

Aarhus University

Decision Support Systems

## PROJECT REPORT

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# 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 appropriate 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 / DIimension reduction methods

## 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 an 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)

# LOGISITIC REGRESSION / LINEAR DISCRIMINANT ANALYSIS

## CROSS VALIDATION / BOOTSTRAP



## SUBSET SELECTION

## SHRINKAGE METHODS / DIMENSION REDUCTION METHODS