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KEY=OF - SHELTON BRENDAN

Data Visualization

A Practical Introduction

Princeton University Press **An accessible primer on how to create effective graphics from data** This book provides students and researchers a hands-on introduction to the principles and practice of data visualization. It explains what makes some graphs succeed while others fail, how to make high-quality figures from data using powerful and reproducible methods, and how to think about data visualization in an honest and effective way. **Data Visualization** builds the reader's expertise in ggplot2, a versatile visualization library for the R programming language. Through a series of worked examples, this accessible primer then demonstrates how to create plots piece by piece, beginning with summaries of single variables and moving on to more complex graphics. Topics include plotting continuous and categorical variables; layering information on graphics; producing effective "small multiple" plots; grouping, summarizing, and transforming data for plotting; creating maps; working with the output of statistical models; and refining plots to make them more comprehensible. Effective graphics are essential to communicating ideas and a great way to better understand data. This book provides the practical skills students and practitioners need to visualize quantitative data and get the most out of their research findings. Provides hands-on instruction using R and ggplot2 Shows how the "tidyverse" of data analysis tools makes working with R easier and more consistent Includes a library of data sets, code, and functions

R Visualizations

Derive Meaning from Data

CRC Press **R Visualizations: Derive Meaning from Data** focuses on one of the two major topics of data analytics: data visualization, a.k.a., computer graphics. In the book, major R systems for visualization are discussed, organized by topic and not by system. Anyone doing data analysis will be shown how to use R to generate any of the basic visualizations with the R visualization systems. Further, this book introduces the author's lessR system, which always can accomplish a visualization with less coding than the use of other systems, sometimes dramatically so, and also provides accompanying statistical analyses. **Key Features** Presents thorough coverage of the leading R visualization system, ggplot2. Gives specific guidance on using base R graphics to attain visualizations of the same quality as those provided by ggplot2. Shows how to create a wide range of data visualizations: distributions of categorical and continuous variables, many types of scatterplots including with a third variable, time series, and maps. Inclusion of the various approaches to R graphics organized by topic instead of by system. Presents the recent work on interactive visualization in R. David W. Gerbing received his PhD from Michigan State University in 1979 in quantitative analysis, and currently is a professor of quantitative analysis in the School of Business at Portland State University. He has published extensively in the social and behavioral sciences with a focus on quantitative methods. His lessR package has been in development since 2009.

R for Data Science

Import, Tidy, Transform, Visualize, and Model Data

"O'Reilly Media, Inc." **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

Probability and Statistics with R

CRC Press **Cohesively Incorporates Statistical Theory with R Implementation**Since the publication of the popular first edition of this comprehensive textbook, the contributed R packages on CRAN have increased from around 1,000 to over 6,000. Designed for an intermediate undergraduate course, **Probability and Statistics with R, Second Edition** explores how some o

Longitudinal Data Analysis for the Behavioral Sciences Using R

SAGE **This book is unique in its focus on showing students in the behavioral sciences how to analyze longitudinal data using R software.** The book focuses on application, making it practical and accessible to students in psychology, education, and related fields, who have a basic foundation in statistics. It provides explicit instructions in R computer programming throughout the book, showing students exactly how a specific analysis is carried out and how output is interpreted.

Statistics and Data Visualization Using R

The Art and Practice of Data Analysis

SAGE Publications Designed to introduce students to quantitative methods in a way that can be applied to all kinds of data in all kinds of situations, **Statistics and Data Visualization Using R: The Art and Practice of Data Analysis** by David S. Brown teaches students statistics through charts, graphs, and displays of data that help students develop intuition around statistics as well as data visualization skills. By focusing on the visual nature of statistics instead of mathematical proofs and derivations, students can see the relationships between variables that are the foundation of quantitative analysis. Using the latest tools in R and RStudio® for calculations and data visualization, students learn valuable skills they can take with them into a variety of future careers in the public sector, the private sector, or academia. Starting at the most basic introduction to data and going through most crucial statistical methods, this introductory textbook quickly gets students new to statistics up to speed running analyses and interpreting data from social science research.

R Programming By Example

Practical, hands-on projects to help you get started with R

Packt Publishing Ltd This step-by-step guide demonstrates how to build simple-to-advanced applications through examples in R using modern tools. **About This Book** Get a firm hold on the fundamentals of R through practical hands-on examples **Get started with good R programming fundamentals for data science** Exploit the different libraries of R to build interesting applications in R **Who This Book Is For** This book is for aspiring data science professionals or statisticians who would like to learn about the R programming language in a practical manner. **Basic programming knowledge is assumed. What You Will Learn** Discover techniques to leverage R's features, and work with packages **Perform a descriptive analysis and work with statistical models using R** Work efficiently with objects without using loops **Create diverse visualizations to gain better understanding of the data** Understand ways to produce good visualizations and create reports for the results **Read and write data from relational databases and REST APIs, both packaged and unpackaged** **Improve performance by writing better code, delegating that code to a more efficient programming language, or making it parallel** **In Detail** R is a high-level statistical language and is widely used among statisticians and data miners to develop analytical applications. Often, data analysis people with great analytical skills lack solid programming knowledge and are unfamiliar with the correct ways to use R. Based on the version 3.4, this book will help you develop strong fundamentals when working with R by taking you through a series of full representative examples, giving you a holistic view of R. We begin with the basic installation and configuration of the R environment. As you progress through the exercises, you'll become thoroughly acquainted with R's features and its packages. With this book, you will learn about the basic concepts of R programming, work efficiently with graphs, create publication-ready and interactive 3D graphs, and gain a better understanding of the data at hand. The detailed step-by-step instructions will enable you to get a clean set of data, produce good visualizations, and create reports for the results. It also teaches you various methods to perform code profiling and performance enhancement with good programming practices, delegation, and parallelization. By the end of this book, you will know how to efficiently work with data, create quality visualizations and reports, and develop code that is modular, expressive, and maintainable. **Style and Approach** This is an easy-to-understand guide filled with real-world examples, giving you a holistic view of R and practical, hands-on experience.

Applied Sport Business Analytics

Human Kinetics "This book addresses the fundamental use of analytical metrics to inform sport managers, framing sport analytics for practical use within organizations. The book is organized to present the background of sport analytics, why it is useful, selected techniques and tools employed, and its applications in sport organizations. The text guides the reader in selecting and communicating information in a useable format, and the translation of metrics in informing managers, guiding decisions, and maximizing efficiency in achieving desired outcomes"--

Forecasting: principles and practice

OTexts Forecasting is required in many situations. Stocking an inventory may require forecasts of demand months in advance. Telecommunication routing requires traffic forecasts a few minutes ahead. Whatever the circumstances or time horizons involved, forecasting is an important aid in effective and efficient planning. This textbook provides a comprehensive introduction to forecasting methods and presents enough information about each method for readers to use them sensibly.

The Grammar of Graphics

Springer Science & Business Media Written for statisticians, computer scientists, geographers, research and applied scientists, and others interested in visualizing data, this book presents a unique foundation for producing almost every quantitative graphic found in scientific journals, newspapers, statistical packages, and data visualization systems. It was designed for a distributed computing environment, with special attention given to conserving computer code and system resources. While the tangible result of this work is a Java production graphics library, the text focuses on the deep structures involved in producing quantitative graphics from data. It investigates the rules that underlie pie charts, bar charts, scatterplots, function plots, maps, mosaics, and radar charts. These rules are abstracted from the work of Bertin, Cleveland, Kosslyn, MacEachren, Pinker, Tufte, Tukey, Tobler, and other theorists of quantitative graphics.

ggplot2

Elegant Graphics for Data Analysis

Springer Science & Business Media Provides both rich theory and powerful applications **Figures are accompanied by code required to produce them** **Full color figures**

Data Mining Applications with R

Academic Press **Data Mining Applications with R** is a great resource for researchers and professionals to understand the wide use of R, a free software environment for statistical computing and graphics, in solving different problems in industry. R is widely used in leveraging data mining techniques across many different industries, including government, finance, insurance, medicine, scientific research and more. This book presents 15 different real-world case studies illustrating various techniques in rapidly growing areas. It is an ideal companion for data mining researchers in academia and industry looking for ways to turn this versatile software into a powerful analytic tool. R code, Data and color figures for the book are provided at the RDataMining.com website. Helps data miners to learn to use R in their specific area of work and see how R can apply in different industries **Presents various case studies in real-world applications, which will help readers to apply the techniques in their work** **Provides code examples and sample data for readers to easily learn the techniques by running the code by themselves**

Statistical Inference Via Data Science

A Modern Dive Into R and the Tidyverse

CRC Press "Statistical Inference via Data Science: A Modern Dive 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"--

Introduction to Data Science

Data Analysis and Prediction Algorithms with R

CRC Press 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, self-reported student heights, 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 hand-written 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.

Advanced R

CRC Press 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.

Text Mining with R

A Tidy Approach

"O'Reilly Media, Inc." 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 ggraph 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 ggraph 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

Bioinformatics Data Skills

Reproducible and Robust Research with Open Source Tools

"O'Reilly Media, Inc." Learn the data skills necessary for turning large sequencing datasets into reproducible and robust biological findings. With this practical guide, you'll learn how to use freely available open source tools to extract meaning from large complex biological data sets. At no other point in human history has our ability to understand life's complexities been so dependent on our skills to work with and analyze data. This intermediate-level book teaches the general computational and data skills you need to analyze biological data. If you have experience with a scripting language like Python, you're ready to get started. Go from handling small problems with messy scripts to tackling large problems with clever methods and tools Process bioinformatics data with powerful Unix pipelines and data tools Learn how to use exploratory data analysis techniques in the R language Use efficient methods to work with genomic range data and range operations Work with common genomics data file formats like FASTA, FASTQ, SAM, and BAM Manage your bioinformatics project with the Git version control system Tackle tedious data processing tasks with with Bash scripts and Makefiles

Reproducible Research with R and R Studio

CRC Press Bringing together computational research tools in one accessible source, Reproducible Research with R and RStudio guides you in creating dynamic and highly reproducible research. Suitable for researchers in any quantitative empirical discipline, it presents practical tools for data collection, data analysis, and the presentation of results. With str

Modern Statistics for Modern Biology

Cambridge University Press A far-reaching course in practical advanced statistics for biologists using R/Bioconductor, data exploration, and simulation.

Modern Statistics with R

From wrangling and exploring data to inference and predictive modelling

BoD - Books on Demand 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.

Statistical Rethinking

A Bayesian Course with Examples in R and Stan

CRC Press **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.

Geocomputation with R

CRC Press **Geocomputation with R** is for people who want to analyze, visualize and model geographic data with open source software. It is based on R, a statistical programming language that has powerful data processing, visualization, and geospatial capabilities. The book equips you with the knowledge and skills to tackle a wide range of issues manifested in geographic data, including those with scientific, societal, and environmental implications. This book will interest people from many backgrounds, especially Geographic Information Systems (GIS) users interested in applying their domain-specific knowledge in a powerful open source language for data science, and R users interested in extending their skills to handle spatial data. The book is divided into three parts: (I) Foundations, aimed at getting you up-to-speed with geographic data in R, (II) extensions, which covers advanced techniques, and (III) applications to real-world problems. The chapters cover progressively more advanced topics, with early chapters providing strong foundations on which the later chapters build. Part I describes the nature of spatial datasets in R and methods for manipulating them. It also covers geographic data import/export and transforming coordinate reference systems. Part II represents methods that build on these foundations. It covers advanced map making (including web mapping), "bridges" to GIS, sharing reproducible code, and how to do cross-validation in the presence of spatial autocorrelation. Part III applies the knowledge gained to tackle real-world problems, including representing and modeling transport systems, finding optimal locations for stores or services, and ecological modeling. Exercises at the end of each chapter give you the skills needed to tackle a range of geospatial problems. Solutions for each chapter and supplementary materials providing extended examples are available at <https://geocompr.github.io/geocompkg/articles/>. Dr. Robin Lovelace is a University Academic Fellow at the University of Leeds, where he has taught R for geographic research over many years, with a focus on transport systems. Dr. Jakub Nowosad is an Assistant Professor in the Department of Geoinformation at the Adam Mickiewicz University in Poznan, where his focus is on the analysis of large datasets to understand environmental processes. Dr. Jannes Muenchow is a Postdoctoral Researcher in the GIScience Department at the University of Jena, where he develops and teaches a range of geographic methods, with a focus on ecological modeling, statistical geocomputing, and predictive mapping. All three are active developers and work on a number of R packages, including *stplanr*, *sabre*, and *RQGIS*.

Panel Data Econometrics with R

John Wiley & Sons **Panel Data Econometrics with R** provides a tutorial for using R in the field of panel data econometrics. Illustrated throughout with examples in econometrics, political science, agriculture and epidemiology, this book presents classic methodology and applications as well as more advanced topics and recent developments in this field including error component models, spatial panels and dynamic models. They have developed the software programming in R and host replicable material on the book's accompanying website.

ggplot2

Elegant Graphics for Data Analysis

Springer This new edition to the classic book by *ggplot2* creator Hadley Wickham highlights compatibility with *knitr* and *RStudio*. *ggplot2* is a data visualization package for R that helps users create data graphics, including those that are multi-layered, with ease. With *ggplot2*, it's easy to: produce handsome, publication-quality plots with automatic legends created from the plot specification superimpose multiple layers (points, lines, maps, tiles, box plots) from different data sources with automatically adjusted common scales add customizable smoothers that use powerful modeling capabilities of R, such as *loess*, linear models, generalized additive models, and robust regression save any *ggplot2* plot (or part thereof) for later modification or reuse create custom themes that capture in-house or journal style requirements and that can easily be applied to multiple plots approach a graph from a visual perspective, thinking about how each component of the data is represented on the final plot This book will be useful to everyone who has struggled with displaying data in an informative and attractive way. Some basic knowledge of R is necessary (e.g., importing data into R). *ggplot2* is a mini-language specifically tailored for producing graphics, and you'll learn everything you need in the book. After reading this book you'll be able to produce graphics customized precisely for your problems, and you'll find it easy to get graphics out of your head and on to the screen or page.

Synthetic Biology and Metabolic Engineering in Plants and Microbes Part B: Metabolism in Plants

Elsevier **Synthetic Biology and Metabolic Engineering in Plants and Microbes, Part B**, the latest volume in the *Methods in Enzymology* series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. This volume covers research methods, synthetic biology, and metabolic engineering in plants and microbes, and includes sections on such topics as the usage of integrases in microbial engineering, biosynthesis, and engineering of tryptophan derived metabolites, regulation and discovery of fungal natural products, and elucidation and localization of plant pathways. Continues the legacy of this premier serial with quality chapters authored by leaders in the field of enzymology Contains two volumes covering research methods in synthetic biology and metabolic engineering in plants and microbes Includes sections on such topics as the uses of integrases in microbial engineering, biosynthesis and engineering of tryptophan derived metabolites, regulation and discovery of fungal natural products, and elucidation and localization of plant pathways

The Book of R

A First Course in Programming and Statistics

No Starch Press **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.

Algorithms for Data Science

Springer This textbook on practical data analytics unites fundamental principles, algorithms, and data. Algorithms are the keystone of data analytics and the focal point of this textbook. Clear and intuitive explanations of the mathematical and statistical foundations make the algorithms transparent. But practical data analytics requires more than just the foundations. Problems and data are enormously variable and only the most elementary of algorithms can be used without modification. Programming fluency and experience with real and challenging data is indispensable and so the reader is immersed in Python and R and real data analysis. By the end of the book, the reader will have gained the ability to adapt algorithms to new problems and carry out innovative analyses. This book has three parts:(a) **Data Reduction:** Begins with the concepts of data reduction, data maps, and information extraction. The second chapter introduces associative statistics, the mathematical foundation of scalable algorithms and distributed computing. Practical aspects of distributed computing is the subject of the Hadoop and MapReduce chapter.(b) **Extracting Information from Data:** Linear regression and data visualization are the principal topics of Part II. The authors dedicate a chapter to the critical domain of Healthcare Analytics for an extended example of practical data analytics. The algorithms and analytics will be of much interest to practitioners interested in utilizing the large and unwieldy data sets of the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System.(c) **Predictive Analytics** Two foundational and widely used algorithms, k-nearest neighbors and naive Bayes, are developed in detail. A chapter is dedicated to forecasting. The last chapter focuses on streaming data and uses publicly accessible data streams originating from the Twitter API and the NASDAQ stock market in the tutorials. This book is intended for a one- or two-semester course in data analytics for upper-division undergraduate and graduate students in mathematics, statistics, and computer science. The prerequisites are kept low, and students with one or two courses in probability or statistics, an exposure to vectors and matrices, and a programming course will have no difficulty. The core material of every chapter is accessible to all with these prerequisites. The chapters often expand at the close with innovations of interest to practitioners of data science. Each chapter includes exercises of varying levels of difficulty. The text is eminently suitable for self-study and an exceptional resource for practitioners.

Latent Variable Modeling with R

Routledge This book demonstrates how to conduct latent variable modeling (LVM) in R by highlighting the features of each model, their specialized uses, examples, sample code and output, and an interpretation of the results. Each chapter features a detailed example including the analysis of the data using R, the relevant theory, the assumptions underlying the model, and other statistical details to help readers better understand the models and interpret the results. Every R command necessary for conducting the analyses is described along with the resulting output which provides readers with a template to follow when they apply the methods to their own data. The basic information pertinent to each model, the newest developments in these areas, and the relevant R code to use them are reviewed. Each chapter also features an introduction, summary, and suggested readings. A glossary of the text's boldfaced key terms and key R commands serve as helpful resources. The book is accompanied by a website with exercises, an answer key, and the in-text example data sets. **Latent Variable Modeling with R:** -Provides some examples that use messy data providing a more realistic situation readers will encounter with their own data. -Reviews a wide range of LVMs including factor analysis, structural equation modeling, item response theory, and mixture models and advanced topics such as fitting nonlinear structural equation models, nonparametric item response theory models, and mixture regression models. -Demonstrates how data simulation can help researchers better understand statistical methods and assist in selecting the necessary sample size prior to collecting data. -www.routledge.com/9780415832458 provides exercises that apply the models along with annotated R output answer keys and the data that corresponds to the in-text examples so readers can replicate the results and check their work. The book opens with basic instructions in how to use R to read data, download functions, and conduct basic analyses. From there, each chapter is dedicated to a different latent variable model including exploratory and confirmatory factor analysis (CFA), structural equation modeling (SEM), multiple groups CFA/SEM, least squares estimation, growth curve models, mixture models, item response theory (both dichotomous and polytomous items), differential item functioning (DIF), and correspondance analysis. The book concludes with a discussion of how data simulation can be used to better understand the workings of a statistical method and assist researchers in deciding on the necessary sample size prior to collecting data. A mixture of independently developed R code along with available libraries for simulating latent models in R are provided so readers can use these simulations to analyze data using the methods introduced in the previous chapters. Intended for use in graduate or advanced undergraduate courses in latent variable modeling, factor analysis, structural equation modeling, item response theory, measurement, or multivariate statistics taught in psychology, education, human development, and social and health sciences, researchers in these fields also appreciate this book's practical approach. The book provides sufficient conceptual background information to serve as a standalone text. Familiarity with basic statistical concepts is assumed but basic knowledge of R is not.

Modelling World Englishes

A Joint Approach to Postcolonial and Non-Postcolonial Varieties

Edinburgh University Press This book brings together two types of varieties of English that have so far been treated separately: postcolonial and non-postcolonial Englishes. It examines these varieties of English against the backdrop of current World Englishes theory, with a special focus on the extra- and Intra-Territorial Forces (EIF) Model. Bringing together a range of distinguished researchers in the field, each chapter tests the validity of this new model, analyses a different variety of English and assesses it in relation to current models of World Englishes. In doing so, the book ends the long-standing conceptual gap between postcolonial and non-postcolonial Englishes and integrates these in a unified framework of World Englishes. Case studies examine English(es) in England, Namibia, the United Arab Emirates, India, Singapore, the Philippines, South Korea, Japan, Australia, North America, the Bahamans, Trinidad, Tristan da Cunha, St. Helena, Bermuda, and the Falkland Islands, Ireland, Gibraltar and Ghana.

Discovering Statistics Using R

SAGE Lecturers - request an e-inspection copy of this text or contact your local SAGE representative to discuss your course needs. Watch Andy Field's introductory video to Discovering Statistics Using R Keeping the uniquely humorous and self-deprecating style that has made students across the world fall in love with Andy Field's books, Discovering Statistics Using R takes students on a journey of statistical discovery using R, a free, flexible and dynamically changing software tool for data analysis that is becoming increasingly popular across the social and behavioural sciences throughout the world. The journey begins by explaining basic statistical and research concepts before a guided tour of the R software environment. Next you discover the importance of exploring and graphing data, before moving onto statistical tests that are the foundations of the rest of the book (for example correlation and regression). You will then stride confidently into intermediate level analyses such as ANOVA, before ending your journey with advanced techniques such as MANOVA and multilevel models. Although there is enough theory to help you gain the necessary conceptual understanding of what you're doing, the emphasis is on applying what you learn to playful and real-world examples that should make the experience more fun than you might expect. Like its sister textbooks, Discovering Statistics Using R is written in an irreverent style and follows the same ground-breaking structure and pedagogical approach. The core material is augmented by a cast of characters to help the reader on their way, together with hundreds of examples, self-assessment tests to consolidate knowledge, and additional website material for those wanting to learn more. Given this book's accessibility, fun spirit, and use of bizarre real-world research it should be essential for anyone wanting to learn about statistics using the freely-available R software.

Modern Data Science with R

CRC Press 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.

Insights from Data with R

An Introduction for the Life and Environmental Sciences

Oxford University Press, USA This accessible and engaging book provides readers with the knowledge, experience, and confidence to work with raw data and unlock essential information (insights) from data summaries and visualisations.

R for Everyone

Advanced Analytics and Graphics

Addison-Wesley Professional 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, Second Edition, 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, manipulation, and visualization; 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. After all this you'll make your code reproducible with LaTeX, RMarkdown, and Shiny. 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 Explore R, RStudio, and R packages Use R for math: variable types, vectors, calling functions, and more Exploit data structures, including data.frames, matrices, and lists Read many different types of data Create attractive, intuitive statistical graphics Write user-defined functions Control program flow with if, ifelse, and complex checks Improve program efficiency with group manipulations Combine and reshape multiple datasets Manipulate strings using R's facilities and regular expressions Create normal, binomial, and Poisson probability distributions Build linear, generalized linear, and nonlinear models Program basic statistics: mean, standard deviation, and t-tests Train machine learning models Assess the quality of models and variable selection Prevent overfitting and perform variable selection, using the Elastic Net and Bayesian methods Analyze univariate and multivariate time series data Group data via K-means and hierarchical clustering Prepare reports, slideshows, and web pages with knitr Display interactive data with RMarkdown and htmlwidgets Implement dashboards with Shiny Build reusable R packages with devtools and Rcpp Register your product at informit.com/register for convenient access to downloads, updates, and corrections as they become available.

Text Mining with R

A Tidy Approach

"O'Reilly Media, Inc." 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 ggraph 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 ggraph 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

R in Action, Third Edition

Data analysis and graphics with R and Tidyverse

Simon and Schuster **R is the most powerful tool you can use for statistical analysis. This definitive guide smooths R's steep learning curve with practical solutions and real-world applications for commercial environments. In R in Action, Third Edition you will learn how to: Set up and install R and RStudio Clean, manage, and analyze data with R Use the ggplot2 package for graphs and visualizations Solve data management problems using R functions Fit and interpret regression models Test hypotheses and estimate confidence Simplify complex multivariate data with principal components and exploratory factor analysis Make predictions using time series forecasting Create dynamic reports and stunning visualizations Techniques for debugging programs and creating packages** R in Action, Third Edition makes learning R quick and easy. That's why thousands of data scientists have chosen this guide to help them master the powerful language. Far from being a dry academic tome, every example you'll encounter in this book is relevant to scientific and business developers, and helps you solve common data challenges. R expert Rob Kabacoff takes you on a crash course in statistics, from dealing with messy and incomplete data to creating stunning visualizations. This revised and expanded third edition contains fresh coverage of the new tidyverse approach to data analysis and R's state-of-the-art graphing capabilities with the ggplot2 package. About the technology Used daily by data scientists, researchers, and quants of all types, R is the gold standard for statistical data analysis. This free and open source language includes packages for everything from advanced data visualization to deep learning. Instantly comfortable for mathematically minded users, R easily handles practical problems without forcing you to think like a software engineer. About the book R in Action, Third Edition teaches you how to do statistical analysis and data visualization using R and its popular tidyverse packages. In it, you'll investigate real-world data challenges, including forecasting, data mining, and dynamic report writing. This revised third edition adds new coverage for graphing with ggplot2, along with examples for machine learning topics like clustering, classification, and time series analysis. What's inside Clean, manage, and analyze data Use the ggplot2 package for graphs and visualizations Techniques for debugging programs and creating packages A complete learning resource for R and tidyverse About the reader Requires basic math and statistics. No prior experience with R needed. About the author Dr. Robert I Kabacoff is a professor of quantitative analytics at Wesleyan University and a seasoned data scientist with more than 20 years of experience. Table of Contents PART 1 GETTING STARTED 1 Introduction to R 2 Creating a dataset 3 Basic data management 4 Getting started with graphs 5 Advanced data management PART 2 BASIC METHODS 6 Basic graphs 7 Basic statistics PART 3 INTERMEDIATE METHODS 8 Regression 9 Analysis of variance 10 Power analysis 11 Intermediate graphs 12 Resampling statistics and bootstrapping PART 4 ADVANCED METHODS 13 Generalized linear models 14 Principal components and factor analysis 15 Time series 16 Cluster analysis 17 Classification 18 Advanced methods for missing data PART 5 EXPANDING YOUR SKILLS 19 Advanced graphs 20 Advanced programming 21 Creating dynamic reports 22 Creating a package

An Introduction to Statistical Learning with Applications in R

Springer Science & Business Media **An Introduction to Statistical Learning provides an accessible overview of the field of statistical learning, an essential toolset for making sense of the vast and complex data sets that have emerged in fields ranging from biology to finance to marketing to astrophysics in the past twenty years. This book presents some of the most important modeling and prediction techniques, along with relevant applications. Topics include linear regression, classification, resampling methods, shrinkage approaches, tree-based methods, support vector machines, clustering, and more. Color graphics and real-world examples are used to illustrate the methods presented. Since the goal of this textbook is to facilitate the use of these statistical learning techniques by practitioners in science, industry, and other fields, each chapter contains a tutorial on implementing the analyses and methods presented in R, an extremely popular open source statistical software platform. Two of the authors co-wrote The Elements of Statistical Learning (Hastie, Tibshirani and Friedman, 2nd edition 2009), a popular reference book for statistics and machine learning researchers. An Introduction to Statistical Learning covers many of the same topics, but at a level accessible to a much broader audience. This book is targeted at statisticians and non-statisticians alike who wish to use cutting-edge statistical learning techniques to analyze their data. The text assumes only a previous course in linear regression and no knowledge of matrix algebra.**

R Graphics, Third Edition

CRC Press **This third edition of Paul Murrell's classic book on using R for graphics represents a major update, with a complete overhaul in focus and scope. It focuses primarily on the two core graphics packages in R - graphics and grid - and has a new section on integrating graphics. This section includes three new chapters: importing external images in to R; integrating the graphics and grid systems; and advanced SVG graphics. The emphasis in this third edition is on having the ability to produce detailed and customised graphics in a wide variety of formats, on being able to share and reuse those graphics, and on being able to integrate graphics from multiple systems. This book is aimed at all levels of R users. For people who are new to R, this book provides an overview of the graphics facilities, which is useful for understanding what to expect from R's graphics functions and how to modify or add to the output they produce. For intermediate-level R users, this book provides all of the information necessary to perform sophisticated customizations of plots produced in R. For advanced R users, this book contains vital information for producing coherent, reusable, and extensible graphics functions.**

Data Science in Education Using R

Routledge **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.**

Advancing Into Analytics

O'Reilly Media, Inc. **Data analytics may seem daunting, but if you're familiar with Excel, you have a head start that can help you make the leap into analytics. Advancing into Analytics will lower your learning curve. Author George Mount, founder and CEO of Stringfest Analytics, clearly and gently guides intermediate Excel users to a solid understanding of analytics and the data stack. This book demonstrates key statistical concepts from spreadsheets and pivots your existing knowledge about data manipulation into R and Python programming. With this practical book at your side, you'll learn how to: Explore a dataset for potential research questions to check assumptions and to build hypotheses Make compelling business recommendations using inferential statistics Load, view, and write datasets using R and Python Perform common data wrangling tasks such as sorting, filtering, and aggregating using R and Python Navigate and execute code in Jupyter notebooks Identify, install, and implement the most useful open source packages for your needs And more.**

Python Data Science Handbook

Essential Tools for Working with Data

"O'Reilly Media, Inc." For many researchers, Python is a first-class tool mainly because of its libraries for storing, manipulating, and gaining insight from data. Several resources exist for individual pieces of this data science stack, but only with the Python Data Science Handbook do you get them all—IPython, NumPy, Pandas, Matplotlib, Scikit-Learn, and other related tools. Working scientists and data crunchers familiar with reading and writing Python code will find this comprehensive desk reference ideal for tackling day-to-day issues: manipulating, transforming, and cleaning data; visualizing different types of data; and using data to build statistical or machine learning models. Quite simply, this is the must-have reference for scientific computing in Python. With this handbook, you'll learn how to use: IPython and Jupyter: provide computational environments for data scientists using Python NumPy: includes the ndarray for efficient storage and manipulation of dense data arrays in Python Pandas: features the DataFrame for efficient storage and manipulation of labeled/columnar data in Python Matplotlib: includes capabilities for a flexible range of data visualizations in Python Scikit-Learn: for efficient and clean Python implementations of the most important and established machine learning algorithms