DESCRIPTION

The essential introduction to the theory and application of linear models—now in a valuable new edition

Since most advanced statistical tools are generalizations of the linear model, it is necessary to first master the linear model in order to move forward to more advanced concepts. The linear model remains the main tool of the applied statistician and is central to the training of any statistician regardless of whether the focus is applied or theoretical. This completely revised and updated new edition successfully develops the basic theory of linear models for regression, analysis of variance, analysis of covariance, and linear mixed models. Recent advances in the methodology related to linear mixed models, generalized linear models, and the Bayesian linear model are also addressed.

Linear Models in Statistics, Second Edition includes full coverage of advanced topics, such as mixed and generalized linear models, Bayesian linear models, two-way models with empty cells, geometry of least squares, vector-matrix calculus, simultaneous inference, and logistic and nonlinear regression. Algebraic, geometrical, frequentist, and Bayesian approaches to both the inference of linear models and the analysis of variance are also illustrated. Through the expansion of relevant material and the inclusion of the latest technological developments in the field, this book provides readers with the theoretical foundation to correctly interpret computer software output as well as effectively use, customize, and understand linear models.

This modern Second Edition features:
New chapters on Bayesian linear models as well as random and mixed linear models

- Expanded discussion of two-way models with empty cells

- Additional sections on the geometry of least squares

- Updated coverage of simultaneous inference

The book is complemented with easy-to-read proofs, real data sets, and an extensive bibliography. A thorough review of the requisite matrix algebra has been added for transitional purposes, and numerous theoretical and applied problems have been incorporated with selected answers provided at the end of the book. A related Web site includes additional data sets and SAS® code for all numerical examples.

Linear Model in Statistics, Second Edition is a must-have book for courses in statistics, biostatistics, and mathematics at the upper-undergraduate and graduate levels. It is also an invaluable reference for researchers who need to gain a better understanding of regression and analysis of variance.

🔥 ABOUT THE AUTHOR

Alvin C. Rencher, PhD, is Professor of Statistics at Brigham Young University. Dr. Rencher is a Fellow of the American Statistical Association and the author of Methods of Multivariate Analysis and Multivariate Statistical Inference and Applications, both published by Wiley.

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NEW TO EDITION

- The book contains easy-to-read proofs and clear explanations of concepts and procedures. Extensive class testing in the first edition has flushed-out errors, inconsistencies, and extraneous subject matter.

- Advanced topics such as mixed and generalized linear models, Bayesian linear models, geometry of least squares, and logistic and nonlinear regression are included in order to show the breadth and depth of the subject matter.

FEATURES

- Special topics such as multiple regression with random x’s and the effect of each variable on R(2) are included.

- Real data sets in most examples are showcased throughout the book and available as downloadable files at an .ftp site.

- Numerous theoretical and applied problems are incorporated, with selected answers placed in an appendix, to challenge the brightest of readers.

- A thorough review of the requisite matrix algebra is added in an appendix for transitional purposes.

- Graphs, charts, tables, SAS output, as well as extensive references, are all provided as pedagogical tools to better understand the material.

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