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Guide to performing data analysis in practice

Whether you are learning data analysis for the first time, or you want to deepen the understanding you already have, this book will prove to an invaluable resource. If you are looking for a book to bring you all the way through the fundamentals to the application of advanced and effective analytics methodologies, and have some prior programming experience and a mathematical background, then this is for you. What You Will Learn

*Data Analysis with R*-Tony Fischetti 2015-12-22 Load, wrangle, and analyze your data using the world’s most powerful statistical programming language

About This Book

Load, manipulate and analyze data from different sources

Gain a deeper understanding of fundamentals of applied statistics

A practical guide to performing data analysis in practice

Who This Book Is For

Whether you are learning data analysis for the first time, or you want to deepen the understanding you already have, this book will prove to an invaluable resource. If you are looking for a book to bring you all the way through the fundamentals to the application of advanced and effective analytics methodologies, and have some prior programming experience and a mathematical background, then this is for you. What You Will Learn

Navigate the R environment

Describe and visualize the behavior of data and relationships between data

Gain a thorough understanding of statistical reasoning and sampling

Employ hypothesis tests to draw inferences from your data

Learn Bayesian methods for estimating parameters

Perform regression to predict continuous variables

Apply powerful classification methods to predict categorical data

Handle missing data gracefully using multiple imputation

Identify and manage problematic data points

Employ parallelization and Rcpp to scale your analyses to larger data

Put best practices into effect to make your job easier and facilitate reproducibility

In Detail

Frequently the tool of choice for academics, R has spread deep into the private sector and can be found in the production pipelines at some of the most advanced and successful enterprises. The power and domain-specificity of R allows the user to express complex analytics easily, quickly, and succinctly. With over 7,000 user contributed packages, it’s easy to find support for the latest and greatest algorithms and techniques. Starting with the basics of R and statistical reasoning, Data Analysis with R dives into advanced predictive analytics, showing how to apply those techniques to real-world data though with real-world examples. Packed with engaging problems and exercises, this book begins with a review of R and its syntax. From there, get to grips with the fundamentals of applied statistics and build on this knowledge to perform sophisticated and powerful analytics.

Solve the difficulties relating to performing data analysis in practice and find solutions to working with “messy data”, large data, communicating results, and facilitating reproducibility. This book is engineered to be an
invaluable resource through many stages of anyone's career as a data analyst. Style and approach Learn data analysis using engaging examples and fun exercises, and with a gentle and friendly but comprehensive "learn-by-doing" approach.

R for Data Science - Hadley Wickham 2016-12-12 "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"—

Mastering Data Analysis with R - Gergely Daroczi 2015-09-30 Gain sharp insights into your data and solve real-world data science problems with R—from data munging to modeling and visualization About This Book Handle your data with precision and care for optimal business intelligence Restructure and transform your data to inform decision-making Packed with practical advice and tips to help you get to grips with data mining Who This Book Is For If you are a data scientist or R developer who wants to explore and optimize your use of R's advanced features and tools, this is the book for you. A basic knowledge of R is required, along with an understanding of database logic. What You Will Learn Connect to and load data from R's range of powerful databases Successfully fetch and parse structured and unstructured data Transform and restructure your data with efficient R packages Define and build complex statistical models with glm Develop and train machine learning algorithms Visualize social networks and graph data Deploy supervised and unsupervised classification algorithms Discover how to visualize spatial data with R In Detail R is an essential language for sharp and successful data analysis. Its numerous features and ease of use make it a powerful way of mining, managing, and interpreting large sets of data. In a world where understanding big data has become key, by mastering R you will be able to deal with your data effectively and efficiently. This book will give you the guidance you need to build and develop your knowledge and expertise. Bridging the gap between theory and practice, this book will help you to understand and use data for a competitive advantage. Beginning with taking you through essential data mining and management tasks such as munging, fetching, cleaning, and restructuring, the book then explores different model designs and the core components of effective analysis. You will then discover how to optimize your use of machine learning algorithms for classification and recommendation systems beside the traditional and more recent statistical methods. Style and approach Covering the essential tasks and skills within data science, Mastering Data Analysis provides you with solutions to the challenges of data science. Each section gives you a theoretical overview before demonstrating how to put the theory to work with real-world use cases and hands-on examples.

Data Analysis with R, Second Edition - Anthony Fischetti 2018-03-28 Learn, by example, the fundamentals of data analysis as well as several intermediate to advanced methods and techniques ranging from classification and regression to Bayesian methods and MCMC, which can be put to immediate use. Key Features Analyze your data using R - the most powerful statistical programming language Learn how to implement applied statistics using practical use-cases Use popular R packages to work with unstructured and structured data Book Description Frequently the tool of choice for academics, R has spread deep into the private sector and can be found in the production pipelines at some of the most advanced and successful enterprises. The power and domain-specificity of R allows the user to express complex analytics easily, quickly, and succinctly. Starting with the basics of R and statistical reasoning, this book dives into advanced predictive analytics, showing how to apply those techniques to real-world data though with real-world examples. Packed with engaging problems and exercises, this book begins with a review of R and its syntax with packages like Rcpp, ggplot2, and dplyr. From there, get to grips with the fundamentals of applied statistics and build on this knowledge to perform sophisticated and powerful analytics. Solve the difficulties relating to performing data analysis in practice and find solutions to working with messy data, large data, communicating results, and facilitating reproducibility. This book is engineered to be an invaluable resource through many stages of anyone’s career as a data analyst. What you will learn Gain a thorough understanding of statistical reasoning and sampling theory Employ hypothesis testing to draw inferences from your data Learn Bayesian methods for estimating parameters Learn Bayesian methods for estimating parameters Train regression, classification, and time series models Handle missing data gracefully using multiple imputation Identify and manage problematic data points Learn how to scale your analyses to larger data with Rcpp, data.table, dplyr, and
parallelization Put best practices into effect to make your job easier and facilitate reproducibility. Who this book is for: Budding data scientists and data analysts who are new to the concept of data analysis, or who want to build efficient analytical models in R will find this book to be useful. No prior exposure to data analysis is needed, although a fundamental understanding of the R programming language is required to get the best out of this 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.

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**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

**Learning R** - Richard Cotton 2013-09-09

Learn how to perform data analysis with the R language and software environment, even if you have little or no programming experience. With the tutorials in this hands-on guide, you'll learn how to use the essential R tools you need to know to analyze data,
including data types and programming concepts. The second half of Learning R shows you real data analysis in action by covering everything from importing data to publishing your results. Each chapter in the book includes a quiz on what you've learned, and concludes with exercises, most of which involve writing R code. Write a simple R program, and discover what the language can do. Use data types such as vectors, arrays, lists, data frames, and strings. Execute code conditionally or repeatedly with branches and loops. Apply R add-on packages, and package your own work for others. Learn how to clean data you import from a variety of sources. Understand data through visualization and summary statistics. Use statistical models to pass quantitative judgments about data and make predictions. Learn what to do when things go wrong while writing data analysis code.

**R: Data Analysis and Visualization** - Tony Fischetti 2016-06-24

Master the art of building analytical models using R. About This Book Load, wrangle, and analyze your data using the world’s most powerful statistical programming language. Build and customize publication-quality visualizations of powerful and stunning R graphs. Develop key skills and techniques with R to create and customize data mining algorithms. Use R to optimize your trading strategy and build up your own risk management system. Discover how to build machine learning algorithms, prepare data, and dig deep into data prediction techniques with R. Who This Book Is For This course is for data scientist or quantitative analyst who are looking at learning R and take advantage of its powerful analytical design framework. It's a seamless journey in becoming a full-stack R developer. What You Will Learn Describe and visualize the behavior of data and relationships between data. Gain a thorough understanding of statistical reasoning and sampling. Handle missing data gracefully using multiple imputation. Create diverse types of bar charts using the default R functions. Familiarize yourself with algorithms written in R for spatial data mining, text mining, and so on. Understand relationships between market factors and their impact on your portfolio. Harness the power of R to build machine learning algorithms with real-world data science applications. Learn specialized machine learning techniques for text mining, big data, and more. In Detail The R learning path created for you has five connected modules, which are a mini-course in their own right. As you complete each one, you'll have gained key skills and be ready for the material in the next module! This course begins by looking at the Data Analysis with R module. This will help you navigate the R environment. You'll gain a thorough understanding of statistical reasoning and sampling. Finally, you'll be able to put best practices into effect to make your job easier and facilitate reproducibility. The second place to explore is R Graphs, which will help you leverage powerful default R graphics and utilize advanced graphics systems such as lattice and ggplot2, the grammar of graphics. You'll learn how to produce, customize, and publish advanced visualizations using this popular and powerful framework. With the third module, Learning Data Mining with R, you will learn how to manipulate data with R using code snippets and be introduced to mining frequent patterns, association, and correlations while working with R programs. The Mastering R for Quantitative Finance module pragmatically introduces both the quantitative finance concepts and their modeling in R, enabling you to build a tailor-made trading system on your own. By the end of the module, you will be well-versed with various financial techniques using R and will be able to place good bets while making financial decisions. Finally, we'll look at the Machine Learning with R module. With this module, you'll discover all the analytical tools you need to gain insights from complex data and learn how to choose the correct algorithm for your specific needs. You'll also learn to apply machine learning methods to deal with common tasks, including classification, prediction, forecasting, and so on. Style and approach Learn data analysis, data visualization techniques, data mining, and machine learning all using R and also learn to build models in quantitative finance using this powerful language.

**Data Science in Education Using R** - Ryan A. Estrellado 2020-10-26

Data Science in Education Using R is the go-to reference for learning data science in the education field. The book answers questions like: What does a data scientist in education do? How do I get started learning R, the popular open-source statistical programming language? And what does a data analysis project in education look like? If you're just getting started with R in an education job, this is the book you'll want with you. This book gets you started with R by teaching the building blocks of programming that you'll use many times in your career. The book takes a "learn by doing" approach and offers eight analysis walkthroughs that show you a data analysis from start to finish, complete with code for you to practice with. The book finishes with how to get involved in the data science community and how to
integrate data science in your education job. This book will be an essential resource for education professionals and researchers looking to increase their data analysis skills as part of their professional and academic development.

**Hands-On Programming with R**-Garrett Grolemund 2014-06-13 Learn how to program by diving into the R language, and then use your newfound skills to solve practical data science problems. With this book, you’ll learn how to load data, assemble and disassemble data objects, navigate R’s environment system, write your own functions, and use all of R’s programming tools. RStudio Master Instructor Garrett Grolemund not only teaches you how to program, but also shows you how to get more from R than just visualizing and modeling data. You’ll gain valuable programming skills and support your work as a data scientist at the same time. Work hands-on with three practical data analysis projects based on casino games Store, retrieve, and change data values in your computer’s memory Write programs and simulations that outperform those written by typical R users Use R programming tools such as if else statements, for loops, and S3 classes Learn how to write lightning-fast vectorized R code Take advantage of R’s package system and debugging tools Practice and apply R programming concepts as you learn them.

**Big Data Analytics with R**-Simon Walkowiak 2016-07-29 Utilize R to uncover hidden patterns in your Big Data About This Book Perform computational analyses on Big Data to generate meaningful results Get a practical knowledge of R programming language while working on Big Data platforms like Hadoop, Spark, H2O and SQL/NoSQL databases, Explore fast, streaming, and scalable data analysis with the most cutting-edge technologies in the market Who This Book Is For This book is intended for Data Analysts, Scientists, Data Engineers, Statisticians, Researchers, who want to integrate R with their current or future Big Data workflows. It is assumed that readers have some experience in data analysis and understanding of data management and algorithmic processing of large quantities of data, however they may lack specific skills related to R. What You Will Learn Learn about current state of Big Data processing using R programming language and its powerful statistical capabilities Deploy Big Data analytics platforms with selected Big Data tools supported by R in a cost-effective and time-saving manner Apply the R language to real-world Big Data problems on a multi-node Hadoop cluster, e.g. electricity consumption across various socio-demographic indicators and bike share scheme usage Explore the compatibility of R with Hadoop, Spark, SQL and NoSQL databases, and H2O platform In Detail Big Data analytics is the process of examining large and complex data sets that often exceed the computational capabilities. R is a leading programming language of data science, consisting of powerful functions to tackle all problems related to Big Data processing. The book will begin with a brief introduction to the Big Data world and its current industry standards. With introduction to the R language and presenting its development, structure, applications in real world, and its shortcomings. Book will progress towards revision of major R functions for data management and transformations. Readers will be introduce to Cloud based Big Data solutions (e.g. Amazon EC2 instances and Amazon RDS, Microsoft Azure and its HDInsight clusters) and also provide guidance on R connectivity with relational and non-relational databases such as MongoDB and HBase etc. It will further expand to include Big Data tools such as Apache Hadoop ecosystem, HDFS and MapReduce frameworks. Also other R compatible tools such as Apache Spark, its machine learning library Spark MLLib, as well as H2O. Style and approach This book will serve as a practical guide to tackling Big Data problems using R programming language and its statistical environment. Each section of the book will present you with concise and easy-to-follow steps on how to process, transform and analyse large data sets.

**Introduction to Data Science**-Rafael A. Irizarry 2019-11-20 Introduction to Data Science: Data Analysis and Prediction Algorithms with R introduces concepts and skills that can help you tackle real-world data analysis challenges. It covers concepts from probability, statistical inference, linear regression, and machine learning. It also helps you develop skills such as R programming, data wrangling, data visualization, predictive algorithm building, file organization with UNIX/Linux shell, version control with Git and GitHub, and reproducible document preparation. This book is a textbook for a first course in data science. No previous knowledge of R is necessary, although some experience with programming may be helpful. The book is divided into six parts: R, data visualization, statistics with R,
data wrangling, machine learning, and productivity tools. Each part has several chapters meant to be presented as one lecture. The author uses motivating case studies that realistically mimic a data scientist’s experience. He starts by asking specific questions and answers these through data analysis so concepts are learned as a means to answering the questions. Examples of the case studies included are: US murder rates by state, trends in world health and economics, the impact of vaccines on infectious disease rates, the financial crisis of 2007-2008, election forecasting, building a baseball team, image processing of handwritten digits, and movie recommendation systems. The statistical concepts used to answer the case study questions are only briefly introduced, so complementing with a probability and statistics textbook is highly recommended for in-depth understanding of these concepts. If you read and understand the chapters and complete the exercises, you will be prepared to learn the more advanced concepts and skills needed to become an expert.

Statistical Inference via Data Science: A ModernDive into R and the Tidyverse - Chester Ismay 2019-12-23 Statistical Inference via Data Science: A ModernDive into R and the Tidyverse provides a pathway for learning about statistical inference using data science tools widely used in industry, academia, and government. It introduces the tidyverse suite of R packages, including the ggplot2 package for data visualization, and the dplyr package for data wrangling. After equipping readers with just enough of these data science tools to perform effective exploratory data analyses, the book covers traditional introductory statistics topics like confidence intervals, hypothesis testing, and multiple regression modeling, while focusing on visualization throughout. Features: ● Assumes minimal prerequisites, notably, no prior calculus nor coding experience ● Motivates theory using real-world data, including all domestic flights leaving New York City in 2013, the Gapminder project, and the data journalism website, FiveThirtyEight.com ● Centers on simulation-based approaches to statistical inference rather than mathematical formulas ● Uses the infer package for "tidy" and transparent statistical inference to construct confidence intervals and conduct hypothesis tests via the bootstrap and permutation methods ● Provides all code and output embedded directly in the text; also available in the online version at moderndive.com This book is intended for individuals who would like to simultaneously start developing their data science toolbox and start learning about the inferential and modeling tools used in much of modern-day research. The book can be used in methods and data science courses and first courses in statistics, at both the undergraduate and graduate levels.

Text Mining with R - Julia Silge 2017-06-12 Much of the data available today is unstructured and text-heavy, making it challenging for analysts to apply their usual data wrangling and visualization tools. With this practical book, you’ll explore text-mining techniques with tidytext, a package that authors Julia Silge and David Robinson developed using the tidy principles behind R packages like ggplot2 and dplyr. You’ll learn how tidytext and other tidy tools in R can make text analysis easier and more effective. The authors demonstrate how treating text as data frames enables you to manipulate, summarize, and visualize characteristics of text. You’ll also learn how to integrate natural language processing (NLP) into effective workflows. Practical code examples and data explorations will help you generate real insights from literature, news, and social media. Learn how to apply the tidy text format to NLP Use sentiment analysis to mine the emotional content of text Identify a document’s most important terms with frequency measurements Explore relationships and connections between words with the ggplot2 and widyr packages Convert back and forth between R’s tidy and non-tidy text formats Use topic modeling to classify document collections into natural groups Examine case studies that compare Twitter archives, dig into NASA metadata, and analyze thousands of Usenet messages

Using R for Introductory Statistics - John Verzani 2018-10-03 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.

Best Practices in Quantitative Methods-Jason W. Osborne 2008 The contributors to Best Practices in Quantitative Methods envision quantitative methods in the 21st century, identify the best practices, and, where possible, demonstrate the superiority of their recommendations empirically. Editor Jason W. Osborne designed this book with the goal of providing readers with the most effective, evidence-based, modern quantitative methods and quantitative data analysis across the social and behavioral sciences. The text is divided into five main sections covering select best practices in Measurement, Research Design, Basics of Data Analysis, Quantitative Methods, and Advanced Quantitative Methods. Each chapter contains a current and expansive review of the literature, a case for best practices in terms of method, outcomes, inferences, etc., and broad-ranging examples along with any empirical evidence to show why certain techniques are better. Key Features: Describes important implicit knowledge to readers: The chapters in this volume explain the important details of seemingly mundane aspects of quantitative research, making them accessible to readers and demonstrating why it is important to pay attention to these details. Compares and contrasts analytic techniques: The book examines instances where there are multiple options for doing things, and make recommendations as to what is the "best" choice—or choices, as what is best often depends on the circumstances. Offers new procedures to update and explicate traditional techniques: The featured scholars present and explain new options for data analysis, discussing the advantages and disadvantages of the new procedures in depth, describing how to perform them, and demonstrating their use. Intended Audience: Representing the vanguard of research methods for the 21st century, this book is an invaluable resource for graduate students and researchers who want a comprehensive, authoritative resource for practical and sound advice from leading experts in quantitative methods.

Graphical Data Analysis with R-Antony Unwin 2016-04-27 See How Graphics Reveal Information Graphical Data Analysis with R shows you what information you can gain from graphical displays. The book focuses on why you draw graphics to display data and which graphics to draw (and uses R to do so). All the datasets are available in R or one of its packages and the R code is available at rosuda.org/GDA. Graphical data analysis is useful for data cleaning, exploring data structure, detecting outliers and unusual groups, identifying trends and clusters, spotting local patterns, evaluating modelling output, and presenting results. This book guides you in choosing graphics and understanding what information you can glean from them. It can be used as a primary text in a graphical data analysis course or as a supplement in a statistics course. Colour graphics are used throughout.

Beginning R-Mark Gardener 2012-05-24 Conquer the complexities of this open source statistical language R is fast becoming the de facto standard for statistical computing and analysis in science, business, engineering, and related fields. This book examines this complex language using simple statistical examples, showing how R operates in a user-friendly context. Both students and workers in fields that require extensive statistical analysis will find this book helpful as they learn to use R for simple summary statistics, hypothesis testing, creating graphs, regression, and much more. It covers formula notation, complex statistics, manipulating data and extracting components, and rudimentary programming. R, the open source statistical language increasingly used to handle statistics and produces publication-quality graphs, is notoriously complex This book makes R easier to understand through the use of simple statistical examples, teaching the necessary elements in the context in which R is actually used Covers getting started with R and using it for simple summary
Head First Data Analysis - Michael Milton 2009-07-17 Today, interpreting data is a critical decision-making factor for businesses and organizations. If your job requires you to manage and analyze all kinds of data, turn to Head First Data Analysis, where you'll quickly learn how to collect and organize data, sort the distractions from the truth, find meaningful patterns, draw conclusions, predict the future, and present your findings to others. Whether you're a product developer researching the market viability of a new product or service, a marketing manager gauging or predicting the effectiveness of a campaign, a salesperson who needs data to support product presentations, or a lone entrepreneur responsible for all of these data-intensive functions and more, the unique approach in Head First Data Analysis is by far the most efficient way to learn what you need to know to convert raw data into a vital business tool. You'll learn how to: Determine which data sources to use for collecting information Assess data quality and distinguish signal from noise Build basic data models to illuminate patterns, and assimilate new information into the models Cope with ambiguous information Design experiments to test hypotheses and draw conclusions Use segmentation to organize your data within discrete market groups Visualize data distributions to reveal new relationships and persuade others Predict the future with sampling and probability models Clean your data to make it useful Communicate the results of your analysis to your audience Using the latest research in cognitive science and learning theory to craft a multi-sensory learning experience, Head First Data Analysis uses a visually rich format designed for the way your brain works, not a text-heavy approach that puts you to sleep.

Applied Spatial Data Analysis with R - Roger S. Bivand 2013-06-21

Applied Spatial Data Analysis with R, second edition, is divided into two basic parts, the first presenting R packages, functions, classes and methods for handling spatial data. This part is of interest to users who need to access and visualise spatial data. Data import and export for many file formats for spatial data are covered in detail, as is the interface between R and the open source GRASS GIS and the handling of spatio-temporal data. The second part showcases more specialised kinds of spatial data analysis, including spatial point pattern analysis, interpolation and geostatistics, areal data analysis and disease mapping. The coverage of methods of spatial data analysis ranges from standard techniques to new developments, and the examples used are largely taken from the spatial statistics literature. All the examples can be run using R contributed packages available from the CRAN website, with code and additional data sets from the book’s own website. Compared to the first edition, the second edition covers the more systematic approach towards handling spatial data in R, as well as a number of important and widely used CRAN packages that have appeared since the first edition. This book will be of interest to researchers who intend to use R to handle, visualise, and analyse spatial data. It will also be of interest to spatial data analysts who do not use R, but who are interested in practical aspects of implementing software for spatial data analysis. It is a suitable companion book for introductory spatial statistics courses and for applied methods courses in a wide range of subjects using spatial data, including human and physical geography, geographical information science and geoinformatics, the environmental sciences, ecology, public health and disease control, economics, public administration and political science. The book has a website where complete code examples, data sets, and other support material may be found: http://www.asdar-book.org. The authors have taken part in writing and maintaining software for spatial data handling and analysis with R in concert since 2003.

Reproducible Research with R and RStudio - Christopher Gandrud 2020-02-21

Praise for previous editions: “Gandrud has written a great outline of how a fully reproducible research project should look from start to finish, with brief explanations of each tool that he uses along the way... Advanced undergraduate students in mathematics, statistics, and similar fields as well as students just beginning their graduate studies would benefit the most from reading this book. Many more experienced R users or second-year graduate students might find themselves thinking, ‘I wish I’d read this book at the start of my studies, when I was first learning R!’...This book could be used as the main text for a class on reproducible research ...”
Reproducible Research with R and R Studio, Third Edition brings together the skills and tools needed for doing and presenting computational research. Using straightforward examples, the book takes you through an entire reproducible research workflow. This practical workflow enables you to gather and analyze data as well as dynamically present results in print and on the web. Supplementary materials and example are available on the author's website. New to the Third Edition Updated package recommendations, examples, URLs, and removed technologies no longer in regular use. More advanced R Markdown (and less LaTeX) in discussions of markup languages and examples. Stronger focus on reproducible working directory tools. Updated discussion of cloud storage services and persistent reproducible material citation. Added discussion of Jupyter notebooks and reproducible practices in industry. Examples of data manipulation with Tidyverse tibbles (in addition to standard data frames) and pivot_longer() and pivot_wider() functions for pivoting data. Features Incorporates the most important advances that have been developed since the editions were published Describes a complete reproducible research workflow, from data gathering to the presentation of results Shows how to automatically generate tables and figures using R Includes instructions on formatting a presentation document via markup languages Discusses cloud storage and versioning services, particularly Github Explains how to use Unix-like shell programs for working with large research projects

Practical R for Mass Communication and Journalism—Sharon Machlis 2018-12-21 Do you want to use R to tell stories? This book was written for you—whether you already know some R or have never coded before. Most R texts focus only on programming or statistical theory. Practical R for Mass Communication and Journalism gives you ideas, tools, and techniques for incorporating data and visualizations into your narratives. You’ll see step by step how to: Analyze airport flight delays, restaurant inspections, and election results Map bank locations, median incomes, and new voting districts Compare campaign contributions to final election results Extract data from PDFs Whip messy data into shape for analysis Scrape data from a website Create graphics ranging from simple, static charts to interactive visualizations for the Web If you work or plan to work in a newsroom, government office, non-profit policy organization, or PR office, Practical R for Mass Communication and Journalism will help you use R in your world. This book has a companion website with code, links to additional resources, and searchable tables by function and task. Sharon Machlis is the author of Computerworld’s Beginner’s Guide to R, host of InfoWorld’s Do More With R video screencast series, admin for the R for Journalists Google Group, and is well known among Twitter users who follow the #rstats hashtag. She is Director of Editorial Data and Analytics at IDG Communications (parent company of Computerworld, InfoWorld, PC World and Macworld, among others) and a frequent speaker at data journalism and R conferences.

Mastering Spark with R—Javier Luraschi 2019-10-07 If you’re like most R users, you have deep knowledge and love for statistics. But as your organization continues to collect huge amounts of data, adding tools such as Apache Spark makes a lot of sense. With this practical book, data scientists and professionals working with large-scale data applications will learn how to use Spark from R to tackle big data and big compute problems. Authors Javier Luraschi, Kevin Kuo, and Edgar Ruiz show you how to use R with Spark to solve different data analysis problems. This book covers relevant data science topics, cluster computing, and issues that should interest even the most advanced users. Analyze, explore, transform, and visualize data in Apache Spark with R Create statistical models to extract information and predict outcomes; automate the process in production-ready workflows Perform analysis and modeling across many machines using distributed computing techniques Use large-scale data from multiple sources and different formats with ease from within Spark Learn about alternative modeling frameworks for graph processing, geospatial analysis, and genomics at scale Dive into advanced topics including custom transformations, real-time data processing, and creating custom Spark extensions

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
Hands-On Exploratory Data Analysis with R - Radhika Datar 2019-05-31

Learn exploratory data analysis concepts using powerful R packages to enhance your R data analysis skills. Key features speed up your data analysis projects using powerful R packages and techniques.

Create multiple hands-on data analysis projects using real-world data. Discover and practice graphical exploratory analysis techniques across domains.

Book Description

Hands-On Exploratory Data Analysis with R will help you build not just a foundation but also expertise in the elementary ways to analyze data. You will learn how to understand your data and summarize its main characteristics. You'll also uncover the structure of your data, and you'll learn graphical and numerical techniques using the R language. This book covers the entire exploratory data analysis (EDA) process—data collection, generating statistics, distribution, and invalidating the hypothesis. As you progress through the book, you will learn how to set up a data analysis environment with tools such as ggplot2, knitr, and R Markdown, using tools such as DOE Scatter Plot and SML2010 for multifactor, optimization, and regression data problems. By the end of this book, you will be able to successfully carry out a preliminary investigation on any dataset, identify hidden insights, and present your results in a business context.

What you will learn
- Learn powerful R techniques to speed up your data analysis projects
- Import, clean, and explore data using powerful R packages
- Practice graphical exploratory analysis techniques
- Create informative data analysis reports using ggplot2
- Identify and clean missing and erroneous data
- Explore data analysis techniques to analyze multi-factor datasets

Who this book is for

Hands-On Exploratory Data Analysis with R is for data enthusiasts who want to build a strong foundation for data analysis. If you are a data analyst, data engineer, software engineer, or product manager, this book will sharpen your skills in the complete workflow of exploratory data analysis.

R Markdown - Yihui Xie 2018-07-27

R Markdown: The Definitive Guide is the first official book authored by the core R Markdown developers that provides a comprehensive and accurate reference to the R Markdown ecosystem. With R Markdown, you can easily create reproducible data analysis reports, presentations, dashboards, interactive applications, books, dissertations, websites, and journal articles, while enjoying the simplicity of Markdown and the great power of R and other languages. In this book, you will learn Basics: Syntax of Markdown and R code chunks, how to generate figures and tables, and how to use other computing languages.

Built-in output formats of R Markdown: PDF/HTML/Word/RTF/Markdown documents and ioslides/Slidy/Beamer/PowPPt presentations.

Extensions and applications: Dashboards, Tufte handouts, xaringan/reveal.js presentations, websites, books, journal articles, and interactive tutorials.

Advanced topics: Parameterized reports, HTML widgets, document templates, custom output formats, and Shiny documents.

Yihui Xie is a software engineer at RStudio. He has authored and co-authored several R packages, including knitr, rmarkdown, bookdown, blogdown, shiny, xaringan, and animation. He has published three other books, Dynamic Documents with R and knitr, bookdown: Authoring Books and Technical Documents with R Markdown, and blogdown: Creating Websites with R Markdown.

J.J. Allaire is the founder of RStudio and the creator of the RStudio IDE. He is an author of several packages in the R Markdown ecosystem including rmarkdown, flexdashboard, learnr, and radix.

Garrett Grolemund is the co-author of R for Data Science and author of Hands-On Programming with R. He wrote the lubridate R package and works for RStudio as an advocate who trains engineers to do data science with R and the Tidyverse.

R for Data Science Cookbook - Yu-Wei, Chiu (David Chiu) 2016-07-29

Over 100 hands-on recipes to effectively solve real-world data problems using the most popular R packages and techniques. About This Book Gain insight into how data scientists collect, process, analyze, and visualize data using some...
of the most popular R packages Understand how to apply useful data 
analysis techniques in R for real-world applications An easy-to-follow guide 
to make the life of data scientist easier with the problems faced while 
performing data analysis Who This Book Is For This book is for those who 
are already familiar with the basic operation of R, but want to learn how to 
efficiently and effectively analyze real-world data problems using practical 
R packages. What You Will Learn Get to know the functional characteristics 
of R language Extract, transform, and load data from heterogeneous 
Sources Understand how easily R can confront probability and statistics 
problems Get simple R instructions to quickly organize and manipulate 
large datasets Create professional data visualizations and interactive 
reports Predict user purchase behavior by adopting a classification 
approach Implement data mining techniques to discover items that are 
frequently purchased together Group similar text documents by using 
various clustering methods Understand how R can confront probability and statistics 
problems Get simple R instructions to quickly organize and manipulate 
large datasets Create professional data visualizations and interactive 
reports Predict user purchase behavior by adopting a classification 
approach Implement data mining techniques to discover items that are 
frequently purchased together Group similar text documents by using 
various clustering methods

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

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

Learning Statistics with R-Daniel Navarro
Regression analysis is a statistical process which enables prediction of relationships between variables. The predictions are based on the casual effect of one variable upon another. Regression techniques for modeling and analyzing are employed on large set of data in order to reveal hidden relationship among the variables. This book will give you a rundown explaining what regression analysis is, explaining you the process from scratch. The first few chapters give an understanding of what the different types of learning are - supervised and unsupervised, how these learnings differ from each other. We then move to covering the supervised learning in details covering the various aspects of regression analysis. The outline of chapters are arranged in a way that gives a feel of all the steps covered in a data science process – loading the training dataset, handling missing values, EDA on the dataset, transformations and feature engineering, model building, assessing the model fitting and performance, and finally making predictions on unseen datasets. Each chapter starts with explaining the theoretical concepts and once the reader gets comfortable with the theory, we move to the practical examples to support the understanding. The practical examples are illustrated using R code including the different packages in R such as R Stats, Caret and so on. Each chapter is a mix of theory and practical examples. By the end of this book you will know all the concepts and pain-points related to regression analysis, and you will be able to implement your learning in your projects. What you will learn Get started with the journey of data science using Simple linear regression Deal with interaction, collinearity and other problems using multiple linear regression Understand diagnostics and what to do if the assumptions fail with proper analysis Load your dataset, treat missing values, and plot relationships with exploratory data analysis Develop a perfect model keeping overfitting, under-fitting, and cross-validation into consideration Deal with classification problems by applying Logistic regression Explore other regression techniques – Decision trees, Bagging, and Boosting techniques Learn by getting it all in action with the help of a real world case study. Who this book is for This book is intended for budding data scientists and data analysts who want to implement regression analysis techniques using R. If you are interested in statistics, data science, machine learning and wants to get an easy introduction to the topic, then this book is what you need! Basic understanding of statistics and math will help you to get the most out of the book. Some programming experience with R will also be helpful.
Fatigue Crack Growth Measurement and Data Analysis - S. J. Hudak 1981

Data Mining with Rattle and R - Graham Williams 2011-08-04 Data mining is the art and science of intelligent data analysis. By building knowledge from information, data mining adds considerable value to the ever increasing stores of electronic data that abound today. In performing data mining many decisions need to be made regarding the choice of methodology, the choice of data, the choice of tools, and the choice of algorithms. Throughout this book the reader is introduced to the basic concepts and some of the more popular algorithms of data mining. With a focus on the hands-on end-to-end process for data mining, Williams guides the reader through various capabilities of the easy to use, free, and open source Rattle Data Mining Software built on the sophisticated R Statistical Software. The focus on doing data mining rather than just reading about data mining is refreshing. The book covers data understanding, data preparation, data refinement, model building, model evaluation, and practical deployment. The reader will learn to rapidly deliver a data mining project using software easily installed for free from the Internet. Coupling Rattle with R delivers a very sophisticated data mining environment with all the power, and more, of the many commercial offerings.

A Handbook of Statistical Analyses Using R, Second Edition - Torsten Hothorn 2009-07-20 A Proven Guide for Easily Using R to Effectively Analyze Data Like its bestselling predecessor, A Handbook of Statistical Analyses Using R, Second Edition provides a guide to data analysis using the R system for statistical computing. Each chapter includes a brief account of the relevant statistical background, along with appropriate references. New to the Second Edition New chapters on graphical displays, generalized additive models, and simultaneous inference A new section on generalized linear mixed models that completes the discussion on the analysis of longitudinal data where the response variable does not have a normal distribution New examples and additional exercises in several chapters A new version of the HSAUR package (HSAUR2), which is available from CRAN This edition continues to offer straightforward descriptions of how to conduct a range of statistical analyses using R, from simple inference to recursive partitioning to cluster analysis. Focusing on how to use R and interpret the results, it provides students and researchers in many disciplines with a self-contained means of using R to analyze their data.

Energy Abstracts for Policy Analysis - 1989

Modern Data Science with R - Benjamin S. Baumer 2021-03-31 From a review of the first edition: "Modern Data Science with R... is rich with examples and is guided by a strong narrative voice. What’s more, it presents an organizing framework that makes a convincing argument that data science is a course distinct from applied statistics" (The American Statistician). Modern Data Science with R is a comprehensive data science textbook for undergraduates that incorporates statistical and computational thinking to solve real-world data problems. Rather than focus exclusively on case studies or programming syntax, this book illustrates how statistical programming in the state-of-the-art R/RStudio computing environment can be leveraged to extract meaningful information from a variety of data in the service of addressing compelling questions. The second edition is updated to reflect the growing influence of the tidyverse set of packages. All code in the book has been revised and styled to be more readable and easier to understand. New functionality from packages like sf, purrr, tidymodels, and tidytext is now integrated into the text. All chapters have been revised, and several have been split, re-organized, or re-imagined to meet the shifting landscape of best practice.

Data Analysis and Graphics Using R - John Maindonald 2006-12-26 Join the revolution ignited by the ground-breaking R system! Starting with an introduction to R, covering standard regression methods, then presenting more advanced topics, this book guides users through the practical and powerful tools that the R system provides. The emphasis is on hands-on analysis, graphical display and interpretation of data. The many worked
examples, taken from real-world research, are accompanied by commentary on what is done and why. A website provides computer code and data sets, allowing readers to reproduce all analyses. Updates and solutions to selected exercises are also available. Assuming only basic statistical knowledge, the book is ideal for research scientists, final-year undergraduate or graduate level students of applied statistics, and practising statisticians. It is both for learning and for reference. This revised edition reflects changes in R since 2003 and has new material on survival analysis, random coefficient models, and the handling of high-dimensional data.

**Introduction to Functional Data Analysis** - Piotr Kokoszka 2017-09-27

Introduction to Functional Data Analysis provides a concise textbook introduction to the field. It explains how to analyze functional data, both at exploratory and inferential levels. It also provides a systematic and accessible exposition of the methodology and the required mathematical framework. The book can be used as textbook for a semester-long course on FDA for advanced undergraduate or MS statistics majors, as well as for MS and PhD students in other disciplines, including applied mathematics, environmental science, public health, medical research, geophysical sciences and economics. It can also be used for self-study and as a reference for researchers in those fields who wish to acquire solid understanding of FDA methodology and practical guidance for its implementation. Each chapter contains plentiful examples of relevant R code and theoretical and data analytic problems. The material of the book can be roughly divided into four parts of approximately equal length: 1) basic concepts and techniques of FDA, 2) functional regression models, 3) sparse and dependent functional data, and 4) introduction to the Hilbert space framework of FDA. The book assumes advanced undergraduate background in calculus, linear algebra, distributional probability theory, foundations of statistical inference, and some familiarity with R programming. Other required statistics background is provided in scalar settings before the related functional concepts are developed. Most chapters end with references to more advanced research for those who wish to gain a more in-depth understanding of a specific topic.

**Energy Research Abstracts** - 1990