Applied Statistical Methods - Exercise 5

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2022-03-26

Problem 1: Helmert Contrasts

Use the dataset of `Body Weight` and `Breed` to fit a linear model of `Body Weight` on `Breed`. The aim of this exercise is to use the `Helmert`-contrasts instead of the defautl `Treatment` contrasts. What are the estimable functions used in the `Helmert`-Contrasts and what are the effects that are reported for the different levels of the factor `Breed`? Verify your answer by comparing estimable functions of solutions of the least squares normal equations to the effects of `lm()`.

The dataset is available under

```
## https://charlotte-ngs.github.io/asmss2022/data/asm_bw_flem.csv
```

Hint

- Use `options(contrasts = c("contr.helmert", "contr.helmert"))` to change the default contrasts to the desired `Helmert`-Contrasts

Problem 2: Simulation

Use the results of the regression of `Body Weight` on `Breast Circumference` and simulate three datasets with 10, 30 and 100 observations respectively. What is the number of observations required to obtain the same regression results from the simulated dataset that you used in the simulation?

The original dataset is available under:

```
## https://charlotte-ngs.github.io/asmss2022/data/asm_bw_flem.csv
```