

Collegio Carlo Alberto
STATISTICAL AND PROGRAMMING TOOLS FOR ECONOMICS
APPLICATIONS
Fall 2013

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Course Description

The course is intended for PhD/Master students who wish to use R for statistical modeling and economic analysis. You will learn to manipulate the data, apply various statistical analyses and to graphically represent the results. After this course, you will be able to analyze your own data with R. Aside from providing analysis tools, one of the primary aims of this course is to develop the level of sophistication necessary to conduct research in modern economics. It is expected that the reader has had at least a pre-calculus course. These will only be briefly reviewed, whereas the more advanced economical and statistical concepts will be treated in depth.

Text

Using R for introductory statistics, Verzani, J., Chapman & Hall/CRC, Boca Raton, FL, 2005.

Homeworks

Homeworks will be assigned on a regular schedule. Late homework will not be accepted.

Grading

Attendance (10%), Homeworks (90%).

Working Together

It is okay to work together on homework. However, when it comes time for you to write up the solutions, I expect you to do this on your own.

TOPICS OF THE COURSE

I. Programming in R

- Objects
- Functions
- Vectors and matrices
- Looping
- Data entry
- Graphics

II. Statistical Analysis

- Statistical models and probability distributions
- Estimation, errors and uncertainty
- Linear models and regression

III. Numerical algorithms

- Random number generation
- Introduction to Monte Carlo simulation
- Copula functions
- Importance sampling and bootstrap
- Simulation of simple stochastic processes

IV. pyRserve (A Python client to remotely access the R statistic package)

- Introduction to Python
- Setting up a connection to Rserve
- Expression evaluation
- Calling functions in R