Midterm Exam (Practice Version)

Statistics 280

Feb. 8, 1998

Directions

1. This is a "practice exam." It is only meant to help you study for the real exam on Feb. 11. This practice exam is not required nor is does it count any part of your grade. It is very much like the real exam, so it will give you a good idea of what you need to study.

2. I recommend that you attempt the exam initially with a 50 min. time limit. That will give you some practice performing in the real exam.

3. You should use your own paper. On the real exam, there will be space provided to work out your solutions.

4. This is a closed book exam. However, you should have your book available for Table A in the on the back of the front cover. Tables will be provided during the exam. You should have your calculator also available – it will be allowed during the exam. No other materials are allowed. There is to be no sharing of calculators during the exam.

5. The exam is worth 100 points. The value of each question is in square brackets after the problem number.

6. If you have any questions, do not hesitate to contact me by email (dcox@stat.rice.edu), phone (713-527-6007), or to come during my office hours (11-11:50 Tue and Wed in DH2080). You may also schedule an appointment by email or phone.

SOME NOTATIONS AND DEFINITIONS: $\bar{x}$ denotes the sample mean, M the sample median, s the sample standard deviation. The first quartile is denoted Q_1 and the third quartile is denoted Q_3. IQR denotes the interquartile range.

1. [25 points] For each of the statements below, circle **T** or **F** for "True" or "False," respectively. (5 pts. each)

T **F** : If the histogram is skewed to the right, we would expect the mean to be larger than the median.

T **F** : If the distribution is bell shaped with no outliers, we expect about 95% of the observations lie within the range $\bar{x} \pm s$.

T **F** : If the correlation between two variables is 0, that means there is no association between the variables.

T **F** : The only way a statistician can obtain a "representative sample" is through a properly designed probability sample.

T **F** : Generally, a few outliers in a data set can have a big effect on the IQR but will not affect the standard deviation much.

2. [30 points] Use the five number summary below to sketch a density histogram for the data set.

$$\text{minimum} = 0, \quad Q_1 = 10, \quad M = 15, \quad Q_3 = 25, \quad \text{maximum} = 50.$$

3. [25 points] Find the mean $\bar{x}$ and standard deviation s of the following data set.

$$x_1 = 7, \quad x_2 = 4, \quad x_3 = 13, \quad x_4 = 8.$$

4. [20 points] Below are 4 values of r, the correlation of a sample, and 4 scatterplots. Match the value of r with the scatterplot by writing the plot label (A, B, C, or D) next to the value of r.

(i) $r = 0.0$

(ii) $r = +0.4$

(iii) $r = -0.8$

(iv) $r = +0.9$