

Introduction of R

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R language

R language is a kind of program language for specialized statistical computing and graphic task. It is referred as an environment or application for R language.

The main task with R is

- Statistical computing (in the academic fields)
- Editing documents including graphical result based on the statistical computation and math symbols.

Features of R

- Interpreted Language: it is implemented and executed without any previously compiling a program.
 - Productivity is good such that it is often used to code a test program for statistical computation.
 - The computational speed is relatively slow compared to C or C++.
- Modern computational method is given by R-package.
- Free software is provided.

Homepage for R



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The R Project for Statistical Computing

Getting Started

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS. To **download R**, please choose your preferred [CRAN mirror](#).

If you have questions about R like how to download and install the software, or what the license terms are, please read our [answers to frequently asked questions](#) before you send an email.

News

- [The R Journal Volume 9/2](#) is available.
- [R version 3.4.3 \(Kite-Eating Tree\)](#) has been released on 2017-11-30.
- [The R Journal Volume 9/1](#) is available.
- [R version 3.3.3 \(Another Canoe\)](#) has been released on Monday 2017-03-06.

Figure: URL: <http://www.r-project.org>

Download and install R.

Editor for Developing R program

Rstudio is popular editor for R programming.



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Infoworld Testing Center
recognized RStudio as a
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R Packages

Our developers and expert



Bring R to the web

Shiny is an elegant and powerful



R studio

- Code editor
- Interface of R-shiny (interactive program on Web)
- Publishing several types of documents.

R studio

The screenshot displays the R Studio interface with four main panels:

- Code Editor (top-left):** Contains R code for matrix operations. It defines a matrix `mat`, a vector `vec`, and a data frame `data`. It then performs matrix multiplication (`mat %*% vec`) and uses `if` statements to conditionally update elements in `mat` based on the values in `vec`.
- Console (bottom-left):** Shows the output of the code execution, including the dimensions of the matrix and the resulting matrix values.
- Environment (top-right):** Lists the objects in the current environment, including `mat`, `mat1`, `mat2`, `rx`, `sol.mat`, `top.mat`, `ux`, and `ix`. It also shows the values of `mat` and `vec`.
- Help Window (bottom-right):** Displays the documentation for the `set()` function, including its usage and arguments.

Figure: Screen of R-studio: the screen is splitted by four panels, code script (top-left), console (bottom-left), environment (top-right), help window (bottom right)

Windows of R-studio

- code script window: the R program is written in this window. The script is usually saved by "R source file". Note that the script can be implemented by "ctrl + enter".
- console window: the output is shown in this window. The screen is can be also seen in the shell environment.
- environment window: the objects in R is shown in this window. In addition there are several useful panels to switch windows.
- help windows: the file explorer, help documents, graphical result are shown in this window.

R studio option

- Encoding option: tools → global options → code → saving → Default text encodings (UTF-8).
- Panel layout: tools → global options → panel layout.

Starting R

- workspace: the space containing R object (data, function, graphic results). Type 'ls()' in colsole window, then you can find the names of r objects in the workspace.
- working directory: the defaul file path used in the workspace. Type 'getwd()', then you can check the current working path. To change the working directory type 'setwd("path")'. R uses '/' to denote the path in the file system. ex) "c:/temp/ranking"
- restoring the workspace: Type 'save.image("")', then you can restore all information of workspace. To load the workspace, type 'load("")'. Be careful to overwrite the object with the same name.
- help: type '?...' then you can see the help file about ...

Install package in R

- Use the package tab in help window. Click the install button and select the package. The corresponding files are downloaded in a directory.
- To load the package, use `library("")`. Then the R objects are loaded in the workspace. But the objects may not be shown by `ls()`. This is because of the management policy of namespace.
- Install "glmnet" and load the library. Type `?glmnet`.

Importing dataset

- click import data set in environment window.
- click From text(readr).
- input the url (<http://archive.ics.uci.edu/ml/machine-learning-databases/wine/wine.data>)
- click the update button.
- delete the check on "first rows as names" and click the update button.
- click import button.

Practice

- check the dataset in the workspace.
- restore the workspace.
- close the R studio without saving the workspace.
- open the workspace and load the previously restored workspace, and check the workspace again.