

Contents

<i>PREFACE</i>	xi
 <i>Chapter 1</i> General Presentation	 1
1. Introduction	1
2. Examples of Applications	5
3. Steps in Data Exploration: Management, Analysis, Synthesis	14
4. Computer Aspects	17
 <i>Chapter 2</i> Statistical Data Exploration	 19
1. Statistics	19
2. Fields of Statistical Data Exploration	19
3. Statistics and Experiments	20
4. Data Analysis, Inductive and Deductive Statistics	21
5. Variables, Statistical Sets, and Data Sets	21
 <i>Chapter 3</i> 1-D Statistical Data Analysis	 27
1. Introduction	27
2. 1-D Analysis of a Quantitative Variable	27
3. 1-D Analysis of a Categorical Variable	50
4. 1-D Analysis of a Categorical Variable with Multiple Forms	53
5. 1-D Analysis of Time Series or Chronological Variables	53
6. Statistical Maps or Cartograms	61
 <i>Chapter 4</i> 2-D Statistical Data Analysis	 63
1. Introduction	63
2. 2-D Analysis of Two Categorical Variables	64
3. 2-D Analysis of Two Quantitative Variables	73
4. 2-D Analysis of a Quantitative Variable and a Categorical Variable	90

5.	2-D Analysis of a Quantitative Variable and a Categorical Variable with Multiple Forms	94
6.	Conclusion	94
<i>Chapter 5</i> <i>N-D Statistical Data Analysis</i>		95
1.	Introduction	95
2.	Joint 3-D Statistical Data Analysis	95
3.	Joint <i>N-D</i> Statistical Data Analysis	102
4.	Cartograms and <i>N-D</i> Analysis	112
<i>Chapter 6</i> Factor Analysis of Individuals– Variables Data Sets		113
1.	Introduction	113
2.	From Linear Adjustment to Factor Analysis	113
3.	From the Origin of Factor Analysis to Modern Factor Analysis Techniques	117
4.	Mathematical Description of Modern Factor Analysis	117
5.	Factor Analysis Formulas	124
<i>Chapter 7</i> Principal Components Analysis		125
1.	Basic Data Sets	125
2.	Different Patterns of Principal Components Analysis	125
3.	Standardized Principal Components Analysis	127
4.	Interpretation of Principal Components Analysis	131
5.	Classifying Supplementary Points into Graphics	143
6.	Rules for Selecting Significant Axes and Elements	153
7.	Standardized Principal Components Analysis Formulas	159
8.	Applications and Case Studies	160
<i>Chapter 8</i> 2-D Correspondence Analysis		169
1.	Introduction	169
2.	Basic Correspondence Data Sets	170
3.	Mathematical Description of Correspondence Analysis	171
4.	Geometric Representation of the Sets <i>I</i> and <i>J</i>	176
5.	Interpretation of the 2-D Correspondence Analysis	189
6.	Factor Graphics	200
7.	Classifying Supplementary Points into Graphics	203
8.	Rules for Selecting Significant Axes and Elements	210
9.	2-D Correspondence Analysis Formulas	216
10.	Patterns of Clouds of Points	221
11.	Patterns of Acceptable Data Sets	225
12.	Case Studies	232

Chapter 9	<i>N</i>-D Correspondence Analysis	241
1.	Introduction	241
2.	Basic Data Sets	242
3.	Equivalence between Analyses of b_{IJ} and k_{IJ}	248
4.	Interpretation of <i>N</i> -D Correspondence Analysis	262
5.	Factor Graphics	273
6.	Classifying Supplementary Points into Graphics	278
7.	Rules for Selecting Significant Axes and Points of $N(I)$, $N(J)$, and $N(Q)$	285
8.	<i>N</i> -D Correspondence Analysis Formulas	287
9.	Patterns of Acceptable Data Sets	288
10.	Case Studies	294
Chapter 10	Classification of Individuals–Variables Data Sets	305
1.	Introduction	305
2.	Basic Data Sets	306
3.	The Mathematical Description of Classifications	306
4.	Partitioning Methods	310
5.	Hierarchical Classification Methods	331
6.	Specific Applications	394
7.	Case Studies	398
Chapter 11	Classification and Analysis of Proximities Data Sets	407
1.	Introduction	407
2.	Proximities Data Sets	407
3.	Proximities Data Sets from Individuals–Variables Data Sets	408
4.	Elementary Description of Proximities Data Sets	412
5.	Factor Analysis of Proximities Data Sets	412
6.	Classification of Proximities Data Sets	416
7.	Computation of Contributions	417
8.	Conclusion	418
Chapter 12	Computer Aspects of Exploratory and Multivariate Data Analysis	419
1.	Place of Exploratory and Multivariate Data Analysis in Statistics	419
2.	Basic Factors for Exploratory and Multivariate Data Analysis Software	4221
3.	Data Analysis Libraries	423
4.	Future Prospects	425

<i>Appendix 1</i>	List of Notations	427
<i>Appendix 2</i>	Reference Data Sets	439
<i>REFERENCES</i>		465
<i>AUTHOR INDEX</i>		469
<i>SUBJECT INDEX</i>		471