Preface

The success of the open-source statistical software "*R*" has made a significant impact on the teaching and research of statistics in the last decade. Analysing data is now easier and more affordable than ever, but choosing the most appropriate statistical methods remains a challenge for many users. To understand and interpret software output, it is necessary to engage with the fundamentals of statistics.

However, many readers do not feel comfortable with complicated mathematics. In this book, we attempt to find a healthy balance between explaining statistical concepts comprehensively and showing their application and interpretation using *R*.

This book will benefit beginners and self-learners from various backgrounds as we complement each chapter with various exercises and detailed and comprehensible solutions. The results involving mathematics and rigorous proofs are separated from the main text, where possible, and are kept in an appendix for interested readers. Our textbook covers material that is generally taught in introductory-level statistics courses to students from various backgrounds, including sociology, biology, economics, psychology, medicine, and others. Most often, we introduce the statistical concepts using examples and illustrate the calculations both manually and using *R*.

However, while we provide a gentle introduction to *R* (in the appendix), this is not a software book. Our emphasis lies on explaining statistical concepts correctly and comprehensively, using exercises and software to delve deeper into the subject matter and learn about the conceptual challenges that the methods present.

This book's homepage, http://chris.userweb.mwn.de/book/, contains additional material, most notably the software codes needed to answer the software exercises, and data sets. In the remainder of this book, we will use grey boxes

```
R-command()                                                    ℝ
```

to introduce the relevant *R* commands. In many cases, the code can be directly pasted into *R* to reproduce the results and graphs presented in the book; in others, the code is abbreviated to improve readability and clarity, and the detailed code can be found online.

Many years of teaching experience, from undergraduate to postgraduate level, went into this book. The authors hope that the reader will enjoy reading it and find it a useful reference for learning. We welcome critical feedback to improve future editions of this book. Comments can be sent to `christian.heumann@stat.uni-muenchen.de`, `shalab@iitk.ac.in`, and `michael.schomaker@uct.ac.za` who contributed equally to this book.

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München, Germany   Christian Heumann
Cape Town, South Africa   Michael Schomaker
Kanpur, India   Shalabh
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