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12A - BENJAMIN KERR

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

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" is one of the most frequently misarticulated sounds in English (Hegde, 2019; Shriberg, 2009). SLPs may devote a significant amount of therapy hours addressing remediation of /r/. The repetitive nature of articulation practice can cause both the student/client and therapist to lose the high level of interest and energy needed to remain focused on targeted, repeated practice that assures generalization of correct sound production. Mastering R: Advanced Articulation Exercises provides SLPs and their students/clients with a wealth of opportunities for practicing the production of /r/ in various contexts to promote generalization. Hodson & Paden (1991) recommend planning remediation to take advantage of the tendency to generalize. Mastering R is intended as a generalization resource to be used after initial instruction in the production of /r/ in isolation, syllables and single words. Mastering R presents novel stimulus items incorporating contemporary topics, references and vocabulary, interesting facts and trivia, and humor, suitable for use with students/clients in grades 4 and above. We have found the use of more engaging and interesting stimulus items tends to increase interest and participation, hopefully increasing the potential for positive therapy outcomes"--

Hands-on Machine Learning with R provides a practical and applied approach to learning and developing intuition into today's most popular machine learning methods. This book serves as a practitioner's guide to the machine learning process and is meant to help the reader learn to apply the machine learning stack within R, which includes using various R packages such as glmnet, h2o, ranger, xgboost, keras, and others to effectively model and gain insight from their data. The book favors a hands-on approach, providing an intuitive understanding of machine learning concepts through concrete examples and just a little bit of theory. Throughout this book, the reader will be exposed to the entire machine learning process including feature engineering, resampling, hyperparameter tuning, model evaluation, and interpretation. The

reader will be exposed to powerful algorithms such as regularized regression, random forests, gradient boosting machines, deep learning, generalized low rank models, and more! By favoring a hands-on approach and using real word data, the reader will gain an intuitive understanding of the architectures and engines that drive these algorithms and packages, understand when and how to tune the various hyperparameters, and be able to interpret model results. By the end of this book, the reader should have a firm grasp of R's machine learning stack and be able to implement a systematic approach for producing high quality modeling results. Features: · Offers a practical and applied introduction to the most popular machine learning methods. · Topics covered include feature engineering, resampling, deep learning and more. · Uses a hands-on approach and real world data.

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

For the NEW 2020 Exam! AP® World History: Modern Crash Course® A Higher Score in Less Time! REA's Crash Course® is the top choice for AP® students who want to make the most of their study time and earn a high score. Here's why more AP® teachers and students turn to REA's AP® World History: Modern Crash Course®: Targeted, Focused Review- Study Only What You Need to Know REA's new 3rd edition addresses all the latest test revisions taking effect through 2020. We cover only the information tested on the exam, so you can make the most of your valuable study time. Expert Test-taking Strategies and Advice Written by Jay Harmon, a seasoned AP® World History teacher, the book gives you the tips and topics that matter most on exam day. Crash Course® relies on the author's extensive analysis of the test's structure and content. By following his advice, you can boost your score in every section of the test. Practice questions – a mini-test in the book, a full-length exam online. Are you ready for your exam? Try our focused practice set inside the book. Then take our full-length online practice exam to ensure you're ready for test day. If you're cramming for the exam or looking for a concise course review, Crash Course® is the study guide every AP® student needs. About the Author: Jay P. Harmon earned his B.S. and M.Ed. from Louisiana State University, Baton Rouge, Louisiana. He began his teaching career in 1982 and has taught in public and private schools in Louisiana and Texas. Mr. Harmon has taught AP® European History, AP® United States History, and AP® World History. He was an exam essay reader in AP® European History and AP® United States History and has been a table leader and question leader in AP® World History since the exam was first administered in 2002. He served on the AP® World History Test Development Committee from 2003 to 2008. His AP® European History and AP® World History websites (www.harmonhistory.com) have been go-to resources for students and teachers for more than a decade. Since 1998, Mr. Harmon has served as a consultant to the College Board®, holding workshops and summer institutes in the United States and abroad. He has also contributed to the development of several history textbooks.

Turn your R code into packages that others can easily download and use. This practical book shows you how to bundle reusable R functions, sample data, and documentation together by applying author Hadley Wickham's package development philosophy. In the process, you'll work with devtools, roxygen, and testthat, a set of R packages that automate common development tasks. Devtools encapsulates best practices that Hadley has learned from years of working with this programming language. Ideal for developers, data scientists, and programmers with various backgrounds, this book starts you with the basics and shows you how to improve your package writing over time. You'll learn to focus on what you want your package to do, rather than think about

package structure. Learn about the most useful components of an R package, including vignettes and unit tests Automate anything you can, taking advantage of the years of development experience embodied in devtools Get tips on good style, such as organizing functions into files Streamline your development process with devtools Learn the best way to submit your package to the Comprehensive R Archive Network (CRAN) Learn from a well-respected member of the R community who created 30 R packages, including ggplot2, dplyr, and tidyr

Master the Shiny web framework—and take your R skills to a whole new level. By letting you move beyond static reports, Shiny helps you create fully interactive web apps for data analyses. Users will be able to jump between datasets, explore different subsets or facets of the data, run models with parameter values of their choosing, customize visualizations, and much more. Hadley Wickham from RStudio shows data scientists, data analysts, statisticians, and scientific researchers with no knowledge of HTML, CSS, or JavaScript how to create rich web apps from R. This in-depth guide provides a learning path that you can follow with confidence, as you go from a Shiny beginner to an expert developer who can write large, complex apps that are maintainable and performant. Get started: Discover how the major pieces of a Shiny app fit together Put Shiny in action: Explore Shiny functionality with a focus on code samples, example apps, and useful techniques Master reactivity: Go deep into the theory and practice of reactive programming and examine reactive graph components Apply best practices: Examine useful techniques for making your Shiny apps work well in production

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

Learn how to manipulate functions and expressions to modify how the R language interprets itself. This book is an introduction to metaprogramming in the R language, so you will write programs to manipulate other programs. Metaprogramming in R shows you how to treat code as data that you can generate, analyze, or modify. R is a very high-level language where all operations are functions and all functions are data that can be manipulated. This book shows you how to leverage R's natural flexibility in how function calls and expressions are evaluated, to create small domain-specific languages to extend R within the R language itself. What You'll Learn Find out about the anatomy of a function in R Look inside a function call Work with R expressions and environments Manipulate expressions in R Use substitutions Who This Book Is For Those with at least some experience with R and certainly for those with experience in other programming languages. Teaching the science and the technology of programming as a unified discipline that shows the deep relationships between programming paradigms. This innovative text presents computer programming as a unified discipline in a way that is both practical and scientifically sound. The book focuses on techniques of lasting value and explains them precisely in terms of a simple abstract machine. The book presents all major programming paradigms in a uniform framework that shows their deep relationships and how and where to use them together. After an introduction to programming concepts, the book presents both well-known and lesser-known computation models ("programming paradigms"). Each model has its own set of techniques and each is included on the basis of its usefulness in practice. The general models include declarative programming, declarative concurrency, message-passing concurrency, explicit state, object-oriented programming, shared-state concurrency, and relational programming. Specialized models include graphical user interface programming, distributed programming, and constraint programming. Each model is based on its kernel language—a simple core language that consists of a small number of programmer-signifi-

cant elements. The kernel languages are introduced progressively, adding concepts one by one, thus showing the deep relationships between different models. The kernel languages are defined precisely in terms of a simple abstract machine. Because a wide variety of languages and programming paradigms can be modeled by a small set of closely related kernel languages, this approach allows programmer and student to grasp the underlying unity of programming. The book has many program fragments and exercises, all of which can be run on the Mozart Programming System, an Open Source software package that features an interactive incremental development environment.

Advanced Regression Models with SAS and R exposes the reader to the modern world of regression analysis. The material covered by this book consists of regression models that go beyond linear regression, including models for right-skewed, categorical and hierarchical observations. The book presents the theory as well as fully worked-out numerical examples with complete SAS and R codes for each regression. The emphasis is on model accuracy and the interpretation of results. For each regression, the fitted model is presented along with interpretation of estimated regression coefficients and prediction of response for given values of predictors. Features: Presents the theoretical framework for each regression. Discusses data that are categorical, count, proportions, right-skewed, longitudinal and hierarchical. Uses examples based on real-life consulting projects. Provides complete SAS and R codes for each example. Includes several exercises for every regression. Advanced Regression Models with SAS and R is designed as a text for an upper division undergraduate or a graduate course in regression analysis. Prior exposure to the two software packages is desired but not required. The Author: Olga Korosteleva is a Professor of Statistics at California State University, Long Beach. She teaches a large variety of statistical courses to undergraduate and master's students. She has published three statistical textbooks. For a number of years, she has held the position of faculty director of the statistical consulting group. Her research interests lie mostly in applications of statistical methodology through collaboration with her clients in health sciences, nursing, kinesiology, and other fields.

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.

Carry out a variety of advanced statistical analyses including generalized additive models, mixed effects models, multiple imputation, machine learning, and missing data techniques using R. Each chapter starts with conceptual background information about the techniques, includes multiple examples using R to achieve results, and concludes with a case study. Written by Matt and Joshua F. Wiley, Advanced R Statistical Programming and Data Models shows you how to conduct data analysis using the popular R language. You'll delve into the preconditions or hypothesis for various statistical tests and techniques and work through concrete examples using R for a variety of these next-level analytics. This is a must-have guide and reference on using and programming with the R language. What You'll LearnConduct advanced analyses in R including: generalized linear models, generalized additive models, mixed effects models, machine learning, and parallel processing Carry out regression modeling using R data visualization, linear and advanced regression, additive models, survival / time to event analysis Handle machine learning using R including parallel processing, dimension reduction, and feature selection and classification Address missing data using multiple imputation in R Work on factor analysis, generalized linear mixed models, and modeling intraindividual variability Who This Book Is For Working professionals, researchers, or students who are familiar with R and basic statistical techniques such as linear regression and who want to learn how to use R to perform more advanced analytics. Particularly, researchers and data analysts in the social sciences may benefit from these techniques. Additionally, analysts who need parallel processing to speed up analytics are given proven code to reduce time to result(s).

Leverage the power of advanced analytics and predictive modeling in Tableau using the statistical powers of R About This Book A comprehensive guide that will bring out the creativity in you to visualize the results of complex calculations using Tableau and R Combine Tableau analytics and visualization with the power of R using this step-by-step guide Wondering how R can be used with Tableau? This book is your one-stop solution. Who This Book Is For This book will appeal to Tableau users who want to go beyond the Tableau interface and deploy the full potential of Tableau, by using R to perform advanced analytics with Tableau. A basic familiarity with R is useful but not compulsory, as the book will start off with concrete examples of R and will move quickly into more advanced spheres of analytics using online data sources to support hands-on learning. Those R developers who want to integrate R in Tableau will also benefit from this book. What You Will Learn Integrate Tableau's analytics with the industry-standard, statistical prowess of R. Make R function calls in Tableau, and visualize R functions with Tableau using RServe. Use the CRISP-DM methodology to create a roadmap for analytics investigations. Implement various supervised and unsupervised learning algorithms in R to return values to Tableau. Make quick, cogent, and data-driven decisions for your business using advanced analytical techniques such as forecasting, predictions, association rules, clustering, classification, and other advanced Tableau/R calculated field functions. In Detail Tableau and R offer accessible analytics by allowing a combination of easy-to-use data visualization along with industry-standard, robust statistical computation. Moving from data visualization into deeper, more advanced analytics? This book will intensify data skills for data viz-savvy users who want to move into analytics and data science in order to enhance their businesses by harnessing the analytical power of R and the stunning visualization capabilities of Tableau. Readers will come across a wide range of machine learning algorithms and learn how descriptive, prescriptive, predictive, and visually appealing analytical solutions can be designed with R and Tableau. In order to maximize learning, hands-on examples will ease the transition from being a data-savvy user to a data analyst using sound statistical tools to perform advanced analytics. By the end of this book, you will get to grips with advanced calculations in R and Tableau for analytics and prediction with the help of use cases and hands-on examples. Style and approach Tableau (uniquely) offers excellent visualization combined with advanced analytics; R is at the pinnacle of statistical computational languages. When you want to move from one view of data to another, backed up by complex computations, the combination of R and Tableau makes the perfect solution. This example-rich guide will teach you how to combine these two to perform advanced analytics by integrating Tableau with R and create beautiful data visualizations.

Discover best practices for choosing, building, training, and improving deep learning models using Keras-R, and TensorFlow-R libraries Key Features Implement deep learning algorithms to build AI models with the help of tips and tricks Understand how deep learning models operate using expert techniques Apply reinforcement learning, computer vision, GANs, and NLP using a range of datasets Book Description Deep learning is a branch of machine learning based on a set of algorithms that attempt to model high-level abstractions in data. Advanced Deep Learning with R will help you understand popular deep learning architectures and their variants in R, along with providing real-life examples for them. This deep learning book starts by covering the essential deep learning techniques and concepts for prediction and classification. You will learn about neural networks, deep learning architectures, and the fundamentals for implementing deep learning with R. The book will also take you through using important deep learning libraries such as Keras-R and TensorFlow-R to implement deep learning algorithms within applications. You will get up to speed with artificial neural networks, recurrent neural networks, convolutional neural networks, long short-term memory networks, and more using advanced examples. Later, you'll discover how to apply generative adversarial networks (GANs) to generate new images; autoencoder neural networks for image dimension reduction, image de-noising and image correction and transfer learning to prepare, define, train, and model a deep neural network. By the end of this book, you will be ready to implement your knowledge and newly acquired skills for applying deep learning algorithms in R through real-world examples. What you will learn Learn how to create binary and multi-class deep neural network models Implement GANs for generating new images Create autoencoder neural networks for image dimension reduction, image de-noising and image correction Implement deep neural networks for performing efficient text classification Learn to define a recurrent convolutional network model for classification in Keras Explore best practices and tips for performance optimization of various deep learning models Who this book is for This book is for data scientists, machine learning practitioners, deep learning researchers and AI enthusiasts who want to develop their skills and knowledge to implement deep learning techniques and algorithms using the power of R. A solid understanding of machine learning and working knowledge of the R programming language are required.

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

An essential guide to the trouble spots and oddities of R. In spite of the quirks exposed here, R is the best computing environment for most data analysis tasks. R is free, open-source, and has thousands of contributed packages. It is used in such diverse fields as ecology, finance, genomics and music. If you are using spreadsheets to understand data, switch to R. You will have safer -- and ultimately, more convenient -- computations.

Modeling spatial and spatio-temporal continuous processes is an important and challenging problem in spatial statistics. Advanced Spatial Modeling with Stochastic Partial Differential Equations Using R and INLA describes in detail the stochastic partial differential equations (SPDE) approach for modeling continuous spatial processes with a Matérn covariance, which has been implemented using the integrated nested Laplace approximation (INLA) in the R-INLA package. Key concepts about modeling spatial processes and the SPDE approach are explained with examples using simulated data and real applications. This book has been authored by leading experts in spatial statistics, including the main developers of the INLA and SPDE methodologies and the R-INLA package. It also includes a wide range of applications: * Spatial and spatio-temporal models for continuous outcomes * Analysis of spatial and spatio-temporal point patterns * Coregionalization spatial and spatio-temporal models * Measurement error spatial models * Modeling preferential sampling * Spatial and spatio-temporal models with physical barriers * Survival analysis with spatial effects * Dynamic space-time regression * Spatial and spatio-temporal models for extremes * Hurdle models with spatial effects * Penalized Complexity priors for spatial models All the examples in the book are fully reproducible. Further information about this book, as well as the R code and datasets used, is available from the book website at http://www.r-inla.org/spde-book. The tools described in this book will be useful to researchers in many fields such as biostatistics, spatial statistics, environmental sciences, epidemiology, ecology and others. Graduate and Ph.D. students will also find this book and associated files a valuable resource to learn INLA and the SPDE approach for spatial modeling.

Up-to-Date Guidance from One of the Foremost Members of the R Core Team Written by John M. Chambers, the leading developer of the original S software, Extending R covers key concepts and techniques in R to support analysis and research projects. It presents the core ideas of R, provides programming guidance for projects of all scales, and introduces new, valuable techniques that extend R. The book first describes the fundamental characteristics and background of R, giving readers a foundation for the remainder of the text. It next discusses topics relevant to programming with R, including the apparatus that supports extensions. The book then extends R's data structures through object-oriented programming, which is the key technique for coping with complexity. The book also incorporates a new structure for interfaces applicable to a variety of languages. A reflection of what R is today, this guide explains how to design and organize extensions to R by correctly using objects, functions, and interfaces. It enables current and future users to add their own contributions and packages to R. A 2017 Choice Outstanding Academic Title

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

This book discusses advanced topics such as R core programing, object oriented R programing, parallel computing with R, and spatial data types. The author leads readers to merge mature and effective methdologies in traditional programing to R programing. It shows how to interface R with C, Java, and other popular programing laguages and platforms.

There are many excellent R resources for visualization, data science, and package development. Hundreds of scattered vi-

gnettes, 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

Program for data analysis using R and learn practical skills to make your work more efficient. This book covers how to automate running code and the creation of reports to share your results, as well as writing functions and packages. Advanced R is not designed to teach advanced R programming nor to teach the theory behind statistical procedures. Rather, it is designed to be a practical guide moving beyond merely using R to programming in R to automate tasks. This book will show you how to manipulate data in modern R structures and includes connecting R to data bases such as SQLite, PostgreSQL, and MongoDB. The book closes with a hands-on section to get R running in the cloud. Each chapter also includes a detailed bibliography with references to research articles and other resources that cover relevant conceptual and theoretical topics. What You Will Learn Write and document R functions Make an R package and share it via GitHub or privately Add tests to R code to insure it works as intended Build packages automatically with GitHub Use R to talk directly to databases and do complex data management Run R in the Amazon cloud Generate presentation-ready tables and reports using R Who This Book Is For Working professionals, researchers, or students who are familiar with R and basic statistical techniques such as linear regression and who want to learn how to take their R coding and programming to the next level.

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 purr (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.

Program for data analysis using R and learn practical skills to make your work more efficient. This revised book explores how to automate running code and the creation of reports to share your results, as well as writing functions and packages. It includes key R 4 features such as a new color palette for charts, an enhanced reference counting system, and normalization of matrix and array types where matrix objects now formally inherit from the array class, eliminating inconsistencies. Advanced R 4 Data Programming and the Cloud is not designed to teach advanced R programming nor to teach the theory behind statistical procedures. Rather, it is designed to be a practical guide moving beyond merely using R; it shows you how to program in R to automate tasks. This book will teach you how to manipulate data in modern R structures and includes connecting R to databases such as PostgreSQL, cloud services such as Amazon Web Services (AWS), and digital dashboards such as Shiny. Each chapter also includes a de-

tailed bibliography with references to research articles and other resources that cover relevant conceptual and theoretical topics. What You Will Learn Write and document R functions using R 4 Make an R package and share it via GitHub or privately Add tests to R code to ensure it works as intended Use R to talk directly to databases and do complex data management Run R in the Amazon cloud Deploy a Shiny digital dashboard Generate presentation-ready tables and reports using R Who This Book Is For Working professionals, researchers, and students who are familiar with R and basic statistical techniques such as linear regression and who want to learn how to take their R coding and programming to the next level.

Predictive Soil Mapping (PSM) is based on applying statistical and/or machine learning techniques to fit models for the purpose of producing spatial and/or spatiotemporal predictions of soil variables i.e. maps of soil properties and classes at different resolutions. It is a multidisciplinary field combining statistics, data science, soil science, physical geography, remote sensing, geoinformation science and a number of other sciences. Predictive Soil Mapping with R is about understanding the main concepts behind soil mapping, mastering R packages that can be used to produce high quality soil maps, and about optimizing all processes involved so that also the production costs can be reduced. The online version of the book is available at: https://envirometrix.github.io/PredictiveSoilMapping/ Pull requests and general comments are welcome. These materials are based on technical tutorials initially developed by the ISRIC's Global Soil Information Facilities (GSIF) development team over the period 2014?2017

For the 2020 Exam! AP® U.S. Government and Politics Crash Course® A Higher Score in Less Time! At REA, we invented the quick-review study guide for AP® exams. A decade later, REA's Crash Course® remains the top choice for AP® students who want to make the most of their study time and earn a high score. Here's why more AP® teachers and students turn to REA's AP® U.S. Government and Politics Crash Course®: Targeted review – everything you need and nothing you don't. Our compact, strategic review is based on an in-depth analysis of the latest course outline and exam format. We unpack the AP® U.S. Government & Politics big ideas and equip you to face the multiple-choice and free-response questions. Crash Course® covers only what's actually tested, so you can make the most of your study time. Expert test-taking strategies and advice. Written by two veteran AP® experts, the book looks at every aspect of today's exam, including required foundational documents and Supreme Court cases, civil liberties and civil rights, and American political ideologies. Boost your score with insights from the people who know the exam from the inside out. Practice questions – a mini-test in the book, a full-length exam online. Are you ready for your exam? Try our focused practice set inside the book. Then go online to take our full-length practice exam. You'll get the benefits of timed testing, detailed answers, and automatic scoring that pinpoints your performance based on the official AP® exam topics – so you'll be confident on test day. Whether you're cramming for the exam or looking to recap and reinforce your teacher's lessons, Crash Course® is the study guide every AP® student needs. About Our Authors Katherine Olson-Goldman has spent the last two decades developing and teaching numerous courses in government and politics, law, and history, including AP® United States Government and Politics, AP® Comparative Government and Politics, and Practical Law. Ms. Olson-Goldman holds a bachelor's degree in political science from DePaul University, a secondary teaching certification from the University of Wisconsin, and a Juris Doctor from Marquette University Law School where she was a Thomas Moore scholar and served on law review. Nancy Fenton, M.A., teaches AP® U.S. Government and Politics at the award-winning Adlai E. Stevenson High School in Lincolnshire, Illinois. She has been teaching government and politics since 2003. Ms. Fenton is also a College Board consultant and has served as a reader for AP® Psychology since 2008 and a table leader since 2017. She has a bachelor's degree in history and holds two master's degrees, one in psychology and one in curriculum and instruction technology.

The US Dept. of Education, in conjunction with the US Dept. of Health and Human Services, recently unveiled a $50 million effort to expand research on early childhood cognitive development. A key issue identified requiring more information and research was the education and professional development of educators. Along these lines, Doug Greer has prepared a book discussing how best to teach, how to design functional curricula, and how to support teachers in using state-of-the-art science instruction materials. The book provides important information both to trainers of future teachers, current teachers, and to supervisors and policy makers in education. To trainers there is information on how to motivate, mentor, and instruct in-service teachers to use the best scientifically based teaching strategies and tactics. To in-service teachers, there is information on how to provide individualized instruction in classrooms with multiple learning and behavior problems, school interventions to help prevent vandalism and truancy, and how curricula and instruction can be designed to teach functional repetoirs rather than inert ideas. To policy makers and supervisors, the book discusses how to determine the effectiveness of curricular innitiatives toward meeting mandated standards in na-

tional assessments. Doug Greer was recently awarded the Fred S. Keller Award for Distinguished Contributions to Education by APA for the research and application of the material covered in this book. School programs incorporating the material used in this book have produced 4-7 times more learning outcomes for students than control and baseline educational programs (see www.cabas.com) The book provides research-based and field-tested procedures for: * Teaching students of all ability levels ranging from preschool to secondary school * How to teach special education students in the context of a regular classroom * Best practices for all teachers to teach more effectively * Means of monitoring and motivating teachers' practices * A comprehensive and system-wide science of teaching—post modern-postmodern! * Tested procedures that result in four to seven times more learning for all students * Tested procedures for supervisors to use with teachers that result in significant student learning * Tested procedures for providing the highest accountability * A systems approach for schooling problems that provide solutions rather than blame * Parent approved and parent requested educational practices * Means for psychologists to work with teachers and students to solve behavior and learning problems * A comprehensive systems science of schooling * An advanced and sophisticated science of pedagogy and curriculum design * Students who are not being served with traditional education can meet or exceed the performance of their more fortunate peers, * Supervisors can mentor teachers and therapists to provide state of the science instruction * Parent education can create a professional setting for parents, educators, and therapists to work together in the best interests of the student, * Teachers and supervisors who measure as they teach produce significantly better outcomes for students, * Systemic solutions to instructional and behavioral problems involving teachers, parents, supervisors provide means to pursue problems to their solution, * A science of teaching, as opposed to an art of teaching, can provide an educational system that treats the students and the parents as the clients.

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.

Advanced Statistics with Applications in R fills the gap between several excellent theoretical statistics textbooks and many applied statistics books where teaching reduces to using existing packages. This book looks at what is under the hood. Many statistics issues including the recent crisis with p-value are caused by misunderstanding of statistical concepts due to poor theoretical background of practitioners and applied statisticians. This book is the product of a forty-year experience in teaching of probability and statistics and their applications for solving real-life problems. There are more than 442 examples in the book: basically every probability or statistics concept is illustrated with an example accompanied with an R code. Many examples, such as Who said π? What team is better? The fall of the Roman empire, James Bond chase problem, Black Friday shopping, Free fall equation: Aristotle

or Galilei, and many others are intriguing. These examples cover biostatistics, finance, physics and engineering, text and image analysis, epidemiology, spatial statistics, sociology, etc. Advanced Statistics with Applications in R teaches students to use theory for solving real-life problems through computations: there are about 500 R codes and 100 datasets. These data can be freely downloaded from the author's website dartmouth.edu/~eugened. This book is suitable as a text for senior undergraduate students with major in statistics or data science or graduate students. Many researchers who apply statistics on the regular basis find explanation of many fundamental concepts from the theoretical perspective illustrated by concrete real-world applications.

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.

All you need to know to become a serious model powerboat racer. Author John Finch covers it all, from model set up to trimming. Read about monos, hydros, tunnels, cats and outriggers, plus engine function and rework, tuned-pipe theory, and hardware selection. This book is the best guide for model boat enthusiasts -- sportsmen and competitors alike.

An Essential Reference for Intermediate and Advanced R ProgrammersAdvanced 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 bo

Advanced Chromatic Monitoring provides a major source of information about the novel approach of chromaticity with examples of how chromaticity may be deployed for various monitoring applications. It shows with examples what can be achieved with chromatic methods in producing relevant information with a variety of test techniques and in facilitating the interpretation of complex data about complicated situations. It will be of interest to postgraduates and researchers in a wide breadth of physical disciplines (engineering, medicine, environmental sciences) and those involved with data acquisition and analysis. Key Features: Applicable to a wide range of disciplines (engineering, medical, environmental, etc) and those interested in science, technology, data acquisition and analysis Provides an extrapolation of new knowledge well beyond that covered in existing literature with regard to dealing with complicated forms and sets of data Addresses inspiring and innovative areas of research including environmental, power delivery and medical monitoring About the Editors: Emeritus Professor Gordon R. Jones – founder and former Director of the Centre for Intelligent Monitoring Systems (CIMS), former Head of the Department of Electrical Engineering and Electronics, and former Director of Electric Arcs Research Group at the University of Liverpool. He was awarded the IEEE Education, Science and Technology Achievement Medal (1999). Professor Joe W. Spencer – the present Director of CIMS at the University of Liverpool, having been Head of the Department of Electrical Engineering and Electronics at Liverpool. He is involved in operating a multi-million pound technology transfer unit (Sensor City, Liverpool) with whose establishment he played a major role and with which CIMS has major interactions.

Master machine learning techniques with R to deliver insights for complex projects About This Book Get to grips with the application of Machine Learning methods using an extensive set of R packages Understand the benefits and potential pitfalls of using machine learning methods Implement the numerous powerful features offered by R with this comprehensive guide to building an independent R-based ML system Who This Book Is For If you want to learn how to use R's machine learning capabilities to solve complex business problems, then this book is for you. Some experience with R and a working knowledge of basic statistical or machine learning will prove helpful. What You Will Learn Gain deep insights to learn the applications of machine learning tools to the industry Manipulate data in R efficiently to prepare it for analysis Master the skill of recognizing techniques for effective visualization of data Understand why and how to create test and training data sets for analysis Familiarize yourself with fundamental learning methods such as linear and logistic regression Comprehend advanced learning methods such as support vector machines Realize why and how to apply unsupervised learning methods In Detail Machine learning is a field of Artificial Intelligence to build systems that learn from data. Given the growing prominence of R—a cross-platform, zero-cost statistical programming environment—there has never been a better time to start applying machine learning to your data. The book starts with introduction to Cross-

Industry Standard Process for Data Mining. It takes you through Multivariate Regression in detail. Moving on, you will also address Classification and Regression trees. You will learn a couple of "Unsupervised techniques". Finally, the book will walk you through text analysis and time series. The book will deliver practical and real-world solutions to problems and variety of tasks such as complex recommendation systems. By the end of this book, you will gain expertise in performing R machine learning and will be able to build complex ML projects using R and its packages. Style and approach This is a book explains complicated concepts with easy to follow theory and real-world, practical applications. It demonstrates the power of R and machine learning extensively while highlighting the constraints.

Statistical Computation for Programmers, Scientists, Quants, Excel Users, and Other Professionals Using the open source R language, you can build powerful statistical models to answer many of your most challenging questions. R has traditionally been difficult for non-statisticians to learn, and most R books assume far too much knowledge to be of help. R for Everyone is the solution. Drawing on his unsurpassed experience teaching new users, professional data scientist Jared P. Lander has written the perfect tutorial for anyone new to statistical programming and modeling. Organized to make learning easy and intuitive, this guide focuses on the 20 percent of R functionality you'll need to accomplish 80 percent of modern data tasks. Lander's self-contained chapters start with the absolute basics, offering extensive hands-on practice and sample code. You'll download and install R; navigate and use the R environment; master basic program control, data import, and manipulation; and walk through several essential tests. Then, building on this foundation, you'll construct several complete models, both linear and nonlinear, and use some data mining techniques. By the time you're done, you won't just know how to write R programs, you'll be ready to tackle the statistical problems you care about most. COVERAGE INCLUDES • Exploring R, RStudio, and R packages • Using R for math: variable types, vectors, calling functions, and more • Exploiting data structures, including data.frames, matrices, and lists • Creating attractive, intuitive statistical graphics • Writing user-defined functions • Controlling program flow with if, ifelse, and complex checks • Improving program efficiency with group manipulations • Combining and reshaping multiple datasets • Manipulating strings using R's facilities and regular expressions • Creating normal, binomial, and Poisson probability distributions • Programming basic statistics: mean, standard deviation, and t-tests • Building linear, generalized linear, and nonlinear models • Assessing the quality of models and variable selection • Preventing overfitting, using the Elastic Net and Bayesian methods • Analyzing univariate and multivariate time series data • Grouping data via K-means and hierarchical clustering • Preparing reports, slideshows, and web pages with knitr • Building reusable R packages with devtools and Rcpp • Getting involved with the R global community