UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Data Analysis

1920-2-E4102B079

Learning objectives

The course allows to know the main techniques of data analysis both from quantitative and qualitative data, under the theorical point of view .
Furthermore it enables to utilize these techniques in order to analyze empirical data.

Knowledge and understanding. Through an exploratory survey on multivariate data of high dimension, knowledge and understanding is provided
in regards to the relationships between variables in a multivariate context.
This goal is reached according to different optics such as the relationship between sets of quantitative and qualitative variables,
the variables that allow to discriminate between groups of individuals, the representation of distances between individuals in reduced dimensions.

Ability to apply knowledge and understanding. By analyzing the most appropriate exploratory data in the various cases,
the student is able to choose the most relevant variables for constructing multivariate linear or non-linear models, logistic models,
variance analysis models, representations of individuals in spaces of not large dimensions.

Contents

Detailed program

4 Interpretation of the results: ?2 decomposition

5 Interpretation of other results

6 Multiple Correspondence Analysis

7 Examples

8 Examples in SAS

D Multidimensional scaling

1 Metric Multidimensional Scaling with Euclidean distances

2 Torgerson Theorem

3 Interpretation of the results

4 Examples

5 Examples in SAS

6 Multidimensional scaling with dissimilarity metrics

7 Multidimensional scaling with ordinal dissimilarity

8 Examples

9 Examples in SAS

Prerequisites

This course should be taken after passing the exam of Multivariate Statistical Analysis.

Teaching methods

The course consists of lectures and practical exercises in a lab with SAS software. The lectures will offer a theoretical background to the methods proposed, while the practical examples will be an application to real data.

Assessment methods

The final test is in written form with optional oral exam. The written test consists in two theoretical questions about the methods introduced in the course and a practical test in the laboratory, to be taken at the time of the theorical written exam with the SAS software, in analogy to what was done during the exercises. The theoretical questions allow to verify the knowledge of the goals, of the methods of resolution, of the comment of the results of the studied methods of exploratory data analysis. The ability to express oneself with an adequate technical language is required. The practical test aims to verify the ability to analyze real data sets using the most appropriate data

analysis methods, adequately commenting and interpreting the results.

There are no separate tests for attending students and non-attending students.

There are no intermediate tests in progress.

Textbooks and Reading Materials

Slides and reading material edited by the professor.

Johnson R. A., Wichern D. W., Applied Multivariate Statistical Analysis, Pearson, 2007.

Morrison D.F., Multivariate Statistical Methods, McGraw-Hill, 2004 (4° ed.).

Semester

2° semester 2° period

Teaching language

Italian