Introduction of R

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R language
R language is a kind of prgram 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 statitical computation and math symbols.

Features of R

- Interpreted Language: it is implemented and executed without any previously compiling a program.
  - Prductivity 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 sofrware is provided.

Homepage for R

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

Download and install R.

Editor for Developing R program

Rstudio is popular editor for R programming.

R studio

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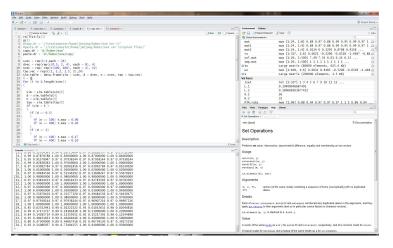- Publishing several types of documents.

R studio

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 $\rightarrow$ global options $\rightarrow$ code $\rightarrow$ saving $\rightarrow$ Default text encodings (UTF-8).
- Panel layout: tools $\rightarrow$ global options $\rightarrow$ 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 intall button and select the package. The correspondint 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 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 botton.
- 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.