BIOS 625: Categorical Data Analysis & Generalized Linear Models Spring 2018 Homework Set 4

INSTRUCTIONS:

Complete with legible handwriting, or use a mathematical editor (like MS Word, LATEX). Combination of the two is also OK. Agresti refers to the textbook [3rd edition].

DUE DATE: April 3rd, 2018

- 1. Agresti 4.2 (a)
- 2. Agresti 4.7
- 3. Agresti 4.8
- 4. Agresti 4.12
- 5. Agresti 4.14
- 6. Agresti 4.16
- 7. Agresti 4.18
- 8. Agresti 4.27
- 9. Conditional on $\lambda > 0$, Y has a Poisson distribution with mean λ . Values of λ vary according to the Gamma density, defined as $f(\lambda; k, \mu) = \frac{(k/\mu)^k}{\Gamma(k)} \exp(-k\lambda/\mu)\lambda^{k-1}$, with $E(\lambda) = \mu$, and $\operatorname{var}(\lambda) = \mu^2/k$. Show that, marginally, Y has the negative binomial (NB) distribution, and explain why the NB model is a smart way to handle Poisson overdispersion.
- $10.~\mathrm{Agresti}~5.2$
- 11. Agresti 5.14
- 12. Agresti 5.18
- 13. Agresti 5.32
- 14. Agresti5.34