Simple Regression Analysis

Xinyu Zhang

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Abstract

This report is about reproducing a simple regression analysis from Section 3.1 (pages 59-71), of *Chapter3. Linear Regression*, from the book "An Introduction to Statistical Learning" (by James et al)

Introduction

The goal is to provide advice on how to improve sales of the particular product. The idea is to determine whether there is relationship between advertising expenditure and sales, and if so, we would like to know the strengh of this relationship and then we can instruct our client to adjust advertising budgets, thereby indirectly increasing sales.In other word, our goal is to develop an accurate model that can be used to prodect sales on the basis of the three media (TV, radio, newspaper) budgets.

Data

The Advertising data set consists of Sales (in thousands of units) of a particular product in 200 different markets (n = 200), 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 suppose that only one media from the data set, **TV**, has an association with **Sales**. Therefore, we use a simple linear model:

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

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

Results

Conclusions

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

Table 1: chart 1

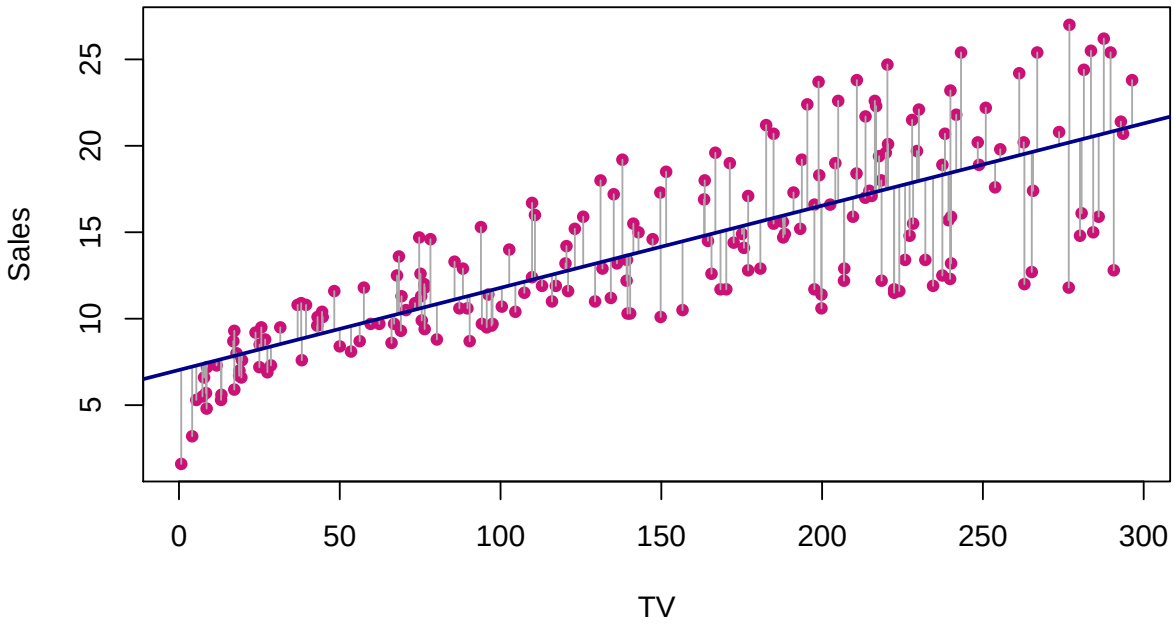

Figure 1: Regression of sales onto TV

Quantity	Value
Residual standard error	3.26
R2	0.61
F-statistic	312.14

Table 2: chart 2