

Contents

Preface	xiii
About the Software	xvii
0 Basic Prerequisite Knowledge	1
0.1 Distributions: Normal, t , and F , 1	
0.2 Confidence Intervals (or Bands) and t -Tests, 4	
0.3 Elements of Matrix Algebra, 6	
1 Fitting a Straight Line by Least Squares	15
1.0 Introduction: The Need for Statistical Analysis, 15	
1.1 Straight Line Relationship Between Two Variables, 18	
1.2 Linear Regression: Fitting a Straight Line by Least Squares, 20	
1.3 The Analysis of Variance, 28	
1.4 Confidence Intervals and Tests for β_0 and β_1 , 34	
1.5 F -Test for Significance of Regression, 38	
1.6 The Correlation Between X and Y , 40	
1.7 Summary of the Straight Line Fit Computations, 44	
1.8 Historical Remarks, 45	
Appendix 1A Steam Plant Data, 46	
Exercises are in “Exercises for Chapters 1–3”, 96	
2 Checking the Straight Line Fit	47
2.1 Lack of Fit and Pure Error, 47	
2.2 Testing Homogeneity of Pure Error, 56	
2.3 Examining Residuals: The Basic Plots, 59	
2.4 Non-normality Checks on Residuals, 61	
2.5 Checks for Time Effects, Nonconstant Variance, Need for Transformation, and Curvature, 62	
2.6 Other Residuals Plots, 67	