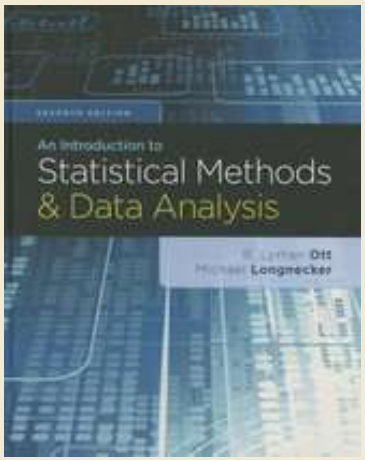
Linear and Generalized models

Saskia Burgers

Biometris, Wageningen University



WAGENINGEN UNIVERSITY
WAGENINGEN UR

Background

- Used to be a 9 ECT course
- Now 2 courses:
  Linear and Multiple linear regression 6 ECT
  Linear algebra 3 ECT

- First three to four weeks:
  Linear and Generalized models only on Mondays
  Refreshing Statistics from your bachelor
- Non-mathematical background: Linear algebra

Week 5-7: adding theoretical background &GLM

Week 5 (27/11/2023)	• Linear models in matrix form • Linear contrasts • Least squares estimation (quadratic form) • Variance covariance matrix **Fox: chapters 9.1-9.3**	• Statistical inference • F-tests, t-test • Sums of squares (unbalanced data) **Fox: chapters 9.4**	• Overview problems in linear models, diagnostics • Levarages • Hat matrix • Cook's distance • Remedies for assumption violation (transformation) • Polynomials and splines? **Fox: chapter 11** **Faraway PRA: chapter 7**
Week 6 (4/12/2023)	• Model selection • Stepwise procedures (pros and cons), all possible subsets • Criteria for model selection • Model validation • Collinearlity? **Fox: chapter 22** **Faraway PRA: chapter 10**	• Maximum Likelihood • Fisher Information • Inference for single and several parameters	**Study day** (6/12/2023)
Week 7 (11/12/2023)	• GLM for binomial data • Odds and OR • Statistical inference in binomial GLM • Deviance comparison **Fox Appendix: chapter D6.1-D6.4** **Fox: chapter 14.1** **Faraway ELM: chapter 2**	• Count data • GLM for poisson data • MLE for poisson GLM • Overdispersion • Goodness of fit **Fox: chapter 14** **Faraway ELM: chapter 2**	• Exponential family • Canonical link function • Deviance **Fox: chapter 15** **Faraway ELM: chapter 3**

Teachers

- Jos Hageman: week 1-3

- Vahe Avagyan: week 4 – 6

- Saskia le Cessie: week 7

- Saskia Burgers: practicals week 1-4
- Teaching assistents practicals week 5 - 7

Practical in R-Studio

- Practicals are mandatory
- We will register your presence
- If you cannot be there, sent an email to course coordinator: Vahe.Avagyan@wur.nl

- Practical available on Brightspace
  Fill in the hand-out and let us check.

- We expected 50 students (not 75)
- We expected a better room for the practicals