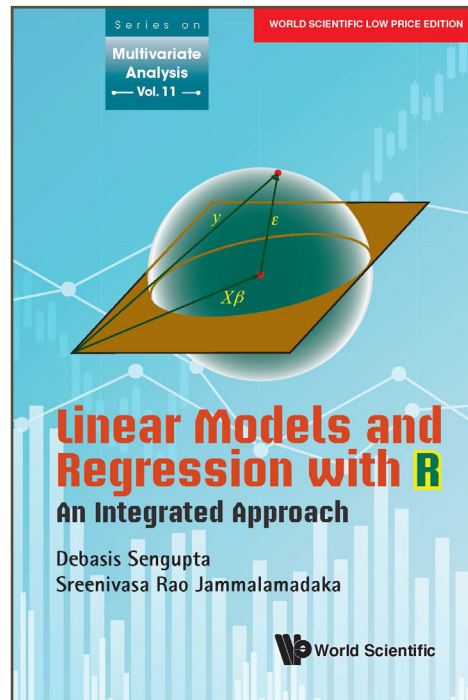


# LINEAR MODELS AND REGRESSION WITH R

## An Integrated Approach

By  
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### ABOUT THE BOOK

Starting with the basic linear model where the design and covariance matrices are of full rank, this book demonstrates how the same statistical ideas can be used to explore the more general linear model with rank-deficient design and/or covariance matrices. The unified treatment presented here provides a clearer understanding of the general linear model from a statistical perspective, thus avoiding the complex matrix-algebraic arguments that are often used in the rank-deficient case. Elegant geometric arguments are used as needed.

The book has a very broad coverage, from illustrative practical examples in Regression and Analysis of Variance alongside their implementation using R, to providing comprehensive theory of the general linear model with 181 worked-out examples, 227 exercises with solutions, 152 exercises without solutions (so that they may be used as assignments in a course), and 320 up-to-date references.

This completely updated and new edition of Linear Models: An Integrated Approach includes the following features:

Applications with data sets, and their implementation in R,

- Comprehensive coverage of regression diagnostics and model building,
- Coverage of other special topics such as collinearity, stochastic and inequality constraints, misspecified models, etc.,
- Use of simple statistical ideas and interpretations to explain advanced concepts, and simpler proofs of many known results,

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- Discussion of models covering mixed-effects/variance components, spatial, and time series data with partially unknown dispersion matrix,
- Thorough treatment of the singular linear model, including the case of multivariate response,
- Insight into updates in the linear model, and their connection with diagnostics, design, variable selection, Kalman filter, etc.,
- Extensive discussion of the foundations of linear inference, along with linear alternatives to least squares.

## READERSHIP

Researchers, lecturers, postgraduates, graduates and undergraduates in statistics and applied mathematics.

## CONTENTS

- Combinatorics and Calculus for Probability
- Basics of Elementary Probability
- Useful Probability Distributions with Applications
- Surprising World of Poisson Probabilities
- Computer Simulation and Probability
- Solutions to Selected Problems

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