

Preface

Approach

Elementary Statistics: A Step by Step Approach was written as an aid in the beginning statistics course to students whose mathematical background is limited to basic algebra. The book follows a nontheoretical approach without formal proofs, explaining concepts intuitively and supporting them with abundant examples. The applications span a broad range of topics certain to appeal to the interests of students of diverse backgrounds and include problems in business, sports, health, architecture, education, entertainment, political science, psychology, history, criminal justice, the environment, transportation, physical sciences, demographics, eating habits, and travel and leisure.

About This Book

While a number of important changes have been made in the seventh edition, the learning system remains untouched and provides students with a useful framework in which to learn and apply concepts. Some of the retained features include the following:

- **Over 1800** exercises are located at the end of major sections within each chapter.
- **Hypothesis-Testing Summaries** are found at the end of Chapter 9 (z , t , χ^2 , and F tests for testing means, proportions, and variances), Chapter 12 (correlation, chi-square, and ANOVA), and Chapter 13 (nonparametric tests) to show students the different types of hypotheses and the types of tests to use.
- A **Data Bank** listing various attributes (educational level, cholesterol level, gender, etc.) for 100 people and several additional data sets using real data are included and referenced in various exercises and projects throughout the book.
- An updated **reference card** containing the formulas and the z , t , χ^2 , and PPMC tables is included with this textbook.
- End-of-chapter **Summaries, Important Terms, and Important Formulas** give students a concise summary of the chapter topics and provide a good source for quiz or test preparation.
- **Review Exercises** are found at the end of each chapter.
- Special sections called **Data Analysis** require students to work with a data set to perform various statistical tests or procedures and then summarize the results. The data are included in the Data Bank in Appendix D and can be downloaded from the book's website at www.mhhe.com/bluman.
- **Chapter Quizzes**, found at the end of each chapter, include multiple-choice, true/false, and completion questions along with exercises to test students' knowledge and comprehension of chapter content.
- The **Appendixes** provide students with an essential algebra review, an outline for report writing, Bayes' theorem, extensive reference tables, a glossary, and answers to all quiz questions, all odd-numbered exercises, selected even-numbered exercises, and an alternate method for using the standard normal distribution.

Changes in the Seventh Edition

- The **Applying the Concepts** feature is included in all sections and gives students an opportunity to think about the new concepts and apply them to hypothetical examples and scenarios similar to those found in newspapers, magazines, and radio and television news programs.

This edition of *Elementary Statistics* is updated and improved for students and instructors in the following ways:

- **Over 300** new exercises have been added, **most using real data**, and many exercises now incorporate thought-provoking questions requiring students to interpret their results.
- Titles have been given to each application example and each exercise problem to emphasize their real-world relevance.
- Six new **Speaking of Statistics** topics have been included.
- An explanation of bar graphs has been added to Chapter 2 since bar graphs are one of the most commonly used graphs in statistics, and they are slightly different from Pareto charts.
- Over 40 examples have been replaced with new ones. Most use real data.
- Two graphs have been added to the explanation of the chi-square distribution in Chapter 7 to help clarify the nature of the distribution and how the distribution is related to the chi-square table.
- The **Excel Technology Step by Step** boxes have been updated to reflect Microsoft Excel 2007.
- The shortcut formula for the standard deviation has been changed. The formula used

now is $s = \sqrt{\frac{n(\sum X^2) - (\sum X)^2}{n(n-1)}}$, which is the one used in most other statistics books.

It also avoids the complex fraction used in the other formula $s = \sqrt{\frac{\sum X^2 - [(\sum X)^2/n]}{n-1}}$.

Many reviewers have stated that they like the first formula better than the second one.

- The cumulative standard normal distribution is used throughout the book.
- The null hypothesis is stated using the equals sign in all cases where appropriate.
- When σ or σ_1 and σ_2 are known, the z tests are used in hypothesis testing. When σ or σ_1 and σ_2 are unknown, the t tests are used in hypothesis testing.
- The F test for two variances is no longer used before the t test for the difference between two means when σ_1 and σ_2 are unknown.
- The **Data Projects** at the end of each chapter are all new and are specific to the areas of Business and Finance, Sports and Leisure, Technology, Health and Wellness, Politics and Economics, and Your Class.

Acknowledgments

It is important to acknowledge the many people whose contributions have gone into the Seventh Edition of *Elementary Statistics*. Very special thanks are due to Jackie Miller of The Ohio State University for her provision of the Index of Applications, her exhaustive accuracy check of the page proofs, and her general availability and advice concerning all matters statistical. The Technology Step by Step sections were provided by Gerry Moultime of Northwood University (MINITAB), John Thomas of College of Lake County (Excel), and Michael Keller of St. Johns River Community College (TI-83 Plus and TI-84 Plus).

I would also like to thank Diane P. Cope for providing the new exercises, Kelly Jackson for writing the new Data Projects, and Sally Robinson for error checking, adding technology-accurate answers to the answer appendix, and writing the Solutions Manuals.

Finally, at McGraw-Hill Higher Education, thanks to Dawn Bercier, Sponsoring Editor; Michelle Driscoll, Developmental Editor; John Osgood, Marketing Manager; Vicki Krug, Senior Project Manager; Amber Beltcher, Digital Product Manager; and Sandra Schnee, Senior Media Project Manager.

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Special thanks for their advice and recommendations for revisions found in the Seventh Edition go to

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Special thanks for their advice and recommendations for revisions found in the Fifth and Sixth Editions go to

Rosalie Abraham, *Florida Community College-North*
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Trania Aquino, *Del Mar College*
Rona Axelrod, *Edison Community College*
Mark D. Baker, M.S., *Illinois State University*
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Cassandra L. Vincent, *Plattsburgh State University*
David Wallach, *Findlay University*
Cheng Wang, *Nova Southeastern University*