

Homework 1: Simple Linear Regression

Legesse Kassa Debusho, UNISA, South Africa and Ziv Shkedy,
Hasselt University, Belgium

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The SAT data

- The case study "SAT and College GPA" contains information about high school and university grades for 105 computer science majors at a local state school.
- The data is available on-line in the data repository (sat.txt)

The SAT data

- Our aim in this question is to model the association between high school GPA and university GPA.
- Fit a linear regression model in which high school GPA is the predictor and university GPA is a response.
- Describe the association between high school GPA and university GPA Based on the fitted model.
- What is the predicted GPA at the university for a student with high school GPA of 3.

The blood pressure data

- The case study "systolic blood pressure" contains information about systolic blood pressure and age of 30 individual.
- The data is available on-line in the data repository (BPdat1.txt)

The blood pressure data

- Our aim in this question is to model the association between systolic blood pressure and age.
- Fit a linear regression model that can be used to predict the systolic blood pressure for a given age.
- What is the predicted value for the systolic blood pressure for an individual with age equal to 40.
- Systolic blood pressure higher than 160 is defined as a risk factor for heart disease. According to your model, what is the age that corresponds to high risk for heart diseases ?

The air quality data

- The air quality data contains information about daily air quality measurements in New York, May to September 1973.
- Use `help(airquality)` to get more information about the data.

The air quality data

- Our aim in this question is to model the association between Ozone (ozone) level and maximum daily temperature (temp).
- Fit a linear regression model of the form

$$\text{Ozone}_i = \beta_0 + \beta_1 \times \text{Temp} + \varepsilon_i.$$

- Produce all for the model. Do you think that the simple linear regression model is an appropriate model in this case ?