

Practice Problems

Problem 13.3:

Find the rejection region for a test of independence of two classifications where the contingency table contains r rows and c columns and

(a) $r = 6, c = 4, \alpha = 0.05$

(b) $r = 3, c = 5, \alpha = 0.10$

(c) $r = 2, c = 2, \alpha = 0.01$

Problem 13.4:

Shopping at secondhand stores is becoming more popular and has even attracted the attention of business schools. A study of customers' attitudes toward secondhand stores interviewed samples of shoppers at two secondhand stores of the same chain in two cities. The breakdown of the respondents by sex is as follows.

	City	City
	1	2
Men	38	68
Women	203	150
Total	241	218

(a) Suppose we want to test the two classifications, gender and city, are independent. Write down the hypothesis.

(b) Find the estimated expected counts based on the null hypothesis in part (a).

(c) Compute the χ^2 test statistic.

(d) Can we reject the null hypothesis at $\alpha = 0.10$?

Problem 13.5:

The study of shoppers in secondhand stores cited in the previous exercise also compared the income distributions of shoppers in the two stores. Here is a two-way table of counts.

Income	City 1	City 2
under \$10,000	70	62
\$10,000 to \$19,999	52	63
\$20,000 to \$24,999	69	50
\$25,000 to \$34,999	22	19
\$35,000 or more	28	24

A statistical calculator gives the chi-square statistic for this table as $\chi^2 = 3.955$. Is there good evidence that customers at the two stores have different income distributions? (Give the degrees of freedom, rejection region, and your conclusion.)