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Nota di contenuto	Foundations of Linear and Generalized Linear Models; Contents; Preface; Purpose of this book; Use as a textbook; Acknowledgments; 1 Introduction to Linear and Generalized Linear Models; 1.1 Components of a Generalized Linear Model; 1.1.1 Random Component of a GLM; 1.1.2 Linear Predictor of a GLM; 1.1.3 Link Function of a GLM; 1.1.4 A GLM with Identity Link Function is a "Linear Model"; 1.1.5 GLMs for Normal, Binomial, and Poisson Responses; 1.1.6 Advantages of GLMs versus Transforming the Data; 1.2 Quantitative/Qualitative Explanatory Variables and Interpreting Effects 1.2.1 Quantitative and Qualitative Variables in Linear Predictors 1.2.2 Interval, Nominal, and Ordinal Variables; 1.2.3 Interpreting Effects in Linear Models; 1.3 Model Matrices and Model Vector Spaces; 1.3.1 Model Matrices Induce Model Vector Spaces; 1.3.2 Dimension of Model Space Equals Rank of Model Matrix; 1.3.3 Example: The One-Way Layout; 1.4 Identifiability and Estimability; 1.4.1 Identifiability of GLM Model Parameters; 1.4.2 Estimability in Linear Models; 1.5 Example: Using Software to Fit a GLM; 1.5.1 Example: Male Satellites for Female Horseshoe Crabs 1.5.2 Linear Model Using Weight to Predict Satellite Counts 1.5.3 Comparing Mean Numbers of Satellites by Crab Color; Chapter Notes;

Exercises; 2 Linear Models: Least Squares Theory; 2.1 Least Squares Model Fitting; 2.1.1 The Normal Equations and Least Squares Solution; 2.1.2 Hat Matrix and Moments of Estimators; 2.1.3 Bivariate Linear Model and Regression Toward the Mean; 2.1.4 Least Squares Solutions When X Does Not Have Full Rank; 2.1.5 Orthogonal Subspaces and Residuals; 2.1.6 Alternatives to Least Squares; 2.2 Projections of Data Onto Model Spaces; 2.2.1 Projection Matrices 2.2.2 Projection Matrices for Linear Model Spaces 2.2.3 Example: The Geometry of a Linear Model; 2.2.4 Orthogonal Columns and Parameter Orthogonality; 2.2.5 Pythagoras's Theorem Applications for Linear Models; 2.3 Linear Model Examples: Projections and SS Decompositions; 2.3.1 Example: Null Model; 2.3.2 Example: Model for the One-way Layout; 2.3.3 Sums of Squares and ANOVA Table for One-Way Layout; 2.3.4 Example: Model for Two-Way Layout with Randomized Block Design; 2.4 Summarizing Variability in a Linear Model; 2.4.1 Estimating the Error Variance for a Linear Model 2.4.2 Sums of Squares: Error (SSE) and Regression (SSR) 2.4.3 Effect on SSR and SSE of Adding Explanatory Variables; 2.4.4 Sequential and Partial Sums of Squares; 2.4.5 Uncorrelated Predictors: Sequential SS = Partial SS = SSR Component; 2.4.6 R-Squared and the Multiple Correlation; 2.5 Residuals, Leverage, and Influence; 2.5.1 Residuals and Fitted Values Are Uncorrelated; 2.5.2 Plots of Residuals; 2.5.3 Standardized and Studentized Residuals; 2.5.4 Leverages from Hat Matrix Measure Potential Influence; 2.5.5 Influential Points for Least Squares Fits 2.5.6 Adjusting for Explanatory Variables by Regressing Residuals

Sommario/riassunto

"This book presents an overview of the foundations and the key ideas and results of linear and generalized linear models under one cover. Written by a prolific academic, researcher, and textbook writer, Foundations of Linear and Generalized Linear Models is soon to become the gold standard by which all existing textbooks on the topic will be compared. While the emphasis is clearly and succinctly on theoretical underpinnings, applications in "R" are presented when they help to elucidate the content or promote practical model building. Each chapter contains approximately 15-20 exercises, primarily for readers to practice and extend the theory, but, also to assimilate the ideas by doing some data analysis. The carefully crafted models and examples convey basic concepts and do not get mired down in non-trivial considerations. An author-maintained web site includes, among other numerous pedagogical supplements, analyses that parallel the "R" routines from the book in SAS, SPSS and Stata"--
