Math 425/525 - Homework 1

Due Wednesday 02/06

1. *Problem 1.1:* A researcher is interested in the effect of an electrolytic sports drink on the endurance of adolescent boys. A group of 30 boys is selected and half are given a treadmill endurance test while consuming the sports drink and the other half take the test while drinking water. For this study, **a)** Identify the population, **b)** Identify the sample.

2. *Problem 1.13:* Explain the difference between a discrete variable and a continuous variable. Give an example of each.

3. *Problem 1.20:* For the data set $X = \{5, -1, 0, -3, -1\}$, find the value of each summation expression: **a)** ΣX, **b)** ΣX^2, **c)** $\Sigma(X + 3)$.

4. *Problem 2.1:* Suppose you had scores $\{5, 7, 8, 4, 7,\ \ 9, 6, 6, 5, 3,\ \ 9, 6, 4, 7, 7,\ \ 8, 6, 7, 8, 5\}$ on a test. Construct a frequency distribution table, including a column for percentile.

5. *Problem 2.4:* Suppose you had scores from Figure 1a on an exam. Place these scores in a grouped frequency distribution table. You may choose the width of the intervals.

6. *Problem 2.14:* For the set of scores $2, 3, 2, 4, 5,\ 2, 4, 2, 1, 7,\ 1, 3, 3, 2, 4,\ 3, 2, 1, 3, 2,$ **a)** Construct a frequency distribution table, **b)** Sketch a graph (line or bar, I don't care) showing the distribution, **c)** Describe the shape of the distribution, **d)** Choose a score which you feel best identifies the center of the distribution.

7. *Problem 2.19:* Complete the final two columns in the frequency distribution table listed in Figure 1b, and answer **a)** What is the percentile rank (percent of scores at or below) X=14, **b)** What is the percentile rank for $X = 29$, **c)** What is the 46th percentile (for what score are 46% of scores at or below you), **d)** What is the 80th percentile?

8. *Problem 3.1 & 3.2 & 3.23:* **a)** What general purpose is served by a good measure of central tendency? **b)** Why is it necessary to have more than one method for measuring central tendency? **c)** Explain why the mean may be a poor measure of central tendency for a skewed distribution, such as household income.

9. *Problem 3.6:* Find the mean, median, and mode for the set of scores in the Figure 1c.

10. *Problem 3.13:* A population of $N = 10$ scores has a mean of $\bar{X} = 24$. If one person with a score of $X = 42$ is removed from the sample, what will be the value for the new mean?

21	40	18	37	32	52	33
24	13	57	41	47	32	43
58	16	38	31	47	29	49
54	22	39	34	45	20	

(a) Data for problem 2.4

X	f	cf	$c\%$
30-34	2		
25-29	4		
20-24	7		
15-19	5		
10-14	2		
5-9	4		

(b) Data for problem 2.19

X	f
10	2
9	3
8	5
7	6
6	3
5	1

(c) Data for problem 3.6

Figure 1: Data needed for problems above