

R4ds Guide

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Teaching Tech Together CRC Press

Advanced R helps you understand how R works at a fundamental level. It is designed for R programmers who want to deepen their understanding of the language, and programmers experienced in other languages who want to understand what makes R different and special. This book will teach you the foundations of R; three fundamental programming paradigms (functional, object-oriented, and metaprogramming); and powerful techniques for debugging and optimising your code. By reading this book, you will learn: The difference between an object and its name, and why the distinction is important The important vector data structures, how they fit together, and how you can pull them apart using subsetting The fine details of functions and environments The condition system, which powers messages, warnings, and errors The powerful functional programming paradigm, which can replace many for loops The three most important OO systems: S3, S4, and R6 The tidy eval toolkit for metaprogramming, which allows you to manipulate code and control evaluation Effective debugging techniques that you can deploy, regardless of how your code is run How to find and remove performance bottlenecks The second edition is a comprehensive update: New foundational chapters: "Names and values," "Control flow," and "Conditions" comprehensive coverage of object oriented programming with chapters on S3, S4, R6, and how to choose between them Much deeper coverage of metaprogramming, including the new tidy evaluation framework use of new package like rlang (<http://rlang.r-lib.org>), which provides a clean interface to low-level operations, and purrr (<http://purrr.tidyverse.org/>) for functional programming Use of color in code chunks and figures Hadley Wickham is Chief Scientist at RStudio, an Adjunct Professor at Stanford University and the University of Auckland, and a member of the R Foundation. He is the lead developer of the tidyverse, a collection of R packages, including ggplot2 and dplyr, designed to support data science. He is also the author of R for Data Science (with Garrett Grolemund), R Packages, and ggplot2: Elegant Graphics for Data Analysis.

Basketball Data Science CRC Press

Provides both rich theory and powerful applications Figures are accompanied by code required to produce them Full color figures

Advanced R Solutions Guilford Publications

"Princeton University Press published Imai's textbook, Quantitative Social Science: An Introduction, an introduction to quantitative

methods and data science for upper level undergrads and graduates in professional programs, in February 2017. What is distinct about the book is how it leads students through a series of applied examples of statistical methods, drawing on real examples from social science research. The original book was prepared with the statistical software R, which is freely available online and has gained in popularity in recent years. But many existing courses in statistics and data sciences, particularly in some subject areas like sociology and law, use STATA, another general purpose package that has been the market leader since the 1980s. We've had several requests for STATA versions of the text as many programs use it by default. This is a "translation" of the original text, keeping all the current pedagogical text but inserting the necessary code and outputs from STATA in their place"--

R Markdown Cookbook OUP Oxford

Machine learning (ML) is progressively reshaping the fields of quantitative finance and algorithmic trading. ML tools are increasingly adopted by hedge funds and asset managers, notably for alpha signal generation and stocks selection. The technicality of the subject can make it hard for non-specialists to join the bandwagon, as the jargon and coding requirements may seem out of reach. Machine Learning for Factor Investing: R Version bridges this gap. It provides a comprehensive tour of modern ML-based investment strategies that rely on firm characteristics. The book covers a wide array of subjects which range from economic rationales to rigorous portfolio back-testing and encompass both data processing and model interpretability. Common supervised learning algorithms such as tree models and neural networks are explained in the context of style investing and the reader can also dig into more complex techniques like autoencoder asset returns, Bayesian additive trees, and causal models. All topics are illustrated with self-contained R code samples and snippets that are applied to a large public dataset that contains over 90 predictors. The material, along with the content of the book, is available online so that readers can reproduce and enhance the examples at their convenience. If you have even a basic knowledge of quantitative finance, this combination of theoretical concepts and practical illustrations will help you learn quickly and deepen your financial and technical expertise.

Network Psychometrics with R "O'Reilly Media, Inc."

Networks have permeated everyday life through everyday realities like the Internet, social networks, and viral marketing. As such, network analysis is an important growth area in the quantitative sciences, with roots in social network analysis going back to the 1930s and graph theory going back centuries. Measurement and analysis are integral components of network research. As a result, statistical methods play a critical role in network analysis. This book is the first of its kind in network research. It can be used as a stand-alone resource in which multiple R packages are used to illustrate how to conduct a wide range of network analyses, from basic manipulation and visualization, to summary and characterization, to modeling of network

data. The central package is *igraph*, which provides extensive capabilities for studying network graphs in R. This text builds on Eric D. Kolaczyk's book *Statistical Analysis of Network Data* (Springer, 2009).

***Statistical Analysis of Network Data with R* CRC Press**

Partial least squares structural equation modeling (PLS-SEM) has become a standard approach for analyzing complex inter-relationships between observed and latent variables. Researchers appreciate the many advantages of PLS-SEM such as the possibility to estimate very complex models and the method's flexibility in terms of data requirements and measurement specification. This practical open access guide provides a step-by-step treatment of the major choices in analyzing PLS path models using R, a free software environment for statistical computing, which runs on Windows, macOS, and UNIX computer platforms. Adopting the R software's *SEMInR* package, which brings a friendly syntax to creating and estimating structural equation models, each chapter offers a concise overview of relevant topics and metrics, followed by an in-depth description of a case study. Simple instructions give readers the "how-tos" of using *SEMInR* to obtain solutions and document their results. Rules of thumb in every chapter provide guidance on best practices in the application and interpretation of PLS-SEM.

***Advanced R* Routledge**

There are many excellent R resources for visualization, data science, and package development. Hundreds of scattered vignettes, web pages, and forums explain how to use R in particular domains. But little has been written on how to simply make R work effectively—until now. This hands-on book teaches novices and experienced R users how to write efficient R code. Drawing on years of experience teaching R courses, authors Colin Gillespie and Robin Lovelace provide practical advice on a range of topics—from optimizing the set-up of RStudio to leveraging C++—that make this book a useful addition to any R user's bookshelf. Academics, business users, and programmers from a wide range of backgrounds stand to benefit from the guidance in *Efficient R Programming*. Get advice for setting up an R programming environment Explore general programming concepts and R coding techniques Understand the ingredients of an efficient R workflow Learn how to efficiently read and write data in R Dive into data carpentry—the vital skill for cleaning raw data Optimize your code with profiling, standard tricks, and other methods Determine your hardware capabilities for handling R computation Maximize the benefits of collaborative R programming Accelerate your transition from R hacker to R programmer

***Machine Learning for Factor Investing: R Version* "O'Reilly Media, Inc."** Hundreds of grassroots groups have sprung up around the world to teach programming, web design, robotics, and other skills outside traditional classrooms. These groups exist so that people don't have to learn these things on their own, but ironically, their founders and instructors are often teaching themselves how to teach. There's a better way. This book presents evidence-based practices that will help you create and deliver lessons that work and build a teaching community around them. Topics include the differences between different kinds of learners, diagnosing and correcting misunderstandings, teaching as a performance art, what motivates and demotivates adult learners, how to be a good ally, fostering a healthy community, getting the word out, and building alliances with like-minded groups. The book includes over a hundred exercises that can be done individually or in groups, over 350 references, and a glossary to help you navigate educational jargon.

***Using R for Data Analysis in Social Sciences* Harper Perennial** 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.

***Statistical Inference via Data Science: A Modern Dive into R and the Tidyverse* Cambridge University Press**

Navigating research careers is often highly challenging for early career researchers (ECRs) in the social sciences. The ability to thrive in research careers is complex and requires "soft" people and management skills and resilience that often cannot be formally taught through university coursework. Written from a peer perspective, this book provides guidance and establishes emotional rapport on topical issues relevant for ECRs in academia and industry. The authors are ECRs who have been successful in navigating their careers, and they seek to connect with readers in a supportive and collegial manner. Each chapter includes elements of story-telling and scientific thinking and is organized into three parts: (1) a personal story that is relevant to the topic; (2) key content on professional and personal effectiveness based on evidence in the psychological, sociological, and/or management sciences; and (3) action points and practical recommendations. The topics covered are specifically curated for people considering undertaking research careers or already working in research, including: Work Hard, Snore Hard: Recovery from Work for Early Career Researchers Networking and Collaborating in Academia: Increasing Your Scientific Impact and Having Fun in the Process Accelerating Your Research Career with Open Science Engaging with the Press and Media Make Your Science Go Viral: How to Maximize the Impact of Your Research Exploring the Horizon: Navigating Research Careers Outside of Academia Thinking like an Implementation Scientist and Applying Your Research in Practice Survival Guide for Early Career Researchers summarizes relevant evidence-based research to offer advice in strategic but also supportive ways to ECRs. It is an essential go-to practical resource for PhD students, postdoctoral fellows, and junior faculty. This book will also benefit senior researchers who are serving as mentors or delivering professional development programs, administrators and educators in institutions of higher learning, and anyone with an interest in building a successful research career.

***An Introductory Guide to R* "O'Reilly Media, Inc."**

***Handbook of Graphs and Networks in People Analytics: With Examples in R and Python* covers the theory and practical implementation of graph methods in R and Python for the analysis of people and organizational networks. Starting with an overview of the origins of graph theory and its current applications in the social sciences, the book proceeds to give in-depth technical instruction on how to construct and store graphs from data, how to visualize those graphs compellingly and how to convert common data structures into graph-friendly form. The book explores critical elements of network analysis in detail, including the measurement of distance and centrality, the detection of communities and cliques, and the analysis of assortativity and similarity. An extension chapter offers an introduction to graph database technologies. Real data sets from various research contexts are used for both instruction and for end of chapter practice exercises and a final chapter contains data sets and exercises ideal for larger personal or group projects of varying difficulty level. Key features: Immediately implementable code, with extensive and varied illustrations of graph variants and layouts. Examples and exercises across a variety of real-life contexts including business, politics, education, social media and crime investigation. Dedicated chapter on graph visualization methods. Practical walkthroughs of common methodological uses: finding influential actors in groups, discovering hidden community structures, facilitating diverse interaction in**

organizations, detecting political alignment, determining what influences connection and attachment. Various downloadable data sets for use both in class and individual learning projects. Final chapter dedicated to individual or group project examples.

Computational Genomics with R No Starch Press

A systematic, innovative introduction to the field of network analysis, *Network Psychometrics with R: A Guide for Behavioral and Social Scientists* provides a comprehensive overview of and guide to both the theoretical foundations of network psychometrics as well as modelling techniques developed from this perspective. Written by pioneers in the field, this textbook showcases cutting-edge methods in an easily accessible format, accompanied by problem sets and code. After working through this book, readers will be able to understand the theoretical foundations behind network modelling, infer network topology, and estimate network parameters from different sources of data. This book features an introduction on the statistical programming language R that guides readers on how to analyse network structures and their stability using R. While *Network Psychometrics with R* is written in the context of social and behavioral science, the methods introduced in this book are widely applicable to data sets from related fields of study. Additionally, while the text is written in a non-technical manner, technical content is highlighted in textboxes for the interested reader. *Network Psychometrics with R* is ideal for instructors and students of undergraduate and graduate level courses and workshops in the field of network psychometrics as well as established researchers looking to master new methods.

Hands-On Programming with R "O'Reilly Media, Inc."

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.

Introduction to Data Science CRC Press

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

Statistical Rethinking CRC Press

This guide for practicing statisticians, data scientists, and R users and programmers will teach the essentials of preprocessing: data leveraging the R programming language to easily and quickly turn noisy data into usable pieces of information. Data wrangling, which is also commonly referred to as data munging, transformation, manipulation, janitor work, etc., can be a painstakingly laborious process. Roughly 80% of data analysis is spent on cleaning and preparing data; however, being a prerequisite to the rest of the data analysis workflow (visualization, analysis, reporting), it is essential that one become fluent and efficient in data wrangling techniques. This book will guide the user through the data wrangling process via a step-by-step tutorial approach and provide a solid foundation for working with data in R. The author's goal is to teach the user how to easily wrangle data in order to spend more time on understanding the content of the data. By the end of the book, the user will have learned: How to work with different types of data such as numerics, characters, regular expressions, factors, and dates The difference between different data structures and how to create, add additional components to, and subset each data structure How to acquire and parse data from locations previously inaccessible How to develop functions and use loop control structures to reduce code redundancy How to use pipe operators to simplify code and make it more readable How to reshape the layout of data and manipulate, summarize, and join data sets

Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R Princeton University Press

Computational Genomics with R provides a starting point for beginners in genomic data analysis and also guides more advanced practitioners to sophisticated data analysis techniques in genomics. The book covers topics from R programming, to machine learning and statistics, to the latest genomic data analysis techniques. The text provides accessible information and explanations, always with the genomics context in the background. This also contains practical and well-documented examples in R so readers can analyze their data by simply reusing the code presented. As the field of computational genomics is interdisciplinary, it requires different starting points for people with different backgrounds. For example, a biologist might skip sections on basic genome biology and start with R programming, whereas a computer scientist might want to start with genome biology. After reading: You will have the basics of R and be able to dive right into specialized uses of R for computational genomics such as using Bioconductor packages. You will be familiar with statistics, supervised and unsupervised learning techniques that are important in data modeling, and exploratory analysis of high-dimensional data. You will understand genomic intervals and operations on them that are used for tasks such as aligned read counting and genomic feature annotation. You will know the basics of processing and quality checking high-throughput sequencing data. You will be able to do sequence analysis, such as calculating GC content for parts of a genome or finding transcription factor binding sites. You will know about visualization techniques used in genomics, such as heatmaps, meta-gene plots, and genomic track visualization. You will be familiar with analysis of different high-throughput sequencing data sets, such as RNA-seq, ChIP-seq, and BS-seq. You will know basic techniques for integrating and interpreting multi-omics datasets. Altuna Akalin is a group leader and head of the Bioinformatics and Omics Data Science Platform at the Berlin Institute of Medical Systems Biology, Max Delbrück Center, Berlin. He has been developing computational methods for analyzing and integrating large-scale genomics data sets since 2002. He has published an extensive body of work in this area. The framework for this book grew out of the yearly computational genomics courses he has been organizing and teaching since 2015.

ggplot2 CRC Press

R Markdown is a powerful tool for combining analysis and reporting

into the single document in the spirit of literate programming and reproducible research. Since the birth of the `rmarkdown` package in early 2014, R Markdown has grown substantially from a package that supports a few output formats (such as HTML, PDF, and Word) to an extensive and diverse ecosystem that enables the creation of books, blogs, scientific articles, websites, and more. Due to its rapid success, this ecosystem is hard to learn completely meaning that R Markdown users, from novices to advanced users, likely do not know all that these packages have to offer. The R Markdown Cookbook confronts this gap by showcasing short, practical examples of wide-ranging tips and tricks to get the most out of these tools. After reading this book, you will learn how to:

- Enhance your R Markdown content with diagrams, citations, and dynamically generated text
- Streamline your workflow with child documents, code chunk references, and caching
- Control the formatting and layout with Pandoc markdown syntax or by writing custom HTML and LaTeX templates
- Utilize chunk options and hooks to fine-tune how your code is processed
- Switch between different language engines to seamlessly incorporate python, D3, and more into your analysis

The Complete Idiot's Guide to the Arctic and Antarctic Routledge

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

Text Mining with R Oxford University Press

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 CRC Press

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/PowerPoint 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 Golemund 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.