

Dynamic Documents With R And Knitr

Very hot area with a wide range of applications; Gives complete numerical analysis and recipes, which will enable readers to quickly apply the techniques to real problems; Includes two new techniques pioneered by Osher and Fedkiw; Osher and Fedkiw are internationally well-known researchers in this area

R is a language and environment for data analysis and graphics. It may be considered an implementation of S, an award-winning language initially developed at Bell Laboratories since the late 1970s. The R project was initiated by Robert Gentleman and Ross Ihaka at the University of Auckland, New Zealand, in the early 1990s, and has been developed by an international team since mid-1997. Historically, econometricians have favored other computing environments, some of which have fallen by the wayside, and also a variety of packages with canned routines. We believe that R has great potential in econometrics, both for research and for teaching. There are at least three reasons for this: (1) R is mostly platform independent and runs on Microsoft Windows, the Mac family of operating systems, and various flavors of Unix/Linux, and also on some more exotic platforms. (2) R is free software that can be downloaded and installed at no cost from a family of mirror sites around the globe, the Comprehensive R Archive Network (CRAN); hence students can easily install it on their own machines. (3) R is open-source software, so that the full source code is available and can be inspected to understand what it really does, learn from it, and modify and extend it. We also like to think that platform independence and the open-source philosophy make R an ideal environment for reproducible econometric research. 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.

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

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

With the advancement of statistical methodology inextricably linked to the use of computers, new methodological ideas must be translated into usable code and then numerically evaluated relative to competing procedures. In response to this, *Statistical Computing in C++ and R* concentrates on the writing of code rather than the development and study of numerical algorithms per se. The book discusses code development in C++ and R and the use of these symbiotic languages in unison. It emphasizes that each offers distinct features that, when used in tandem, can take code writing beyond what can be obtained from either language alone. The text begins with some basics of object-oriented languages, followed by a "boot-camp" on the use of C++ and R. The authors then discuss code development for the solution of specific computational problems that are relevant to statistics including optimization, numerical linear algebra, and random number generation. Later chapters introduce abstract data structures (ADTs) and parallel computing concepts. The appendices cover R and UNIX Shell programming. Features Includes numerous student exercises ranging from elementary to challenging Integrates both C++ and R for the solution of statistical computing problems Uses C++ code in R and R functions in C++ programs Provides downloadable programs, available from the authors' website The translation of a mathematical problem into its

computational analog (or analogs) is a skill that must be learned, like any other, by actively solving relevant problems. The text reveals the basic principles of algorithmic thinking essential to the modern statistician as well as the fundamental skill of communicating with a computer through the use of the computer languages C++ and R. The book lays the foundation for original code development in a research environment.

Introduces a realistic approach to leading, managing, and growing your Agile team or organization. Written for current managers and developers moving into management, Appelo shares insights that are grounded in modern complex systems theory, reflecting the intense complexity of modern software development. Recognizes that today's organizations are living, networked systems; that you can't simply let them run themselves; and that management is primarily about people and relationships. Deepens your understanding of how organizations and Agile teams work, and gives you tools to solve your own problems. Identifies the most valuable elements of Agile management, and helps you improve each of them.

In computational science, reproducibility requires that researchers make code and data available to others so that the data can be analyzed in a similar manner as in the original publication. Code must be available to be distributed, data must be accessible in a readable format, and a platform must be available for widely distributing the data and code. In addition, both data and code need to be licensed permissively enough so that others can reproduce the work without a substantial legal burden. Implementing Reproducible Research covers many of the elements necessary for conducting and distributing reproducible research. It explains how to accurately reproduce a scientific result. Divided into three parts, the book discusses the tools, practices, and

dissemination platforms for ensuring reproducibility in computational science. It describes: Computational tools, such as Sweave, knitr, VisTrails, Sumatra, CDE, and the Declaratron system Open source practices, good programming practices, trends in open science, and the role of cloud computing in reproducible research Software and methodological platforms, including open source software packages, RunMyCode platform, and open access journals Each part presents contributions from leaders who have developed software and other products that have advanced the field. Supplementary material is available at www.ImplementingRR.org.

The need for reproducibility in computational research has been highlighted by a number of recent failures to replicate published data analytic findings. Most efforts to ensure reproducibility involve providing guarantees that reported results can be generated from the data via the reported methods, with a popular avenue being dynamic documents. This insurance is necessary but not sufficient for full validation, as inappropriately chosen methods will simply reproduce questionable results. To fully verify computational research we must replicate analysts' research processes, including: choice of and response to exploratory or intermediate results, identification of potential analysis strategies and statistical methods, selection of a single strategy from among those considered, and finally, the generation of reported results using the chosen method. We present the concept of comprehensive dynamic documents. These documents represent the full breadth of an analyst's work during computational research, including code and text describing: intermediate and exploratory computations, alternate methods, and even ideas the analyst had which were not fully pursued. Furthermore, additional information can be embedded in the documents such as data

provenance, experimental design, or details of the computing system on which the work was originally performed. We also propose computational models for representing, processing, and programmatically operating on such documents within R. These comprehensive documents act as databases, encompassing both the work that the analyst has performed and the relationships among specific pieces of that work. This allows us to investigate research in a number of ways difficult or impossible to achieve given only a description of the final strategy. We can explore the choice of methods and whether due diligence was performed during an analysis. Secondly, we can compare alternative strategies either side-by-side or interactively. Finally, we can treat these complex documents as data about the research process and analyze them programmatically. We also present a proof-of-concept set of software tools for working with comprehensive dynamic documents. This includes an R package which implements a framework for comprehensive documents in R, an extension of the IPython Notebook platform which allows users to author and interactively view them, and a caching mechanism which provides the efficiency necessary for interactive, self-updating views of such documents.

bookdown: Authoring Books and Technical Documents with R Markdown presents a much easier way to write books and technical publications than traditional tools such as LaTeX and Word. The bookdown package inherits the simplicity of syntax and flexibility for data analysis from R Markdown, and extends R Markdown for technical writing, so that you can make better use of document elements such as figures, tables, equations, theorems, citations, and references. Similar to LaTeX, you can number and cross-reference these elements with bookdown. Your document can even include live

examples so readers can interact with them while reading the book. The book can be rendered to multiple output formats, including LaTeX/PDF, HTML, EPUB, and Word, thus making it easy to put your documents online. The style and theme of these output formats can be customized. We used books and R primarily for examples in this book, but bookdown is not only for books or R. Most features introduced in this book also apply to other types of publications: journal papers, reports, dissertations, course handouts, study notes, and even novels. You do not have to use R, either. Other choices of computing languages include Python, C, C++, SQL, Bash, Stan, JavaScript, and so on, although R is best supported. You can also leave out computing, for example, to write a fiction. This book itself is an example of publishing with bookdown and R Markdown, and its source is fully available on GitHub.

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

Extensions and applications: Dashboards, Tufte handouts, xaringan/reveal.js presentations, websites, books, journal articles, and interactive tutorials Advanced topics: Parameterized reports, HTML widgets, document templates, custom output formats, and Shiny documents. Yihui Xie is a software engineer at RStudio. He has authored and co-authored several R packages, including knitr, rmarkdown, bookdown, blogdown, shiny, xaringan, and animation. He has published three other books, Dynamic Documents with R and knitr, bookdown: Authoring Books and Technical Documents with R Markdown, and blogdown: Creating Websites with R Markdown. J.J. Allaire is the founder of RStudio and the creator of the RStudio IDE. He is an author of several packages in the R Markdown ecosystem including rmarkdown, flexdashboard, learnr, and radix. Garrett Golemund is the co-author of R for Data Science and author of Hands-On Programming with R. He wrote the lubridate R package and works for RStudio as an advocate who trains engineers to do data science with R and the Tidyverse.

Quickly and Easily Write Dynamic Documents Suitable for both beginners and advanced users, Dynamic Documents with R and knitr, Second Edition makes writing statistical reports easier by integrating computing directly with reporting. Reports range from homework, projects, exams, books, blogs, and web pages to virtually any documents related to statistical graphics, computing, and data analysis. The book covers basic applications for beginners while guiding power users in understanding the extensibility of the knitr package. New to the Second

Edition A new chapter that introduces R Markdown v2
Changes that reflect improvements in the knitr package
New sections on generating tables, defining custom
printing methods for objects in code chunks, the
C/Fortran engines, the Stan engine, running engines in a
persistent session, and starting a local server to serve
dynamic documents Boost Your Productivity in Statistical
Report Writing and Make Your Scientific Computing with
R Reproducible Like its highly praised predecessor, this
edition shows you how to improve your efficiency in
writing reports. The book takes you from program output
to publication-quality reports, helping you fine-tune every
aspect of your report.

This is the second edition of David Powers' highly-
respected PHP Solutions: Dynamic Web Design Made
Easy. This new edition has been updated by David to
incorporate changes to PHP since the first edition and to
offer the latest techniques—a classic guide modernized
for 21st century PHP techniques, innovations, and best
practices. You want to make your websites more
dynamic by adding a feedback form, creating a private
area where members can upload images that are
automatically resized, or perhaps storing all your content
in a database. The problem is, you're not a programmer
and the thought of writing code sends a chill up your
spine. Or maybe you've dabbled a bit in PHP and
MySQL, but you can't get past baby steps. If this
describes you, then you've just found the right book.
PHP and the MySQL database are deservedly the most
popular combination for creating dynamic websites.
They're free, easy to use, and provided by many web

hosting companies in their standard packages.

Unfortunately, most PHP books either expect you to be an expert already or force you to go through endless exercises of little practical value. In contrast, this book gives you real value right away through a series of practical examples that you can incorporate directly into your sites, optimizing performance and adding functionality such as file uploading, email feedback forms, image galleries, content management systems, and much more. Each solution is created with not only functionality in mind, but also visual design. But this book doesn't just provide a collection of ready-made scripts: each PHP Solution builds on what's gone before, teaching you the basics of PHP and database design quickly and painlessly. By the end of the book, you'll have the confidence to start writing your own scripts or—if you prefer to leave that task to others—to adapt existing scripts to your own requirements. Right from the start, you're shown how easy it is to protect your sites by adopting secure coding practices.

Class-tested and coherent, this textbook teaches classical and web information retrieval, including web search and the related areas of text classification and text clustering from basic concepts. It gives an up-to-date treatment of all aspects of the design and implementation of systems for gathering, indexing, and searching documents; methods for evaluating systems; and an introduction to the use of machine learning methods on text collections. All the important ideas are explained using examples and figures, making it perfect for introductory courses in information retrieval for

advanced undergraduates and graduate students in computer science. Based on feedback from extensive classroom experience, the book has been carefully structured in order to make teaching more natural and effective. Slides and additional exercises (with solutions for lecturers) are also available through the book's supporting website to help course instructors prepare their lectures.

State space models have gained tremendous popularity in recent years in as disparate fields as engineering, economics, genetics and ecology. After a detailed introduction to general state space models, this book focuses on dynamic linear models, emphasizing their Bayesian analysis. Whenever possible it is shown how to compute estimates and forecasts in closed form; for more complex models, simulation techniques are used. A final chapter covers modern sequential Monte Carlo algorithms. The book illustrates all the fundamental steps needed to use dynamic linear models in practice, using R. Many detailed examples based on real data sets are provided to show how to set up a specific model, estimate its parameters, and use it for forecasting. All the code used in the book is available online. No prior knowledge of Bayesian statistics or time series analysis is required, although familiarity with basic statistics and R is assumed.

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 Little known to many, R works just as well with JavaScript—this book delves into the various ways both languages can work together. The ultimate aim of this work is to put the reader at ease with inviting JavaScript in their data science workflow. In that respect the book is not teaching one JavaScript but rather we show how little JavaScript can greatly support and enhance R code. Therefore, the focus is on integrating external JavaScript libraries and no prior knowledge of JavaScript is required. Key Features: ? Easy to pick up. ? An entry way to learning JavaScript for R. ? Covers topics not covered anywhere else. ? Easy to follow along. Summary R in Action, Second Edition presents both the R language and the examples that make it so

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

exploring and presenting data visually. And this expanded second edition includes new chapters on forecasting, data mining, and dynamic report writing. What's Inside Complete R language tutorial Using R to manage, analyze, and visualize data Techniques for debugging programs and creating packages OOP in R Over 160 graphs About the Author Dr. Rob Kabacoff is a seasoned researcher and teacher who specializes in data analysis. He also maintains the popular Quick-R website at statmethods.net. Table of Contents PART 1 GETTING STARTED

Introduction to R Creating a dataset Getting started with graphs Basic data management Advanced data management PART 2 BASIC METHODS Basic graphs Basic statistics PART 3 INTERMEDIATE METHODS Regression Analysis of variance Power analysis Intermediate graphs Resampling statistics and bootstrapping PART 4 ADVANCED METHODS Generalized linear models Principal components and factor analysis Time series Cluster analysis Classification Advanced methods for missing data PART 5 EXPANDING YOUR SKILLS Advanced graphics with ggplot2 Advanced programming Creating a package Creating dynamic reports Advanced graphics with the lattice package available online only from manning.com/kabacoff2 Vehicle Dynamics and Control provides a comprehensive coverage of vehicle control systems and the dynamic models used in the development of

these control systems. The control system applications covered in the book include cruise control, adaptive cruise control, ABS, automated lane keeping, automated highway systems, yaw stability control, engine control, passive, active and semi-active suspensions, tire-road friction coefficient estimation, rollover prevention, and hybrid electric vehicles. In developing the dynamic model for each application, an effort is made to both keep the model simple enough for control system design but at the same time rich enough to capture the essential features of the dynamics. A special effort has been made to explain the several different tire models commonly used in literature and to interpret them physically. In the second edition of the book, chapters on roll dynamics, rollover prevention and hybrid electric vehicles have been added, and the chapter on electronic stability control has been enhanced. The use of feedback control systems on automobiles is growing rapidly. This book is intended to serve as a useful resource to researchers who work on the development of such control systems, both in the automotive industry and at universities. The book can also serve as a textbook for a graduate level course on Vehicle Dynamics and Control.

Dynamic Documents with R and knitr
CRC Press
This early work by Stephen Vincent Benét was originally published in 1937 and we are now

republishing it with a brand new introductory biography. 'The Devil and Daniel Webster' is a short story about a successful lawyer who believes you can win your soul back from the devil. Stephen Vincent Benét was born on 22nd July 1898 in Bethlehem, Pennsylvania, United States. Benét was an accomplished writer at an early age, having had his first book published at 17 and submitting his third volume of poetry in lieu of a thesis for his degree. During his time at Yale, he was an influential figure at the 'Yale Lit' literary magazine, and a fellow member of the Elizabethan Club. Benét was also a part-time contributor for the early Time Magazine. Benét's best known works are the book-length narrative poem American Civil War, John Brown's Body (1928), for which he won a Pulitzer Prize in 1929, and two short stories, The Devil and Daniel Webster (1936) and By the Waters of Babylon (1937). Benét won a second Pulitzer Prize posthumously for his unfinished poem Western Star in 1944.

Literate programming is a programming methodology that combines a programming language with a documentation language, making programs more easily maintained than programs written only in a high-level language. A literate programmer is an essayist who writes programs for humans to understand. When programs are written in the recommended style they can be transformed

into documents by a document compiler and into efficient code by an algebraic compiler. This anthology of essays includes Knuth's early papers on related topics such as structured programming as well as the Computer Journal article that launched literate programming. Many examples are given, including excerpts from the programs for TeX and METAFONT. The final essay is an example of CWEB, a system for literate programming in C and related languages. Index included.

The high-level language of R is recognized as one of the most powerful and flexible statistical software environments, and is rapidly becoming the standard setting for quantitative analysis, statistics and graphics. R provides free access to unrivalled coverage and cutting-edge applications, enabling the user to apply numerous statistical methods ranging from simple regression to time series or multivariate analysis. Building on the success of the author's bestselling *Statistics: An Introduction using R*, *The R Book* is packed with worked examples, providing an all inclusive guide to R, ideal for novice and more accomplished users alike. The book assumes no background in statistics or computing and introduces the advantages of the R environment, detailing its applications in a wide range of disciplines. Provides the first comprehensive reference manual for the R language, including practical guidance and full coverage of the graphics facilities. Introduces all the

statistical models covered by R, beginning with simple classical tests such as chi-square and t-test. Proceeds to examine more advance methods, from regression and analysis of variance, through to generalized linear models, generalized mixed models, time series, spatial statistics, multivariate statistics and much more. The R Book is aimed at undergraduates, postgraduates and professionals in science, engineering and medicine. It is also ideal for students and professionals in statistics, economics, geography and the social sciences.

Extracting content from text continues to be an important research problem for information processing and management. Approaches to capture the semantics of text-based document collections may be based on Bayesian models, probability theory, vector space models, statistical models, or even graph theory. As the volume of digitized textual media continues to grow, so does the need for designing robust, scalable indexing and search strategies (software) to meet a variety of user needs. Knowledge extraction or creation from text requires systematic yet reliable processing that can be codified and adapted for changing needs and environments. This book will draw upon experts in both academia and industry to recommend practical approaches to the purification, indexing, and mining of textual information. It will address document identification, clustering and categorizing documents,

cleaning text, and visualizing semantic models of text.

Master the programming language of choice among statisticians and data analysts worldwide Coming to grips with R can be tough, even for seasoned statisticians and data analysts. Enter R For Dummies, the quick, easy way to master all the R you'll ever need. Requiring no prior programming experience and packed with practical examples, easy, step-by-step exercises, and sample code, this extremely accessible guide is the ideal introduction to R for complete beginners. It also covers many concepts that intermediate-level programmers will find extremely useful. Master your R ABCs ? get up to speed in no time with the basics, from installing and configuring R to writing simple scripts and performing simultaneous calculations on many variables Put data in its place ? get to know your way around lists, data frames, and other R data structures while learning to interact with other programs, such as Microsoft Excel Make data dance to your tune ? learn how to reshape and manipulate data, merge data sets, split and combine data, perform calculations on vectors and arrays, and much more Visualize it ? learn to use R's powerful data visualization features to create beautiful and informative graphical presentations of your data Get statistical ? find out how to do simple statistical analysis, summarize your variables, and conduct

classic statistical tests, such as t-tests Expand and customize R ? get the lowdown on how to find, install, and make the most of add-on packages created by the global R community for a wide variety of purposes Open the book and find: Help downloading, installing, and configuring R Tips for getting data in and out of R Ways to use data frames and lists to organize data How to manipulate and process data Advice on fitting regression models and ANOVA Helpful hints for working with graphics How to code in R What R mailing lists and forums can do for you

Conflict is inherent in virtually every aspect of human relations, from sport to parliamentary democracy, from fashion in the arts to paradigmatic challenges in the sciences, and from economic activity to intimate relationships. Yet, it can become among the most serious social problems humans face when it loses its constructive features and becomes protracted over time with no obvious means of resolution. This book addresses the subject of intractable social conflict from a new vantage point. Here, these types of conflict represent self-organizing phenomena, emerging quite naturally from the ongoing dynamics in human interaction at any scale—from the interpersonal to the international. Using the universal language and computational framework of nonlinear dynamical systems theory in combination with recent insights from social psychology, intractable conflict is understood as a system locked in special attractor states that constrain the thoughts and actions of the parties to the conflict. The emergence and maintenance of attractors for conflict can be described by means of formal models that incorporate the results of computer simulations, experiments,

field research, and archival analyses. Multi-disciplinary research reflecting these approaches provides encouraging support for the dynamical systems perspective. Importantly, this text presents new views on conflict resolution. In contrast to traditional approaches that tend to focus on basic, short-lived cause-effect relations, the dynamical perspective emphasizes the temporal patterns and potential for emergence in destructive relations. Attractor deconstruction entails restoring complexity to a conflict scenario by isolating elements or changing the feedback loops among them. The creation of a latent attractor trades on the tendency toward multi-stability in dynamical systems and entails the consolidation of incongruent (positive) elements into a coherent structure. In the bifurcation scenario, factors are identified that can change the number and types of attractors in a conflict scenario. The implementation of these strategies may hold the key to unlocking intractable conflict, creating the potential for constructive social relations.

There are many excellent R resources for visualization, data science, and package development. Hundreds of scattered vignettes, web pages, and forums explain how to use R in particular domains. But little has been written on how to simply make R work effectively—until now. This hands-on book teaches novices and experienced R users how to write efficient R code. Drawing on years of experience teaching R courses, authors Colin Gillespie and Robin Lovelace provide practical advice on a range of topics—from optimizing the set-up of RStudio to leveraging C++—that make this book a useful addition to any R user’s bookshelf. Academics, business users, and programmers from a wide range of backgrounds stand to benefit from the guidance in *Efficient R Programming*. Get advice for setting up an R programming environment Explore general programming concepts and R coding techniques Understand the ingredients of an efficient

R workflow Learn how to efficiently read and write data in R
Dive into data carpentry—the vital skill for cleaning raw data
Optimize your code with profiling, standard tricks, and other
methods Determine your hardware capabilities for handling R
computation Maximize the benefits of collaborative R
programming Accelerate your transition from R hacker to R
programmer

Praise for previous editions: "Gandrud has written a great outline of how a fully reproducible research project should look from start to finish, with brief explanations of each tool that he uses along the way... Advanced undergraduate students in mathematics, statistics, and similar fields as well as students just beginning their graduate studies would benefit the most from reading this book. Many more experienced R users or second-year graduate students might find themselves thinking, 'I wish I'd read this book at the start of my studies, when I was first learning R!'... This book could be used as the main text for a class on reproducible research ..." (The American Statistician) Reproducible Research with R and R Studio, Third Edition brings together the skills and tools needed for doing and presenting computational research. Using straightforward examples, the book takes you through an entire reproducible research workflow. This practical workflow enables you to gather and analyze data as well as dynamically present results in print and on the web. Supplementary materials and example are available on the author's website. New to the Third Edition Updated package recommendations, examples, URLs, and removed technologies no longer in regular use. More advanced R Markdown (and less LaTeX) in discussions of markup languages and examples. Stronger focus on reproducible working directory tools. Updated discussion of cloud storage services and persistent reproducible material citation. Added discussion of Jupyter notebooks and

reproducible practices in industry. Examples of data manipulation with Tidyverse tibbles (in addition to standard data frames) and `pivot_longer()` and `pivot_wider()` functions for pivoting data. Features Incorporates the most important advances that have been developed since the editions were published Describes a complete reproducible research workflow, from data gathering to the presentation of results Shows how to automatically generate tables and figures using R Includes instructions on formatting a presentation document via markup languages Discusses cloud storage and versioning services, particularly Github Explains how to use Unix-like shell programs for working with large research projects

This book is about using interactive and dynamic plots on a computer screen as part of data exploration and modeling, both alone and as a partner with static graphics and non-graphical computational methods. The area of interactive and dynamic data visualization emerged within statistics as part of research on exploratory data analysis in the late 1960s, and it remains an active subject of research today, as its use in practice continues to grow. It now makes substantial contributions within computer science as well, as part of the growing fields of information visualization and data mining, especially visual data mining. The material in this book includes:

- An introduction to data visualization, explaining how it differs from other types of visualization.
- A description of four toolbox of interactive and dynamic graphical methods.
- An approach for exploring missing values in data.
- An explanation of the use of these tools in cluster analysis and supervised classification.
- An overview of additional material available on the web.
- A description of the data used in the analyses and exercises.

The book's examples use the software R and Gobi. R (Ihaka & Gentleman 1996, R Development Core Team 2006) is a free software environment

for statistical computing and graphics; it is most often used from the command line, provides a wide variety of statistical methods, and includes high-quality static graphics. R arose in the Department of the University of Australia and is now developed and maintained by a global collaborative effort. This edited volume provides a venue for scholars whose work challenges the typical, static conceptions, and methods of studying creativity. More specifically, the book will serve as an effort to introduce more dynamic definitions, conceptions, and approaches for studying creativity in the context of educational practice. By doing so, it feeds the strong contemporary need for more dynamic conceptions of creativity in educational settings. This is particularly important given the fast evolution of modern society and the widespread consensus that efforts to develop creative potential should be democratized -- extending well beyond the boundaries of the gifted subset and the walls of the classroom. This work recognizes that more dynamic perspectives on creativity are necessary for understanding its complexity, value, and meaning in educational contexts. This book studies and applies modern flexible regression models for survival data with a special focus on extensions of the Cox model and alternative models with the aim of describing time-varying effects of explanatory variables. Use of the suggested models and methods is illustrated on real data examples, using the R-package `timereg` developed by the authors, which is applied throughout the book with worked examples for the data sets.

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

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.

blogdown: Creating Websites with R Markdown provides a practical guide for creating websites using the blogdown package in R. In this book, we show you how to use dynamic R Markdown documents to build static websites featuring R code (or other programming languages) with automatically rendered output such as graphics, tables, analysis results, and HTML widgets. The blogdown package is also suitable for technical writing with elements such as citations, footnotes, and LaTeX math. This makes blogdown an ideal platform for any website designed to communicate information about data science, data analysis, data visualization, or R programming. Note that blogdown is not just for blogging or sites about R; it can also be used to create general-purpose websites. By default, blogdown uses Hugo, a popular open-source static website generator, which provides a fast and flexible way to build your site content to be shared online. Other website generators like Jekyll and Hexo are also supported. In this book, you will learn how to: Build a website using the blogdown package; Create blog posts and other website content as dynamic documents that can be easily edited and updated; Customize Hugo templates to suit your site's needs; Publish your website online; Migrate your existing websites to blogdown and Hugo. Yihui Xie is a software engineer at RStudio. He has authored and co-authored several R packages, including knitr, rmarkdown, bookdown, blogdown, shiny, xaringan, and animation.

He has published two other books, *Dynamic Documents with R and knitr* and *bookdown: Authoring Books and Technical Documents with R Markdown*. Amber Thomas is a data journalist and "maker" at the online publication of visual essays: *The Pudding* (<https://pudding.cool>). Her educational background was marine biology, but she has a strong love of data analysis, visualization, and storytelling. Alison Presmanes Hill is an Associate Professor of Pediatrics at Oregon Health & Science University, where she teaches Computer Science courses on data analysis, data science, and visualization. Her research focuses on using computational methods to study the development of children with neurodevelopmental disorders, in particular Autism Spectrum Disorders.

Streamline your organization by replacing paper documents with electronic solutions *Paperless* is one part inspiration and two parts instruction. You will be inspired by real-world case studies as you meet people who have brought paperless change to their organizations. You will learn what worked and how you can apply these experiences to your own work. Meet lawyers, doctors, and business leaders who have transformed their operations with Adobe technology. Also, learn how city, state, and federal governments are saving money and providing better services with paperless solutions. The inspiration is just the beginning. The majority of this book is instruction on Adobe's most important paperless technologies. Each section is full of hands-on demos that will show you how to get real business value from products you may already own. You

will learn how to create and use digital signatures, certify PDFs, and integrate dynamic documents with your existing systems. This book explains all you need to know to be on your way to a paperless future. • Read the stories of those who have created today's leading-edge paperless solutions. • Learn how the Federal Government uses certified PDFs and how New York State uses e-Forms to save millions of dollars. • Find out how the Kane County court system takes advantage of PDF forms to protect abuse victims. • See how one doctor is reducing Medicare costs by replacing expensive emergency room visits with paperless house calls. • Follow in-depth lessons on Acrobat®, LiveCycle® Designer, LiveCycle® ES/ES2, and InDesign® Server. • Download demos, source code, and sample files to use with the book's exercises (www.paperlessbook.info).

"Using real-world examples, such as the ones in J.P. Terry's Paperless, to illustrate how PDF can be used to move from paper to electronic processes is a simple-to-understand, yet very powerful learning tool for business and government alike." — Lori DeFurio, Group Product Manager, Acrobat, Adobe Systems

"In Paperless, J.P. Terry weaves the business case and technical implementation into a complete story on how a variety of businesses have benefited from Adobe solutions. This book is an enjoyable read and a must-have reference for automating business processes." — Jeff Stanier, Senior Product Manager, Adobe LiveCycle

Development Research in Practice leads the reader through a complete empirical research project, providing links to continuously updated resources on the DIME

Wiki as well as illustrative examples from the Demand for Safe Spaces study. The handbook is intended to train users of development data how to handle data effectively, efficiently, and ethically. “In the DIME Analytics Data Handbook, the DIME team has produced an extraordinary public good: a detailed, comprehensive, yet easy-to-read manual for how to manage a data-oriented research project from beginning to end. It offers everything from big-picture guidance on the determinants of high-quality empirical research, to specific practical guidance on how to implement specific workflows—and includes computer code! I think it will prove durably useful to a broad range of researchers in international development and beyond, and I learned new practices that I plan on adopting in my own research group.†?

—Marshall Burke, Associate Professor, Department of Earth System Science, and Deputy Director, Center on Food Security and the Environment, Stanford University

“Data are the essential ingredient in any research or evaluation project, yet there has been too little attention to standardized practices to ensure high-quality data collection, handling, documentation, and exchange.

Development Research in Practice: The DIME Analytics Data Handbook seeks to fill that gap with practical guidance and tools, grounded in ethics and efficiency, for data management at every stage in a research project.

This excellent resource sets a new standard for the field and is an essential reference for all empirical researchers.†?

—Ruth E. Levine, PhD, CEO, IDinsight
“Development Research in Practice: The DIME Analytics Data Handbook is an important resource and a must-

read for all development economists, empirical social scientists, and public policy analysts. Based on decades of pioneering work at the World Bank on data collection, measurement, and analysis, the handbook provides valuable tools to allow research teams to more efficiently and transparently manage their work flows—yielding more credible analytical conclusions as a result.†? —Edward Miguel, Oxfam Professor in Environmental and Resource Economics and Faculty Director of the Center for Effective Global Action, University of California, Berkeley

“The DIME Analytics Data Handbook is a must-read for any data-driven researcher looking to create credible research outcomes and policy advice. By meticulously describing detailed steps, from project planning via ethical and responsible code and data practices to the publication of research papers and associated replication packages, the DIME handbook makes the complexities of transparent and credible research easier.†? —Lars Vilhuber, Data Editor, American Economic Association, and Executive Director, Labor Dynamics Institute, Cornell University

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`.

Anyone studying the history of this institution in America must read Thelin's classic text, which has distinguished itself as the most wide-ranging and engaging account of the origins and evolution of America's institutions of higher learning.

This comprehensive study of dynamic programming applied to numerical solution of optimization problems. It will interest aerodynamic, control, and industrial engineers, numerical analysts, and computer specialists, applied mathematicians, economists, and operations and systems analysts. Originally published in 1962. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University

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