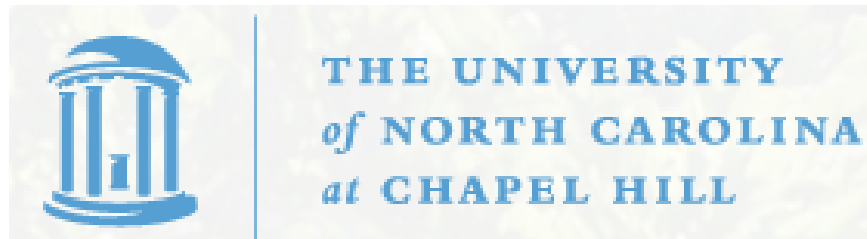


STOR 590:
ADVANCED LINEAR MODELS
Instructor: Richard L. Smith

Class Notes:
September 11, 2020



CLASS ANNOUNCEMENTS

- HW3 — due today
- HW4 posted — due Friday September 18
- Structured office hours — try again next week
- Post September 26, 6pm, return September 28, 6pm
Almost final, will confirm for sure next week
- Final exam — also planning take-home, schedule to be fixed
- Spring 2020 midterm and final exams have been posted
- Also posted an update to the “GLM” handout

GLM Algorithm (p. 155)

1. Model defined by means μ_i , link function $\eta_i = g(\mu_i)$, variance function $V(\mu)$ and dispersion parameter ϕ .
2. Initial estimates $\hat{\mu}^{(0)}$ and hence $\hat{\eta}^{(0)}$
3. At iteration k form $z^{(k)} = \hat{\eta}^{(k)} + (y - \hat{\mu}^{(k)}) \frac{d\eta}{d\mu} \Big|_{\hat{\eta}^{(k)}}$
4. Weights $\frac{1}{w^{(k)}} = \left(\frac{d\eta}{d\mu} \right)^2 \Big|_{\hat{\eta}^{(k)}} V(\hat{\mu}^{(k)})$
5. Fit ordinary linear model to $z^{(k)}$ with weights $w^{(k)}$
6. Set $k = k + 1$ and return to step 3
7. Iterate to convergence
8. Estimate $\text{Var}(\hat{\beta}) = (X^T W X)^{-1} \hat{\phi}$.