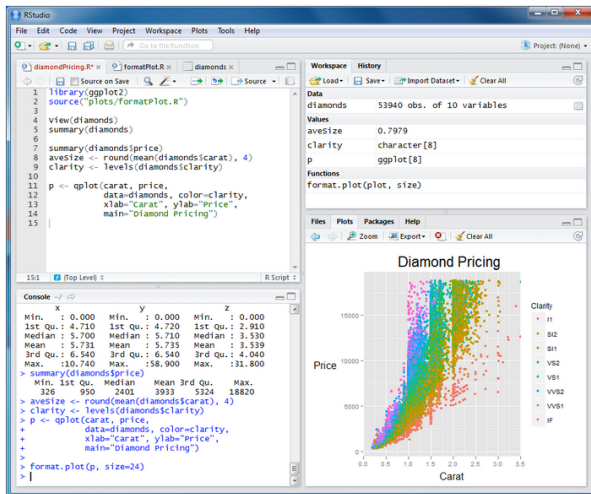
R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.

Source Code for all Platforms

Windows and Mac users most likely want to download the precompiled binaries listed in the upper box, not the source code. The sources have to be compiled before you can use them. If you do not know what this means, you probably do not want to do it!

- The latest release (2013-04-03, Masked Marvel): [R-3.0.0.tar.gz](#), read [what's new](#) in the latest version.
- Sources of [R alpha and beta releases](#) (daily snapshots, created only in time periods before a planned release).
- Daily snapshots of current patched and development versions are [available here](#). Please read about [new features and bug fixes](#) before filing corresponding feature requests or bug reports.
- Source code of older versions of R is [available here](#).
- Contributed extension [packages](#)

A text editor is highly recommended, e.g. **RStudio**



How is R different from Excel? R is a command-line interface

```
R version 2.15.2 (2012-10-26) -- "Trick or Treat"  
Copyright (C) 2012 The R Foundation for Statistical Computing  
ISBN 3-900051-07-0  
Platform: x86_64-w64-mingw32/x64 (64-bit)
```

```
R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.
```

```
Natural language support but running in an English locale
```

```
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.
```

```
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.
```

```
> |
```

What next??

Lines of code are executed by R at the prompt (`>`)

Enter the code and press enter, the output is returned

```
> print('hello world!')
```

```
[1] "hello world!"
```

```
> 2+2
```

```
[1] 4
```

```
> (2+2)/4
```

```
[1] 1
```

```
> rep("a",4)
```

```
[1] "a" "a" "a" "a"
```

Assigning data to R objects is critical for analysis

Assignment is possible using `<-` or `=`

```
> a<-2
```

```
> a
```

```
[1] 2
```

```
> b=3
```

```
> b
```

```
[1] 3
```

```
> a+1
```

```
[1] 3
```

```
> b*a
```

```
[1] 6
```

Anatomy of a function - functions perform tasks for you, much like in Excel

`function(arguments)`

```
> c(1,2) #concatenate function
```

```
[1] 1 2
```

```
> mean(c(1,2)) #mean function
```

```
[1] 1.5
```

How are data imported into R?

R needs to know where the data are located on your computer:

```
> setwd("C:/projects/my_data/")
```

This establishes a 'working directory' for data import/export

R can import almost any type of data - usually not directly from Excel

Where to go for help?

- A user-friendly [intro to R](#)
- Several good introductory texts are available - Zuur et al. 2009. A Beginner's Guide to R. Springer.
- [R cheatsheet](#)
- Google is your friend
- Help files for each function using '?function' - may or may not be helpful
- An [intro to R](#) - very detailed
- Ask us!