Aarhus University

Decision Support Systems

PROJECT REPORT

Author:

Lasse Lildholdt
(201507170)
Stinus Skovgaard
(201507170)
Daniel Tøttrup
(201507170)
Johan Vasegaard
(201507170)
Frederik Madsen
(201507170)

Supervisor:

Christian Fischer Pedersen

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Kapitel 1

INTRODUCTION

In this project report, the reader will be presented with problem solutions for the course Decision support systems. Throughout the solution the reader will achieve knowledge on several different subject within the main area. Each topic will be presented with the theory along with solutions for appropiate exercise to validate the presented theory.

The main topics which will be handled in this report will be as follows:

- Simple linear regression / Multiple linear regression
- Logisitic regression / Linear discriminant analysis
- Cross validation / Bootstrap
- Subset selection
- Shrinkage methods / DImension reduction methods

Kapitel 2

SIMPLE LINEAR REGRESSION / MULTIPLE LINEAR REGRESSION

The simple Linear Regression approach is a quick and simple method for fitting a line through a 2-dimensional dataset. It is assumed that there is a approximately linear relationship between the two dimensions. This can be written mathematically as:

$$Y \approx \beta_0 + \beta_1 * X \tag{2.1}$$

eq. (2.1) can also be seen as "Regressing Y onto X". As an example the dataset Advertising.csv contains sales og a certain product and advertisement money spent on certain media platforms. X represents TV advertising and Y represents sales. It is the possible to regress sales onto TV.

In order to do this, we need to calculate the constants β_0 and β_1 which represents the intercept and slope terms in the linear model.

Kapitel 3

LOGISITIC REGRESSION / LINEAR DISCRIMINANT ANALYSIS

Kapitel 4

CROSS VALIDATION / BOOTSTRAP

Kapitel 5

SUBSET SELECTION

Kapitel 6

SHRINKAGE METHODS / DIMENSION REDUCTION METHODS