Simple Regression Analysis

Your Name

Oct 07, 2016

Abstract

In this report we reproduce the main results displayed in section 3.1 *Simple Linear Regression* (chapter 3) of the book **An Introduction to Statistical Learning**.

Introduction

The overall goal is to provide advice on how to improve sales of the particular product. More specifically, the idea is to determine whether there is an association between advertising and sales, and if so, develop an accurate model that can be used to predict sales on the basis of the three media budgets.

Data

The Advertising data set consists of the `Sales` (in thousands of units) of a particular product in 200 different markets, along with advertising budgets (in thousands of dollars) for the product in each of those markets for three different media: `TV`, `Radio`, and `Newspaper`.

Methodology

We consider one media from the data set, `TV`, and study its relationship with `Sales`. For this purpose, we use a simple linear model:

$$Sales = \beta_0 + \beta_1 TV$$

To estimate the coefficients β_0 and β_1 we fit a regression model via the least squares criterion.

Results

We compute the regression coefficients

Table 1: Information about Regression Coefficients

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	7.03	0.46	15.36	0.00
TV	0.05	0.00	17.67	0.00

More information about the least squares model is given in the table below:

Table 2: Regression Quality Indices

Quantity	Value
RSS	3.26
R2	0.61
F-stat	312.14

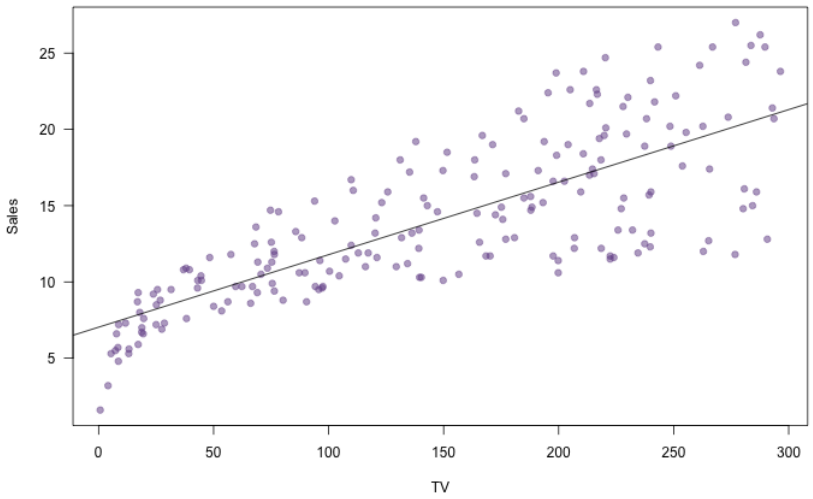

Figure 1: Scatterplot with fitted regression line

Here's the scatterplot

Conclusions

That's it!