

## Dynamic Documents With R And Knitr, Second Edition (Chapman Hall/CRC: The R Series)

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 cover 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 `splannr`, `sabre`, and `RQGIS`.

The cut-and-paste approach to writing statistical reports is not only tedious and laborious, but also can be harmful to scientific research, because it is inconvenient to reproduce the results. Dynamic Documents with R and knitr introduces a new approach via dynamic documents, i.e. integrating computing directly with reporting. A comprehensive guide

This is the first book in the series to focus on dynamic hyperpolarized nuclear magnetic resonance, a burgeoning topic in biophysics. The volume follows the format and style of the Handbook of Modern Biophysics series and expands on topics already discussed in previous volumes. It builds a theoretical and experimental framework for students and researchers who wish to investigate the biophysics and biomedical application of dynamic hyperpolarized NMR. All contributors are internationally recognized experts, lead the dynamic hyperpolarized NMR field, and have first-hand knowledge of the chapter material. The book covers the following topics: Hyperpolarization by dissolution Dynamic Nuclear Polarization Design considerations for implementing a hyperpolarizer Chemical Shift Imaging with Dynamic Hyperpolarized NMR Signal Sampling Strategies in Dynamic Hyperpolarized NMR Kinetic Modeling of Enzymatic Reactions in Analyzing Hyperpolarized NMR Data Using Hyperpolarized NMR to Understand Biochemistry from Cells to Humans Innovating Metabolic Biomarkers for Hyperpolarized NMR New Insights into Metabolic Regulation from Hyperpolarized 13C MRS/MRI Studies Novel Views on Heart Function from Dynamic Hyperpolarized NMR Insights on Lactate Metabolism in Skeletal Muscle based on 13C Dynamic Nuclear Polarization Studies About the Editors Dirk Mayer is Professor of Diagnostic Radiology and Nuclear Medicine at the University of Maryland and is the Director of Metabolic Imaging. He is a recognized expert on dynamic nuclear polarization (DNP) MRI-based imaging techniques and has optimized acquisition and reconstruction techniques, has constructed kinetic modeling for quantitative analysis, and has developing new probes. Thomas Jue is Professor of Biochemistry and Molecular Medicine at the University of California Davis. He is an internationally recognized expert in developing and applying magnetic resonance techniques to study animal as well as human physiology in vivo. He served as a Chair of the Biophysics Graduate Group Program at UC Davis, where he started to redesign a graduate curriculum that balances physical science/mathematics formalism and biomedical perspective in order to promote interest at the interface of physical science, engineering, mathematics, biology, and medicine. The Handbook of Modern Biophysics represents an aspect of that effort.

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 R and GGobi

Level Set Methods and Dynamic Implicit Surfaces

Authoring Books and Technical Documents with R Markdown

R Markdown Cookbook

Extending R

bookdown

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

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.

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.

This book constitutes the refereed proceedings of the 9th International Conference on Parallel Computing Technologies, PaCT 2007, held in Pereslavl-Zalessky, Russia in September 2007 - in conjunction with the the Russian-Taiwan symposium on Methods and Tools of Parallel Programming of Multicomputers. The 37 revised full papers and 24 revised poster papers presented together with 2 invited paper were carefully reviewed and selected from 98 submissions. The papers are organized in topical sections on models and languages, applications, techniques for parallel programming supporting, cellular automata, as well as methods and tools of parallel programming of multicomputers.

Javascript for R

Introduction to Information Retrieval

Learning from Dynamic Visualization

9th International Conference, PaCT 2007, Pereslavl-Zalessky, Russia, September 3-7, 2007, Proceedings

Innovations in Research and Application

Fundamentals of Internet of Things for Non-Engineers

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 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 data 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 Publication 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 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. 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 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 Quick-R website at [statmethods.net](http://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](http://manning.com/kabacoff2)

The coronavirus pandemic has upended local, national, and global food systems, and put the Sustainable Development Goals further out of reach. But lessons from the world's response to the pandemic can help address future shocks and avert a system change. In the 2021 Global Food Policy Report, IFPRI researchers and other food policy experts explore the impacts of the pandemic and government policy responses, particularly for the poor and disadvantaged, and consider what it would take to transform our food systems to be healthy, resilient, efficient, sustainable, and inclusive. Chapters in the report look at balancing health and economic policies, promoting healthy diets and nutrition, strengthening social protection policies, integrating natural resource protection into food sector policies, and enhancing the contribution of the private sector. Regional sections look at the diverse experiences around the world, and a special section on finance looks at innovative financing for food system transformation. Critical questions addressed include: - Who felt the greatest impact from falling incomes and food system disruptions caused by the pandemic? - How can countries find an effective balance among health, economic, and social policies in the face of crisis? - How did lockdowns affect diet quality and quantity in rural and urban areas? - Do national social protection systems such as cash transfers have the capacity to protect poor and vulnerable groups in a global crisis? - How did integration of agricultural and ecosystem polices help prevent the next pandemic? - How did companies accelerate ongoing trends in digitalization and integration to keep food supply chains moving? - What different challenges did the pandemic pose for Africa, and Latin America and how did these regions respond?

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 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 had 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 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 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 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. A new 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 In addition to 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 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 constitutes the thoroughly refereed post-conference proceedings of the 12th International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics, CIBB 2015, held in Naples, Italy, in September, 2015. The 24 papers presented were carefully reviewed and selected from 24 submissions. They present problems concerning computational techniques in bioinformatics, systems biology and medical informatics discussing cutting edge methodologies and recent science discoveries, as well as novel challenges with an high impact on molecular biology and translational medicine.

12th International Meeting, CIBB 2015, Naples, Italy, September 10-12, 2015, Revised Selected Papers

R Markdown

Dynamic Linear Models with R

Development Research in Practice

The Entrepreneurial State

Statistical Computing in C++ and R

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

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.

In the twenty years since their inception, modern dynamic light-scattering techniques have become increasingly sophisticated, and their applications have grown exceedingly diverse. Applications of the techniques to problems in physics, chemistry, biology, medicine, and fluid mechanics have proliferated. It is probably no longer possible for one or two authors to write a monograph to cover in depth the advances in scattering techniques and the main areas in which they have made a major impact. This volume, which we expect to be the first of a series, presents reviews of selected specialized areas by renowned experts. It makes no attempt to be comprehensive; it emphasizes a body of related applications to polymeric, biological, and colloidal systems, and to critical phenomena. The well-known monographs on dynamic light scattering by Berne and Pecora and by Chu were published almost ten years ago. They provided comprehensive treatments of the general principles of dynamic light scattering and gave introductions to a wide variety of applications, but naturally they could not treat the new applications and advances in older ones that have arisen in the last decade. The new applications include studies of interacting particles in solution (Chapter 4); scaling approaches to the dynamics of polymers, including polymers in semidilute solution (Chapter 5); the use of both Fabry-Perot interferometry and photon correlation spectroscopy to study bulk polymers (Chapter 6); studies of micelles and microemulsions (Chapter 8); studies of polymer gels (Chapter 9).

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

Debunking Public vs. Private Sector Myths

Data analysis and graphics with R

Blogdown

Parallel Computing Technologies

The Definitive Guide

Dynamic Documents with R and Knitr, 2nd Edition

*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*

*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.*

*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, Tuftte 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 markdown, flexdashboard, learnr, and radix. Garrett Grolmund 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.*

*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*

*Dynamic Documents with R and knitr*

*Reproducible Research with R and R Studio*

*Implementing Reproducible Research*

*Modern Statistics for Modern Biology*

*Designing Web Navigation*

*The R Book*

*Dynamic Population Models is the first book to comprehensively discuss and synthesize the emerging field of dynamic modeling. Incorporating the latest research, it includes thorough discussions of population growth and momentum under gradual fertility declines, the impact of changes in the timing of events on fertility measures, and the complex relationship between period and cohort measures. The book is designed to be accessible to those with only a minimal knowledge of calculus.*

*The IoT is the next manifestation of the Internet. The trend started by connecting computers to computers, progressed to connecting people to people, and is now moving to connect everything to everything. The movement started like a race—with a lot of fanfare, excitement, and cheering. We’re now into the work phase, and we have to figure out how to make the dream come true. The IoT will have many faces and involve many fields as it progresses. It will involve technology, design, security, legal policy, business, artificial intelligence, design, Big Data, and forensics; about any field that exists now. This is the reason for this book. There are books in each one of these fields, but the focus was always "an inch wide and a mile deep." There’s a need for a book that will introduce the IoT to non-engineers and allow them to dream of the possibilities and explore the work venues in this area. The book had to be "a mile wide and a few inches deep." The editors met this goal by engaging experts from a number of fields and asking them to come together to create an introductory IoT book. Fundamentals of Internet of Things for Non-Engineers Provides a comprehensive view of the current fundamentals and the anticipated future trends in the realm of Internet of Things from a practitioner’s point of view Brings together a variety of voices with subject matter expertise in these diverse topical areas to provide leaders, students, and lay persons with a fresh worldview of the Internet of Things and the background to succeed in related technology decision-making Enhances the reader’s experience through a review of actual applications of Internet of Things end points and devices to solve business and civic problems along with notes on lessons learned Prepares readers to embrace the Internet of Things era and address complex business, social, operational, educational, and personal systems integration questions and opportunities*

*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.*

*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.*

*Dynamic Documents for Data Analytic Science*

*Clustering, Classification, and Retrieval*

*Optimizing the User Experience*

*2021 Global food policy report: Transforming food systems after COVID-19: Synopsis*

*Geocomputation with R*

*Efficient R Programming*

*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.*

*Thoroughly rewritten for today’s web environment, this bestselling book offers a fresh look at a fundamental topic of web site development: navigation design. Amid all the changes to the Web in the past decade, and all the hype about Web 2.0 and various "rich" interactive technologies, the basic problems of creating a good web navigation system remain. Designing Web Navigation demonstrates that good navigation is not about technology—it’s about the ways people find information, and how you guide them. Ideal for beginning to intermediate web designers, managers, other non-designers, and web development pros looking for another perspective, Designing Web Navigation offers basic design principles, development techniques and practical advice, with real-world examples and essential concepts seamlessly folded in. How does your web site serve your business objectives? How does it meet a user’s needs? You’ll learn that navigation design touches most other aspects of web site development. This book: Provides the foundations of web navigation and offers a framework for navigation design Paints a broad picture of web navigation and basic human information behavior Demonstrates how navigation reflects brand and affects site credibility Helps you understand the problem you’re trying to solve before you set out to design Thoroughly reviews the mechanisms and different types of navigation Explores "information scent" and "information shape" Explains "persuasive" architecture and other design concepts Covers special contexts, such as navigation design for web applications Includes an entire chapter on tagging While Designing Web Navigation focuses on creating navigation systems for large, information-rich sites serving a business purpose, the principles and techniques in the book also apply to small sites. Well researched and cited, this book serves as an excellent reference on the topic, as well as a superb teaching guide. Each chapter ends with suggested reading and a set of questions that offer exercises for experiencing the concepts in action.*

*All the Tools for Gathering and Analyzing Data and Presenting Results Reproducible Research with R and RStudio, Second 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. New to the Second Edition The rmarkdown package that allows you to create reproducible research documents in PDF, HTML, and Microsoft Word formats using the simple and intuitive Markdown syntax Improvements to RStudio’s interface and capabilities, such as its new tools for handling R Markdown documents Expanded knitr R code chunk capabilities The kable function in the knitr package and the texreg package for dynamically creating tables to present your data and statistical results An improved discussion of file organization, enabling you to take full advantage of relative file paths so that your documents are more easily reproducible across computers and systems The dplyr, magrittr, and tidyr packages for fast data manipulation Numerous modifications to R syntax in user-created packages Changes to GitHub’s and Dropbox’s interfaces Create Dynamic and Highly Reproducible Research This updated book provides all the tools to combine your research with the presentation of your findings. It saves you time searching for information so that you can spend more time actually addressing your research questions. Supplementary files used for the examples and a reproducible research project are available on the author’s website.*

*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.*

*The DIME Analytics Data Handbook*

*Reproducible Research with R and RStudio*

*A Tidy Approach*

*Dynamic Hyperpolarized Nuclear Magnetic Resonance*

*Computational Intelligence Methods for Bioinformatics and Biostatistics*

*Literate Programming*

***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.***

***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***

***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.***

***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 int- active 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 ?elds 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 our 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 GGobi. R (Ihaka & Gent-man 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. It arose in the Statistics Department of the University of Au- land and is now developed and maintained by a global collaborative effort.***

***Interactive and Dynamic Graphics for Data Analysis***

***R in Action***

***Creating Websites with R Markdown***

***Advanced R***

***Survey of Text Mining***

***Applied Econometrics with R***

***This volume tackles issues arising from today’s high reliance on learning from visualizations in general and dynamic visualizations in particular at all levels of education. It reflects recent changes in educational practice through which text no longer occupies its traditionally dominant role as the prime means of presenting to-be-learned information to learners. Specifically, the book targets the dynamic visual components of multimedia educational resources and singles out how they can influence learning in their own right. It aims to help bridge the increasing gap between pervasive adoption of dynamic visualizations in educational practice and our limited understanding of the role that these representations can play in learning. The volume has recruited international leaders in the field to provide diverse perspectives on the dynamic visualizations and learning. It is the first comprehensive book on the topic that brings together contributions from both renowned researchers and expert practitioners. Rather than aiming to present a broad general overview of the field, it focuses on innovative work that is at the cutting edge. As well as further developing and complementing existing approaches, the contributions emphasize fresh ideas that may challenge existing orthodoxies and point towards future directions for the field. They seek to stimulate further new developments in the design and use of dynamic visualizations for learning as well as the rigorous, systematic investigation of their educational effectiveness. the volume="" sheds="" light="" on="" the="" complex="" and="" highly="" demanding="" processes="" of="" conceptualizing,="" developing="" implementing="" dynamic="" visualizations="" in="" practice="" as="" well="" challenges="" relating="" research="" application="" perspectives.***

***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.***

*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.*

*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.*

*A Practical Guide to Smarter Programming*

*Dynamic Population Models*

*Dynamic Light Scattering*

*Text Mining with R*

*Applications of Photon Correlation Spectroscopy*

From one of the world's leading economists, a bestselling expose of the state's crucial role in sparking innovation and growth-and the dangers of ignoring this truth Conventional wisdom holds that innovation is the preserve of the private sector, best left in the hands of that modern day folk hero-the lone entrepreneur. In this popular tale, the role of the public sector is simply to get out of the way, at best fixing market failures, in order to facilitate our daring hero's bold, risk-taking endeavours. But what if this powerful, contemporary myth is wrong? In this sharp and controversial expose, Mariana Mazzucato comprehensively debunks the myth of a lumbering, bureaucratic state weighing down a dynamic private sector, to reveal how public investments have been behind many of the greatest innovations of our time. From the technologies that make the iPhone 'smart', to biotech, pharmaceuticals and today's emerging green technologies, it is the state that has been the investor of first resort, our boldest and most valuable innovator. Meanwhile, the private sector only finds the courage to invest after the entrepreneurial state has made the truly pioneering, high-risk investments. This false narrative has real world consequences - a select few get credit for what is an intensely collective effort, privatising rewards reaped from socialized risks. Mazzucato makes a powerful case that a failure to understand the state's entrepreneurial role is leading us down the wrong path-towards a future of stagnant growth and increased inequality. As we face the new challenges of the twenty-first century, Mazzucato argues that we need to reinvent the entrepreneurial state, to co-create the opportunities of the future -- and the kinds of public-private deals that will allow smart, innovation-led growth to also be more inclusive growth.

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.