

MULTIVARIATE STATISTICAL ANALYSIS

Lecture 1 Introduction to MSA

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Contents

1. Introduction to Multivariate Statistical Analysis
2. The basic concepts of Multivariate Statistical Analysis
3. Multivariate Linear Regression Models
4. Principal Component Analysis
5. Factor Analysis
6. Canonical Correlation Analysis
7. Clustering
8. Classification

Contents

1. Introduction to Multivariate Statistical Analysis

1.1. Purpose of MSA

1.2. The key issues in MSA

1.3. Applications of MSA

Contents

2. The basic concepts of MSA

2.1. Random Vector and Matrices

2.2. Mean Vectors and Covariance Matrices

2.3. The Multivariate Normal Distribution

2.4. The basic theorems

Contents

3. Multivariate Linear Regression Models

3.1. The Classical Linear Regression Model

3.2. Multivariate Multiple Regression

Contents

4. Principal Components Analysis

4.1. Introduction

4.2. Extracting the PCs of multivariate data

4.3. Approximating multivariable data by PCs

4.4. Investigating of the PCs of multivariate data

Contents

5. Factor Analysis

5.1. Introduction

5.2. The Orthogonal Factor Model

5.3. Methods of Estimation

Contents

6. Canonical Correlation Analysis

6.1. Introduction

6.2. Canonical Variables and Canonical Correlations

6.3. The Sample Canonical Variates and Sample Canonical Correlations

6.4. The Population Canonical Variables

Contents

7. Clustering

7.1. Introduction

7.2. Hierarchical Clustering Methods

7.3. Nonhierarchical Clustering Methods

Contents

8. Classification

8.1. Introduction

8.2. Classification based on Probability Density Functions

8.3. Fisher Classification Method

1. Introduction to MSA

1.1. Purpose of MSA

- **Intended Audience**

Researchers in scientific fields regularly process multivariable data (Biology, Physics, Social Sciences, Computer Science, etc.)

- **Present concepts and methods** of MSA based on **Statistics, Probability, Calculus and Linear Algebra.**

- **Scientific inquiry is an iterative learning process,** achieved by receiving and analyzing data.

1. Introduction to MSA

1.1. The goal of MSA

- Data **Reduction** and Structural Simplification.
- **Sorting** and **Grouping**.
- Investigating of **the dependence** among variables.
- **Prediction**
- Hypothesis **Construction** and **Testing**

1. Introduction to MSA

1.2. The Key Issues in MSA

- Multivariate linear regression models
- Principal Components Analysis
- Factor Analysis
- Canonical Correlation Analysis
- Clustering
- Classification