Name: _____ Andrew ID: _____

Minitab Problems 1-4

Statistical Reasoning 90-707 Dr. Nancy Pfenning

1. For works of art featured at the 1913 International Exhibition of Modern Art, how did the sale prices compare for male and female artists?

   (a) Tell what variables are involved, and whether they are quantitative or categorical.

   (b) **Before you even look at the data**, try to make a reasonable guess for each of the following:

      i. Which group will have a higher center (or about the same)?_____

      ii. Which group will have more spread (or about the same)?_____

      iii. What shapes do you expect? Do you expect outliers? If so, from any artists in particular?

   (c) Use **MINITAB Basics Example I** to make a comparison:

      i. Does one group have a considerably higher center?

      ii. Does one group have more spread?

      iii. Compare the shapes.

   (d) **Summarize** your findings in a few sentences. Be sure to express your results specifically in terms of the variable(s) of interest, and mention to what extent the results match your guesses in (b).

2. For works of art featured at the 1913 International Exhibition of Modern Art, were male or female artists more likely to use watercolors (as opposed to other media such as oil, pastel, drawing, etching, stone, etc.)?

   (a) What variable or variables are involved? For each variable, tell whether it is quantitative or categorical. Which variable (if any) should play the role of explanatory variable?_____

   (b) **Before you even look at the data**, do you expect the variables to be dependent?_____ If so, for which explanatory group do you expect to see a higher proportion using watercolors?

   (c) Use **MINITAB Basics Example U** (only the relevant parts) to produce a two-way table of counts and row percents. Does one group have a considerably higher proportion using watercolors?

   (d) **Summarize** your findings in a few sentences. Be sure to express your results specifically in terms of the variable(s) of interest, and mention to what extent the results match your guesses in (b).

3. Data have been obtained on 80 fast food items. To give you an idea of what to expect, calories per serving ranged from 79 (Korean Bibimbap) to 433 (a chocolate waffle). We want to identify what's typical for number of calories per serving of the 80 fast food items.

   (a) What variable is involved?_____
   What type is it? (i) quantitative (ii) categorical

   (b) **Before you even look at the data**, try to make a rough guess for each of the following: [If you're completely clueless, just answer with a "?".]

      i. (center) mean:_____median: _____
      ii. (spread) standard deviation: _____
      iii. shape:_____
      Do you expect some data values will be outliers? (Explain briefly.)

   (c) Use **MINITAB Basics Examples C-F** to find the following:
   Five Number Summary:_____ _____ _____ _____ _____
   mean_____
   standard deviation _____
   shape (based on stemplot/histogram/boxplot)_____

   (d) **Summarize** your findings in a few sentences. Be sure to express your results specifically in terms of the variable of interest, and mention to what extent the results match your guesses in (b).

4. How are number of calories and grams of fat related for servings of a sample of 80 fast food items?

   (a) What variables are involved? For each variable, tell whether it is quantitative or categorical.
   Which, if any, would be the obvious choice for explanatory variable?_____

   (b) **Before you even look at the data**, try to make a reasonable guess for each of the following: [If you're completely clueless, just answer with a "?".]

      i. form (linear or curved): _____
      ii. direction (positive, negative, or none):_____
      iii. strength (strong, moderate, or weak):_____
      Do you expect outliers? (Explain briefly.)

   (c) Use **MINITAB Basics Example Q** (only the relevant parts) to answer the following:
   Does the scatterplot show a roughly linear form?_____
   What is the regression line equation?_____
   What is the value of the correlation r? _____
   What is the typical residual size s? _____

   (d) **Summarize** your findings in a few sentences. Be sure to express your results specifically in terms of the variable(s) of interest, and mention to what extent the results match your guesses in (b).