ANOVA and Random Effects Models

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Repeated Measurements

▶ Same characteristics (`Body Weight`, `BC`, ...) measured multiple times for the same animal
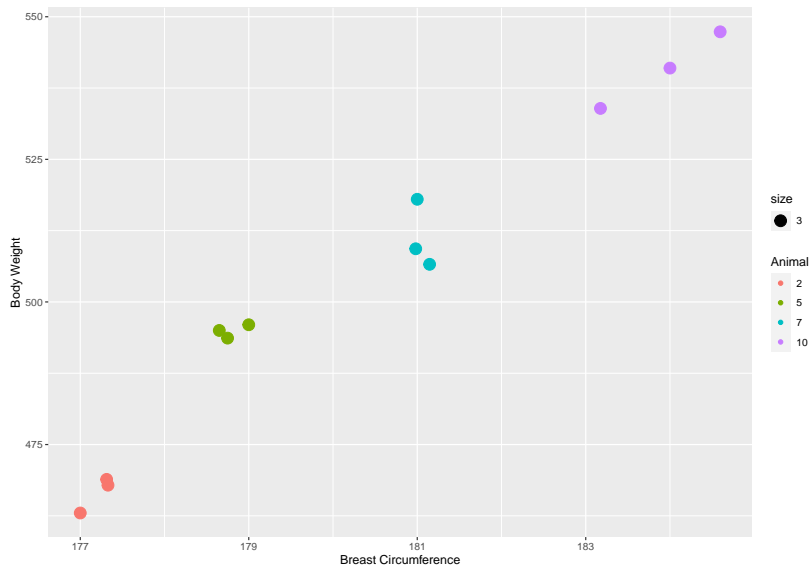
Animal	Breast Circumference	Body Weight
2	177.0000	463.0000
2	177.3129	468.8940
2	177.3292	467.8753
5	179.0000	496.0000
5	178.6501	495.0033
5	178.7485	493.6563
7	181.0000	518.0000
7	180.9819	509.3221

▶ Column `Animal` no longer just a counter, it becomes a model factor

Properties

- What is the benefit of repeated measurements?
- Equivalent to more animals in the dataset?
- Assumption: repeated observations of the same animal are more "similar"
- No longer independence of observations

Data Scatterplot

Statistical Analysis

- Technically, same regression analysis is possible

- But assumption of independence is violated

- Consequence of independence

$$var(\mathbf{e}) = \mathbf{I} * \sigma_e^2$$

* Check residuals plot

No Repeated Measures