Using R With Multivariate Statistics

Multivariate Analysis for the Behavioral Sciences, Second Edition

Chemometrics with R

The majority of data sets collected by researchers in all disciplines are multivariate, meaning that several measurements, observations, or recordings are taken on each of the units in the data set. These units might be human subjects, archaeological artifacts, countries, or a vast variety of other things. In a few cases, it may be sensible to isolate each variable and study it separately, but in most instances all the variables need to be examined simultaneously in order to fully grasp the structure and key features of the data. For this purpose, one or another method of multivariate analysis might be helpful, and it is with such methods that this book is largely concerned. Multivariate analysis includes methods both for describing and exploring such data and for making formal inferences about them. The aim of all the techniques is, in general sense, to display or extract the signal in the data in the presence of noise and to find out what the data show us in the midst of their apparent chaos. An Introduction to Applied Multivariate Analysis with R explores the correct application of these methods so as to extract as much information as possible from the data at hand, particularly as some type of graphical representation, via the R software. Throughout the book, the authors give many examples of R code used to apply the multivariate techniques to multivariate data.

Time Series


Applied Multivariate Analysis

The majority of data sets collected by researchers in all disciplines are multivariate, meaning that several measurements, observations, or recordings are taken on each of the units in the data set. These units might be human subjects, archaeological artifacts, countries, or a vast variety of other things. In a few cases, it may be sensible to isolate each variable and study it separately, but in most instances all the variables need to be examined simultaneously in order to fully grasp the structure and key features of the data. For this purpose, one or another method of multivariate analysis might be helpful, and it is with such methods that this book is largely concerned. Multivariate analysis includes methods both for describing and exploring such data and for making formal inferences about them. The aim of all the techniques is, in general sense, to display or extract the signal in the data in the presence of noise and to find out what the data show us in the midst of their apparent chaos. An Introduction to Applied Multivariate Analysis with R explores the correct application of these methods so as to extract as much information as possible from the data at hand, particularly as some type of graphical representation, via the R software. Throughout the book, the authors give many examples of R code used to apply the multivariate techniques to multivariate data.

An Introduction to Applied Multivariate Analysis with R

Join the revolution ignited by the ground-breaking R system! Starting with an introduction to R, covering standard regression methods, then presenting more advanced topics, this book guides users through the practical and powerful tools that the R system provides. The emphasis is on hands-on analysis, graphical display and interpretation of data. The many worked examples, taken from real-word applications, are accompanied by commentary on what is done and why. A website provides datasets, allowing readers to reproduce all analyses. Updates and solutions to selected exercises are also available. Assuming only basic statistical knowledge, the book is ideal for research scientists, final-year undergraduate or graduate level students of applied statistics, and practising statisticians. It is both for learning and for reference. This revised edition reflects changes in R since 2003 and has new material on survival analysis, random coefficient models, and the handling of high-dimensional data.

Applied Multivariate Statistical Analysis (Classic Version)


Using R for Introductory Statistics

Full of real-world case studies and practical advice, Exploratory Multivariate Analysis by Example Using R, Second Edition focuses on four fundamental methods of multivariate exploratory data analysis that are most suitable for applications. It covers principal component analysis (PCA) when variables are quantitative, correspondence analysis (CA) a
Where To Download Using R With Multivariate Statistics

Written by the author of the lattice system, this book describes lattice in considerable depth, beginning with the essentials and systematically delving into specific low levels details as necessary. No prior experience with lattice is required to read the book, although basic familiarity with R is assumed. The book contains close to 150 figures produced with lattice. Many of the examples emphasize principles of good graphical design; almost all use real data sets that are publicly available in various R packages. All code and figures in the book are also available online, along with supplementary material covering more advanced topics.

Modern Statistics for Modern Biology

Multivariate Generalized Linear Mixed Models Using R presents robust and methodologically sound models for analyzing large and complex data sets, enabling readers to answer increasingly complex research questions. The book applies the principles of modeling to longitudinal data from panel and related studies via the Sabre software package in R.A Un

Applied Univariate, Bivariate, and Multivariate Statistics Using Python

Easy Statistics for Food Science with R presents the application of statistical techniques to assist students and researchers who work in food science and food engineering in choosing the appropriate statistical technique. The book focuses on the use of univariate and multivariate statistical methods in the field of food science. The techniques are presented in a simplified form without relying on complex mathematical proofs. This book was written to help researchers from different fields to analyze their data and make valid decisions. The development of modern statistical packages makes the analysis of data easier than before. The book focuses on the application of statistics and correct methods for the analysis and interpretation of data. R statistical software is used throughout the book to analyze the data. Contains numerous step-by-step tutorials help the reader to learn quickly. Covers the theory and application of the statistical techniques. Shows how to analyze data using R software Provides R scripts for all examples and figures

Applied Multivariate Statistics for the Social Sciences

This two-part treatment deals with foundations as well as models and applications. Topics include continuous multivariate distributions; regression and analysis of variance; factor analysis and latent structure analysis; and structuring multivariate populations. 1962 edition.

Learning Statistics Using R

Applied Statistics for Environmental Science with R presents the theory and application of statistical techniques in environmental science and aids researchers in choosing the appropriate statistical technique for analyzing their data. Focusing on the use of univariate and multivariate statistical methods, this book acts as a step-by-step resource to facilitate understanding in the use of R statistical software for interpreting data in the field of environmental science. Researchers utilizing statistical analysis in environmental science and engineering will find this book to be essential in solving their day-to-day research problems. Includes step-by-step tutorials to aid in understanding the process and implementation of unique data. Presents statistical theory in a simple way without complex mathematical proofs Shows how to analyze data using R software and provides R scripts for all examples and figures

Multivariate Statistics:

A unique textbook introducing and demonstrating the use of R in psychology. Statistics for Psychology Using R comprehensively covers standard statistical methods along with advanced topics such as multivariate techniques, factor analysis, and multiple regression widely used in the field of psychology and other social sciences. Its innovative structure and pedagogical approach coupled with numerous worked-out examples and self-assessment tests make it a user-friendly and easy-to-understand companion for students and scholars with limited background in statistics. The standout feature of this textbook is that it demonstrates the application of R—a free, flexible, and dynamically changing software for statistical computing and data analysis, which is becoming increasingly popular across social and behavioral sciences.

Applied Meta-Analysis with R

A clear and efficient balance between theory and application of statistical modeling techniques in the social and behavioral sciences. Written as a general and accessible introduction, Applied Univariate, Bivariate, and Multivariate Statistics provides an overview of statistical modeling techniques used in fields in the social and behavioral sciences. Blending statistical theory and methodology, the book surveys both the technical and theoretical aspects of good data analysis. Featuring applied resources at various levels, the book includes statistical techniques such as t-tests and correlation as well as more advanced procedures such as MANOVA, factor analysis, and structural equation modeling. To promote a more in-depth interpretation of statistical techniques across the sciences, the book surveys some of the technical arguments underlying formulas and equations. Applied Univariate, Bivariate, and Multivariate Statistics also features demonstrations of statistical techniques using software packages such as R and SPSS®. Examples of hypothetical and real data with subsequent statistical analyses Historical and philosophical insights into many of the techniques used in modern social science. A companion website that includes further instructional details, additional data sets, solutions to selected exercises, and multiple programming options An ideal textbook for courses in statistics and methodology at the upper-undergraduate and graduate-levels in psychology, political science, biology, sociology, education, economics, communications, law, and survey research. Applied Univariate, Bivariate, and Multivariate Statistics is also a useful reference for practitioners and researchers in their field of application. DANIEL J. DENIS, PhD, is Associate Professor of Quantitative Psychology at the University of Montana where he teaches courses in univariate and multivariate statistics. He has published a number of articles in peer-reviewed journals and has served as consultant to researchers and practitioners in a variety of fields.

Statistics for Psychology Using R

This is the first book on multivariate analysis to look at large data sets which describes the state of the art in analyzing such data. Material such as database management systems is included that has never appeared in statistics books before.

Spatial Data Analysis in Ecology and Agriculture Using R

This book offers readers an accessible introduction to the world of multivariate statistics in the life sciences, providing a comprehensive description of the general data analysis paradigm, from exploratory analysis (principal component analysis, self-organizing maps and clustering) to modeling (classification, regression) and validation (including variable selection). It also includes a special section discussing several more specific topics in the area of chemometrics, such as outlier detection, and biomarker identification. The corresponding R code is provided for all the examples in the book; and scripts, functions and data are available in a separate R package. This second revised edition features not only updates on many of the topics covered, but also several sections of new material (e.g., on handling missing values in PCA, multivariate process monitoring and batch correction).

Applied Multivariate Statistics with R

The goals of this text are to develop the skills and an appreciation for the richness and versatility of modern time series analysis as a tool for analyzing dependent data. A useful feature of the presentation is the inclusion of nontrivial data sets illustrating the richness of potential applications to problems in the biological, physical, and social sciences as well as medicine. The text presents a balanced and comprehensive treatment of both time and frequency domain methods with an emphasis on data analysis. Numerous examples using data illustrate solutions to problems such as discovering natural and anthropogenic climate change, evaluating pain perception experiments using functional magnetic resonance imaging, and the analysis of economic and financial problems. The text can be used for a one semester/quarter introductory time series course where the prerequisites are an understanding of linear regression, basic calculus-based probability skills, and math...
skills at the high school level. All of the numerical examples use the R statistical package without assuming that the reader has previously used the software. Robert H. Shumway is Professor Emeritus of Statistics, University of California, Davis. He is a Fellow of the American Statistical Association and has won the American Statistical Association Award for Outstanding Statistical Application. He is the author of numerous texts and served on editorial boards such as the Journal of Forecasting and the Journal of the American Statistical Association. David S. Stoffer is Professor of Statistics, University of Pittsburgh. He is a Fellow of the American Statistical Association and has won the American Statistical Association Award for Outstanding Statistical Application. He is currently on the editorial boards of the Journal of Forecasting, the Annals of Statistical Mathematics, and the Journal of Time Series Analysis. He served as a Program Director in the Division of Mathematical Sciences at the National Science Foundation and as an Associate Editor for the Journal of the American Statistical Association and the Journal of Business & Economic Statistics.

**Multivariate Generalized Linear Mixed Models Using R**

The intensive use of automatic data acquisition system and the use of cloud computing for process monitoring have led to an increased occurrence of industrial processes that utilize statistical process control and capability analysis. These analyses are performed almost exclusively with multivariate methodologies. The aim of this Brief is to present the most important MSQC techniques developed in R language. The book is divided into two parts. The first part contains the basic R elements, an introduction to statistical procedures, and the main aspects related to Statistical Quality Control (SQC). The second part covers the construction of multivariate control charts, the calculation of Multivariate Capability Indices.

**Practical Multivariate Analysis**

Multivariate statistics and mathematical models provide flexible and powerful tools essential in most disciplines. Nevertheless, many practicing researchers lack an adequate knowledge of these techniques, or did once know the techniques, but have not been able to keep abreast of new developments. The Handbook of Applied Multivariate Statistics and Statistical Modeling explains the appropriate uses of multivariate procedures and mathematical modeling techniques, and prescribe practices that enable applied researchers to use these procedures effectively without needing to concern themselves with the mathematical basis. The Handbook emphasizes using models and statistics as tools. The objective of the book is to inform readers about which tool to use to accomplish which task. Each chapter begins with a discussion of what kinds of questions a particular technique can and cannot answer. As multivariate statistics and modeling techniques are useful across disciplines, these examples include issues of concern in biological and social sciences as well as the humanities.

**Multivariate Analysis of Ecological Data**

This title is part of the Pearson Modern Classics series. Pearson Modern Classics are acclaimed titles at a value price. Please visit www.pearsonhighered.com/math-classics-series for a complete list of titles. For courses in Multivariate Statistics, Marketing Research, Intermediate Business Statistics, Statistics in Education, and graduate-level courses in Experimental Design and Statistics. Appropriate for experimental scientists in a variety of disciplines, this market-leading text offers a readable introduction to the statistical analysis of multivariate observations. Its primary goal is to impart the knowledge necessary to make proper interpretations and select appropriate techniques for analyzing multivariate data. Ideal for a junior/senior or graduate level course. Students and researchers who need to learn the basic concepts and procedures of multivariate analysis can use this handbook as an introduction to the statistical methods for describing and analyzing multivariate data, the text assumes two or more statistics courses as a prerequisite. R for Statistics: A practical, “how-to” reference for anyone performing essential statistical analyses and data management tasks in Python. Applied Univariate, Bivariate, and Multivariate Statistics Using Python delivers a comprehensive introduction to a wide range of statistical methods performed using Python in a single, one-stop reference. The book contains user-friendly guidance and instructions on using Python to run a variety of statistical procedures without getting bogged down in unnecessary theory. Throughout, the author emphasizes a set of computational tools used in the discovery of empirical patterns, as well as several popular statistical analyses and data management tasks that can be immediately applied. The datasets used in the book are small enough to easily be entered into Python manually, although they can also be downloaded for free from www.datasciencemedia.com. Only minimal knowledge of statistics is assumed, and the book is perfect for those seeking an easily accessible pocket statistical analysis with Python. Applied Univariate, Bivariate, and Multivariate Statistics Using Python represents the fastest way to learn how to analyze data with Python. Readers will also benefit from the inclusion of: A thorough review of essential statistical principles, including types of data, scales of measurement, significance tests, significance levels, and type I and type II errors. An introduction to Python, including how to communicate with Python. A treatment of exploratory data analysis, basic statistics, and visual displays, including frequencies and descriptives, stem-and-leaf plots, q-q plots, box-and-whisker plots, and data transformations. An exploration of data management in Python. An accessible toolkit for statistical analysis with Python. The book provides step-by-step guidance and instruction on using Python for undergraduate and graduate students in the social, behavioral, and natural sciences. Applied Univariate, Bivariate, and Multivariate Statistics Using Python will also earn a place in the libraries of researchers and data analysts seeking a quick go-to resource for univariate, bivariate, and multivariate analysis in Python.

**An R and S-Plus® Companion to Multivariate Analysis**

Provisioning easy-to-use R script programs that teach descriptive statistics, graphing, and other statistical methods, Learning Statistics Using R shows readers how to run and utilize R, a free integrated statistical suite that has an extensive library of functions. Lecturers - contact your local SAGE representative to discuss your course needs or to request an inspection copy. Randall E. Schumacker’s comprehensive book describes in detail the processing of variables in statistical procedures. Covering a wide range of topics, from probability and sampling distribution to statistical theorems and chi-square, this introductory book helps readers learn not only how to use formulae to calculate statistics, but also how specific statistics fit into the overall research process. Learning Statistics Using R covers data input from vectors, arrays, matrices and data frames, as well as the input of data sets from SPSS, SAS, STATA and other software packages. Schumacker’s text provides the freedom to effectively calculate, manipulate, and graphically display data, using R, on different computer operating systems without the expense of commercial software. Learning Statistics Using R places statistics within the framework of conducting research, where statistical research hypotheses can be directly addressed. Each chapter includes discussion and explanations, tables and graphs, and R functions and outputs to enrich readers’ understanding of statistics through statistical computing and modeling.

**Univariate, Bivariate, and Multivariate Statistics Using R**

Most data sets collected by researchers are univariate, and in most cases, the variables need to be examined simultaneously to get the most informative results. This book covers the core univariate methodology along with some basic theory for each method described. It also provides the necessary R and S-PLUS code for each analysis.

**Modern Multivariate Statistical Techniques**

This book explains the advanced but essential concepts of Multivariate Statistics in a practical way while touching the mathematical logic in a befitting manner. The illustrations are based on real case studies from a super specialty hospital where active research is going on.

**Essentials of Multivariate Data Analysis**

Key features: Unique in its combination of serving as an introduction to spatial statistics and to modeling agricultural and ecological data using R. Provides exercises in each chapter to help the book's use as a course textbook or for self-study. Adds new material on generalized additive models, point pattern analysis, and new methods of Bayesian analysis of spatial data. Includes a completely revised chapter on the analysis of spatiotemporal data featuring recently introduced software and methods. Updates its coverage of R software including newly introduced packages Spatial Data Analysis in Ecology and Agriculture Using R, 2nd Edition provides practical instruction on the use of the R programming language to analyze spatial data arising from research in ecology, agriculture, and environmental science. Readers have praised the book's practical coverage of spatial statistics, real-world examples, and user-friendly approach in presenting and explaining R code.
Where To Download Using R With Multivariate Statistics

Multivariate Statistical Quality Control Using R

Applied Univariate, Bivariate, and Multivariate Statistics

The authors have cleverly used exercises and their solutions to explore the concepts of multivariate data analysis. Broken down into three sections, this book has been structured to allow students in economics and finance to work their way through a well-formulated exploration of this core topic. The first part of this book is devoted to graphical techniques. The second deals with multivariate random variables and presents the derivation of estimators and tests for various practical situations. The final section contains a wide variety of exercises in applied multivariate data analysis.

Handbook of Applied Multivariate Statistics and Mathematical Modeling

Using R for Introductory Statistics guides students through the basics of R, helping them overcome the sometimes steep learning curve. The author does this by breaking the material down into small, task-oriented steps. The second edition maintains the features that made the first edition so popular, while updating data, examples, and changes to R in line with the current version. See What's New in the Second Edition: Increased emphasis on more idiomatic R provides a grounding in the functionality of base R. Discussions of the use of RStudio helps new R users avoid as many pitfalls as possible. Use of knitr package makes code easier to read and therefore easier to reason about. Additional use of user-contributed packages makes for easier R programming. The second 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.

Multivariate Statistical Quality Control Using R

Applied Multivariate Statistics Made Simple

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.

Multivariate Statistical Methods

Now in its 6th edition, the authoritative textbook Applied Multivariate Statistics for the Social Sciences, continues to provide advanced students with a practical and conceptual understanding of statistical procedures through examples and data-sets from actual research studies. With the added expertise of co-author Keenan Pituch (University of Texas-Austin), this 6th edition retains many key features of the previous editions, including its breadth and depth of coverage, a review chapter on matrix algebra, applied coverage of MANOVA, and emphasis on statistical power. In this new edition, the authors continue to provide practical guidelines for checking the data, assessing assumptions, interpreting, and reporting the results to help students analyze data from their own research confidently and professionally. Features new to this edition include: NEW chapter on Logistic Regression (Ch. 11) that helps readers understand and use this very flexible and widely used procedure NEW chapter on Multivariate Multilevel Modeling (Ch. 14) that helps readers understand the benefits of this “newer” procedure and how it can be used in conventional and multilevel settings NEW Example Results Section write-ups that illustrate how results should be presented in research papers and journal articles NEW coverage of missing data (Ch. 1) to help students understand and address problems associated with incomplete data Completely re-written chapters on Exploratory Factor Analysis (Ch. 9), Hierarchical Linear Modeling (Ch. 13), and Structural Equation Modeling (Ch. 16) with increased focus on understanding models and interpreting results NEW analysis summaries, inclusion of more syntax explanations, and reduction in the number of SPSS/SAS dialogue boxes to guide students through data analysis in a more streamlined and direct approach Updated syntax to reflect most recent versions of IBM SPSS (21) / SAS (9.3) A free online resources site at www.rovelled.com/9780415836661 with data sets and syntax from the text, additional data sets, and instructor’s resources (including PowerPoint lecture slides for select chapters, a conversion guide for 5th edition adopters, and answers to exercises). Ideal for advanced graduate-level courses in education, psychology, and other social sciences in which multivariate statistics, advanced statistics, or quantitative techniques courses are taught, this book also appeals to practicing researchers as a valuable reference. Pre-requisites include a course on factorial ANOVA and covariance; however, a working knowledge of matrix algebra is not assumed.

Data Analysis and Graphics Using R

Using formal descriptions, graphical illustrations, practical examples, and R software tools, Introduction to Multivariate Statistical Analysis in Chemometrics presents simple yet thorough explanations of the most important multivariate statistical methods for analyzing chemical data. It includes discussions of various principal component methods, such as principal component analysis, regression analysis, classification methods, and clustering. Written by a chemometrician and a statistician, the book reflects the practical approach of chemometrics and the more formally oriented one of statistics. To enable a better understanding of the statistical methods, the authors apply them to real data examples from chemistry. They also examine results from different methods, comparing traditional approaches with their robust counterparts. In addition, the authors use the freely available R package to implement methods, encouraging readers to go through the examples and adapt the procedures to their own problems. Focusing on the practicality of the methods and the validity of the results, this book offers concise mathematical descriptions of many multivariate methods and employs graphical schemes to visualize key concepts. It effectively imparts a basic understanding of how to apply statistical methods to multivariate scientific data.

Introduction to Multivariate Statistical Analysis in Chemometrics

Using R with Multivariate Statistics by Randall E. Schumacker is a quick guide to using R, free-access software available for Windows and Mac operating systems that allows users to customize statistical analysis. Designed to serve as a companion to a more comprehensive text on multivariate statistics, this book helps students understand the statistical techniques and their use in the social and behavioral sciences. In this new edition, the authors continue to provide practical guidelines for checking the data, assessing assumptions, interpreting, and reporting the results to help students analyze data from their own research confidently and professionally. Features new to this edition include: NEW chapter on Logistic Regression (Ch. 11) that helps readers understand and use this very flexible and widely used procedure NEW chapter on Multivariate Multilevel Modeling (Ch. 14) that helps readers understand the benefits of this “newer” procedure and how it can be used in conventional and multilevel settings NEW Example Results Section write-ups that illustrate how results should be presented in research papers and journal articles NEW coverage of missing data (Ch. 1) to help students understand and address problems associated with incomplete data Completely re-written chapters on Exploratory Factor Analysis (Ch. 9), Hierarchical Linear Modeling (Ch. 13), and Structural Equation Modeling (Ch. 16) with increased focus on understanding models and interpreting results NEW analysis summaries, inclusion of more syntax explanations, and reduction in the number of SPSS/SAS dialogue boxes to guide students through data analysis in a more streamlined and direct approach Updated syntax to reflect most recent versions of IBM SPSS (21) / SAS (9.3) A free online resources site at www.rovelled.com/9780415836661 with data sets and syntax from the text, additional data sets, and instructor’s resources (including PowerPoint lecture slides for select chapters, a conversion guide for 5th edition adopters, and answers to exercises). Ideal for advanced graduate-level courses in education, psychology, and other social sciences in which multivariate statistics, advanced statistics, or quantitative techniques courses are taught, this book also appeals to practicing researchers as a valuable reference. Pre-requisites include a course on factorial ANOVA and covariance; however, a working knowledge of matrix algebra is not assumed.
Lattice

Although there are several good books on principal component methods (PCMs) and related topics, we felt that many of them are either too theoretical or too advanced. This book provides a solid practical guide to summarize, visualize, and interpret the most important information in a large multivariate data sets, using principal component methods in R. The visualization is based on the factoextra R package that we developed for creating easily beautiful ggplot2-based graphs from the output of PCMs. This book contains 4 parts. Part I provides a quick introduction to R and presents the key features of FactoMineR and factoextra. Part II describes classical principal component methods to analyze data sets containing, respectively, Univariate Component Analysis (UCA, for one categorical variable), Bivariate Component Analysis (BCA, for two categorical variables), Multiple CA (MCA, for a data set with more than 2 categorical variables). In Part III, you'll learn advanced methods for analyzing a data set containing a mix of variables (continuous and categorical) structured or not into groups: Factor Analysis of Mixed Data (FAMD) and Multiple Factor Analysis (MFA). Part IV covers hierarchical clustering on principal components (HCPC), which is useful for performing clustering with a data set containing only categorical variables or with a mixed data of categorical and continuous variables.

Using R With Multivariate Statistics

This book brings the power of multivariate statistics to graduate-level practitioners, making these analytical methods accessible without lengthy mathematical derivations. Using the open source, shareware program R, Professor Zelterman demonstrates the process and outcomes for a wide array of multivariate statistical applications. Chapters cover graphical displays, linear algebra, univariate, bivariate and multivariate normal distributions, factor methods, linear regression, discriminant analysis, clustering, time series models, and additional methods. Zelterman uses practical examples from diverse disciplines to welcome readers from a variety of academic specialties. Those with backgrounds in statistics will learn new methods while they review more familiar topics. Chapters include exercises, real data sets, and R implementations. The data are interesting, real-world topics, particularly from health and biology-related contexts. As an example of the approach, the text examines a sample from the Behavior Risk Factor Surveillance System, discussing both the shortcomings of the data as well as useful analyses. The text avoids theoretical derivations beyond those needed to fully appreciate the methods. Prior experience with R is not necessary.

Exploratory Multivariate Analysis by Example Using R

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 unrivaled 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, this book is packed with examples and more accomplished users. 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.

Applied Statistics for Environmental Science with R

In biostatistical research and courses, practitioners and students often lack a thorough understanding of how to apply statistical methods to synthesize biomedical and clinical trial data. Filling this knowledge gap, Applied Meta-Analysis with R shows how to implement statistical meta-analysis methods to real data using R. Drawing on their extensive research and teaching experiences, the authors provide detailed, step-by-step explanations of the implementation of meta-analysis methods, and offer exercises drawn from examples in the literature. After presenting the data and necessary background for understanding the applications, various methods for analyzing meta-data are introduced. The authors then develop analysis code using the appropriate R packages and functions. This systematic approach helps readers thoroughly understand the analysis methods and R implementation, enabling them to use R and the methods to analyze their own meta-data. Suitable as a graduate-level text for a meta-data analysis course, the book is also a valuable reference for practitioners and biostatisticians (even those with little or no experience in using R) in public health, medical research, governmental agencies, and the pharmaceutical industry.

Multivariate Nonparametric Methods with R

Multivariate Statistical Methods: A Primer provides an introductory overview of multivariate methods without getting too deep into the mathematical details. This fourth edition is a revised and updated version of this bestselling introductory textbook. It retains the clear and concise style of the previous editions of the book and focuses on examples from biological and environmental sciences. The major update with this edition is that R code has been included for each of the analyses described, although in practice any standard statistical package can be used. The original idea with this book still applies. This was to make it as short as possible and enable readers to begin using multivariate methods in an intelligent manner. With updated information on multivariate analyses, new references, and R code included, this book continues to provide a timely introduction to useful tools for multivariate statistical analysis.

Practical Guide To Principal Component Methods in R

A practical source for performing essential statistical analyses and data management tasks in R Univariate, Bivariate, and Multivariate Statistics Using R offers a practical and very user-friendly introduction to the use of R software that covers a range of statistical methods featured in data analysis and data science. The author—a noted expert in quantitative teaching—has written a quick go-to reference for performing essential statistical analyses and data management tasks in R. Requiring only minimal prior knowledge, the book introduces concepts needed for an immediate yet clear understanding of statistical concepts essential to interpreting software output. The author explores univariate, bivariate, and multivariate statistical methods, as well as nonparametric tests. Altogether a hands-on manual on the applied statistics and essential R computing capabilities needed to write theses, dissertations, as well as research publications. The book is comprehensive in its coverage of univariate through to multivariate procedures, while serving as a friendly and gentle introduction to R software for the newcomer. This important resource offers an introductory, concise guide to the computational tools that are useful for making sense out of data using R statistical software Provides a resource for students and professionals in the social, behavioral, and natural sciences. The book uses empirical data, and provides illustrations of how to perform analyses and visualization.

Easy Statistics for Food Science with R

Multivariate Analysis for the Behavioral Sciences, Second Edition is designed to show how a variety of statistical methods can be used to analyse data collected by psychologists and other behavioral scientists. Assuming some familiarity with introductory statistics, the book begins by briefly describing a variety of study designs used in the behavioral sciences, and the concept of models for data analysis. The contentious issues of p-values and confidence intervals are also discussed in the introductory chapter. After describing graphical methods, the book covers regression methods, including simple linear regression, multiple regression, locally weighted regression, generalized linear models, logistic regression, and survival analysis. There are further chapters covering longitudinal data and missing values, before the last seven chapters deal with multivariate analysis, including principal components analysis, factor analysis, multidimensional scaling, correspondence analysis, and cluster analysis. Features: Presents an accessible introduction to multivariate analysis for behavior scientists Contains a large number of real data sets, including cognitive behavioral therapy, crime rates, and drug usage Includes Page 5/6
nearly 100 exercises for course use or self-study Supplemented by a GitHub repository with all datasets and R code for the examples and exercises Theoretical details are separated from the main body of the text Suitable for anyone working in the behavioral sciences with a basic grasp of statistics