Midterm for Categorical Data Analysis

Do not discuss with others! Due: 2021/11/17 before class

1. **Exercise 2.8.**

2. **Exercise 2.12.**

3. **(a) Exercise 2.30.**

   (b) Obtain and interpret the one-sided mid p-value for Exercise 2.30.

4. **The following table refers to applicants to graduate school at a famous university. It presents admissions by gender of applicant for the 6 largest departments.**

	Whether Admitted			
	Male		Female	
Department	Yes	No	Yes	No
A	512	313	89	19
B	353	207	17	8
C	120	205	202	391
D	138	279	131	244
E	53	138	94	299
F	22	351	24	317
Total	1198	1493	557	1278

   Let *Z* be department, *X* be gender, and *Y* be decision.
   (a) Estimate marginal odds ratio and conditional odds ratios for *X* and *Y*. Interpret and explain the results.
   (b) At α=0.05, test whether there is conditional independence?
   (c) At α=0.05, test whether there is homogeneous *XY* association?

5. **The following is a $3 \times 4 \times 4$ table that cross-classifies dumping severity (*Y*) and operation (*X*) for 4 hospitals (*Z*). The 4 operations refer to treatments for duodenal ulcer patients and has a natural ordering. Dumping severity describes a possible undesirable side effect of the operation, and its 3 categories are also ordered.**

	Hospital 1			Hosptial 2			Hospital 3			Hospital 4		
Operation	N	S	M	N	S	M	N	S	M	N	S	M
A	23	7	2	18	6	1	8	6	3	12	9	1
B	23	10	5	18	6	2	12	4	4	15	3	2
C	20	13	5	13	13	2	11	6	2	14	8	3
D	24	10	6	9	15	2	7	7	4	13	6	4

   To study the association between operation and dumping severity, do the following tests and draw conclusions for: 1) non-zero correlation, 2) mean operation scores differ, 3) general association.

   Note: Consider equally-spaced scores if necessary.

6. **Exercise 3.18.**