Theory of Linear Models
Exercises 4

4 February 2019

1. In the variance components model given in lectures, write down the set of values which can be take by the variance component σ_1^2.

2. Write down the form of a generalized linear model with a normal distribution and a log link function. Explain the difference between this and a Box-Cox transformation with $\lambda = 0$.

3. Consider the two candidate models

$$Y_i = \theta_0 e^{\theta_1 x_i} + \epsilon_i$$

and

$$\log Y_i = \log \theta_0 + \theta_1 x_i + \epsilon_i,$$

where $\epsilon \sim N(\mathbf{0}, \sigma^2 \mathbf{I})$ in each case.

   (a) Explain the similarities and differences between these two models.

   (b) How should an experimenter decide between them?

   (c) Suggest a more general model that could be used instead of either of these.