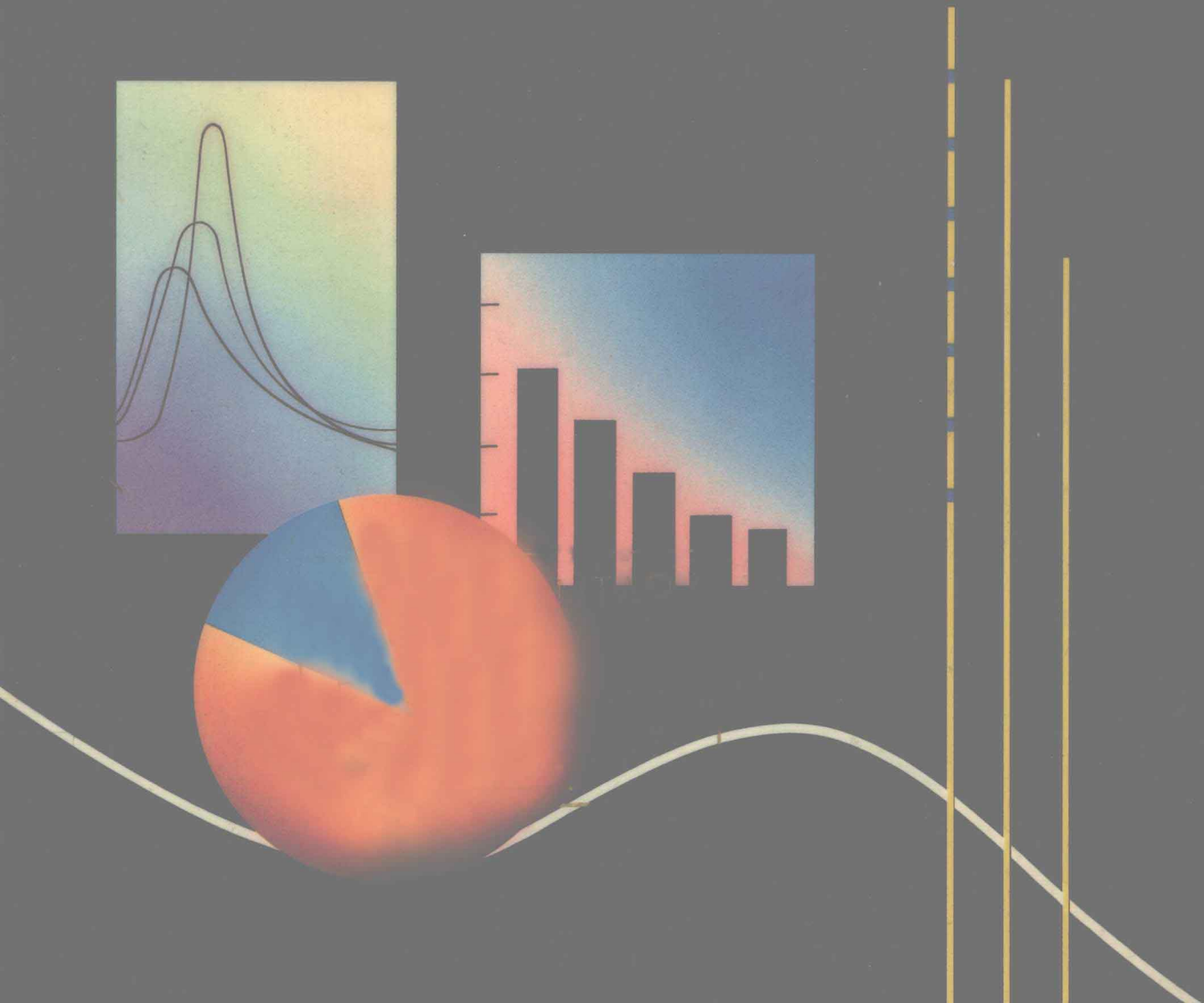
THIRD EDITION

STATISTICS

AN INTRODUCTION

MASON LIND MARCHAL



THIRD EDITION

STATISTICS

AN INTRODUCTION

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HBJ

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To Anita, Jane, and Andrea

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Preface

Statistics: An Introduction, Third Edition, is intended for use in an applied introductory statistics course. As in the previous editions, the principles of both descriptive and inferential statistics are discussed and illustrated in situations that are close to most students' own experience. Students with a background limited to basic algebra will be able to complete most of the necessary mathematical calculations.

This book is appropriate for use in any survey course in statistics. The material is organized so that it provides the greatest possible flexibility of use. Illustrations and exercises are drawn from disciplines as varied as sociology, education, business, sports, demography, meteorology, politics, and mathematics. Considerable latitude has been built into the organization of chapter topics so that the text can be adapted for use in a one-semester or one-quarter course or a two-quarter course. A one-semester course, for example, might include Chapters 1–10, 13, and 14. Time permitting, Chapters 11 and 16 would be logical additions.

SPECIAL FEATURES

Statistics: An Introduction, Third Edition, has a number of special features that will motivate and assist students as they progress through the material:

- Each chapter begins with a set of *learning objectives*—what the student should be able to do upon completion of the chapter. These objectives act as advance organizers and motivators.
- At the beginning of each chapter, the important concepts that were presented in the preceding chapter are reviewed in a brief *introduction* that explains how these earlier concepts are linked to the present chapter. Then, a chapter overview introduces the new chapter's topics.
- The discussion of each concept is followed by a realistic *problem and solution.*

- Throughout the chapter are interspersed a number of *Self-Reviews*, each one closely patterned after the chapter problems that precede it. The Self-Reviews help students monitor their progress, and they provide students with constant reinforcement. Answers and methods of solution for Self-Reviews are given at the end of the chapter.
- Many interesting, real-world *Exercises* are incorporated within and at the end of each chapter. Answers and methods of solution for all even-numbered exercises are given at the back of the book.
- Every important *new term and formula* is defined and has been placed in a box for easy reference.
- Each chapter includes a *Summary*.
- End-of-chapter *Achievement Tests* help students evaluate their comprehension of the material covered. Answers and methods of solution are given at the back of the book.
- A *Unit Review* is included after each of six major groups of chapters. Each includes a brief review, key concepts, key terms, key symbols, review problems, and a section called "Using Statistics," in which a situation is presented for which statistics can provide a solution, followed by a discussion of the situation and its resolution.
- Each chapter contains an interesting, challenging *Case*.
- A *Glossary* is included at the back of the book.
- The normal distribution and Student's t distribution are printed on the front and back endpapers for easy reference.
- Simple *flowcharts* are presented throughout the textbook to help students choose the appropriate formula or test statistic.

The Third Edition also includes

- a large number of new chapter exercises;
- extensive use of statistical software in problem solving, especially in the multiple correlation and regression chapters;
- blue computer shapes next to selected exercises to indicate that statistical software is strongly recommended to solve these problems. Black computer shapes indicate that the use of statistical software is recommended, but not absolutely necessary;
- the concept of the p-value introduced in hypothesis testing;
- "drill" problems, scattered through the chapters, that allow the student to concentrate on the basic calculations;
- in Chapters 4 and 6, Chebyshev's Theorem for interpreting the standard deviation;
- in the Multiple Regression chapter, emphasis on the interpretation of computer software output, which includes a global test to determine the significance of a set of regression coefficients. This chapter also includes a test of significance for individual regression coefficients.

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ANCILLARY MATERIALS

A complete ancillary package accompanies the Third Edition.

The comprehensive *Study Guide* is organized much like the textbook. Each chapter includes objectives, problems and solutions, exercises, a summary, and assignments on perforated pages that can be removed and graded by the instructor. Ample space is provided for computations.

An *Instructor's/Solutions Manual* contains the solutions to all chapter exercises, Unit Review exercises, and Cases in the textbook and to the assignments in the Study Guide. In addition, it includes lecture materials and in-class lecture problems (plus solutions to these problems), prepared in a larger typeface so that they can easily be used as transparency masters.

An *EasyStat Guide* is available for the Third Edition. This guide, prepared by Toni M. Somers of Wayne State University, is a user-friendly program for any IBM-PC system. *EasyStat* is a computer program that works within the framework of a spreadsheet and includes a data set for 1,000 urban families, from which students can select random samples for carrying out exercises.

An all-new *Testbook* is available, organized by chapter with each chapter containing true–false, multiple choice, problem, and essay questions. The questions in a chapter may be used as a test over the entire chapter, selected questions may be chosen and given in class as a "pop" quiz, the entire chapter test may be assigned to be completed outside of class, or questions from several chapters may be combined to form a unit test, a midterm, or a final examination. The answers to the questions appear at the end of each chapter of the Testbook. The Testbook is also available computerized, in IBM, Macintosh, and Apple II formats.

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Contents

Preface v

CHAPTER ONE

What Is Statistics? 1

INTRODUCTION 2
USES OF STATISTICS 3
TYPES OF STATISTICS 4
THE NATURE OF STATISTICAL DATA 7
A WORD OF ENCOURAGEMENT 11
COMPUTER APPLICATIONS 11
SUMMARY 12
CHAPTER ACHIEVEMENT TEST 13
ANSWERS TO SELF-REVIEW 14

CHAPTER TWO

Summarizing Data: Frequency Distributions and Graphic Presentation 15

INTRODUCTION 16
FREQUENCY DISTRIBUTION 16
SUGGESTIONS FOR CONSTRUCTING A FREQUENCY DISTRIBUTION 19
STEM-AND-LEAF DISPLAYS 22
PORTRAYING THE FREQUENCY DISTRIBUTION GRAPHICALLY 25
SUMMARY 44
CASE 54

CHAPTER ACHIEVEMENT TEST 56
ANSWERS TO SELF-REVIEW 59

. . . . . **CHAPTER THREE** . . . . . .

Descriptive Statistics: Measures of Central Tendency **61**

INTRODUCTION 62
THE SAMPLE MEAN ($\bar{X}$) 62
THE POPULATION MEAN (μ) 64
THE PROPERTIES OF THE ARITHMETIC MEAN 65
THE MEDIAN ($\tilde{X}$) 67
THE MODE (*Md*) 70
CHOOSING AN AVERAGE 70
GEOMETRIC MEAN (*GM*) 72
ESTIMATION OF THE MEAN ($\bar{X}$) FROM GROUPED DATA 73
ESTIMATION OF THE MEDIAN ($\tilde{X}$) FROM GROUPED DATA 77
THE MODE (*Md*) FROM GROUPED DATA 79
CHOOSING AN AVERAGE FOR DATA IN A FREQUENCY DISTRIBUTION 81
SUMMARY 83
CASE 87
CHAPTER ACHIEVEMENT TEST 88
ANSWERS TO SELF-REVIEW 90

. . . . . **CHAPTER FOUR** . . . . . .

Descriptive Statistics: Measures of Dispersion and Skewness **91**

INTRODUCTION 92
COMPUTATIONAL FORMULA FOR VARIANCE (σ^2) 102
MEASURES OF DISPERSION FOR DATA IN A FREQUENCY DISTRIBUTION 105
RELATIVE DISPERSION 113
THE COEFFICIENT OF SKEWNESS 115
A COMPUTER EXAMPLE 117
SUMMARY 118
CASE 123
CHAPTER ACHIEVEMENT TEST 123
ANSWERS TO SELF-REVIEW 126

UNIT REVIEW

Chapters 1, 2, 3, and 4 128

KEY CONCEPTS 128
KEY TERMS 129
KEY SYMBOLS 129
PROBLEMS 130
USING STATISTICS 133
DETERMINING A FORMULA 134

CHAPTER FIVE

An Introduction to Probability 135

INTRODUCTION 136
PROBABILITY CONCEPTS 137
TYPES OF PROBABILITY 139
PROBABILITY RULES 141
COMPLEMENT RULE 156
SOME COUNTING PRINCIPLES 157
SUMMARY 163
CASE 169
CHAPTER ACHIEVEMENT TEST 170
ANSWERS TO SELF-REVIEW 173

CHAPTER SIX

Probability Distributions 175

INTRODUCTION 176
WHAT IS A PROBABILITY DISTRIBUTION? 176
DISCRETE AND CONTINUOUS RANDOM VARIABLES 178
THE MEAN (μ) AND VARIANCE (σ^2) OF A PROBABILITY DISTRIBUTION 180
THE BINOMIAL PROBABILITY DISTRIBUTION 184
THE POISSON PROBABILITY DISTRIBUTION 193
SUMMARY 196
CASE 201
CHAPTER ACHIEVEMENT TEST 201
ANSWERS TO SELF-REVIEW 203

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CHAPTER SEVEN

The Normal Probability Distribution **205**

INTRODUCTION 206
CHARACTERISTICS OF A NORMAL PROBABILITY DISTRIBUTION 207
THE "FAMILY" OF NORMAL DISTRIBUTIONS 207
THE *STANDARD* NORMAL PROBABILITY DISTRIBUTION 210
THE NORMAL APPROXIMATION TO THE BINOMIAL 221
THE NORMAL APPROXIMATION TO THE POISSON DISTRIBUTION 227
SUMMARY 229
CASE 233
CHAPTER ACHIEVEMENT TEST 234
ANSWERS TO SELF-REVIEW 236

UNIT REVIEW

Chapters 5, 6, and 7 **238**

KEY CONCEPTS 238
KEY TERMS 240
KEY SYMBOLS 240
PROBLEMS 240
USING STATISTICS 244
DETERMINING THE DISTRIBUTION 245

CHAPTER EIGHT

Sampling Distributions and the Central Limit Theorem **246**

INTRODUCTION 247
METHODS OF PROBABILITY SAMPLING 248
SAMPLING ERROR 254
THE SAMPLING DISTRIBUTION OF THE SAMPLE MEAN 255
THE CENTRAL LIMIT THEOREM 260
CONFIDENCE INTERVALS 260
STANDARD ERROR OF THE SAMPLE MEAN ($\sigma_{\bar{x}}$) 263
POINT AND INTERVAL ESTIMATES 264
STANDARD ERROR OF A SAMPLE PROPORTION (σ_p) 267

CONFIDENCE INTERVALS FOR PROPORTIONS 268
FINITE POPULATION CORRECTION FACTOR 270
CHOOSING AN APPROPRIATE SAMPLE SIZE 272
SUMMARY 274
CASE 279
CHAPTER ACHIEVEMENT TEST 279
ANSWERS TO SELF-REVIEW 281

CHAPTER NINE

Hypothesis Tests: Large-Sample Methods **283**

INTRODUCTION 284
THE GENERAL IDEA 284
A TEST INVOLVING THE POPULATION MEAN (LARGE SAMPLES) 287
A TEST FOR TWO POPULATION MEANS (LARGE SAMPLES) 297
SUMMARY 301
CASE 305
CHAPTER ACHIEVEMENT TEST 305
ANSWERS TO SELF-REVIEW 307

CHAPTER TEN

Testing a Hypothesis about Proportions **309**

INTRODUCTION 310
A TEST DEALING WITH POPULATION PROPORTIONS 310
A TEST DEALING WITH TWO POPULATION PROPORTIONS 314
SUMMARY 319
CASE 322
CHAPTER ACHIEVEMENT TEST 323
ANSWERS TO SELF-REVIEW 325

UNIT REVIEW

Chapters 8, 9, and 10 **327**

KEY CONCEPTS 327
KEY TERMS 328
KEY SYMBOLS 329

PROBLEMS 329
USING STATISTICS 332

CHAPTER ELEVEN
Hypothesis Tests: Small-Sample Methods 335

INTRODUCTION 336
CHARACTERISTICS OF THE *t* DISTRIBUTION 336
TESTING A HYPOTHESIS ABOUT A POPULATION MEAN 337
COMPARING TWO POPULATION MEANS 344
A TEST OF PAIRED OBSERVATIONS 350
SUMMARY 355
CASE 359
CHAPTER ACHIEVEMENT TEST 360
ANSWERS TO SELF-REVIEW 363

CHAPTER TWELVE
Analysis of Variance 365

INTRODUCTION 366
THE *F* DISTRIBUTION 366
COMPARING TWO POPULATION VARIANCES 367
UNDERLYING ASSUMPTIONS FOR ANOVA 370
THE ANOVA TEST 373
SUMMARY 384
CASE 389
CHAPTER ACHIEVEMENT TEST 390
ANSWERS TO SELF-REVIEW 392

UNIT REVIEW
Chapters 11 and 12 394

KEY CONCEPTS 394
KEY TERMS 395
KEY SYMBOLS 395
PROBLEMS 395
USING STATISTICS 400
DETERMINING A FORMULA 402

CHAPTER THIRTEEN

Correlation Analysis 403

INTRODUCTION 404
CORRELATION ANALYSIS 404
THE COEFFICIENT OF CORRELATION 408
THE COEFFICIENT OF DETERMINATION 413
TESTING THE SIGNIFICANCE OF THE COEFFICIENT OF CORRELATION 415
RANK-ORDER CORRELATION 417
SUMMARY 423
CASE 430
CHAPTER ACHIEVEMENT TEST 431
ANSWERS TO SELF-REVIEW 434

CHAPTER FOURTEEN

Regression Analysis 436

INTRODUCTION 437
LINEAR REGRESSION 437
FITTING A LINE TO DATA 442
THE METHOD OF LEAST SQUARES 446
DRAWING THE LINE OF REGRESSION 447
THE STANDARD ERROR OF ESTIMATE 450
ASSUMPTIONS ABOUT REGRESSION 454
COMPUTING CONFIDENCE-INTERVAL ESTIMATES 456
SUMMARY 463
CASE 470
CHAPTER ACHIEVEMENT TEST 471
ANSWERS TO SELF-REVIEW 473

CHAPTER FIFTEEN

Multiple Regression and Correlation Analysis 475

INTRODUCTION 476
ASSUMPTIONS ABOUT MULTIPLE REGRESSION AND CORRELATION 476
THE MULTIPLE REGRESSION EQUATION 477
MEASURING THE STRENGTH OF THE ASSOCIATION 479
THE ANOVA TABLE 482
A COMPUTER APPLICATION 484

GLOBAL TEST FOR THE MULTIPLE REGRESSION EQUATION 489
EVALUATING INDIVIDUAL REGRESSION COEFFICIENTS 490
SUMMARY 494
CASE 502
CHAPTER ACHIEVEMENT TEST 503
ANSWERS TO SELF-REVIEW 506

UNIT REVIEW
Chapters 13, 14, and 15 507

KEY CONCEPTS 507
KEY TERMS 508
KEY SYMBOLS 508
PROBLEMS 509
USING STATISTICS 513

CHAPTER SIXTEEN
Analysis of Nominal-Level Data: The Chi-Square Distribution 518

INTRODUCTION 519
THE CHI-SQUARE (χ^2) DISTRIBUTION 519
GOODNESS-OF-FIT TEST: EQUAL EXPECTED FREQUENCIES 520
GOODNESS-OF-FIT TEST: UNEQUAL EXPECTED FREQUENCIES 526
CONTINGENCY-TABLE ANALYSIS 533
SUMMARY 540
CASE 545
CHAPTER ACHIEVEMENT TEST 545
ANSWERS TO SELF-REVIEW 548

CHAPTER SEVEENTEEN
Nonparametric Methods: Analysis of Ranked Data 549

INTRODUCTION 550
THE SIGN TEST 550
THE SIGN TEST WITH LARGE SAMPLES 559

THE WILCOXON SIGNED-RANK TEST 562
THE WILCOXON RANK-SUM TEST 567
ANALYSIS OF VARIANCE BY RANKS (THE KRUSKAL–WALLIS TEST) 572
SUMMARY 577
CASE 582
CHAPTER ACHIEVEMENT TEST 582
ANSWERS TO SELF-REVIEW 585

UNIT REVIEW

Chapters 16 and 17 587

KEY CONCEPTS 587
KEY TERMS 588
KEY SYMBOLS 588
PROBLEMS 589
USING STATISTICS 592
DETERMINING A FORMULA 595

Appendix Tables 596
Glossary 612
Answers to Chapter Achievement Tests 616
Solutions to Even-Numbered Exercises 629
Index 705

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