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Multivariate Analysis for the Behavioral Sciences, Second Edition
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Analysis

Practical Guide to Logistic Regression covers the key points of the basic logistic regression model and illustrates how to use it properly to model a binary response variable. This powerful methodology can be used to analyze data from various fields, including medical and health outcomes research, business analytics and data science, ecology, fisheries, astronomy, transportation, insurance, economics, recreation, and sports. By harnessing the capabilities of the logistic model, analysts can better understand their data, make appropriate predictions and classifications, and determine the odds of one value of a predictor compared to another. Drawing on his many years of teaching logistic regression, using logistic-based models in research, and writing about the subject, Professor Hilbe focuses on the most important features of the logistic model. Serving as a guide between the author and readers, the book explains how to construct a logistic model, interpret coefficients and odds ratios, predict probabilities and their standard errors based on the model, and evaluate the model as to its fit. Using a variety of real data examples, mostly from health outcomes, the author offers a basic step-by-step guide to developing and interpreting observation and grouped logistic models as well as penalized and exact logistic regression. He also gives a step-by-step guide to modeling Bayesian logistic regression. R statistical software is used throughout the book to display the statistical models while SAS and Stata codes for all examples are included at the end of each chapter. The example code can be adapted to readers' own analyses. All the code is available on the author's website. If you are a researcher or student with experience in multiple linear regression and want to learn about logistic regression, Paul Allison's *Logistic Regression Using SAS: Theory and Application, Second Edition*, is for you! Informal and nontechnical, this book both explains the theory behind logistic regression, and looks at all the practical details involved in its implementation using SAS. Several real-world examples are included in full detail. This book also explains the differences and similarities among the many generalizations of the logistic regression model. The following topics are covered: binary logistic regression, logit analysis of contingency tables, multinomial logit analysis, ordered logit analysis, discrete-choice analysis, and Poisson regression. Other highlights include discussions on how to use the GENMOD procedure to do loglinear analysis and GEE estimation for longitudinal binary data. Only basic knowledge of the SAS DATA step is assumed. The second edition describes many new features of PROC LOGISTIC, including conditional logistic regression, exact logistic regression, generalized logit models, ROC curves, the ODDS RATIO statement (for analyzing interactions), and the EFFECT PLOT statement (for graphing nonlinear effects). Also new is

coverage of PROC SURVEYLOGISTIC (for complex samples), PROC GLIMMIX (for generalized linear mixed models), PROC QLIM (for selection models and heterogeneous logit models), and PROC MDC (for advanced discrete choice models). SAS Products and Releases: SAS/STAT: 9.3_M1, 9.3, 9.22, 9.21_M1, 9.21, 9.2, 9.1.3, 9.1.2, 9.1, 9.0 Operating Systems: Windows Many texts are excellent sources of knowledge about individual statistical tools, but the art of data analysis is about choosing and using multiple tools. Instead of presenting isolated techniques, this text emphasizes problem solving strategies that address the many issues arising when developing multivariable models using real data and not standard textbook examples. It includes imputation methods for dealing with missing data effectively, methods for dealing with nonlinear relationships and for making the estimation of transformations a formal part of the modeling process, methods for dealing with "too many variables to analyze and not enough observations," and powerful model validation techniques based on the bootstrap. This text realistically deals with model uncertainty and its effects on inference to achieve "safe data mining". 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. Many different people, from social scientists to government agencies to business professionals, depend on the results of multivariate models to inform their decisions. Researchers use these advanced statistical techniques to analyze relationships among multiple variables, such as how exercise and weight relate to the risk of heart disease, or how unemployment and interest rates affect economic growth. Yet, despite the widespread need to plainly and effectively explain the results of multivariate analyses to varied audiences, few are properly taught this critical skill. The Chicago Guide to Writing about Multivariate Analysis is the book researchers turn to when looking for guidance on how to clearly present statistical results and break through the jargon that often clouds writing about applications of statistical analysis. This new edition features even more topics and real-world examples, making it the must-have resource for anyone who needs to communicate complex research results. For this second edition, Jane E. Miller includes four new chapters that cover writing about interactions, writing about event history analysis, writing about multilevel models, and the "Goldilocks principle" for choosing the right size contrast for interpreting results for different variables. In addition, she has updated or added numerous examples, while retaining her clear voice and focus on writers thinking critically about their intended audience and objective. Online podcasts, templates, and an updated study guide will help readers apply skills from the book to their own projects and courses. This continues to be the only book that brings together all of the steps involved in communicating findings based on multivariate analysis—finding data, creating variables, estimating statistical models, calculating overall effects, organizing ideas, designing tables and charts, and writing prose—in a single volume. When aligned with Miller's twelve fundamental principles for quantitative writing, this approach will empower readers—whether students or experienced researchers—to communicate their findings clearly and effectively. Jason W. Osborne's *Best Practices in Logistic Regression* provides students with an accessible, applied approach that communicates logistic regression in clear and concise terms. The book effectively leverages readers' basic intuitive understanding of simple and multiple regression to guide them into a sophisticated mastery of logistic regression. Osborne's applied approach offers students and instructors a clear

perspective, elucidated through practical and engaging tools that encourage student comprehension. *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 behavioral scientists Contains a large number of real data sets, including cognitive behavioral therapy, crime rates, and drug usage Includes 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 From the reviews of the First Edition. "An interesting, useful, and well-written book on logistic regression models . . . Hosmer and Lemeshow have used very little mathematics, have presented difficult concepts heuristically and through illustrative examples, and have included references." —Choice "Well written, clearly organized, and comprehensive . . . the authors carefully walk the reader through the estimation of interpretation of coefficients from a wide variety of logistic regression models . . . their careful explication of the quantitative re-expression of coefficients from these various models is excellent." —Contemporary Sociology "An extremely well-written book that will certainly prove an invaluable acquisition to the practicing statistician who finds other literature on analysis of discrete data hard to follow or heavily theoretical." —The Statistician In this revised and updated edition of their popular book, David Hosmer and Stanley Lemeshow continue to provide an amazingly accessible introduction to the logistic regression model while incorporating advances of the last decade, including a variety of software packages for the analysis of data sets. Hosmer and Lemeshow extend the discussion from biostatistics and epidemiology to cutting-edge applications in data mining and machine learning, guiding readers step-by-step through the use of modeling techniques for dichotomous data in diverse fields. Ample new topics and expanded discussions of existing material are accompanied by a wealth of real-world examples—with extensive data sets available over the Internet. *Logistic Regression Models* presents an overview of the full range of logistic models, including binary, proportional, ordered, partially ordered, and unordered categorical response regression procedures. Other topics discussed include panel, survey, skewed, penalized, and exact logistic models. The text illustrates how to apply the various models to health, environmental, physical, and social science data. Examples illustrate successful modeling The text first provides basic terminology and concepts, before explaining the foremost methods of estimation (maximum likelihood and IRLS) appropriate for logistic models. It then presents an in-depth discussion of related terminology and examines logistic regression model development and interpretation of the results. After focusing on the construction and interpretation of various interactions, the author evaluates assumptions and goodness-of-fit tests that can be used for model assessment. He also covers binomial logistic regression, varieties of overdispersion, and a number of extensions to the basic binary and binomial logistic model. Both real and simulated data are used to explain and test the concepts involved. The appendices give an overview of marginal effects and discrete change as well as a 30-page tutorial on using Stata commands related to the examples used in the text. Stata is used for most examples while R is provided at the end of the chapters to replicate examples in the text. Apply the models to your own data Data files for examples and questions used in the text as well as code for user-authored commands are provided on the book's website, formatted in Stata, R, Excel, SAS, SPSS, and Limdep. See Professor Hilbe discuss the book. How to perform and interpret multivariable analysis, using plain language rather than complex derivations. Jason W. Osborne's *Best Practices in Logistic Regression* provides students with an accessible, applied approach that communicates logistic regression in clear and concise terms. The book

effectively leverages readers' basic intuitive understanding of simple and multiple regression to guide them into a sophisticated mastery of logistic regression. Osborne's applied approach offers students and instructors a clear perspective, elucidated through practical and engaging tools that encourage student comprehension. A short introduction to the subject, this text is aimed at students & practitioners in the behavioural & social sciences. It offers a conceptual overview of the foundations of MDA & of a range of specific techniques including multiple regression, logistic regression & log-linear analysis. This book is about making machine learning models and their decisions interpretable. After exploring the concepts of interpretability, you will learn about simple, interpretable models such as decision trees, decision rules and linear regression. Later chapters focus on general model-agnostic methods for interpreting black box models like feature importance and accumulated local effects and explaining individual predictions with Shapley values and LIME. All interpretation methods are explained in depth and discussed critically. How do they work under the hood? What are their strengths and weaknesses? How can their outputs be interpreted? This book will enable you to select and correctly apply the interpretation method that is most suitable for your machine learning project. This pocket guide introduces readers to linear regression analysis, analysis of variance and covariance, and path analysis with an emphasis on the basic statistics. It prepares doctoral students and early career social work researchers with limited statistics exposure in the use of multivariate methods by providing an easy-to-understand presentation. *Computer-Aided Multivariate Analysis, Fourth Edition* enables researchers and students with limited mathematical backgrounds to understand the concepts underlying multivariate statistical analysis, perform analysis using statistical packages, and understand the output. New topics include Loess and Poisson regression, nominal and ordinal logistic regression, interpretation of interactions in logistic and survival analysis, and imputation for missing values. This book includes new exercises and references, and updated options in the latest versions of the statistical packages. All data sets and codebooks are available for download. The authors explain the assumptions made in performing each analysis and test, how to determine if your data meets those assumptions, and what to do if they do not. What to Watch out for sections in each chapter warn of common difficulties. By reading this text, you will know what method to use with your data set, how to get the results, and how to interpret them and explain them to others. New in the Fourth Edition: Expanded explanation of checking for goodness of fit in logistic regression and survival analysis Kaplan-Meier estimates of survival curves, formal tests for comparing survival between groups, interactions and the use of time-dependent covariates in survival analysis Expanded discussion of how to handle missing values Latest features of the S-PLUS package in addition to SAS, SPSS, STATA, and STATISTICA for multivariate analysis Data sets for the problems are available at the CRC web site: <http://www.crcpress.com/product/isbn/9781584883081> Commands and output for examples used in the text for each statistical package are available at the UCLA web site: <http://www.ats.ucla.edu/stat/examples/cama4/> The contributors to *Best Practices in Quantitative Methods* envision quantitative methods in the 21st century, identify the best practices, and, where possible, demonstrate the superiority of their recommendations empirically. Editor Jason W. Osborne designed this book with the goal of providing readers with the most effective, evidence-based, modern quantitative methods and quantitative data analysis across the social and behavioral sciences. The text is divided into five main sections covering select best practices in Measurement, Research Design, Basics of Data Analysis, Quantitative Methods, and Advanced Quantitative Methods. Each chapter contains a current and expansive review of the literature, a case for best practices in terms of method, outcomes, inferences, etc., and broad-ranging examples along with any empirical evidence to show why certain techniques are better. Key Features: Describes important implicit knowledge to readers: The chapters in this volume explain the important details of seemingly mundane aspects of quantitative research, making them accessible to readers and demonstrating why it is important to pay attention to these details. Compares and contrasts analytic techniques: The book examines instances where there are multiple options for doing things, and make recommendations as to what is the "best" choice—or choices, as what is best often depends on the circumstances. Offers new procedures to update and explicate traditional techniques: The featured scholars present and explain new options for data analysis, discussing the advantages and disadvantages of the new procedures in depth, describing how to perform them, and demonstrating their use. Intended

Audience: Representing the vanguard of research methods for the 21st century, this book is an invaluable resource for graduate students and researchers who want a comprehensive, authoritative resource for practical and sound advice from leading experts in quantitative methods. Multivariable regression models are of fundamental importance in all areas of science in which empirical data must be analyzed. This book proposes a systematic approach to building such models based on standard principles of statistical modeling. The main emphasis is on the fractional polynomial method for modeling the influence of continuous variables in a multivariable context, a topic for which there is no standard approach. Existing options range from very simple step functions to highly complex adaptive methods such as multivariate splines with many knots and penalisation. This new approach, developed in part by the authors over the last decade, is a compromise which promotes interpretable, comprehensible and transportable models. During the past decade there has been an explosion in computation and information technology. With it have come vast amounts of data in a variety of fields such as medicine, biology, finance, and marketing. The challenge of understanding these data has led to the development of new tools in the field of statistics, and spawned new areas such as data mining, machine learning, and bioinformatics. Many of these tools have common underpinnings but are often expressed with different terminology. This book describes the important ideas in these areas in a common conceptual framework. While the approach is statistical, the emphasis is on concepts rather than mathematics. Many examples are given, with a liberal use of color graphics. It should be a valuable resource for statisticians and anyone interested in data mining in science or industry. The book's coverage is broad, from supervised learning (prediction) to unsupervised learning. The many topics include neural networks, support vector machines, classification trees and boosting---the first comprehensive treatment of this topic in any book. This major new edition features many topics not covered in the original, including graphical models, random forests, ensemble methods, least angle regression & path algorithms for the lasso, non-negative matrix factorization, and spectral clustering. There is also a chapter on methods for "wide" data (p bigger than n), including multiple testing and false discovery rates. Trevor Hastie, Robert Tibshirani, and Jerome Friedman are professors of statistics at Stanford University. They are prominent researchers in this area: Hastie and Tibshirani developed generalized additive models and wrote a popular book of that title. Hastie co-developed much of the statistical modeling software and environment in R/S-PLUS and invented principal curves and surfaces. Tibshirani proposed the lasso and is co-author of the very successful *An Introduction to the Bootstrap*. Friedman is the co-inventor of many data-mining tools including CART, MARS, projection pursuit and gradient boosting. In a conversational tone, *Regression & Linear Modeling* provides conceptual, user-friendly coverage of the generalized linear model (GLM). Readers will become familiar with applications of ordinary least squares (OLS) regression, binary and multinomial logistic regression, ordinal regression, Poisson regression, and loglinear models. The author returns to certain themes throughout the text, such as testing assumptions, examining data quality, and, where appropriate, nonlinear and non-additive effects modeled within different types of linear models. Available with Perusall—an eBook that makes it easier to prepare for class Perusall is an award-winning eBook platform featuring social annotation tools that allow students and instructors to collaboratively mark up and discuss their SAGE textbook. Backed by research and supported by technological innovations developed at Harvard University, this process of learning through collaborative annotation keeps your students engaged and makes teaching easier and more effective. Learn more. The focus in this Second Edition is again on logistic regression models for individual level data, but aggregate or grouped data are also considered. The book includes detailed discussions of goodness of fit, indices of predictive efficiency, and standardized logistic regression coefficients, and examples using SAS and SPSS are included. More detailed consideration of grouped as opposed to case-wise data throughout the book Updated discussion of the properties and appropriate use of goodness of fit measures, R-square analogues, and indices of predictive efficiency Discussion of the misuse of odds ratios to represent risk ratios, and of over-dispersion and under-dispersion for grouped data Updated coverage of unordered and ordered polytomous logistic regression models. 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 newest versions of IBM SPSS (21) /SAS (9.3) A free online resources site at www.routledge.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. From the reviews of the First Edition. "An interesting, useful, and well-written book on logistic regression models . . . Hosmer and Lemeshow have used very little mathematics, have presented difficult concepts heuristically and through illustrative examples, and have included references." —Choice "Well written, clearly organized, and comprehensive . . . the authors carefully walk the reader through the estimation of interpretation of coefficients from a wide variety of logistic regression models . . . their careful explication of the quantitative re-expression of coefficients from these various models is excellent." —Contemporary Sociology "An extremely well-written book that will certainly prove an invaluable acquisition to the practicing statistician who finds other literature on analysis of discrete data hard to follow or heavily theoretical." —The Statistician In this revised and updated edition of their popular book, David Hosmer and Stanley Lemeshow continue to provide an amazingly accessible introduction to the logistic regression model while incorporating advances of the last decade, including a variety of software packages for the analysis of data sets. Hosmer and Lemeshow extend the discussion from biostatistics and epidemiology to cutting-edge applications in data mining and machine learning, guiding readers step-by-step through the use of modeling techniques for dichotomous data in diverse fields. Ample new topics and expanded discussions of existing material are accompanied by a wealth of real-world examples-with extensive data sets available over the Internet. *Practical Guide to Logistic Regression* covers the key points of the basic logistic regression model and illustrates how to use it properly to model a binary response variable. This powerful methodology can be used to analyze data from various fields, including medical and health outcomes research, business analytics and data science, ecology, fisheries, astronomy, transportation, insurance, economics, recreation, and sports. By harnessing the capabilities of the logistic model, analysts can better understand their data, make appropriate predictions and classifications, and determine the odds of one value of a predictor compared to another. Drawing on his many years of teaching logistic regression, using logistic-based models in research, and writing about the subject, Professor Hilbe focuses on the most important features of the logistic model. Serving as a guide between the author and readers, the book explains how to construct a logistic model, interpret coefficients and odds ratios, predict probabilities and their standard errors based on the model, and evaluate the model as to its fit. Using a variety of real data examples, mostly from health outcomes, the author offers a basic step-by-step guide to developing and interpreting observation and

grouped logistic models as well as penalized and exact logistic regression. He also gives a step-by-step guide to modeling Bayesian logistic regression. R statistical software is used throughout the book to display the statistical models while SAS and Stata codes for all examples are included at the end of each chapter. The example code can be adapted to readers' own analyses. All the code is available on the author's website. This new version of the bestselling Computer-Aided Multivariate Analysis has been appropriately renamed to better characterize the nature of the book. Taking into account novel multivariate analyses as well as new options for many standard methods, *Practical Multivariate Analysis, Fifth Edition* shows readers how to perform multivariate statistical analyses and understand the results. For each of the techniques presented in this edition, the authors use the most recent software versions available and discuss the most modern ways of performing the analysis. New to the Fifth Edition Chapter on regression of correlated outcomes resulting from clustered or longitudinal samples Reorganization of the chapter on data analysis preparation to reflect current software packages Use of R statistical software Updated and reorganized references and summary tables Additional end-of-chapter problems and data sets The first part of the book provides examples of studies requiring multivariate analysis techniques; discusses characterizing data for analysis, computer programs, data entry, data management, data clean-up, missing values, and transformations; and presents a rough guide to assist in choosing the appropriate multivariate analysis. The second part examines outliers and diagnostics in simple linear regression and looks at how multiple linear regression is employed in practice and as a foundation for understanding a variety of concepts. The final part deals with the core of multivariate analysis, covering canonical correlation, discriminant, logistic regression, survival, principal components, factor, cluster, and log-linear analyses. While the text focuses on the use of R, S-PLUS, SAS, SPSS, Stata, and STATISTICA, other software packages can also be used since the output of most standard statistical programs is explained. Data sets and code are available for download from the book's web page and CRC Press Online. With an exciting new look, math diagnostic tool, and a research roadmap to navigate projects, this new edition of Andy Field's award-winning text offers a unique combination of humor and step-by-step instruction to make learning statistics compelling and accessible to even the most anxious of students. The Fifth Edition takes students from initial theory to regression, factor analysis, and multilevel modeling, fully incorporating IBM SPSS Statistics® version 25 and fascinating examples throughout. SAGE edge offers a robust online environment featuring an impressive array of free tools and resources for review, study, and further exploration, keeping both instructors and students on the cutting edge of teaching and learning. Course cartridges available for Blackboard and Moodle. Learn more at edge.sagepub.com/field5e Stay Connected Connect with us on Facebook and share your experiences with Andy's texts, check out news, access free stuff, see photos, watch videos, learn about competitions, and much more. Video Links Go behind the scenes and learn more about the man behind the book at Andy's YouTube channel Andy Field is the award winning author of *An Adventure in Statistics: The Reality Enigma* and is the recipient of the UK National Teaching Fellowship (2010), British Psychological Society book award (2006), and has been recognized with local and national teaching awards (University of Sussex, 2015, 2016). An in-depth, comprehensive and practical guide to egocentric network analysis, focusing on fundamental theoretical, research design, and analytic issues. *Select the Optimal Model for Interpreting Multivariate Data* *Introduction to Multivariate Analysis: Linear and Nonlinear Modeling* shows how multivariate analysis is widely used for extracting useful information and patterns from multivariate data and for understanding the structure of random phenomena. Along with the basic concepts of various procedures in traditional multivariate analysis, the book covers nonlinear techniques for clarifying phenomena behind observed multivariate data. It primarily focuses on regression modeling, classification and discrimination, dimension reduction, and clustering. The text thoroughly explains the concepts and derivations of the AIC, BIC, and related criteria and includes a wide range of practical examples of model selection and evaluation criteria. To estimate and evaluate models with a large number of predictor variables, the author presents regularization methods, including the L1 norm regularization that gives simultaneous model estimation and variable selection. For advanced undergraduate and graduate students in statistical science, this text provides a systematic description of both traditional and newer techniques in multivariate analysis and machine learning. It also

introduces linear and nonlinear statistical modeling for researchers and practitioners in industrial and systems engineering, information science, life science, and other areas. A new edition of the definitive guide to logistic regression modeling for health science and other applications This thoroughly expanded Third Edition provides an easily accessible introduction to the logistic regression (LR) model and highlights the power of this model by examining the relationship between a dichotomous outcome and a set of covariables. *Applied Logistic Regression, Third Edition* emphasizes applications in the health sciences and handpicks topics that best suit the use of modern statistical software. The book provides readers with state-of-the-art techniques for building, interpreting, and assessing the performance of LR models. New and updated features include: A chapter on the analysis of correlated outcome data A wealth of additional material for topics ranging from Bayesian methods to assessing model fit Rich data sets from real-world studies that demonstrate each method under discussion Detailed examples and interpretation of the presented results as well as exercises throughout *Applied Logistic Regression, Third Edition* is a must-have guide for professionals and researchers who need to model nominal or ordinal scaled outcome variables in public health, medicine, and the social sciences as well as a wide range of other fields and disciplines. A clear and concise introduction and reference for anyone new to the subject of statistics. *Probability and Bayesian Modeling* is an introduction to probability and Bayesian thinking for undergraduate students with a calculus background. The first part of the book provides a broad view of probability including foundations, conditional probability, discrete and continuous distributions, and joint distributions. Statistical inference is presented completely from a Bayesian perspective. The text introduces inference and prediction for a single proportion and a single mean from Normal sampling. After fundamentals of Markov Chain Monte Carlo algorithms are introduced, Bayesian inference is described for hierarchical and regression models including logistic regression. The book presents several case studies motivated by some historical Bayesian studies and the authors' research. This text reflects modern Bayesian statistical practice. Simulation is introduced in all the probability chapters and extensively used in the Bayesian material to simulate from the posterior and predictive distributions. One chapter describes the basic tenets of Metropolis and Gibbs sampling algorithms; however several chapters introduce the fundamentals of Bayesian inference for conjugate priors to deepen understanding. Strategies for constructing prior distributions are described in situations when one has substantial prior information and for cases where one has weak prior knowledge. One chapter introduces hierarchical Bayesian modeling as a practical way of combining data from different groups. There is an extensive discussion of Bayesian regression models including the construction of informative priors, inference about functions of the parameters of interest, prediction, and model selection. The text uses JAGS (Just Another Gibbs Sampler) as a general-purpose computational method for simulating from posterior distributions for a variety of Bayesian models. An R package ProbBayes is available containing all of the book datasets and special functions for illustrating concepts from the book. A respected introduction to biostatistics, thoroughly updated and revised The first edition of *Biostatistics: A Methodology for the HealthSciences* has served professionals and students alike as a leading resource for learning how to apply statistical methods to the biomedical sciences. This substantially revised Second Edition brings the book into the twenty-first century for today's aspiring and practicing medical scientist. This versatile reference provides a wide-ranging look at basic and advanced biostatistical concepts and methods in a format calibrated to individual interests and levels of proficiency. Written with an eye toward the use of computer applications, the book examines the design of medical studies, descriptive statistics, and introductory ideas of probability theory and statistical inference; explores more advanced statistical methods; and illustrates important current uses of biostatistics. New to this edition are discussions of Longitudinal data analysis Randomized clinical trials Bayesian statistics GEE The bootstrap method Enhanced by a companion Web site providing data sets, selected problems and solutions, and examples from such current topics as HIV/AIDS, this is a thoroughly current, comprehensive introduction to the field. This is the second of a two-part guide to quantitative analysis using the IBM SPSS Statistics software package; this volume focuses on multivariate statistical methods and advanced forecasting techniques. More often than not, regression models involve more than one independent variable. For example, forecasting methods are commonly applied to aggregates such as inflation rates, unemployment, exchange rates, etc., that have

complex relationships with determining variables. This book introduces multivariate regression models and provides examples to help understand theory underpinning the model. The book presents the fundamentals of multivariate regression and then moves on to examine several related techniques that have application in business-orientated fields such as logistic and multinomial regression. Forecasting tools such as the Box-Jenkins approach to time series modeling are introduced, as well as exponential smoothing and naïve techniques. This part also covers hot topics such as Factor Analysis, Discriminant Analysis and Multidimensional Scaling (MDS). 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 procedures allow social workers and other human services researchers to analyze complex, multidimensional social problems and interventions in ways that minimize oversimplification. This pocket guide provides a concise, practical, and economical introduction to four procedures for the analysis of multiple dependent variables: multivariate analysis of variance (MANOVA), multivariate analysis of covariance (MANCOVA), multivariate multiple regression (MMR), and structural equation modeling (SEM). Each procedure will be presented in a way that allows readers to compare and contrast them in terms of (1) appropriate research context; (2) required statistical assumptions, including levels of measurement of variables to be modeled; (3) analytical steps; (4) sample size; and (5) strengths and weaknesses. This invaluable guide facilitates course extensibility in scope and depth by allowing instructors to supplement course content with rigorous statistical procedures. Detailed annotated examples using Stata, SPSS (PASW), SAS, and Amos, together with additional resources, discussion of key terms, and a companion website, make this an unthreatening guide for producers and consumers of social work research knowledge. Making statistics—and statistical software—accessible and rewarding This book provides readers with step-by-step guidance on running a wide variety of statistical analyses in IBM® SPSS® Statistics, Stata, and other programs. Author David Kremelberg begins his user-friendly text by covering charts and graphs through regression, time-series analysis, and factor analysis. He provides a background of the method, then explains how to run these tests in IBM SPSS and Stata. He then progresses to more advanced kinds of statistics such as HLM and SEM, where he describes the tests and explains how to run these tests in their appropriate software including HLM and AMOS. This is an invaluable guide for upper-level undergraduate and graduate students across the social and behavioral sciences who need assistance in understanding the various statistical packages. Enables readers to start doing actual data analysis fast for a truly hands-on learning experience This concise and very easy-to-use primer introduces readers to a host of computational tools useful for making sense out of data, whether that data come from the social, behavioral, or natural sciences. The book places great emphasis on both data analysis and drawing conclusions from empirical observations. It also provides formulas where needed in many places, while always remaining focused on concepts rather than mathematical abstraction. SPSS Data Analysis for Univariate, Bivariate, and Multivariate Statistics offers a variety of popular statistical analyses and data management tasks using SPSS that readers can immediately apply as needed for their own research, and emphasizes many helpful computational tools used in the discovery of empirical patterns. The book begins with a review of essential statistical principles before introducing readers to SPSS. The book then goes on to offer chapters on: Exploratory Data Analysis, Basic Statistics, and Visual Displays; Data Management in SPSS; Inferential Tests on Correlations, Counts, and Means; Power Analysis and Estimating Sample Size; Analysis of Variance - Fixed and Random Effects; Repeated Measures ANOVA; Simple and Multiple Linear Regression; Logistic Regression; Multivariate Analysis of Variance (MANOVA) and Discriminant Analysis;

Principal Components Analysis; Exploratory Factor Analysis; and Non-Parametric Tests. This helpful resource allows readers to: Understand data analysis in practice rather than delving too deeply into abstract mathematical concepts Make use of computational tools used by data analysis professionals. Focus on real-world application to apply concepts from the book to actual research Assuming only minimal, prior knowledge of statistics, SPSS Data Analysis for Univariate, Bivariate, and Multivariate Statistics is an excellent “how-to” book for undergraduate and graduate students alike. This book is also a welcome resource for researchers and professionals who require a quick, go-to source for performing essential statistical analyses and data management tasks. Despite the recent rapid growth in machine learning and predictive analytics, many of the statistical questions that are faced by researchers and practitioners still involve explaining why something is happening. Regression analysis is the best ‘swiss army knife’ we have for answering these kinds of questions. This book is a learning resource on inferential statistics and regression analysis. It teaches how to do a wide range of statistical analyses in both R and in Python, ranging from simple hypothesis testing to advanced multivariate modelling. Although it is primarily focused on examples related to the analysis of people and talent, the methods easily transfer to any discipline. The book hits a ‘sweet spot’ where there is just enough mathematical theory to support a strong understanding of the methods, but with a step-by-step guide and easily reproducible examples and code, so that the methods can be put into practice immediately. This makes the book accessible to a wide readership, from public and private sector analysts and practitioners to students and researchers. Key Features: • 16 accompanying datasets across a wide range of contexts (e.g. academic, corporate, sports, marketing) • Clear step-by-step instructions on executing the analyses. • Clear guidance on how to interpret results. • Primary instruction in R but added sections for Python coders. • Discussion exercises and data exercises for each of the main chapters. • Final chapter of practice material and datasets ideal for class homework or project work. Most social work researchers are familiar with linear regression techniques, which are fairly straightforward to conduct, interpret, and present. However, linear regression is not appropriate for discrete dependent variables, and social work research frequently employs these variables, focusing on outcomes such as placement in foster care or not; level of severity of elder abuse or depression symptoms; or number of reoffenses by juvenile delinquents in the year following adjudication. This book presents detailed discussions of regression models that are appropriate for a variety of discrete dependent variables. The major challenges of such analyses lie in the non-linear relationships between independent and dependent variables, and particularly in interpreting and presenting findings. Clear language guides the reader briefly through each step of the analysis, using SPSS and result presentation to enhance understanding of the important link function. The book begins with a brief review of linear regression; next, the authors cover basic binary logistic regression, which provides a foundation for the other techniques. In particular, comprehension of the link function is vital in order to later interpret these methods' results. Though the book assumes a basic understanding of linear regression, reviews and definitions throughout provide useful reminders of important terms and their meaning, and throughout the book the authors provide detailed examples based on their own data, which readers may work through by accessing the data and output on companion website. Social work and other social sciences faculty, students, and researchers who already have a basic understanding of linear regression but are not as familiar with the regression analysis of discrete dependent variables will find this straightforward pocket guide to be a terrific boon to their bookshelves. For additional resources, visit <http://www.oup.com/us/pocketguides>. The linear regression model is the most commonly used statistical method in the social sciences. This book considers regression models that are appropriate when the dependent variable is censored, truncated, binary, ordinal, nominal, or count. I refer to these variables as categorical and limited dependent variables (hereafter CLDVs). Until recently, the greatest obstacle in using models for CLDVs was the lack of software that was flexible, stable, and easy to use. This limitation no longer applies since these models can be estimated routinely with standard software. Now, the greatest impediment is the complexity of the models and the difficulty in interpreting the results. The difficulties arise because most models for CLDVs are nonlinear.

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