
Contents

Preface	vii
0 What Is a Statistical Model?	1
0.1 Fundamental Terminology	3
0.2 Four-Step Process	7
0.3 Chapter Summary	12
0.4 Exercises	13
 Unit A: Linear Regression	
1 Simple Linear Regression	25
1.1 The Simple Linear Regression Model	25
1.2 Conditions for a Simple Linear Model	30
1.3 Assessing Conditions	33
1.4 Transformations	39
1.5 Outliers and Influential Points	46
1.6 Chapter Summary	53
1.7 Exercises	55
2 Inference for Simple Linear Regression	67
2.1 Inference for Regression Slope	67
2.2 Partitioning Variability—ANOVA	70
2.3 Regression and Correlation	73
2.4 Intervals for Predictions	76
2.5 Chapter Summary	79
2.6 Exercises	81
3 Multiple Regression	95
3.1 Multiple Linear Regression Model	97
3.2 Assessing a Multiple Regression Model	100
3.3 Comparing Two Regression Lines	106
3.4 New Predictors from Old	117

3.5 Correlated Predictors	127
3.6 Testing Subsets of Predictors	134
3.7 Case Study: Predicting in Retail Clothing	138
3.8 Chapter Summary	147
3.9 Exercises	149
4 Additional Topics in Regression	165
4.1 Topic: Added Variable Plots	165
4.2 Topic: Techniques for Choosing Predictors	169
4.3 Topic: Identifying Unusual Points in Regression	180
4.4 Topic: Coding Categorical Predictors	189
4.5 Topic: Randomization Test for a Relationship	198
4.6 Topic: Bootstrap for Regression	202
4.7 Exercises	208

Unit B: Analysis of Variance

5 One-Way ANOVA	221
5.1 The One-Way Model: Comparing Groups	223
5.2 Assessing and Using the Model	232
5.3 Scope of Inference	241
5.4 Fisher's Least Significant Difference	250
5.5 Chapter Summary	256
5.6 Exercises	260
6 Multifactor ANOVA	273
6.1 The Two-Way Additive Model (Main Effects Model)	273
6.2 Interaction in the Two-Way Model	286
6.3 Two-Way Nonadditive Model (Two-Way ANOVA with Interaction)	293
6.4 Case Study	302
6.5 Chapter Summary	310
6.6 Exercises	311
7 Additional Topics in Analysis of Variance	323
7.1 Topic: Levene's Test for Homogeneity of Variances	323
7.2 Topic: Multiple Tests	328
7.3 Topic: Comparisons and Contrasts	336
7.4 Topic: Nonparametric Statistics	347
7.5 Topic: ANOVA and Regression with Indicators	354
7.6 Topic: Analysis of Covariance	368
7.7 Exercises	382

8 Overview of Experimental Design	397
8.1 Comparisons and Randomization	398
8.2 Randomization F-Test	407
8.3 Design Strategy: Blocking	418
8.4 Design Strategy: Factorial Crossing	424
8.5 Chapter Summary	433
8.6 Exercises	435
 Unit C: Logistic Regression	
9 Logistic Regression	449
9.1 Choosing a Logistic Regression Model	449
9.2 Logistic Regression and Odds Ratios	463
9.3 Assessing the Logistic Regression Model	471
9.4 Formal Inference: Tests and Intervals	480
9.5 Chapter Summary	487
9.6 Exercises	490
10 Multiple Logistic Regression	503
10.1 Overview	503
10.2 Choosing, Fitting, and Interpreting Models	506
10.3 Checking Conditions	517
10.4 Formal Inference: Tests and Intervals	524
10.5 Case Study: Bird Nests	534
10.6 Chapter Summary	538
10.7 Exercises	539
11 Additional Topics in Logistic Regression	555
11.1 Topic: Fitting the Logistic Regression Model	555
11.2 Topic: Assessing Logistic Regression Models	562
11.3 Randomization Tests for Logistic Regression	577
11.4 Analyzing Two-Way Tables with Logistic Regression	580
11.5 Exercises	588
Short Answers	603
Indexes	619
General Index	619
Dataset Index	623