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Titolo	Computational finance : an introductory course with R / / by Argimiro Arratia
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Descrizione fisica	1 online resource (X, 301 p. 41 illus., 26 illus. in color.)
Collana	Atlantis Studies in Computational Finance and Financial Engineering, , 2352-3255 ; ; 1
Disciplina	332
Soggetti	R (Llenguatge de programació) Finances - Informàtica Finances - Models matemàtics R (Computer program language) Computer simulation Statistics Economics, Mathematical Macroeconomics Simulation and Modeling Statistics for Business, Management, Economics, Finance, Insurance Quantitative Finance Macroeconomics/Monetary Economics//Financial Economics Statistics and Computing/Statistics Programs
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	An abridged introduction to finance -- Statistics of financial time series -- Correlations, causalities and similarities -- Time series models in finance -- Brownian motion, binomial trees and Monte Carlo simulation -- Trade on pattern mining or value estimation -- Optimization heuristics in finance -- Portfolio optimization -- Online finance -- Appendix: The R programming environment.
Sommario/riassunto	The book covers a wide range of topics, yet essential, in Computational Finance (CF), understood as a mix of Finance, Computational Statistics, and Mathematics of Finance. In that regard it is unique in its kind, for it

touches upon the basic principles of all three main components of CF, with hands-on examples for programming models in R. Thus, the first chapter gives an introduction to the Principles of Corporate Finance: the markets of stock and options, valuation and economic theory, framed within Computation and Information Theory (e.g. the famous Efficient Market Hypothesis is stated in terms of computational complexity, a new perspective). Chapters 2 and 3 give the necessary tools of Statistics for analyzing financial time series, it also goes in depth into the concepts of correlation, causality and clustering. Chapters 4 and 5 review the most important discrete and continuous models for financial time series. Each model is provided with an example program in R. Chapter 6 covers the essentials of Technical Analysis (TA) and Fundamental Analysis. This chapter is suitable for people outside academics and into the world of financial investments, as a primer in the methods of charting and analysis of value for stocks, as it is done in the financial industry. Moreover, a mathematical foundation to the seemly ad-hoc methods of TA is given, and this is new in a presentation of TA. Chapter 7 reviews the most important heuristics for optimization: simulated annealing, genetic programming, and ant colonies (swarm intelligence) which is material to feed the computer savvy readers. Chapter 8 gives the basic principles of portfolio management, through the mean-variance model, and optimization under different constraints which is a topic of current research in computation, due to its complexity. One important aspect of this chapter is that it teaches how to use the powerful tools for portfolio analysis from the RMetrics R-package. Chapter 9 is a natural continuation of chapter 8 into the new area of research of online portfolio selection. The basic model of the universal portfolio of Cover and approximate methods to compute are also described.