

Modern Regression Methods, 2nd edn

T. P. RYAN, 2008
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Although regression is among the most commonly used statistical methods, its users often fail to recognize—to quote Dr Ryan—that

‘there is much more in regression analysis than developing a regression equation’.

Modern Regression Methods argues convincingly that a ‘complete regression analysis’ should always be performed. Such analysis includes

- (a) a test of model improvement following transformation of the response and/or predictors,
- (b) a check of model assumptions,
- (c) a search for outliers and
- (d) a search for influential observations.

Building on this approach, the book starts by discussing the uses and limitations of simple and multiple linear regression (Chapters 1–6). Among the many interesting points that are made here by Dr Ryan, I wish to underline the following:

- (a) the demonstration that a *comprehensive* battery of diagnostic plots is needed before a judgement on model fit can be reached;
- (b) an enlightening discussion of the ‘wrong signs’ problem of the regression coefficients;
- (c) a careful consideration of the limitations of multiple linear regression with random predictors.

Chapter 7 is a short and balanced review of the main techniques for the selection of regressors and Chapter 8 discusses how polynomial and trigonometric terms can be employed alone or together to model non-linear relationships. Chapter 9 on logistic regression is unique in that it offers a practical comparison of maximum likelihood, conditional maximum likelihood and partial maximum likelihood logistic regression which cannot be found in any other textbook.

Chapters 10–14 are well-structured accounts of non-parametric regression, robust regression, ridge regression, non-linear regression and experimental designs for regression. Although these chapters are more mathematical than others, there is no doubt that the presentation of these important methods is more accessible here than in most other textbooks. Chapter 15 is a review of regression techniques that are not covered by previous chapters, e.g. quantile regression. Although they are not dealt with in detail, the reader is given very clear indications about

their uses and limitations, and an updated bibliography. I suggest that every user of regression methods, novice or advanced, gives a careful reading to Chapter 16, which analyses five data sets with the aim of helping the reader to develop a comprehensive regression modelling approach. (These data sets along with other data and MINITAB macros can be downloaded from the publisher’s site.)

In conclusion, although *Modern Regression Methods* was written having in mind mostly ‘undergraduates in statistics, mathematics and physical sciences’, more advanced users may also benefit from its comprehensiveness and from its highly structured and practical approach.

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Lattice: Multivariate Data Visualization with R

D. SARKAR, 2008
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Deepayan Sarkar’s *Lattice: Multivariate Data Visualization with R* is a fantastic addition to Springer’s ‘Use R!’ series. As the creator of the Lattice package, Sarkar is well qualified for writing this text: his knowledge is reflected in the breadth of topics and the depth in which they are covered. The book will be of interest to intermediate and advanced users of R looking to expand their data visualization beyond the basic R graphics functions.

The book and its companion Web site (<http://lmdvr.r-forge.r-project.org>) provide a comprehensive insight into Lattice, which is an R data visualization package based on the Trellis suite from S and S-PLUS. In the tradition of ‘Use R!’, the book and Web site provide all the code and data that are required to replicate the many examples. The book’s preface refers novice R users to the first chapter of Dalgaard (2008) to gain the prerequisite knowledge. I would also suggest that inexperienced readers familiarize themselves with a data set and have an idea of how they would like to visualize it. This will help to target the reading of the book, as many of the chapters go beyond the requirements of the majority of R users.

Chapters 1 and 2 are essential for those new to Lattice. They provide insight into the logic behind the package and the basic functions that are required to use it. Chapters 3–6 cover the topics that are of most interest to routine R users, including captions, legends, labels, density plots, histograms,