An Introduction to R

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1 An Introduction to R

This course is meant to be a guide for those who want to learn how to use the R software: a "step-by-step" approach will be used to guide students from the most basic operations with R to some advanced concepts. The course will be held in an interactive way: students will be asked to actively use R from the very beginning. Knowledge of other programming languages is helpful, but not required to attend the course.

The course is divided in 6 modules of 4 hours each according to the following programme:

1.1 I Introduction

- Installation and administration

- Managing datasets; importing and exporting data

- Understanding R objects and learning how to manipulate them

- Types of variables in R

1.2 II Plotting in R

- Understanding the "Pen on paper" way of plotting

- Basic plots (dotplots, boxplot, histograms, etc...): tips & triks

- Manipulation of plot parameters

- Exporting plots (caveats and workarounds)

1.3 III Exploratory Data Analysis

Graphical techniques to explore datasets and choose the most appropriate statistical analyses.

1.4 IV Models in R

- Understanding model formulas

- Testing of assumptions and interpretation of results of the following analyses:

  - One- and Two-Samples tests
  - Regression
  - Analysis of Variance

1.5 V Programming in R

- How to Write your own scripts

- Common pitfalls in R programming and Good Coding Practices

- "Computing on the language" and Object Oriented Programming techniques

1.6 VI Some advanced topics (optional)

- Trellis and ggplot2 plots

- Spatial data in R