

INTRODUCTION TO R

1. Generalities:

R language is *oriented to objects*. Almost any entity suitable to be created, used or modified is an object.

All objects created in a session are stored in a workspace. By default, at the end of the session we are asked if we want to save the workspace. If the answer is affirmative, then it is saved in the file `.RData`, which is automatically loaded when starting R.

The workspace can be saved anytime to a different file by menu

RGui → File → Save Workspace.

The saved Workspace can be reloaded in subsequent sessions by

RGui → File → Load Workspace.

Objects are manipulated by *operators* and *functions*.

2. Operators:

They may be *arithmetic*, *logical* or *comparative*, but their result depends on the type of object operated.

3. Functions:

The functions are distributed in packages. Those packages can be found in folders of the same name in the directory

R-Home/library

The package *base* contains the kernel of R; that is, all basic functions for reading, writing and manipulating data, along with some graphical and statistical functions.

The code of the functions is in an ASCII format file with the same name of the package, contained in the directory *R* of the corresponding package folder.

Menus:

- *File → Source R code*: Executes the R code of an .R file. This file may contain functions which will be available for use.
- *File → Display File*: To display the contents of any file.
- *File → Save History*: Saves all realized actions (without their output) to a file. If we don't do this but we save the workspace at the end of the session, the last history is automatically added to the file .Rhistory.
- *File → Change directory*: Changes the working directory. It creates an alias of R in the new directory, and anytime we run the alias it works in the settled directory by default.
- *File → Save to File*: Saves the complete contents of RGui Console to a .txt file.

- *Packages* → *Load Package*: Loads in memory a package of functions which are stored in the *library* directory.

Objects:

- ✓ Type of objects: variable, vector, factor, array, matrix, data.frame, ts, list, function, expression.
- ✓ Properties of objects: name, value/s, attributes of single elements of the object. Two intrinsic attributes are *mode* (numeric, character, logical, complex) and *length* (number of elements).

Description of objects:

- *vector*: set of elements of the same mode (numeric, character, logical or complex).
- *factor*: set of codes belonging to a certain set of categories, called *levels* of the factor, which at the same time may be labelled.
- *array*: set of elements of the same mode represented as an n -dimensional cube.
- *matrix*: 2-dimensional array.
- *data.frame*: set of vectors or factors of the same length.
- *list*: set of objects of any type.