

CONTENTS

Preface vi

Unit A: Data 1

Chapter 1. Collecting Data 2

- 1.1. The Structure of Data 4
- 1.2. Sampling from a Population 16
- 1.3. Experiments and Observational Studies 29

Chapter 2. Describing Data 46

- 2.1. Categorical Variables 48
- 2.2. One Quantitative Variable: Shape and Center 63
- 2.3. One Quantitative Variable: Measures of Spread 77
- 2.4. Boxplots and Quantitative/Categorical Relationships 93
- 2.5. Two Quantitative Variables: Scatterplot and Correlation 106
- 2.6. Two Quantitative Variables: Linear Regression 123
- 2.7. Data Visualization and Multiple Variables 137

Unit A: Essential Synthesis 161

Review Exercises 174

Projects Online

Unit B: Understanding Inference 193

Chapter 3. Confidence Intervals 194

- 3.1. Sampling Distributions 196
- 3.2. Understanding and Interpreting Confidence Intervals 213
- 3.3. Constructing Bootstrap Confidence Intervals 228
- 3.4. Bootstrap Confidence Intervals using Percentiles 242

Chapter 4. Hypothesis Tests 256

- 4.1. Introducing Hypothesis Tests 258
- 4.2. Measuring Evidence with P-values 272
- 4.3. Determining Statistical Significance 288
- 4.4. A Closer Look at Testing 303
- 4.5. Making Connections 318

Unit B: Essential Synthesis 341

Review Exercises 351

Projects Online

Unit C: Inference with Normal and t-Distributions 369**Chapter 5. Approximating with a Distribution** 370

- 5.1. Hypothesis Tests Using Normal Distributions 372
- 5.2. Confidence Intervals Using Normal Distributions 387

Chapter 6. Inference for Means and Proportions 402

- 6.1. Inference for a Proportion
 - 6.1-D Distribution of a Proportion 404
 - 6.1-CI Confidence Interval for a Proportion 407
 - 6.1-HT Hypothesis Test for a Proportion 414
- 6.2. Inference for a Mean
 - 6.2-D Distribution of a Mean 419
 - 6.2-CI Confidence Interval for a Mean 424
 - 6.2-HT Hypothesis Test for a Mean 433
- 6.3. Inference for a Difference in Proportions
 - 6.3-D Distribution of a Difference in Proportions 438
 - 6.3-CI Confidence Interval for a Difference in Proportions 441
 - 6.3-HT Hypothesis Test for a Difference in Proportions 446
- 6.4. Inference for a Difference in Means
 - 6.4-D Distribution of a Difference in Means 452
 - 6.4-CI Confidence Interval for a Difference in Means 455
 - 6.4-HT Hypothesis Test for a Difference in Means 461
- 6.5. Paired Difference in Means 468

Unit C: Essential Synthesis 477

- Review Exercises 489
- Projects Online

Unit D: Inference for Multiple Parameters 505**Chapter 7. Chi-Square Tests for Categorical Variables** 506

- 7.1. Testing Goodness-of-Fit for a Single Categorical Variable 508
- 7.2. Testing for an Association between Two Categorical Variables 523

Chapter 8. ANOVA to Compare Means 538

- 8.1. Analysis of Variance 540
- 8.2. Pairwise Comparisons and Inference after ANOVA 563

Chapter 9. Inference for Regression 574

- 9.1. Inference for Slope and Correlation 576
- 9.2. ANOVA for Regression 591
- 9.3. Confidence and Prediction Intervals 603

Chapter 10. Multiple Regression 610

- 10.1. Multiple Predictors 612
- 10.2. Checking Conditions for a Regression Model 624
- 10.3. Using Multiple Regression 633

Unit D: Essential Synthesis 647

- Review Exercises 661
- Projects Online

The Big Picture: Essential Synthesis 669

- Exercises for the Big Picture: Essential Synthesis 683

Chapter P. Probability Basics 688

- P.1. Probability Rules 690
- P.2. Tree Diagrams and Bayes' Rule 702
- P.3. Random Variables and Probability Functions 709
- P.4. Binomial Probabilities 716
- P.5. Density Curves and the Normal Distribution 724

Appendix A. Chapter Summaries 737**Appendix B. Selected Dataset Descriptions 749****Partial Answers 761****Index 000**

- General Index 000
- Data Index 000