SYLLABUS DEL CORSO

Altre attività - Livellamento al software R

2324-1-F8204B028-R

Learning objectives

The objective of this course is to introduce the R software (https://www.r-project.org/).

Contents

After a short theoretical and historical introduction, we will discuss the basics of the R language focusing on the most important data structures (e.g. vectors, lists, matrices, dataframes and so on) and the main programming concepts (e.g. recyling, floating point arithmetics, missing values, control flows, ...). During the third and fourth classes we will examine several univariate distributions via summary statistics, histograms, bar plot, scatterplots and we will apply these graphical tools to explore some classical probability theorems (e.g. law of large numbers and central limit theorem). Finally, we will import and analyse an external dataset.

Detailed program

Classes 1 and 2:
* The historical development of the R software and Rstudio IDE + installation details;
* The most important data structures (logical, interger, double, ...);
* Vectorised operations and recycling.

Class 3:
* Matrices;
* Subset and subset-assignment;
* Lists.

Class 4:
* Base graphics;
* How to define new R functions.

Class 5:
* Control flows (if, for, else, while, ...);
* Import and analyse external data.

Prerequisites

No previous programming knowledge is required. Some exercises recall basic concepts of probability and statistical inference.

Teaching methods

Lab sessions.

Assessment methods

The exam will be held in a lab and you will be required to solve some statistical and numerical exercises using the R software.

Partecipating and passing this course guarantee the acquisition of 2 credits related to "Other educational activities" for the CLAMSES master's degree: [Altre attività formative- 2 CFU - Scienze Statistiche ed Economiche (unimib.it)](#).

You can only take this exame once and the exam will be in October 2023.

Textbooks and Reading Materials

* The .R files shared during the classes.
* De Micheaux, P.L., Drouilhet, R. and Liquet, B., 2013. The R software. Springer. New York. Available [online](#) using the Univerity's wifi (or the VPN).
* Venables, W. N., Smith D. M. & the R Core Team (2021). An Introduction to R. Available [online](#).

Semester

The course will start before the beginning of the first semester and, in particular, the classes will be held from 18/09/2023 to 22/09/2023.

Teaching language

Italian

Sustainable Development Goals

QUALITY EDUCATION