Applied Statistical Methods - Exercise 6

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Problem 1: Sire Model

Use the following dataset to predict breeding values using a sire model. The dataset is available from

```
## https://charlotte-ngs.github.io/asmss2023/data/asm_ped_sim_data.csv
```

Hints

- The variance component σ_s^2 of the sire effect can be assumed to be 2.25.
- The variance component σ_e^2 of the random resiudals is 36.
- Sex is modelled as a fixed effect.
- The sire pedigree relationship can be computed using the `pedigreemm` package.

Problem 2: Animal Model

Use the same dataset as in Problem 1 to predict breeding values, but use an animal model instead of a sire model. The dataset is available from

```
## https://charlotte-ngs.github.io/asmss2023/data/asm_ped_sim_data.csv
```

Hints

- The variance component σ_u^2 of the breeding value can be assumed to be 9.
- The variance component σ_e^2 of the random resiudals is 36.
- Sex is modelled as a fixed effect.
- The numerator relationship matrix can be computed using the `pedigreemm` package.

Problem 3: Model Comparison

Compare the order of the predicted breeding values for the sires from the sire model and from the animal model.