

## TABLE OF CONTENTS

### Front Matter

- TitlePage
- InfoPage

### Licensing

### Back Matter

- Index

## 1: The Nature of Statistics

- 1.0: Introduction
- 1.1: Descriptive and Inferential Statistics
- 1.2: Variables and Types of Data
  - 1.2.1: Levels of Measurement
- 1.3: Data Collection and Sampling Techniques
- 1.5: Computers and Calculators
  - 1.5.1: Using Spreadsheets for Statistics
- 1.4: Experimental Design and Ethics
  - 1.4.1: More on Experiments
  - 1.4.2: Observational Studies and Sampling Strategies
- 1.E: Sampling and Data (Optional Exercises)
- Index

## 2: Frequency Distributions and Graphs

- 2.0: Prelude to Graphs
- 2.2: Histograms, Ogives, and Frequency Polygons
  - 2.2.1: Frequency Polygons and Time Series Graphs
- 2.3: Other Types of Graphs
  - 2.3.1: Stem-and-Leaf Graphs (Stemplots), Line Graphs, and Bar Graphs
  - 2.3.2: Dot Plots
  - 2.3.3: Guide to Fairly Good Graphs
  - 2.3.4: Presenting Data in Tables
- 2.1: Organizing Data - Frequency Distributions
- 2.E: Graphs (Optional Exercises)
- Index

## 3: Data Description

- 3.0: Prelude to Descriptive Statistics
- 3.1: Measures of the Center of the Data
  - 3.1.1: Skewness and the Mean, Median, and Mode
- 3.2: Measures of Variation
  - 3.2.1: Coefficient of Variation
  - 3.2.2: The Empirical Rule and Chebyshev's Theorem

- 3.3: Measures of Position
  - 3.3.1: Measures of Location- Deciles
  - 3.3.2: Z-scores
- 3.4: Exploratory Data Analysis
- 3.E: Descriptive Statistics (Optional Exercises)
  - 3.E: Measures of Position (Optional Exercises)
- Index

## 4: Probability and Counting

- 4.1: Sample Spaces and Probability
  - 4.1.1: Introduction to Probability
  - 4.1.2: Terminology
- 4.2: Independent and Mutually Exclusive Events
- 4.3: The Addition and Multiplication Rules of Probability
  - 4.3.1: Contingency Tables
  - 4.3.2: Tree and Venn Diagrams
- 4.4: Counting Rules
  - 4.4.1: Permutations
  - 4.4.2: Permutations with Similar Elements
  - 4.4.3: Combinations
- 4.5: Probability And Counting Rules
- 4.E: Probability Topics (Optional Exercises)
  - 4.E: Combinations (Optional Exercises)
  - 4.E: Permutations (Optional Exercises)
  - 4.E: Permutations with Similar Elements (Optional Exercises)
  - 4.E: Probability Using Tree Diagrams and Combinations (Optional Exercises)
  - 4.E: Tree Diagrams and the Multiplication Axiom (Optional Exercises)
- Index

## 5: Discrete Probability Distributions

- 5.0: Prelude to Discrete Random Variables
- 5.1: Probability Distribution Function (PDF) for a Discrete Random Variable
- 5.2: Mean or Expected Value and Standard Deviation
- 5.3: Binomial Distribution
  - 5.4.1: Binomial Distribution Formula
- 5.E: Discrete Random Variables (Optional Exercises)

## 6: Continuous Random Variables and the Normal Distribution

- 6.0: Introduction
  - 6.0.1: Continuous Probability Functions
  - 6.0.2: The Uniform Distribution
- 6.1: The Normal Distribution
  - 6.1.1: The Standard Normal Distribution
- 6.2: Applications of the Normal Distribution
- 6.3: The Central Limit Theorem
- 6.4: Normal Approximation to the Binomial Distribution
- 6.E: The Normal Distribution (Optional Exercises)

- 6.E: The Central Limit Theorem for Sample Means (Optional Exercises)
- 6.E: The Standard Normal Distribution (Optional Exercises)

## 7: Confidence Intervals and Sample Size

- 7.1: Confidence Intervals
- 7.2: Confidence Intervals for the Mean with Known Standard Deviation
- 7.3: Confidence Intervals for the Mean with Unknown Standard Deviation
- 7.4: Confidence Intervals and Sample Size for Proportions
- 7.5: Confidence Intervals (Summary)
- 7.E: Confidence Intervals (Optional Exercises)
  - 7.E: Confidence Intervals for the Mean with Known Standard Deviation (Optional Exercises)

## 8: Hypothesis Testing with One Sample

- 8.1: Steps in Hypothesis Testing
  - 8.1.1: Null and Alternative Hypotheses
  - 8.1.2: Outcomes and the Type I and Type II Errors
  - 8.1.3: Distribution Needed for Hypothesis Testing
  - 8.1.4: Rare Events, the Sample, Decision and Conclusion
  - 8.1.5: Additional Information on Hypothesis Tests
- 8.2: Hypothesis Test Examples for Means
- 8.3: Hypothesis Test Examples for Means with Unknown Standard Deviation
- 8.4: Hypothesis Test Examples for Proportions
- 8.E: Hypothesis Testing (Optional Exercises)
  - 8.E: Distribution Needed for Hypothesis Testing (Optional Exercises)
  - 8.E: Hypothesis Testing with One Sample (Optional Exercises)
  - 8.E: Null and Alternative Hypotheses (Optional Exercises)
  - 8.E: Outcomes and the Type I and Type II Errors (Optional Exercises)
  - 8.E: Rare Events, the Sample, Decision and Conclusion (Optional Exercises)

## 9: Inferences with Two Samples

- 9.1: Prelude to Hypothesis Testing with Two Samples
- 9.2: Inferences for Two Population Means- Large, Independent Samples
- 9.3: Inferences for Two Population Means - Unknown Standard Deviations
- 9.4: Inferences for Two Population Means - Paired Samples
- 9.5: Inferences for Two Population Proportions
- 9.6: Which Analysis Should You Conduct?
- 9.E: Hypothesis Testing with Two Samples (Optional Exercises)

## 10: Correlation and Regression

- 10.0: Prelude to Linear Regression and Correlation
  - 10.1.1: Review- Linear Equations
  - 10.1.2: Scatter Plots
- 10.1: Testing the Significance of the Correlation Coefficient
- 10.2: The Regression Equation
  - 10.2.1: Prediction
- 10.3: Outliers
- 10.E: Linear Regression and Correlation (Optional Exercises)
  - 10.E: Linear Equations (Optional Exercises)

- 10.E: Outliers (Optional Exercises)
- 10.E: Prediction (Optional Exercises)
- 10.E: Scatter Plots (Optional Exercises)
- 10.E: Testing the Significance of the Correlation Coefficient (Optional Exercises)
- 10.E: The Regression Equation (Optional Exercise)

## 11: Chi-Square and Analysis of Variance (ANOVA)

- 11.0: Prelude to The Chi-Square Distribution
  - 11.0.1: Facts About the Chi-Square Distribution
- 11.1: Goodness-of-Fit Test
- 11.2: Tests Using Contingency tables
  - 11.2.1: Test of Independence
  - 11.2.2: Test for Homogeneity
  - 11.2.3: Comparison of the Chi-Square Tests
- 11.3: Prelude to F Distribution and One-Way ANOVA
  - 11.3.1: One-Way ANOVA
  - 11.3.2: The F Distribution and the F-Ratio
  - 11.3.3: Facts About the F Distribution
  - 11.3.4: How to Use Microsoft Excel® for Regression Analysis
- 11.E: F Distribution and One-Way ANOVA (Optional Exercises)
- 11.E: The Chi-Square Distribution (Optional Exercises)

## 12: Nonparametric Statistics

- 12.1: Benefits of Distribution Free Tests
- 12.2: Randomization Tests - Two Conditions
- 12.3: Randomization Tests - Two or More Conditions
- 12.4: Randomization Association
- 12.5: Fisher's Exact Test
- 12.6: Rank Randomization Two Conditions
- 12.7: Rank Randomization Two or More Conditions
- 12.8: Rank Randomization for Association
- 12.9: Statistical Literacy Standard
- 12.10: Wilcoxon Signed-Rank Test
- 12.11: Kruskal–Wallis Test
- 12.12: Spearman Rank Correlation
- 12.13: Choosing the Right Test
- 12.E: Distribution Free Tests (Exercises)

## 13: Appendices

- 13.1: A | Statistical Table- Standard Normal (Z)
- 13.2: A | Statistical Table- Student t Distribution
- 13.3: A | Statistical Table- Chi-Square Distribution
- 13.4: A | Statistical Table- F Distribution
- 13.5: B | Mathematical Phrases, Symbols, and Formulas

## Index

[Glossary](#)

[Detailed Licensing](#)