

STAT 445 Lab 6
ASSIGNMENT # 6
Due: Lab 7 (at the end)

Question 1

A company test markets 3 new brands (A, B & C) of a chocolate drink. A number of individuals are randomly chosen in a typical urban market ($n = 32$), a typical suburban market ($n = 32$), and a typical rural market ($n = 30$). After tasting all 3 brands (in a random order), each person specifies which brand he or she prefers over the others. The preferences are given in the following contingency table.

	Urban	Suburban	Rural
A	5	7	5
B	16	21	23
C	11	4	2
	32	32	30

- (a) Use Pearson's χ^2 to assess the strength of evidence against the null hypothesis that consumer preferences are homogeneous across the three market locations.
- (b) Use Fisher's exact test to assess the evidence.
- (c) Which of the two p-values is more reliable in this case? Why?

Question 2

The datafile 'assign6.dat' (course website) contains 20 observations on the variable *change*. Your purpose is to estimate the location of *change*.

- (a) Calculate the mean and the median.
- (b) Calculate Huber's estimate with $c = 1.345$. Use MAD for the estimate of scale.
- (c) Repeat (b) using $c = 0.001$ and $c = 10$. What are your observations?
- (d) Which of the three estimates is the most resistant to outliers? Which is the least resistant?
- (e) Suppose that the distribution is normal. Which of the estimates is the most efficient? Which is the least efficient?
- (f) Based on (c), (d) and (e), comment on the idea behind Huber's estimate.