

The R Series

Implementing Reproducible Research



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Implementing Reproducible Research Chapman Hallcrc The R Series

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Implementing Reproducible Research Victoria Stodden, 2014-01-01 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

Implementing Reproducible Research Victoria Stodden, Friedrich Leisch, Roger D. Peng, 2018-12-14 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

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Reproducible Research with R and RStudio Christopher Gandrud, 2020-02-21 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

Reproducible Research with R and R Studio Christopher Gandrud, 2018-09-03 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

Practical Multivariate Analysis Abdelmonem Afifi, Susanne May, Robin Donatello, Virginia A. Clark, 2019-10-16 This is the sixth edition of a popular textbook on multivariate analysis Well regarded for its practical and accessible approach with excellent examples and good guidance on computing the book is particularly popular for teaching outside statistics i.e. in epidemiology social science business etc The sixth edition has been updated with a new chapter on data visualization a distinction made between exploratory and confirmatory analyses and a new section on generalized estimating equations and many new updates throughout This new edition will enable the book to continue as one of the leading textbooks in the area particularly for non statisticians Key Features Provides a comprehensive practical and accessible introduction to multivariate analysis Keeps mathematical details to a minimum so particularly geared toward a non statistical audience Includes lots of detailed worked examples guidance on computing and exercises Updated with a new chapter on data visualization

R - FOR BASIC AND APPLIED SCIENCES JANARDHAN KADARI, 2023-11-22 R is a Statistical programming language R is Free and open source R is an interpreted language not a compiled one The R programming environment contains the range of tools for parallel computing machine and deep learning and for working with big Data including Torch and Tensorflow facilitating construction and implementation of neural networks The Bioconductor repository contains over a thousand of software packages written in R for analyzing data sets from CDNA microarrays to copy number variation and epigenomics Robert Gentleman Sorin Draghici Due to Data Handling and Modeling capabilities and its flexibility R is becoming the most widely used software in bioinformatics The R program is built from a variety of packages These packages are libraries of commands The Packages are available from the CRAN website The current R is the result of a collaborative effort of the R core Group R has many functions for statistical analysis and graphics R has an effective data handling and storage facility R provides operators for calculation on arrays vectors lists and

matrices This Book Covers all these with suitable examples R has a collection of tools for data analysis Keeping in view the Beginners apprehensions the Book provides the Salient Features of Descriptive Statistics Covers the specific R tools for Statistical analysis Throughout the Book examples are accompanied by R commands for easy reference This Book Covers data handling graphics and a wide range of Statistical techniques The Book would be of immense help to basic sciences Engineering Business Statistics medicine streams Biotechnology Pharma Bioinformatics Genetics and Epidemiology

Analyzing Baseball Data with R Jim Albert, Benjamin S. Baumer, Max Marchi, 2024-08-01 Our community has continued to grow exponentially thanks to those who inspire the next generation And inspiring the next generation is what the authors of *Analyzing Baseball Data with R* are doing They are setting the career path for still thousands more We all need some sort of kickstart to take that first or second step You may be a beginner R coder but you need access to baseball data How do you access this data how do you manipulate it how do you analyze it This is what this book does for you But it does more by doing what sabermetrics does best it asks baseball questions Throughout the book baseball questions are asked some straightforward and others more thought provoking From the Foreword by Tom Tango *Analyzing Baseball Data with R* Third Edition introduces R to sabermetricians baseball enthusiasts and students interested in exploring the richness of baseball data It equips you with the necessary skills and software tools to perform all the analysis steps from importing the data to transforming them into an appropriate format to visualizing the data via graphs to performing a statistical analysis The authors first present an overview of publicly available baseball datasets and a gentle introduction to the type of data structures and exploratory and data management capabilities of R They also cover the ggplot2 graphics functions and employ a tidyverse friendly workflow throughout Much of the book illustrates the use of R through popular sabermetrics topics including the Pythagorean formula runs expectancy catcher framing career trajectories simulation of games and seasons patterns of streaky behavior of players and launch angles and exit velocities All the datasets and R code used in the text are available for download online New to the third edition is the revised R code to make use of new functions made available through the tidyverse The third edition introduces three chapters of new material focusing on communicating results via presentations using the Quarto publishing system web applications using the Shiny package and working with large data files An online version of this book is hosted at <https://beanumber.github.io/abdwr3e>

Euro-Par 2015: Parallel Processing Workshops Sascha Hunold, Alexandru Costan, Domingo Giménez, Alexandru Iosup, Laura Ricci, María Engracia Gómez

Requena, Vittorio Scarano, Ana Lucia Varbanescu, Stephen L. Scott, Stefan Lankes, Josef Weidendorfer, Michael Alexander, 2015-12-17 This book constitutes the thoroughly refereed post conference proceedings of 12 workshops held at the 21st International Conference on Parallel and Distributed Computing Euro Par 2015 in Vienna Austria in August 2015 The 67 revised full papers presented were carefully reviewed and selected from 121 submissions The volume includes papers from the following workshops BigDataCloud 4th Workshop on Big Data Management in Clouds Euro EDUPAR First European

Workshop on Parallel and Distributed Computing Education for Undergraduate Students Hetero Par 13th International Workshop on Algorithms Models and Tools for Parallel Computing on Heterogeneous Platforms LSDVE Third Workshop on Large Scale Distributed Virtual Environments OMHI 4th International Workshop on On chip Memory Hierarchies and Interconnects PADAPS Third Workshop on Parallel and Distributed Agent Based Simulations PELGA Workshop on Performance Engineering for Large Scale Graph Analytics REPPAR Second International Workshop on Reproducibility in Parallel Computing Resilience 8th Workshop on Resiliency in High Performance Computing in Clusters Clouds and Grids ROME Third Workshop on Runtime and Operating Systems for the Many Core Era UCHPC 8th Workshop on UnConventional High Performance Computing and VHPC 10th Workshop on Virtualization in High Performance Cloud Computing

Behavior Analysis with Machine Learning Using R Enrique Garcia Ceja, 2021-11-25 Behavior Analysis with Machine Learning Using R introduces machine learning and deep learning concepts and algorithms applied to a diverse set of behavior analysis problems It focuses on the practical aspects of solving such problems based on data collected from sensors or stored in electronic records The included examples demonstrate how to perform common data analysis tasks such as data exploration visualization preprocessing data representation model training and evaluation All of this using the R programming language and real life behavioral data Even though the examples focus on behavior analysis tasks the covered underlying concepts and methods can be applied in any other domain No prior knowledge in machine learning is assumed Basic experience with R and basic knowledge in statistics and high school level mathematics are beneficial Features Build supervised machine learning models to predict indoor locations based on WiFi signals recognize physical activities from smartphone sensors and 3D skeleton data detect hand gestures from accelerometer signals and so on Program your own ensemble learning methods and use Multi View Stacking to fuse signals from heterogeneous data sources Use unsupervised learning algorithms to discover criminal behavioral patterns Build deep learning neural networks with TensorFlow and Keras to classify muscle activity from electromyography signals and Convolutional Neural Networks to detect smiles in images Evaluate the performance of your models in traditional and multi user settings Build anomaly detection models such as Isolation Forests and autoencoders to detect abnormal fish behaviors This book is intended for undergraduate graduate students and researchers from ubiquitous computing behavioral ecology psychology e health and other disciplines who want to learn the basics of machine learning and deep learning and for the more experienced individuals who want to apply machine learning to analyze behavioral data

Using R for Modelling and Quantitative Methods in Fisheries Malcolm Haddon, 2020-08-27 Using R for Modelling and Quantitative Methods in Fisheries has evolved and been adapted from an earlier book by the same author and provides a detailed introduction to analytical methods commonly used by fishery scientists ecologists and advanced students using the open source software R as a programming tool Some knowledge of R is assumed as this is a book about using R but an introduction to the development and working of functions and how one can

explore the contents of R functions and packages is provided. The example analyses proceed step by step using code listed in the book and from the book's companion R package MQMF available from GitHub and the standard archive CRAN. The examples are designed to be simple to modify so the reader can quickly adapt the methods described to use with their own data. A primary aim of the book is to be a useful resource to natural resource practitioners and students.

Featured Chapters

Model Parameter Estimation provides a detailed explanation of the requirements and steps involved in fitting models to data using R and mainly maximum likelihood methods. **On Uncertainty** uses R to implement bootstrapping likelihood profiles, asymptotic errors and Bayesian posteriors to characterize any uncertainty in an analysis. The use of the Monte Carlo Markov Chain methodology is examined in some detail. **Surplus Production Models** applies all the methods examined in the earlier parts of the book to conducting a stock assessment. This included fitting alternative models to the available data, characterizing the uncertainty in different ways and projecting the optimum models forward in time as the basis for providing useful management advice.

Brain-Computer Interfaces 1 Maureen Clerc, Laurent Bougrain, Fabien Lotte, 2016-07-14. Brain computer interfaces (BCI) are devices which measure brain activity and translate it into messages or commands, thereby opening up many investigation and application possibilities. This book provides keys for understanding and designing these multi-disciplinary interfaces which require many fields of expertise such as neuroscience, statistics, informatics and psychology. This first volume, *Methods and Perspectives*, presents all the basic knowledge underlying the working principles of BCI. It opens with the anatomical and physiological organization of the brain, followed by the brain activity involved in BCI and following with information extraction which involves signal processing and machine learning methods. BCI usage is then described from the angle of human learning and human machine interfaces. The basic notions developed in this reference book are intended to be accessible to all readers interested in BCI, whatever their background. More advanced material is also offered for readers who want to expand their knowledge in disciplinary fields underlying BCI. This first volume will be followed by a second volume entitled *Technology and Applications*.

INFORMS Analytics Body of Knowledge James J. Cochran, 2018-10-23. Standardizes the definition and framework of analytics. 2 on Book Authority's list of the Best New Analytics Books to Read in 2019. January 2019. We all want to make a difference. We all want our work to enrich the world. As analytics professionals, we are fortunate this is our time. We live in a world of pervasive data and ubiquitous powerful computation. This convergence has inspired and accelerated the development of both analytic techniques and tools, and this potential for analytics to have an impact has been a huge call to action for organizations, universities and governments. This title from the Institute for Operations Research and the Management Sciences (INFORMS) represents the perspectives of some of the most respected experts on analytics. Readers with various backgrounds in analytics, from novices to experienced professionals, will benefit from reading about and implementing the concepts and methods covered here. Peer-reviewed chapters provide readers with in-depth insights and a better understanding of the dynamic field of analytics. The

INFORMS Analytics Body of Knowledge documents the core concepts and skills with which an analytics professional should be familiar establishes a dynamic resource that will be used by practitioners to increase their understanding of analytics and presents instructors with a framework for developing academic courses and programs in analytics [Using R for Data Analysis in Social Sciences](#) Quan Li,2018-05-09 Using R for Data Analysis in Social Sciences offers a step by step guide on using free software R to conduct and reproduce published quantitative analysis It walks readers through data preparation visualization analysis and reporting Test used in undergraduate classes and student self study it is appropriate for any introductory course on R data analysis and empirical social scientific research [R for Political Data Science](#) Francisco Urdinez,Andres Cruz,2020-11-17 R for Political Data Science A Practical Guide is a handbook for political scientists new to R who want to learn the most useful and common ways to interpret and analyze political data It was written by political scientists thinking about the many real world problems faced in their work The book has 16 chapters and is organized in three sections The first on the use of R is for those users who are learning R or are migrating from another software The second section on econometric models covers OLS binary and survival models panel data and causal inference The third section is a data science toolbox of some the most useful tools in the discipline data imputation fuzzy merge of large datasets web mining quantitative text analysis network analysis mapping spatial cluster analysis and principal component analysis Key features Each chapter has the most up to date and simple option available for each task assuming minimal prerequisites and no previous experience in R Makes extensive use of the Tidyverse the group of packages that has revolutionized the use of R Provides a step by step guide that you can replicate using your own data Includes exercises in every chapter for course use or self study Focuses on practical based approaches to statistical inference rather than mathematical formulae Supplemented by an R package including all data As the title suggests this book is highly applied in nature and is designed as a toolbox for the reader It can be used in methods and data science courses at both the undergraduate and graduate levels It will be equally useful for a university student pursuing a PhD political consultants or a public official all of whom need to transform their datasets into substantive and easily interpretable conclusions [Learn R](#) Pedro J. Aphalo,2024-04-26 Learning a computer language like R can be either frustrating fun or boring Having fun requires challenges that wake up the learner s curiosity but also provide an emotional reward for overcoming them The book is designed so that it includes smaller and bigger challenges in what I call playgrounds in the hope that all readers will enjoy their path to R fluency Fluency in the use of a language is a skill that is acquired through practice and exploration For students and professionals in the biological sciences humanities and many applied fields recognizing the parallels between R and natural languages should help them feel at home with R The approach I use is similar to that of a travel guide encouraging exploration and describing the available alternatives and how to reach them The intention is to guide the reader through the R landscape of 2024 and beyond What is new in the second edition Text expanded by more than 25% to include additional R features and gentler and

more detailed explanations Contains 24 new diagrams and flowcharts seven new tables and revised text and code examples for clarity All three indexes were expanded and answers to 28 frequently asked questions added What will you find in this book Programming concepts explained as they apply to current R Emphasis on the role of abstractions in programming Few prescriptive rules mostly the author's preferences together with alternatives Presentation of the R language emphasizing the R way of doing things Tutoring for programming in the small using scripts for data analysis Explanation of the differences between R proper and extensions for data wrangling The grammar of graphics is described as a language for the construction of data visualisations Examples of data exchange between R and the foreign world using common file formats Coaching to become an independent R user capable of writing original scripts and solving future challenges *Open Science by Design* National Academies of Sciences, Engineering, and Medicine, Policy and Global Affairs, Board on Research Data and Information, Committee on Toward an Open Science Enterprise, 2018-09-09 Openness and sharing of information are fundamental to the progress of science and to the effective functioning of the research enterprise The advent of scientific journals in the 17th century helped power the Scientific Revolution by allowing researchers to communicate across time and space using the technologies of that era to generate reliable knowledge more quickly and efficiently Harnessing today's stunning ongoing advances in information technologies the global research enterprise and its stakeholders are moving toward a new open science ecosystem Open science aims to ensure the free availability and usability of scholarly publications the data that result from scholarly research and the methodologies including code or algorithms that were used to generate those data Open Science by Design is aimed at overcoming barriers and moving toward open science as the default approach across the research enterprise This report explores specific examples of open science and discusses a range of challenges focusing on stakeholder perspectives It is meant to provide guidance to the research enterprise and its stakeholders as they build strategies for achieving open science and take the next steps *Learning Microeconometrics with R* Christopher P. Adams, 2020-12-29 This book provides an introduction to the field of microeconometrics through the use of R The focus is on applying current learning from the field to real world problems It uses R to both teach the concepts of the field and show the reader how the techniques can be used It is aimed at the general reader with the equivalent of a bachelor's degree in economics statistics or some more technical field It covers the standard tools of microeconometrics OLS instrumental variables Heckman selection and difference in difference In addition it introduces bounds factor models mixture models and empirical Bayesian analysis Key Features Focuses on the assumptions underlying the algorithms rather than their statistical properties Presents cutting edge analysis of factor models and finite mixture models Uses a hands on approach to examine the assumptions made by the models and when the models fail to estimate accurately Utilizes interesting real world data sets that can be used to analyze important microeconomic problems Introduces R programming concepts throughout the book Includes appendices that discuss some of the standard statistical concepts and R programming used in the book **R for**

Conservation and Development Projects Nathan Whitmore, 2020-12-21 This book is aimed at conservation and development practitioners who need to learn and use R in a part time professional context It gives people with a non technical background a set of skills to graph map and model in R It also provides background on data integration in project management and covers fundamental statistical concepts The book aims to demystify R and give practitioners the confidence to use it Key Features Viewing data science as part of a greater knowledge and decision making system Foundation sections on inference evidence and data integration Plain English explanations of R functions Relatable examples which are typical of activities undertaken by conservation and development organisations in the developing world Worked examples showing how data analysis can be incorporated into project reports

Humanities Data in R Taylor Arnold, Lauren Tilton, 2024-07-22 This book teaches readers to integrate data analysis techniques into humanities research practices using the R programming language Methods for general purpose visualization and analysis are introduced first followed by domain specific techniques for working with networks text geospatial data temporal data and images The book is designed to be a bridge between quantitative and qualitative methods individual and collaborative work and the humanities and social sciences The second edition of the text is a significant revision with almost every aspect of the text rewritten in some way The most notable difference is the incorporation of new R packages such as ggplot2 and dplyr that center broad data science concepts This 2nd edition of *Humanities Data with R* does not presuppose background programming experience Early chapters take readers from R set up to exploratory data analysis with one chapter dedicated to each stage of the data science pipeline data collection visualization manipulation and relational joins Following this text analysis networks temporal data geospatial data and image analysis each have a dedicated chapter These are grounded in examples to move readers beyond the intimidation of adding new tools to their research The final section of the book extends the core material with additional computer science techniques for processing large datasets Everything is hands on image analysis is explained using digitized photographs from the 1930s and networks are applied to page links on Wikipedia After working through these examples with the provided data code and book website readers are prepared to apply new methods to their own work The open source R programming language with its myriad packages and popularity within the sciences and social sciences is particularly well suited to working with humanities data R packages are also highlighted in an appendix The methodology will have wide application in classrooms and self study for the humanities but also for use in linguistics anthropology and political science Outside the classroom this intersection of humanities and computing is particularly relevant for research and new modes of dissemination across archives museums and libraries

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follower valve train while retaining traditional cast iron block and head the 2 3l sohc was the base engine of numerous 1974

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