

- Preface p. xv
- 1 Introduction to Data Analysis and Decision Making p. 2
 - 1. Introduction p. 4
 - 2. An Overview of the Book p. 6
 - 3. A Sampling of Examples p. 13
 - 4. Modeling and Models p. 24
 - 5. Conclusion p. 29
 - Case Study: Entertainment on a Cruise Ship p. 30
- 2 Describing Data: Graphs and Tables p. 32
 - 1. Introduction p. 34
 - 2. Basic Concepts p. 35
 - 3. Frequency Tables and Histograms p. 39
 - 4. Analyzing Relationships with Scatterplots p. 50
 - 5. Time Series Plots p. 54
 - 6. Exploring Data with Pivot Tables p. 59
 - 7. Conclusion p. 68
 - Case Study: Customer Arrivals at Bank98 p. 74
 - Case Study: Automobile Production and Purchases p. 74
 - Case Study: Saving, Spending, and Social Climbing p. 75
- 3 Describing Data: Summary Measures p. 76
 - 1. Introduction p. 78
 - 2. Measures of Central Location p. 78
 - 3. Quartiles and Percentiles p. 80
 - 4. Minimum, Maximum, and Range p. 81
 - 5. Measures of Variability: Variance and Standard Deviation p. 82
 - 6. Obtaining Summary Measures with Add-Ins p. 86
 - 7. Measures of Association: Covariance and Correlation p. 91
 - 8. Describing Data Sets with Boxplots p. 95
 - 9. Applying the Tools p. 99
 - 10. Conclusion p. 116
 - Case Study: The Dow Jones Averages p. 124
 - Case Study: Other Market Indexes p. 126
- 4 Probability and Probability Distributions p. 128
 - 1. Introduction p. 130
 - 2. Probability Essentials p. 131
 - 3. Distribution of a Single Random Variable p. 137
 - 4. An Introduction to Simulation p. 141
 - 5. Subjective Versus Objective Probabilities p. 146
 - 6. Derived Probability Distributions p. 148
 - 7. Distribution of Two Random Variables: Scenario Approach p. 152
 - 8. Distribution of Two Random Variables: Joint Probability Approach p. 159
 - 9. Independent Random Variables p. 159
 - 10. Weighted Sums of Random Variables p. 174
 - 11. Conclusion p. 181
 - Case Study: Simpson's Paradox p. 190
- 5 Normal, Binomial, and Poisson Distributions p. 192

- 1. Introduction p. 194
- 2. The Normal Distribution p. 195
- 3. Applications of the Normal Distribution p. 204
- 4. The Binomial Distribution p. 216
- 5. Applications of the Binomial Distribution p. 220
- 6. The Poisson Distribution p. 232
- 7. Fitting a Probability Distribution to Data: BestFit p. 236
- 8. Conclusion p. 239
- Case Study: EuroWatch Company p. 245
- Case Study: Cashing in on the Lottery p. 246
- 6 Decision Making Under Uncertainty p. 248
- 1. Introduction p. 250
- 2. Elements of a Decision Analysis p. 251
- 3. The Precision Tree Add-In p. 262
- 4. Introduction to Influence Diagrams p. 272
- 5. More Single-Stage Examples p. 278
- 6. Multistage Decision Problems p. 288
- 7. Bayes' Rule p. 297
- 8. Incorporating Attitudes Toward Risk p. 305
- 9. Conclusion p. 313
- Case Study: Jogger Shoe Company p. 324
- 7 Sampling and Sampling Distributions p. 327
- 1. Introduction p. 328
- 2. Sampling Terminology p. 328
- 3. Methods for Selecting Random Samples p. 331
- 4. An Introduction to Estimation p. 345
- 5. Conclusion p. 362
- Case Study: Sampling from Videocassette Renters p. 371
- 8 Confidence Interval Estimation p. 372
- 1. Introduction p. 374
- 2. Sampling Distributions p. 375
- 3. Confidence Interval for a Mean p. 379
- 4. Confidence Interval for a Total p. 384
- 5. Confidence Interval for a Proportion p. 387
- 6. Confidence Interval for a Standard Deviation p. 392
- 7. Confidence Interval for the Difference Between Means p. 396
- 8. Confidence Interval for the Difference Between Proportions p. 409
- 9. Controlling Confidence Interval Length p. 416
- 10. Conclusion p. 424
- Case Study: Harrigan University Admissions p. 431
- Case Study: Employee Retention at D and Y p. 432
- Case Study: Delivery Times at SnowPea Restaurant p. 433
- Case Study: The Bodfish Lot Cruise p. 434
- 9 Hypothesis Testing p. 436
- 1. Introduction p. 438
- 2. Concepts in Hypothesis Testing p. 439

- 3. Hypothesis Tests for a Population Mean p. 445
- 4. Hypothesis Tests for Other Parameters p. 455
- 5. One-Way ANOVA p. 476
- 6. Tests for Normality p. 483
- 7. Conclusion p. 489
- Case Study: Regression Toward the Mean p. 494
- Case Study: Baseball Statistics p. 495
- Case Study: The Wichita Anti-Drunk Driving Advertising Campaign p. 495
- 10 Statistical Process Control p. 498
- 1. Introduction p. 501
- 2. Deming's 14 Points p. 502
- 3. Basic Ideas Behind Control Charts p. 505
- 4. Control Charts for Variables p. 507
- 5. Control Charts for Attributes p. 527
- 6. Process Capability p. 535
- 7. Conclusion p. 546
- Case Study: The Lamination Process at Intergalactica p. 551
- Case Study: Paper Production for Fornax at the Pluto Mill p. 553
- 11 Regression Analysis: Estimating Relationships p. 560
- 1. Introduction p. 562
- 2. Scatterplots: Graphing Relationships p. 564
- 3. Correlations: Indicators of Linear Relationships p. 573
- 4. Simple Linear Regression p. 575
- 5. Multiple Regression p. 585
- 6. Modeling Possibilities p. 591
- 7. Validation of the Fit p. 617
- 8. Conclusion p. 619
- Case Study: Quantity Discounts at the FirmChair Company p. 626
- Case Study: Housing Price Structure in MidCity p. 626
- Case Study: Demand for French Bread at Howie's p. 627
- Case Study: Investing for Retirement p. 627
- 12 Regression Analysis: Statistical Inference p. 628
- 1. Introduction p. 630
- 2. The Statistical Model p. 631
- 3. Inferences About the Regression Coefficients p. 634
- 4. Multicollinearity p. 640
- 5. Include/Exclude Decisions p. 644
- 6. Stepwise Regression p. 649
- 7. A Test for the Overall Fit: The ANOVA Table p. 654
- 8. The Partial F Test p. 658
- 9. Outliers p. 667
- 10. Violations of Regression Assumptions p. 673
- 11. Prediction p. 677
- 12. Conclusion p. 685
- Case Study: The Artsy Corporation p. 696
- Case Study: Heating Oil at Dupree Fuels Company p. 697

- Case Study: Developing a Flexible Budget at the Gunderson Plant p. 699
- Case Study: Forecasting Overhead at Wagner Printers p. 700
- 13 Time Series Analysis and Forecasting p. 702
 - 1. Introduction p. 704
 - 2. Forecasting Methods: An Overview p. 705
 - 3. Random Series p. 709
 - 4. The Random Walk Model p. 719
 - 5. Autoregression Models p. 723
 - 6. Regression-Based Trend Models p. 729
 - 7. Moving Averages p. 736
 - 8. Exponential Smoothing p. 742
 - 9. Deseasonalizing: The Ratio-to-Moving-Averages Method p. 756
 - 10. Estimating Seasonality with Regression p. 760
 - 11. Econometric Models p. 765
 - 12. Conclusion p. 766
- Case Study: Arrivals at the Credit Union p. 770
- Case Study: Forecasting Weekly Sales at Amanta p. 770
- 14 Introduction to Optimization Modeling p. 772
 - 1. Introduction p. 774
 - 2. A Brief History of Linear Programming p. 774
 - 3. Introduction to LP Modeling p. 775
 - 4. Sensitivity Analysis and the SolverTable Add-In p. 783
 - 5. The Linear Assumptions p. 789
 - 6. Graphical Solution Method p. 791
 - 7. Infeasibility and Unboundedness p. 795
 - 8. A Multiperiod Production Problem p. 797
 - 9. A Decision Support System p. 804
 - 10. Conclusion p. 805
- Case Study: Shelby Shelving p. 811
- 15 Optimization Modeling: Applications p. 814
 - 1. Introduction p. 816
 - 2. Static Workforce Scheduling p. 817
 - 3. Blending Models p. 823
 - 4. Logistics Models p. 830
 - 5. Aggregate Planning Models p. 841
 - 6. A Dynamic Financial Model p. 849
 - 7. Integer Programming Models p. 854
 - 8. Nonlinear Models p. 870
 - 9. Conclusion p. 879
- Case Study: Giant Motor Company p. 884
- Case Study: GMS Stock Hedging p. 886
- Case Study: Durham Asset Management p. 888
- 16 Simulation Models p. 890
 - 1. Introduction p. 892
 - 2. Random Numbers p. 893
 - 3. Introduction to Spreadsheet Simulation p. 895

- 4. Simulating from Other Probability Distributions p. 902
- 5. Simulating with @Risk p. 911
- 6. A Financial Planning Model p. 925
- 7. A Cash Balance Model p. 933
- 8. Simulating Stock Prices and Options p. 938
- 9. A Market Share Model p. 952
- 10. Simulating Correlated Values p. 959
- 11. Using TopRank with @Risk for Powerful Modeling p. 965
- 12. Conclusion p. 974
- Case Study: Ski Jacket Production p. 983
- Case Study: The College Fund Investment Decision p. 984
- Case Study: Ebony Bath Soap p. 984
- Case Study: Bond Investment Strategy p. 985
- References p. 987
- Index p. 989