

HW5

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Problem 1 (40 pts) The table below lists graduate admissions information for the six largest departments at U.C. Berkeley in the fall of 1973. This the example we saw in the lecture notes, and you can use the data files and code provided in Lesson 5.

Dept.	men rejected	men accepted	women rejected	women accepted
A	313	512	19	89
B	207	353	8	17
C	205	120	391	202
D	278	139	244	131
E	138	53	299	94
F	351	22	317	24

Let D = department, S =sex,and A = admission status (rejected or accepted).

- (a) Give the marginal table $S \times A$. Analyze the marginal table for $S \times A$, reporting the X^2 test and odds ratio. Is there any evidence of gender bias in graduate admissions?
- (b) Give the partial table $S \times A$ for each level of D . Examine the $S \times A$ tables within each level of D , reporting the X^2 statistics and odds ratios. Does this contradict what you found in part (a)? Why or why not? What is the Cochran-Mantel-Haenszel (CMH) statistic for our example? What does this statistic tell you about the relationship between admission and gender when adjusting for department?
- (c) Drop the department "A" from the analysis, and re-test for the conditional independence model. What is the CMH statistic now and what does it tell you about the relationship between admission and gender when adjusting for department?
- (d) In the Lesson 5 notes we saw that with the department A in the analysis, the model of homogenous associations was rejected (the Breslow-Day statistic =18.83, with $df=5$, $p\text{-value}=0.0021$). Report the Breslow-day statistics for the analysis without department A. What is your conclusion now about the this model?