Functional Data Structures In R Advanced Statistical Programming In R

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R for Data Science - Hadley Wickham 2016-12-12
Learn how to use R to turn raw data into insight, knowledge, and understanding. This book introduces you to R, RStudio, and the tidyverse, a collection of R packages designed to work together to make data science fast, fluent, and fun. Suitable for readers with no previous programming experience, R for Data Science is designed to get you doing data science as quickly as possible. Authors Hadley Wickham and Garrett Grolemund guide you through the steps of importing, wrangling, exploring, and modeling your data and communicating the results. You'll get a complete, big-picture understanding of the data science cycle, along with basic tools you need to manage the details. Each section of the book is paired with exercises to help you practice what you've learned along the way. You'll learn how to: Wrangle—transform your datasets into a form convenient for analysis Program—learn powerful R tools for solving data problems with greater clarity and ease Explore—examine your data, generate hypotheses, and quickly test them Model—provide a low-dimensional summary that captures true "signals" in your dataset Communicate—learn R Markdown for integrating prose, code, and results
Introduction to Statistics and Data Analysis - Christian Heumann 2017-01-26

This introductory statistics textbook conveys the essential concepts and tools needed to develop and nurture statistical thinking. It presents descriptive, inductive and explorative statistical methods and guides the reader through the process of quantitative data analysis. In the experimental sciences and interdisciplinary research, data analysis has become an integral part of any scientific study. Issues such as judging the credibility of data, analyzing the data, evaluating the reliability of the obtained results and finally drawing the correct and appropriate conclusions from the results are vital. The text is primarily intended for undergraduate students in disciplines like business administration, the social sciences, medicine, politics, macroeconomics, etc. It features a wealth of examples, exercises and solutions with computer code in the statistical programming language R as well as supplementary material that will enable the reader to quickly adapt all methods to their own applications.
Python for Data Analysis - Wes McKinney 2017-09-25
Get complete instructions for manipulating, processing, cleaning, and crunching datasets in Python. Updated for Python 3.6, the second edition of this hands-on guide is packed with practical case studies that show you how to solve a broad set of data analysis problems

effectively. You'll learn the latest versions of pandas, NumPy, IPython, and Jupyter in the process. Written by Wes McKinney, the creator of the Python pandas project, this book is a practical, modern introduction to data science tools in Python. It's ideal for analysts new to Python and for Python programmers new to data science and scientific computing. Data files and related material are available on GitHub. Use the IPython shell and Jupyter notebook for exploratory computing Learn basic and advanced features in NumPy (Numerical Python) Get started with data analysis tools in the pandas library Use flexible tools to load, clean, transform, merge, and reshape data Create informative visualizations with matplotlib Apply the pandas groupby facility to slice, dice, and summarize datasets Analyze and manipulate regular and irregular time series data Learn how to solve real-world data analysis problems with thorough, detailed examples

Applied Statistics with R - Justin C. Touchon 2021-06-30
The statistical analyses that students of the life-sciences are being expected to perform are becoming increasingly advanced. Whether at the undergraduate, graduate, or post-graduate level, this book provides the tools needed to properly analyze your data in an efficient, accessible, plainspoken, frank, and occasionally humorous manner, ensuring that readers come away with the knowledge of which analyses they should use and when they should use them. The book uses the statistical language R, which is the choice of ecologists worldwide and is rapidly becoming the 'go-to' stats program throughout the life-sciences. Furthermore, by using a single, real-world dataset throughout the book, readers are encouraged to become deeply familiar with an imperfect but realistic set of data. Indeed, early chapters are specifically designed to teach basic data manipulation skills and build good habits in preparation for learning more advanced analyses. This approach also demonstrates the importance of viewing data through different lenses, facilitating an easy and natural progression from linear and generalized linear models through to mixed effects versions of those same analyses. Readers will also learn advanced plotting and data-wrangling techniques, and gain an introduction to writing

their own functions. Applied Statistics with R is suitable for senior undergraduate and graduate students, professional researchers, and practitioners throughout the life-sciences, whether in the fields of ecology, evolution, environmental studies, or computational biology.

Advanced Analytics with R and Tableau - Jen Stirrup 2017-08-22
Leverage the power of advanced analytics and predictive modeling in Tableau using the statistical powers of R About This Book A comprehensive guide that will bring out the creativity in you to visualize the results of complex calculations using Tableau and R Combine Tableau analytics and visualization with the power of R using this step-by-step guide Wondering how R can be used with Tableau? This book is your one-stop solution. Who This Book Is For This book will appeal to Tableau users who want to go beyond the Tableau interface and deploy the full potential of Tableau, by using R to perform advanced analytics with Tableau. A basic familiarity with R is useful but not compulsory, as the book will start off with concrete examples of R and will move quickly into more advanced spheres of analytics using online data sources to support hands-on learning. Those R developers who want to integrate R in Tableau will also benefit from this book. What You Will Learn Integrate Tableau's analytics with the industry-standard, statistical prowess of R. Make R function calls in Tableau, and visualize R functions with Tableau using RServe. Use the CRISP-DM methodology to create a roadmap for analytics investigations. Implement various supervised and unsupervised learning algorithms in R to return values to Tableau. Make quick, cogent, and data-driven decisions for your business using advanced analytical techniques such as forecasting, predictions, association rules, clustering, classification, and other advanced Tableau/R calculated field functions. In Detail Tableau and R offer accessible analytics by allowing a combination of easy-to-use data visualization along with industry-standard, robust statistical computation. Moving from data visualization into deeper, more advanced analytics? This book will intensify data skills for data viz-savvy users who want to move into analytics and data science in order to enhance their businesses by harnessing

the analytical power of R and the stunning visualization capabilities of Tableau. Readers will come across a wide range of machine learning algorithms and learn how descriptive, prescriptive, predictive, and visually appealing analytical solutions can be designed with R and Tableau. In order to maximize learning, hands-on examples will ease the transition from being a data-savvy user to a data analyst using sound statistical tools to perform advanced analytics. By the end of this book, you will get to grips with advanced calculations in R and Tableau for analytics and prediction with the help of use cases and hands-on examples. Style and approach Tableau (uniquely) offers excellent visualization combined with advanced analytics; R is at the pinnacle of statistical computational languages. When you want to move from one view of data to another, backed up by complex computations, the combination of R and Tableau makes the perfect solution. This example-rich guide will teach you how to combine these two to perform advanced analytics by integrating Tableau with R and create beautiful data visualizations.

Advanced R Solutions - Malte Grosser 2021-08-24
This book offers solutions to all 284 exercises in Advanced R, Second Edition. All the solutions have been carefully documented and made to be as clear and accessible as possible. Working through the exercises and their solutions will give you a deeper understanding of a variety of programming challenges, many of which are relevant to everyday work. This will expand your set of tools on a technical and conceptual level. You will be able to transfer many of the specific programming schemes directly and will discover far more elegant solutions to everyday problems. Features: When R creates copies, and how it affects memory usage and code performance Everything you could ever want to know about functions The differences between calling and exiting handlers How to employ functional programming to solve modular tasks The motivation, mechanics, usage, and limitations of R's highly pragmatic S3 OO system The R6 OO system, which is more like OO programming in other languages The rules that R uses to parse and evaluate expressions How to use metaprogramming to generate HTML or LaTeX

with elegant R code How to identify and resolve performance bottlenecks

R For Dummies - Andrie de Vries 2012-06-06
Master the programming language of choice among statisticians and data analysts worldwide Coming to grips with R can be tough, even for seasoned statisticians and data analysts. Enter R For Dummies, the quick, easy way to master all the R you'll ever need. Requiring no prior programming experience and packed with practical examples, easy, step-by-step exercises, and sample code, this extremely accessible guide is the ideal introduction to R for complete beginners. It also covers many concepts that intermediate-level programmers will find extremely useful. Master your R ABCs ? get up to speed in no time with the basics, from installing and configuring R to writing simple scripts and performing simultaneous calculations on many variables Put data in its place ? get to know your way around lists, data frames, and other R data structures while learning to interact with other programs, such as Microsoft Excel Make data dance to your tune ? learn how to reshape and manipulate data, merge data sets, split and combine data, perform calculations on vectors and arrays, and much more Visualize it ? learn to use R's powerful data visualization features to create beautiful and informative graphical presentations of your data Get statistical ? find out how to do simple statistical analysis, summarize your variables, and conduct classic statistical tests, such as t-tests Expand and customize R ? get the lowdown on how to find, install, and make the most of add-on packages created by the global R community for a wide variety of purposes Open the book and find: Help downloading, installing, and configuring R Tips for getting data in and out of R Ways to use data frames and lists to organize data How to manipulate and process data Advice on fitting regression models and ANOVA Helpful hints for working with graphics How to code in R What R mailing lists and forums can do for you
R Through Excel - Richard M. Heiberger 2010-01-23
In this book, the authors build on RExcel, a free add-in for Excel that can be downloaded from the R distribution network. RExcel seamlessly integrates the entire set of R's statistical and

graphical methods into Excel, allowing students to focus on statistical methods and concepts and minimizing the distraction of learning a new programming language.

Advanced Object-Oriented Programming in R - Thomas Mailund 2017-06-23
Learn how to write object-oriented programs in R and how to construct classes and class hierarchies in the three object-oriented systems available in R. This book gives an introduction to object-oriented programming in the R programming language and shows you how to use and apply R in an object-oriented manner. You will then be able to use this powerful programming style in your own statistical programming projects to write flexible and extendable software. After reading Advanced Object-Oriented Programming in R, you'll come away with a practical project that you can reuse in your own analytics coding endeavors. You'll then be able to visualize your data as objects that have state and then manipulate those objects with polymorphic or generic methods. Your projects will benefit from the high degree of flexibility provided by polymorphism, where the choice of concrete method to execute depends on the type of data being manipulated. What You'll Learn Define and use classes and generic functions using R Work with the R class hierarchies Benefit from implementation reuse Handle operator overloading Apply the S4 and R6 classes Who This Book Is For Experienced programmers and for those with at least some prior experience with R programming language. /div

R Programming for Data Science - Roger D. Peng 2012-04-19
Data science has taken the world by storm. Every field of study and area of business has been affected as people increasingly realize the value of the incredible quantities of data being generated. But to extract value from those data, one needs to be trained in the proper data science skills. The R programming language has become the de facto programming language for data science. Its flexibility, power, sophistication, and expressiveness have made it an invaluable tool for data scientists around the world. This book is about the fundamentals of R programming. You will get started with the basics of the language, learn how to manipulate datasets, how to write functions, and how to debug and optimize code. With the fundamentals provided in this book, you will have a solid foundation on which to build your data science toolbox.

Using R and RStudio for Data Management, Statistical Analysis, and Graphics - Nicholas J. Horton 2015-03-10
Improve Your Analytical SkillsIncorporating the latest R packages as well as new case studies and applications, Using R and RStudio for Data Management, Statistical Analysis, and Graphics, Second Edition covers the aspects of R most often used by statistical analysts. New users of R will find the book's simple approach easy to understand while more

The Book of R - Tilman M. Davies 2016-07-16
The Book of R is a comprehensive, beginner-friendly guide to R, the world's most popular programming language for statistical analysis. Even if you have no programming experience and little more than a grounding in the basics of mathematics, you'll find everything you need to begin using R effectively for statistical analysis. You'll start with the basics, like how to handle data and write simple programs, before moving on to more advanced topics, like producing statistical summaries of your data and performing statistical tests and modeling. You'll even learn how to create impressive data visualizations with R's basic graphics tools and contributed packages, like ggplot2 and ggvis, as well as interactive 3D visualizations using the rgl package. Dozens of hands-on exercises (with downloadable solutions) take you from theory to practice, as you learn: –The fundamentals of programming in R, including how to write data frames, create functions, and use variables, statements, and loops –Statistical concepts like exploratory data analysis, probabilities, hypothesis tests, and regression modeling, and how to execute them in R –How to access R's thousands of functions, libraries, and data sets –How to draw valid and useful conclusions from your data –How to create publication-quality graphics of your results Combining detailed explanations with real-world examples and exercises, this book will provide you with a solid understanding of both statistics and the depth of R's functionality. Make The Book of R your doorway into the growing world of data analysis.

Learning Statistics with R - Daniel Navarro
2013-01-13
"Learning Statistics with R" covers the contents of an introductory statistics class, as typically taught to undergraduate psychology students, focusing on the use of the R statistical software and adopting a light, conversational style throughout. The book discusses how to get started in R, and gives an introduction to data manipulation and writing scripts. From a statistical perspective, the book discusses descriptive statistics and graphing first, followed by chapters on probability theory, sampling and estimation, and null hypothesis testing. After introducing the theory, the book covers the analysis of contingency tables, t-tests, ANOVAs and regression. Bayesian statistics are covered at the end of the book. For more information (and the opportunity to check the book out before you buy!) visit http://ua.edu.au/ccs/teaching/lsr or http://learningstatisticswithr.com

Statistical Rethinking - Richard McElreath
2018-01-03
Statistical Rethinking: A Bayesian Course with Examples in R and Stan builds readers' knowledge of and confidence in statistical modeling. Reflecting the need for even minor programming in today's model-based statistics, the book pushes readers to perform step-by-step calculations that are usually automated. This unique computational approach ensures that readers understand enough of the details to make reasonable choices and interpretations in their own modeling work. The text presents generalized linear multilevel models from a Bayesian perspective, relying on a simple logical interpretation of Bayesian probability and maximum entropy. It covers from the basics of regression to multilevel models. The author also discusses measurement error, missing data, and Gaussian process models for spatial and network autocorrelation. By using complete R code examples throughout, this book provides a practical foundation for performing statistical inference. Designed for both PhD students and seasoned professionals in the natural and social sciences, it prepares them for more advanced or specialized statistical modeling. Web Resource The book is accompanied by an R package (rethinking) that is available on the author's website and GitHub. The two core functions (map and map2stan) of this package allow a variety of statistical models to be constructed from standard model formulas.

Research Methods Using R - Daniel H. Baker
2022
Providing complete coverage of advanced research methods for undergraduates, Daniel H. Baker supports students in their mastery of more advanced research methods and their application in R.This brand new title brings together coverage of a variety of topics for readers with basic statistical knowledge. It begins with material on the fundamental tools - nonlinear curve fitting and function optimization, stochastic methods, and Fourier (frequency) analysis - before leading readers on tomore specialist content - bivariate and multivariate statistics, Bayesian statistics, and machine learning methods. Several chapters also discuss methods that can be used to improve research practises, including power analysis, meta-analysis, reproducible data analysis.Written to build a student's confidence with using R in a step-by-step way, early chapters present the essentials, ensuring that the content is accessible to those that have never programmed before. By giving them a feel for how the software works in practice, students are gradually introduced tosimple examples of techniques before building up to more detailed implementations demonstrated in worked examples.Readers are also presented with opportunities to try analysis techniques for themselves. Practice questions are presented at the end of each chapter with answer guidance supplied in the book, while multiple-choice-questions with instant feedback can be accessed online. The author also providesdatasets online which students can use to practise their new skills.Digital formats and resourcesThis book is available for students and institutions to purchase in a variety of formats, and is supported by online resources.- The e-book offers a mobile experience and convenient access along with functionality, navigation features, and links that offer extra learning support. This book is accompanied by online resources including multiple-choice-questions with instant feedback, example code, and data files allowingstudents to run examples

independently.

Modern R Programming Cookbook - Jaynal Abedin 2017-10-10
Recipes for emerging developers in R programming and data scientists to simplify their R programming capabilities About This Book Develop strategies to speed up your R code Tackle programming problems and explore both functional and object-oriented programming techniques Learn how to address the core problems of programming in R with the most popular R packages for common tasks Who This Book Is For This book is for developers who would like to enhance the R programming skills. Basic knowledge of R programming is assumed. What You Will Learn Install R and its various IDE for a given platform along with installing libraries from different repositories and version control Learn about basic data structures in R and how to work with them Write customized R functions and handle recursions, exceptions in R environments Create the data processing task as a step by step computer program and execute using dplyr Extract and process unstructured text data Interact with database management system to develop statistical applications Formulate and implement parallel processing in R In Detail R is a powerful tool for statistics, graphics, and statistical programming. It is used by tens of thousands of people daily to perform serious statistical analyses. It is a free, open source system whose implementation is the collective accomplishment of many intelligent, hard-working people. There are more than 2,000 available add-ons, and R is a serious rival to all commercial statistical packages. The objective of this book is to show how to work with different programming aspects of R. The emerging R developers and data science could have very good programming knowledge but might have limited understanding about R syntax and semantics. Our book will be a platform develop practical solution out of real world problem in scalable fashion and with very good understanding. You will work with various versions of R libraries that are essential for scalable data science solutions. You will learn to work with Input / Output issues when working with relatively larger dataset. At the end of this book readers will also learn how to work with databases from within R and also what and how meta programming helps in developing applications. Style and approach This book will be a companion for R programmer and emerging developers in R programming areas. This book will contain recipes related to advanced R programming which will enable users to solve complex problems efficiently.

Learning R Programming - Kun Ren 2016-10-28
Become an efficient data scientist with R About This Book Explore the R language from basic types and data structures to advanced topics Learn how to tackle programming problems and explore both functional and object-oriented programming techniques Learn how to address the core problems of programming in R and leverage the most popular packages for common tasks Who This Book Is For This is the perfect tutorial for anyone who is new to statistical programming and modeling. Anyone with basic programming and data processing skills can pick this book up to systematically learn the R programming language and crucial techniques. What You Will Learn Explore the basic functions in R and familiarize yourself with common data structures Work with data in R using basic functions of statistics, data mining, data visualization, root solving, and optimization Get acquainted with R's evaluation model with environments and meta-programming techniques with symbol, call, formula, and expression Get to grips with object-oriented programming in R: including the S3, S4, RC, and R6 systems Access relational databases such as SQLite and non-relational databases such as MongoDB and Redis Get to know high performance computing techniques such as parallel computing and Rcpp Use web scraping techniques to extract information Create RMarkdown, an interactive app with Shiny, DiagramR, interactive charts, ggvis, and more In Detail R is a high-level functional language and one of the must-know tools for data science and statistics. Powerful but complex, R can be challenging for beginners and those unfamiliar with its unique behaviors. Learning R Programming is the solution - an easy and practical way to learn R and develop a broad and consistent understanding of the language. Through hands-on examples you'll discover powerful R tools, and R best practices that will

give you a deeper understanding of working with data. You'll get to grips with R's data structures and data processing techniques, as well as the most popular R packages to boost your productivity from the offset. Start with the basics of R, then dive deep into the programming techniques and paradigms to make your R code excel. Advance quickly to a deeper understanding of R's behavior as you learn common tasks including data analysis, databases, web scraping, high performance computing, and writing documents. By the end of the book, you'll be a confident R programmer adept at solving problems with the right techniques. Style and approach Developed to make learning easy and intuitive, this book comes packed with a wide variety of statistical and graphical techniques and a wealth of practical information for anyone looking to get started with this exciting and powerful language.

Statistics and Data Analysis for Microarrays Using R and Bioconductor - Sorin Draghici 2016-04-19
Richly illustrated in color, Statistics and Data Analysis for Microarrays Using R and Bioconductor, Second Edition provides a clear and rigorous description of powerful analysis techniques and algorithms for mining and interpreting biological information. Omitting tedious details, heavy formalisms, and cryptic notations, the text takes a hands-on,

Handbook of Statistical Analysis and Data Mining Applications - Robert Nisbet 2017-11-09
Handbook of Statistical Analysis and Data Mining Applications, Second Edition, is a comprehensive professional reference book that guides business analysts, scientists, engineers and researchers, both academic and industrial, through all stages of data analysis, model building and implementation. The handbook helps users discern technical and business problems, understand the strengths and weaknesses of modern data mining algorithms and employ the right statistical methods for practical application. This book is an ideal reference for users who want to address massive and complex datasets with novel statistical approaches and be able to objectively evaluate analyses and solutions. It has clear, intuitive explanations of the principles and tools for solving problems using modern analytic

techniques and discusses their application to real problems in ways accessible and beneficial to practitioners across several areas—from science and engineering, to medicine, academia and commerce. Includes input by practitioners for practitioners Includes tutorials in numerous fields of study that provide step-by-step instruction on how to use supplied tools to build models Contains practical advice from successful real-world implementations Brings together, in a single resource, all the information a beginner needs to understand the tools and issues in data mining to build successful data mining solutions Features clear, intuitive explanations of novel analytical tools and techniques, and their practical applications

Metaprogramming in R - Thomas Mailund 2017-06-01
Learn how to manipulate functions and expressions to modify how the R language interprets itself. This book is an introduction to metaprogramming in the R language, so you will write programs to manipulate other programs. Metaprogramming in R shows you how to treat code as data that you can generate, analyze, or modify. R is a very high-level language where all operations are functions and all functions are data that can be manipulated. This book shows you how to leverage R's natural flexibility in how function calls and expressions are evaluated, to create small domain-specific languages to extend R within the R language itself. What You'll Learn Find out about the anatomy of a function in R Look inside a function call Work with R expressions and environments Manipulate expressions in R Use substitutions Who This Book Is For Those with at least some experience with R and certainly for those with experience in other programming languages.

Modern Statistics with R - Måns Thulin 2021-07-28
The past decades have transformed the world of statistical data analysis, with new methods, new types of data, and new computational tools. The aim of Modern Statistics with R is to introduce you to key parts of the modern statistical toolkit. It teaches you: - Data wrangling - importing, formatting, reshaping, merging, and filtering data in R. - Exploratory data analysis - using visualisation and multivariate techniques to explore datasets. - Statistical inference - modern

methods for testing hypotheses and computing confidence intervals. - Predictive modelling - regression models and machine learning methods for prediction, classification, and forecasting. - Simulation - using simulation techniques for sample size computations and evaluations of statistical methods. - Ethics in statistics - ethical issues and good statistical practice. - R programming - writing code that is fast, readable, and free from bugs. Starting from the very basics, Modern Statistics with R helps you learn R by working with R. Topics covered range from plotting data and writing simple R code to using cross-validation for evaluating complex predictive models and using simulation for sample size determination. The book includes more than 200 exercises with fully worked solutions. Some familiarity with basic statistical concepts, such as linear regression, is assumed. No previous programming experience is needed. R for Everyone - Jared P. Lander 2013-12-20 Statistical Computation for Programmers, Scientists, Quants, Excel Users, and Other Professionals Using the open source R language, you can build powerful statistical models to answer many of your most challenging questions. R has traditionally been difficult for non-statisticians to learn, and most R books assume far too much knowledge to be of help. R for Everyone is the solution. Drawing on his unsurpassed experience teaching new users, professional data scientist Jared P. Lander has written the perfect tutorial for anyone new to statistical programming and modeling. Organized to make learning easy and intuitive, this guide focuses on the 20 percent of R functionality you'll need to accomplish 80 percent of modern data tasks. Lander's self-contained chapters start with the absolute basics, offering extensive hands-on practice and sample code. You'll download and install R; navigate and use the R environment; master basic program control, data import, and manipulation; and walk through several essential tests. Then, building on this foundation, you'll construct several complete models, both linear and nonlinear, and use some data mining techniques. By the time you're done, you won't just know how to write R programs, you'll be ready to tackle the statistical problems you care about most. COVERAGE INCLUDES • Exploring R, RStudio, and R packages • Using R for math: variable types, vectors, calling functions, and more • Exploiting data structures, including data.frames, matrices, and lists • Creating attractive, intuitive statistical graphics • Writing user-defined functions • Controlling program flow with if, ifelse, and complex checks • Improving program efficiency with group manipulations • Combining and reshaping multiple datasets • Manipulating strings using R's facilities and regular expressions • Creating normal, binomial, and Poisson probability distributions • Programming basic statistics: mean, standard deviation, and t-tests • Building linear, generalized linear, and nonlinear models • Assessing the quality of models and variable selection • Preventing overfitting, using the Elastic Net and Bayesian methods • Analyzing univariate and multivariate time series data • Grouping data via K-means and hierarchical clustering • Preparing reports, slideshows, and web pages with knitr • Building reusable R packages with devtools and Rcpp • Getting involved with the R global community

Beginning Data Science in R - Thomas Mailund 2017-03-09
Discover best practices for data analysis and software development in R and start on the path to becoming a fully-fledged data scientist. This book teaches you techniques for both data manipulation and visualization and shows you the best way for developing new software packages for R. Beginning Data Science in R details how data science is a combination of statistics, computational science, and machine learning. You'll see how to efficiently structure and mine data to extract useful patterns and build mathematical models. This requires computational methods and programming, and R is an ideal programming language for this. This book is based on a number of lecture notes for classes the author has taught on data science and statistical programming using the R programming language. Modern data analysis requires computational skills and usually a minimum of programming. What You Will Learn Perform data science and analytics using statistics and the R programming language Visualize and explore data, including working with large data sets found in big data Build an R package Test and check your code Practice

version control Profile and optimize your code Who This Book Is For Those with some data science or analytics background, but not necessarily experience with the R programming language.

Portfolio Optimization with R/Rmetrics -

Domain-Specific Languages in R - Thomas Mailund 2018-06-23
Gain an accelerated introduction to domain-specific languages in R, including coverage of regular expressions. This compact, in-depth book shows you how DSLs are programming languages specialized for a particular purpose, as opposed to general purpose programming languages. Along the way, you'll learn to specify tasks you want to do in a precise way and achieve programming goals within a domain-specific context. Domain-Specific Languages in R includes examples of DSLs including large data sets or matrix multiplication; pattern matching DSLs for application in computer vision; and DSLs for continuous time Markov chains and their applications in data science. After reading and using this book, you'll understand how to write DSLs in R and have skills you can extrapolate to other programming languages. What You'll Learn Program with domain-specific languages using R Discover the components of DSLs Carry out large matrix expressions and multiplications Implement metaprogramming with DSLs Parse and manipulate expressions Who This Book Is For Those with prior programming experience. R knowledge is helpful but not required.

Advanced R - Hadley Wickham 2015-09-15
An Essential Reference for Intermediate and Advanced R Programmers Advanced R presents useful tools and techniques for attacking many types of R programming problems, helping you avoid mistakes and dead ends. With more than ten years of experience programming in R, the author illustrates the elegance, beauty, and flexibility at the heart of R. The book develops the necessary skills to produce quality code that can be used in a variety of circumstances. You will learn: The fundamentals of R, including standard data types and functions Functional programming as a useful framework for solving wide classes of problems The positives and negatives of metaprogramming How to write

fast, memory-efficient code This book not only helps current R users become R programmers but also shows existing programmers what's special about R. Intermediate R programmers can dive deeper into R and learn new strategies for solving diverse problems while programmers from other languages can learn the details of R and understand why R works the way it does.

Complex Models and Computational Methods in Statistics - Matteo Grigoletto 2013-01-26
The use of computational methods in statistics to face complex problems and highly dimensional data, as well as the widespread availability of computer technology, is no news. The range of applications, instead, is unprecedented. As often occurs, new and complex data types require new strategies, demanding for the development of novel statistical methods and suggesting stimulating mathematical problems. This book is addressed to researchers working at the forefront of the statistical analysis of complex systems and using computationally intensive statistical methods.

Functional Programming in R - Thomas Mailund 2017-03-27
Master functions and discover how to write functional programs in R. In this concise book, you'll make your functions pure by avoiding side-effects; you'll write functions that manipulate other functions, and you'll construct complex functions using simpler functions as building blocks. In Functional Programming in R, you'll see how we can replace loops, which can have side-effects, with recursive functions that can more easily avoid them. In addition, the book covers why you shouldn't use recursion when loops are more efficient and how you can get the best of both worlds. Functional programming is a style of programming, like object-oriented programming, but one that focuses on data transformations and calculations rather than objects and state. Where in object-oriented programming you model your programs by describing which states an object can be in and how methods will reveal or modify that state, in functional programming you model programs by describing how functions translate input data to output data. Functions themselves are considered to be data you can manipulate and much of the strength of functional programming comes from manipulating functions; that is,

building more complex functions by combining simpler functions. What You'll Learn Write functions in R including infix operators and replacement functions Create higher order functions Pass functions to other functions and start using functions as data you can manipulate Use Filer, Map and Reduce functions to express the intent behind code clearly and safely Build new functions from existing functions without necessarily writing any new functions, using point-free programming Create functions that carry data along with them Who This Book Is For Those with at least some experience with programming in R.

Functional Data Structures in R - Thomas Mailund 2017-11-18
Get an introduction to functional data structures using R and write more effective code and gain performance for your programs. This book teaches you workarounds because data in functional languages is not mutable: for example you'll learn how to change variable-value bindings by modifying environments, which can be exploited to emulate pointers and implement traditional data structures. You'll also see how, by abandoning traditional data structures, you can manipulate structures by building new versions rather than modifying them. You'll discover how these so-called functional data structures are different from the traditional data structures you might know, but are worth understanding to do serious algorithmic programming in a functional language such as R. By the end of Functional Data Structures in R, you'll understand the choices to make in order to most effectively work with data structures when you cannot modify the data itself. These techniques are especially applicable for algorithmic development important in big data, finance, and other data science applications. What You'll Learn Carry out algorithmic programming in R Use abstract data structures Work with both immutable and persistent data Emulate pointers and implement traditional data structures in R Build new versions of traditional data structures that are known Who This Book Is For Experienced or advanced programmers with at least a comfort level with R. Some experience with data structures recommended.

The Art of R Programming - Norman Matloff 2011-10-11

R is the world's most popular language for developing statistical software: Archaeologists use it to track the spread of ancient civilizations, drug companies use it to discover which medications are safe and effective, and actuaries use it to assess financial risks and keep economies running smoothly. The Art of R Programming takes you on a guided tour of software development with R, from basic types and data structures to advanced topics like closures, recursion, and anonymous functions. No statistical knowledge is required, and your programming skills can range from hobbyist to pro. Along the way, you'll learn about functional and object-oriented programming, running mathematical simulations, and rearranging complex data into simpler, more useful formats. You'll also learn to: –Create artful graphs to visualize complex data sets and functions –Write more efficient code using parallel R and vectorization –Interface R with C/C++ and Python for increased speed or functionality –Find new R packages for text analysis, image manipulation, and more –Squash annoying bugs with advanced debugging techniques Whether you're designing aircraft, forecasting the weather, or you just need to tame your data, The Art of R Programming is your guide to harnessing the power of statistical computing.

Advanced Statistics in Criminology and Criminal Justice - David Weisburd 2021-10-21
This book provides the student, researcher or practitioner with the tools to understand many of the most commonly used advanced statistical analysis tools in criminology and criminal justice, and also to apply them to research problems. The volume is structured around two main topics, giving the user flexibility to find what they need quickly. The first is "the general linear model" which is the main analytic approach used to understand what influences outcomes in crime and justice. It presents a series of approaches from OLS multivariate regression, through logistic regression and multi-nomial regression, hierarchical regression, to count regression. The volume also examines alternative methods for estimating unbiased outcomes that are becoming more common in criminology and criminal justice, including analyses of randomized experiments and propensity score matching. It also examines the

problem of statistical power, and how it can be used to better design studies. Finally, it discusses meta analysis, which is used to summarize studies; and geographic statistical analysis, which allows us to take into account the ways in which geographies may influence our statistical conclusions.

Using R for Introductory Statistics, Second Edition - John Verzani 2014-06-26
The second edition of a bestselling textbook, Using R for Introductory Statistics guides students through the basics of R, helping them overcome the sometimes steep learning curve. The author does this by breaking the material down into small, task-oriented steps. The second edition maintains the features that made the first edition so popular, while updating data, examples, and changes to R in line with the current version. See What's New in the Second Edition: Increased emphasis on more idiomatic R provides a grounding in the functionality of base R. Discussions of the use of RStudio helps new R users avoid as many pitfalls as possible. Use of knitr package makes code easier to read and therefore easier to reason about. Additional information on computer-intensive approaches motivates the traditional approach. Updated examples and data make the information current and topical. The book has an accompanying package, UsingR, available from CRAN, R's repository of user-contributed packages. The package contains the data sets mentioned in the text (data(package="UsingR")), answers to selected problems (answers()), a few demonstrations (demo()), the errata (errata()), and sample code from the text. The topics of this text line up closely with traditional teaching progression; however, the book also highlights computer-intensive approaches to motivate the more traditional approach. The authors emphasize realistic data and examples and rely on visualization techniques to gather insight. They introduce statistics and R seamlessly, giving students the tools they need to use R and the information they need to navigate the sometimes complex world of statistical computing.

Model-Based Clustering and Classification for Data Science - Charles Bouveyron 2019-09-30
Cluster analysis finds groups in data automatically. Most methods have been heuristic and leave open such central questions as: how many clusters are there? Which method should I use? How should I handle outliers? Classification assigns new observations to groups given previously classified observations, and also has open questions about parameter tuning, robustness and uncertainty assessment. This book frames cluster analysis and classification in terms of statistical models, thus yielding principled estimation, testing and prediction methods, and sound answers to the central questions. It builds the basic ideas in an accessible but rigorous way, with extensive data examples and R code; describes modern approaches to high-dimensional data and networks; and explains such recent advances as Bayesian regularization, non-Gaussian model-based clustering, cluster merging, variable selection, semi-supervised and robust classification, clustering of functional data, text and images, and co-clustering. Written for advanced undergraduates in data science, as well as researchers and practitioners, it assumes basic knowledge of multivariate calculus, linear algebra, probability and statistics.

R Cookbook - JD Long 2019-06-21
Perform data analysis with R quickly and efficiently with more than 275 practical recipes in this expanded second edition. The R language provides everything you need to do statistical work, but its structure can be difficult to master. These task-oriented recipes make you productive with R immediately. Solutions range from basic tasks to input and output, general statistics, graphics, and linear regression. Each recipe addresses a specific problem and includes a discussion that explains the solution and provides insight into how it works. If you're a beginner, R Cookbook will help get you started. If you're an intermediate user, this book will jog your memory and expand your horizons. You'll get the job done faster and learn more about R in the process. Create vectors, handle variables, and perform basic functions Simplify data input and output Tackle data structures such as matrices, lists, factors, and data frames Work with probability, probability distributions, and random variables Calculate statistics and confidence intervals and perform statistical tests Create a variety of graphic displays Build

statistical models with linear regressions and analysis of variance (ANOVA) Explore advanced statistical techniques, such as finding clusters in your data

R Cookbook - Paul Teetor 2011-03-03
With more than 200 practical recipes, this book helps you perform data analysis with R quickly and efficiently. The R language provides everything you need to do statistical work, but its structure can be difficult to master. This collection of concise, task-oriented recipes makes you productive with R immediately, with solutions ranging from basic tasks to input and output, general statistics, graphics, and linear regression. Each recipe addresses a specific problem, with a discussion that explains the solution and offers insight into how it works. If you're a beginner, R Cookbook will help get you started. If you're an experienced data programmer, it will jog your memory and expand your horizons. You'll get the job done faster and learn more about R in the process. Create vectors, handle variables, and perform other basic functions Input and output data Tackle data structures such as matrices, lists, factors, and data frames Work with probability, probability distributions, and random variables Calculate statistics and confidence intervals, and perform statistical tests Create a variety of graphic displays Build statistical models with linear regressions and analysis of variance (ANOVA) Explore advanced statistical techniques, such as finding clusters in your data "Wonderfully readable, R Cookbook serves not only as a solutions manual of sorts, but as a truly enjoyable way to explore the R language—one practical example at a time."—Jeffrey Ryan, software consultant and R package author

Doing Meta-Analysis with R - Mathias Harrer 2021-09-15
Doing Meta-Analysis with R: A Hands-On Guide serves as an accessible introduction on how meta-analyses can be conducted in R. Essential steps for meta-analysis are covered, including calculation and pooling of outcome measures, forest plots, heterogeneity diagnostics, subgroup analyses, meta-regression, methods to control for publication bias, risk of bias assessments and plotting tools. Advanced but highly relevant topics such as network meta-analysis, multi-three-level meta-analyses, Bayesian meta-

analysis approaches and SEM meta-analysis are also covered. A companion R package, dmetar, is introduced at the beginning of the guide. It contains data sets and several helper functions for the meta and metafor package used in the guide. The programming and statistical background covered in the book are kept at a non-expert level, making the book widely accessible. Features • Contains two introductory chapters on how to set up an R environment and do basic imports/manipulations of meta-analysis data, including exercises • Describes statistical concepts clearly and concisely before applying them in R • Includes step-by-step guidance through the coding required to perform meta-analyses, and a companion R package for the book

R in Action - Robert I. Kabacoff 2015-05-20
Summary R in Action, Second Edition presents both the R language and the examples that make it so useful for business developers. Focusing on practical solutions, the book offers a crash course in statistics and covers elegant methods for dealing with messy and incomplete data that are difficult to analyze using traditional methods. You'll also master R's extensive graphical capabilities for exploring and presenting data visually. And this expanded second edition includes new chapters on time series analysis, cluster analysis, and classification methodologies, including decision trees, random forests, and support vector machines. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Business pros and researchers thrive on data, and R speaks the language of data analysis. R is a powerful programming language for statistical computing. Unlike general-purpose tools, R provides thousands of modules for solving just about any data-crunching or presentation challenge you're likely to face. R runs on all important platforms and is used by thousands of major corporations and institutions worldwide. About the Book R in Action, Second Edition teaches you how to use the R language by presenting examples relevant to scientific, technical, and business developers. Focusing on practical solutions, the book offers a crash course in statistics, including elegant methods for dealing with messy and incomplete data.

You'll also master R's extensive graphical capabilities for exploring and presenting data visually. And this expanded second edition includes new chapters on forecasting, data mining, and dynamic report writing. What's Inside Complete R language tutorial Using R to manage, analyze, and visualize data Techniques for debugging programs and creating packages OOP in R Over 160 graphs About the Author Dr. Rob Kabacoff is a seasoned researcher and teacher who specializes in data analysis. He also maintains the popular Quick-R website at statmethods.net. Table of Contents PART 1 GETTING STARTED Introduction to R Creating a dataset Getting started with graphs Basic data management Advanced data management PART 2 BASIC METHODS Basic graphs Basic statistics PART 3 INTERMEDIATE METHODS Regression Analysis of variance Power analysis Intermediate graphs Resampling statistics and bootstrapping PART 4 ADVANCED METHODS Generalized linear models Principal components and factor analysis Time series Cluster analysis Classification Advanced methods for missing data PART 5 EXPANDING YOUR SKILLS Advanced graphics with ggplot2 Advanced programming Creating a package Creating dynamic reports Advanced graphics with the lattice package available online only from manning.com/kabacoff2

Python and R for the Modern Data Scientist - Rick J. Scavetta 2021-06-22
Success in data science depends on the flexible and appropriate use of tools. That includes Python and R, two of the foundational programming languages in the field. This book guides data scientists from the Python and R communities along the path to becoming bilingual. By recognizing the strengths of both languages, you'll discover new ways to accomplish data science tasks and expand your skill set. Authors Rick Scavetta and Boyan Angelov explain the parallel structures of these languages and highlight where each one excels, whether it's their linguistic features or the powers of their open source ecosystems. You'll learn how to use Python and R together in real-world settings and broaden your job opportunities as a bilingual data scientist. Learn Python and R from the perspective of your current language Understand the strengths and weaknesses of each language Identify use cases where one language is better suited than the other Understand the modern open source ecosystem available for both, including packages, frameworks, and workflows Learn how to integrate R and Python in a single workflow Follow a case study that demonstrates ways to use these languages together

Functional Data Structures in R - Thomas Mailund 2017-11-17
Get an introduction to functional data structures using R and write more effective code and gain performance for your programs. This book teaches you workarounds because data in functional languages is not mutable: for example you'll learn how to change variable-value bindings by modifying environments, which can be exploited to emulate pointers and implement traditional data structures. You'll also see how, by abandoning traditional data structures, you can manipulate structures by building new versions rather than modifying them. You'll discover how these so-called functional data structures are different from the traditional data structures you might know, but are worth understanding to do serious algorithmic programming in a functional language such as R. By the end of Functional Data Structures in R, you'll understand the choices to make in order to most effectively work with data structures when you cannot modify the data itself. These techniques are especially applicable for algorithmic development important in big data, finance, and other data science applications. What You'll Learn Carry out algorithmic programming in R Use abstract data structures Work with both immutable and persistent data Emulate pointers and implement traditional data structures in R Build new versions of traditional data structures that are known Who This Book Is For Experienced or advanced programmers with at least a comfort level with R. Some experience with data structures recommended.

Statistics for Library and Information Services - Alon Friedman 2015-11-11
Statistics for Library and Information Services, written for non-statisticians, provides logical, user-friendly, and step-by-step instructions to make statistics more accessible for students and professionals in the field of Information Science. It emphasizes concepts of statistical theory and

data collection methodologies, but also extends to the topics of visualization creation and display, so that the reader will be able to better conduct statistical analysis and communicate his/her findings. The book is tailored for information science students and professionals. It has specific examples of dataset sets, scripts, design modules, data repositories, homework assignments, and a glossary lexicon that matches the field of Information Science. The textbook provides a visual road map that is customized specifically for Information Science instructors, students, and professionals regarding statistics and visualization. Each chapter in the book includes full-color illustrations on how to use R for the statistical model that particular chapter will cover. This book is arranged in 17 chapters, which are organized into five main sections: the first section introduces research design and data collection; the second section discusses basic statistical concepts, including descriptive, bivariate, time series, and regression analyses; section 3 covers the subject of visualization creation using Open Source R; section 4 covers decision making from the analysis; and the last section provides examples and references. Every chapter illustrates how to use Open Source R and features two subsections for the major ideas of the chapter: its statistical model and its visual representation. The statistical model captures the main statistical formulas/theories covered in each chapter, while the visual representation addresses the subject of the types of visualization that are produced from the statistical analysis model covered in that particular chapter. Don't miss the book's companion Web site at www.statisticsforlis.org