

Name: \_\_\_\_\_

## Lab Problems 1-4

CHS Statistics 200  
Dr. Nancy Pfenning

1. How many siblings did surveyed students have?
  - (a) What variable or variables are involved? For each variable, tell whether it is quantitative or 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: \_\_\_\_\_ range: \_\_\_\_\_ to \_\_\_\_\_
    - iii. shape: \_\_\_\_\_  
Do you expect 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 one or two 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 surveyed students, how does the amount of cash carried compare for males versus females?

(a) What variable or variables are involved? For each variable, tell whether it is 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?

(c) Use **MINITAB Basics Examples H and 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 one or two 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. Does eating breakfast depend at all on whether a surveyed student is male or female?

(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 eating breakfast?

(c) Use **MINITAB Basics Example U** to produce a two-way table of counts and row percents. Does one group have a considerably higher proportion eating breakfast?

(d) **Summarize** your findings in one or two 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).

4. **Part A:** How are surveyed students' Writing SATs related to their **Math** SATs?

- (a) What variable or variables are involved? For each variable, tell whether it is quantitative or categorical.

To analyze the data, take Writing SAT as the response variable. Would the opposite assignment of roles also make sense? \_\_\_\_\_

- (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? \_\_\_\_\_

- (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 one or two 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).

- (e) **Part B:** Now repeat the above for this question: How are surveyed students' Writing SATs related to their **Verbal** SATs? What is the explanatory variable?

\_\_\_\_\_

- (f) **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? \_\_\_\_\_

- (g) 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  $s$ ? \_\_\_\_\_

- (h) **Summarize** your findings in one or two 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 (f). Finally, discuss how the relationship in Part B compares to the relationship in Part A.

