

Homework 7
Thursday November 14, 2019

1. Problem 7.4, pages 233–234 of Agresti (2007).
2. Problem 7.19 page 241 Agresti (2007).
3. Problem 7.20, page 242 of Agresti (2007).
4. Using the data in Table 5.12 in Agresti (2007), do the following:
 - (a) Fit the loglinear model of homogenous association. Report the estimated conditional odds ratio between smoking and lung cancer. Obtain a 99% confidence interval for the true odds ratio. Interpret.
 - (b) Test goodness-of-fit of the model. Interpret.
 - (c) Consider the simpler model of conditional independence between smoking and lung cancer, given city. Compare the fit to the homogeneous association model, and Interpret.
 - (d) Fit a logit model containing effects of smoking and city on lung cancer. Use the smoking effect to estimate the conditional odds ratio between smoking and lung cancer. How does this compare to the estimate from the log-linear model?
 - (e) Use (b) to test the hypothesis of a common odds ratio between smoking and lung cancer for these eight studies. How does the result compare to the Breslow-Day test?
5. Problem 7.15, page 240 of Agresti (2007). Be sure to use the data from Table 7.13.

Add part (c): Consider Alcohol, Cigarette and Marijuana use to be the “response” variables and Race and Gender to be “explanatory”. Analyze the data. For this part, be sure to

- Describe your model selection strategy.
- Give a full interpretation of the final model you select.
- Summarize your findings in non-technical language (i.e., Give two or three lines that could be used as the opening of an newspaper or magazine article reporting the results).