


# An introduction to


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 is extremely powerful, yet not easy to master in the beginning. The main disadvantage compared to other statistical programs is the very primitive user interface. Because of the supposedly steep learning curve, several tools have been developed to facilitate the transition to R. In this introduction, I explain how to install R, give some exercises and provide some hints to familiarize yourself with R. I will also explain where extra information can be found that may answer specific questions.

## Preliminary Work

For installation instructions, I assume MS Windows is used. During and after installation, you

**Installation** Go to the website <http://www.r-project.org>. In the column on the left hand side, click on the CRAN link under the subheading **Download**. The right hand side changes to a page with “CRAN Mirrors”. This is a list of computers from which the  software and extensions can be downloaded. Click on a link (e.g. the one from the Netherlands). Now both the left hand side and the right hand side of the page change. (This page can be saved as a bookmark/favorite.) On the right hand side, click on Windows under the subheading **Download and Install R**. Then click on base and download/install R-2.10.1-win32.exe. You can use the default installation options.

**First Steps** Start the program, e.g. via the start menu. One window inside the main R window is opened. Read the text in the **R Console** window. In the console window, write the text `demo(graphics)` after the “>”-sign and hit the *Return/Enter* key. A graphics window is opened. Hitting *Return/Enter* changes the graph that is displayed. After a few more graphs, the demo is finished. Next write the text `help.start()` in the console window. A page is opened in your web browser with links to documentation, the installed “packages”, a search engine and the FAQ. If you want to become a regular R user, you are strongly advised to read “An Introduction to R” and the FAQ. Don’t do that right now, though.

**Install Extra Packages** We will use some extra packages that need to be installed from the internet as well. The easiest way is through the menu in R. Click on the **Packages** menu and select **Select CRAN mirror...** Again a download computer location needs to be chosen. Next click on **Install package(s)...** in the same **Packages** menu. A long list of available additions (called *packages*) is shown. Install the packages `Rcmdr`, `RcmdrPlugin.Export`,

RcmdrPlugin.sos and RcmdrPlugin.TeachingDemos. (They can be selected together via the standard MS Windows procedure using the **Shift** or **Ctrl** key.) This may take a couple of minutes, so in the mean time have a further look at the R web site (see next topic below). As soon as installation is finished, go to **Open the Rcmdr GUI** below.

**A Further Look at the Website** Go back to the CRAN mirror. On the left hand side, several links are of interest. The most interesting one for a starter are the links under Documentation. The link Contributed gives access to weeks of freely downloadable reading material. Also have a look at the FAQs one day you start using R seriously. Other interesting links are Packages under **Software** and Task Views and Search under CRAN.

**Open the Rcmdr GUI** In the R console window, write `library(Rcmdr)`. You may be asked to install some extra packages. Click “yes”. This will again take several minutes. In the mean time, we can have a further look at the R web site. When finished installing, an extra window called **R Commander** is opened. Make this a full screen window. Open a data set of your own via the menu **Data** → **Import Data** (e.g. choose the `trial.sav` data from the Practical Biostatistics course. Play with the data, e.g. via “View data set” or some of the options under the **Statistics** or **Graphs** menu.

**End Exercise** Close the program, either via the menu **File Exit** under the **R Commander** window, or by typing `q()` in the R console window.

## Some important links

- A shortlist of R functions can be downloaded from [http://rpad.googlecode.com/svn-history/r76/Rpad\\_homepage/index.html](http://rpad.googlecode.com/svn-history/r76/Rpad_homepage/index.html). A full reference manual with all R function in the basic R distribution can be obtained from <http://cran.r-project.org/doc/manuals/fullrefman.pdf>
- A basic introduction to R, somewhat in line with my course, can be found at <http://www.math.ilstu.edu/dhkim/Rstuff/Rtutor.html>. A further introduction to R is found on <http://www.statmethods.net/index.html>. This page shows the commands to be used for many aspects of a statistical analysis, and has been created especially for experienced users of some other statistical packages.

Yet another site to get you started is

[http://zoonek2.free.fr/UNIX/48\\_R/all.html](http://zoonek2.free.fr/UNIX/48_R/all.html).

There is also an R wiki with information for starters and much more information

<http://wiki.r-project.org/rwiki/doku.php>.

- There is a book called “R for SAS and SPSS users”. The website for the book is

<http://rforsasandspssusers.com/>.

This web site also has a freely downloadable early version of the book. It also has a comparison table that lists for many SAS and SPSS procedures the corresponding R packages.

- Many books have been written that explain how to use R for statistical analysis. See <http://www.r-project.org/doc/bib/R-books.html>, <http://www.r-project.org/doc/bib/R-publications.html> and <http://www.math.smith.edu/sasr/>. And don't forget the free information that was referred to in the **Preliminary Work** section, such as <http://cran.r-project.org/other-docs.html> and <http://cran.r-project.org/manuals.html>.

- In the **Preliminary Work** section, you have worked with the R Commander GUI. Other GUI's are found at

<http://www.sciviews.org/SciViews-K/index.html>,

<http://www-sre.wu-wien.ac.at/SimpleR/>

or <http://stats.math.uni-augsburg.de/JGR/>.

There also exists a commercial GUI for R, called R-Plus,

<http://www.experience-rplus.com/>;

a free trial can be downloaded.

- The standard R distribution comes with a basic syntax editor, which is started by opening or creating a script file. More sophisticated editors for R are

Tinn-R (<http://sourceforge.net/projects/tinn-r/>),

WinEDT (<http://www.winedt.com/>) together with the RWinEDt plugin, see

<http://cran.r-project.org/web/packages/RWinEdt/vignettes/RWinEdt.pdf>

or Relax (<http://www.wiwi.uni-bielefeld.de/~wolf/software/relax/relax.html>)

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- A web site with many beautiful graphs and the corresponding R code is <http://addictedtor.free.fr/graphiques/>.
- There exist programs that allow to run R from Excel (<http://rcom.univie.ac.at/>) and from SPSS (see the SPSS web site, search on R plug-in or look at <http://www.spss.com/devcentral/>).