

P8129 Assignment #6

1. Use the dataset shown in Table 7.6 (Amitrityline data) to answer the following questions. Descriptions are given in Problem 7.25. (Problem 7.25 itself is not a part of homework assignment.)

- (1) Write down your model.
- (2) Obtain the OLSE and a consistent estimate of its variance.
- (3) Obtain the WLSE and a consistent estimate of its variance.

2. The dataset 'inf.dat' shows the four repeated measurements of prolactin levels from 30 women at 15, 30, 45, and 60 minutes after injecting Thyrotropin Releasing Hormone (TRH). There are three groups of women depending on their fertility status. Before the injection of TRH, two baseline prolactin levels are also measured. Let Y_{ij} denote the prolactin level of the i^{th} individual for the j^{th} time point, where $i = 1 \dots 30$, and $j = 1, 2, 3, 4$. The group membership, time, and baseline are covariates of interest. For the baseline measurement, use the average of the second and third columns. 1.

Fit a random intercept model. [You may transform the outcomes if necessary]

2. Fit a random intercept and a random slope model.
3. Test whether the three groups have the same response curve.
4. Compare the standard errors of the time and group effects from the first two models with those from a linear model that ignores correlation among the repeated measurements. Which model produce smaller standard errors and why?