Math 115 - Test 1

Name _____

September 18, 2014

Score _____

Show all work to receive full credit. Supply explanations where necessary.

1. (10 points) Determine whether each statement is true (T) or false (F).

   (a) _____ A statistic is a numerical value that describes a population characteristic.

   (b) _____ To select a cluster sample, divide a population into groups and then select all of the members of at least one of the groups.

   (c) _____ Data at the ordinal level are quantitative only.

   (d) _____ A sample is a subset of the population.

   (e) _____ Numerical calculations can be performed on data at the nominal level.

   (f) _____ In a frequency distribution, the class width is the distance between the lower and upper limits of a class.

   (g) _____ The mean is the measure of central tendency that is least affected by outliers.

   (h) _____ The standard deviation of a sample could be a negative number.

   (i) _____ The mode is never a good measure of central tendency.

   (j) _____ Asking your ten best friends to participate in a survey is an example of a systematic sample.

2. (5 points) A sample of PSC students is obtained as described. Identify the type of sampling. Choose from *random, systematic, convenience, stratified, cluster*.

   (a) Students are selected as they walk in the main door.

   (b) Students are separated into groups according to age, then 20 students are selected from each age group.

   (c) A complete list of students is compiled and every 150th name is selected.

   (d) Students are separated into groups according to last initial. Ten letters are chosen at random and all students with that initial are selected.

   (e) Student ID numbers are selected at random by using a computer.

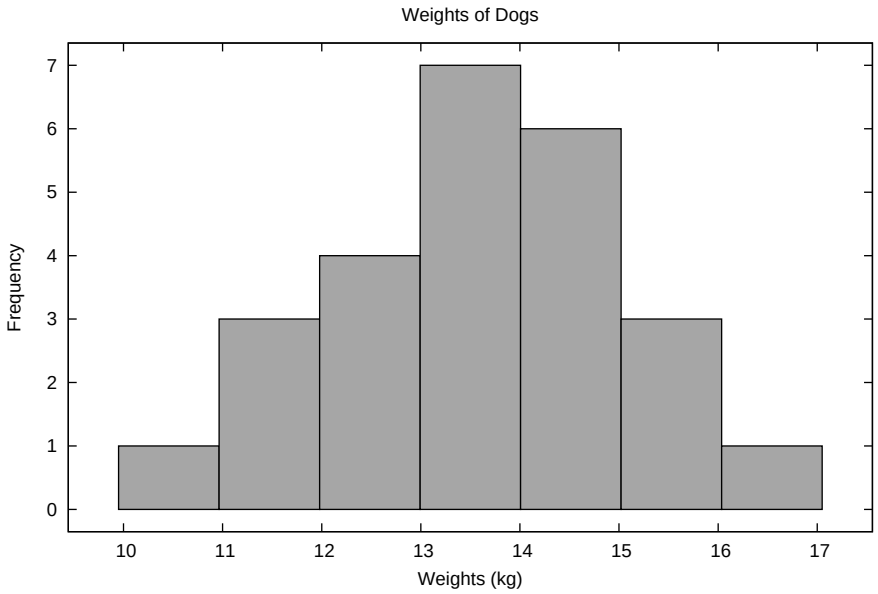
3. (3 points) Determine whether the data are quantitative or qualitative.

   (a) Weights of infants in a hospital

   (b) Student ID numbers

   (c) Eye colors

4. (3 points) The following histogram shows the distribution of weights of dogs in a local shelter.



(a) How many dogs are in the sample?

(b) If the histogram was changed to a relative frequency histogram, what would be the height of the fourth bar?

(c) Are numbers of dogs discrete or continuous?

5. (10 points) The frequency distribution shown below gives the daily high temperatures (in °F) last year in Cleveland, OH.

High Temp (°F)	Frequency
20–30	19
31–41	43
42–52	68
53–63	69
64–74	74
75–85	68
86–96	24

(a) What is the class width?

(b) What are the class boundaries associated with the last class listed above?

(c) What are the class midpoints?

(d) Use class midpoints to estimate the (weighted) mean salary.

(e) Use class midpoints to estimate the (weighted) median.

6. (4 points) The depths (in inches) at which 10 artifacts were found at an archaeological dig are listed below.

20.7 24.8 30.5 26.2 36.0 34.3 30.3 29.5 27.0 38.5

(a) Find the range of the data set.

(b) Change 38.5 to 60.5, and then find the range of the new data set.

(c) Use your calculator to compute the standard deviation.

7. (2 points) You are applying for jobs at two companies. Company A offers starting salaries with $\bar{x} = \$31{,}000$ and $s = \$1000$. Company B offers starting salaries with $\bar{x} = \$31{,}000$ and $s = \$5000$. From which comapny are you more likely to get an offer of \$33,000 or more? Explain why you think so.

8. (2 points) Identify the population and the sample: A survey of 1012 U.S. adults found that 5% consider pet-friendliness an important factor for choosing a hotel.

9. (3 points) Sketch a histogram showing a distribution that is skewed left. In your distribution, which is greater, the mean or median?

10. (8 points) Construct a stem-and-leaf plot for the following data (be sure to provide a key). Then find the mean, median, and mode.

12	28	32	49	51	50	10	12	27	38
24	48	48	21	32	36	21	47	32	37