

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

R and/or Minitab along with a calculator may be used for this entire section. Once you have completed this section, e-mail Part II to Dr. Price at [pricejr@etsu.edu](mailto:pricejr@etsu.edu), Dr. Lewis at [lewiscn2@etsu.edu](mailto:lewiscn2@etsu.edu), and Dr. Hendrickson at [hendricksonj@etsu.edu](mailto:hendricksonj@etsu.edu). Please make sure you e-mail it to all three professors.

Use the following for questions 1-7. A survey of 657 students was recently conducted. Among the reported results were Student, Height, Gender, Shoes, Number, Dvds, ToSleep, WakeUp, Haircut, Job and Drink. The data file (<http://faculty.etsu.edu/pricejr/1530/studentdata-1.csv>) was setup as follows:

Column1: Student (ID number 1,2, ..., 657)
Column2: Height (How tall are you? In inches)
Column3: Gender (male, female)
Column4: Shoes (How many pairs of shoes do you own?)
Column5: Number (Choose a whole number between 1 and 10)
Column6: Dvds (How many dvds do you own?)
Column7: ToSleep (Give the time you went to bed last night. -2.5= 9:30pm, -1 = 11pm, 0 = midnight, 1 = 1am)
Column8: WakeUp (Give the time you woke up this morning. 5:30 am = 5.5, 10am = 10, 13 = 1pm)
Column9: Haircut (What was the cost (in dollars) of your last haircut, including tip? Dollars)
Column10: Job (How many hours per week do you work?)
Column11: Drink (Do you prefer water, pop, or milk with your meal?)

1. **Who** are the individuals?

- A. The people who conducted the survey.
- B. Student, Height, Gender, Shoes, Number, Dvds, ToSleep, WakeUp, Haircut, Job, and Drink.
- C. The semester that the survey was conducted.
- D. All students that have ever attended college.
- E. The 657 students surveyed.

2. Which variables are **categorical**?

- A. Gender, Drink
- B. Height, Student, Drink
- C. Male, Pop, ToSleep, WakeUp
- D. Height, Shoes, Number, Dvds, ToSleep, Haircut, Job

3. The variable **Dvds** in the dataset contains the number of movie DVDs owned by students in the class.

- A. Create an appropriate graph to display the distribution of this variable and insert it here.
- B. State the appropriate descriptive statistics for the shape of the distribution to describe the center and spread of the variable. Include the appropriate output.
- C. Comment on your findings.

4. The variable **Height** contains the height (in inches) of each student in the class.

- A. Construct a graph to compare the heights of males and females and insert it here.
- B. Comment on the graph.
- C. How much taller are male students than female students, on average?

5. Construct a table that represents the student responses from the survey to the question “What do you typically drink with dinner?”

- A. Create an appropriate graph to display the distribution of this variable and insert it here.
- B. Describe this distribution.
- C. Do males and females prefer the same drink for dinner? Explain. Include any appropriate output.
- D. What percent of females prefer water? Include any appropriate output.

6. The variables **ToSleep** and **WakeUp** contain, respectively, the time to bed and wake-up for each student a previous evening. (The data are recorded as hours past midnight, so a value of -2 indicates 10 p.m.)

- A. Create an appropriate graph to display the relationship between **ToSleep** and **WakeUp**. Insert it here.
- B. Describe the relationship between **ToSleep** and **WakeUp** using the graph produced in part A.
- C. Report the value of the correlation between this pair of variables.
- D. Obtain the equation for the least squares regression of **ToSleep** and **WakeUp**. State it here.
- E. Predict the wake-up time for a student who went to bed at midnight.

7. Using the variable **Haircut**, estimate how much more females spend on haircuts than males on the average by producing a 90% confidence interval and interpret.

8. A vendor of milk products produces and sells low-fat dry milk to a company that uses it to produce baby formula. In order to determine the fat content of the milk, both the company and the vendor take an observation from each lot and test it for fat content in percent.

Lot Number	1	2	3	4	5	6	7	8	9	10
Company Test Results (A)	0.50	0.58	0.90	1.17	1.14	1.25	0.75	1.22	0.74	0.80
Vendor Test Results (B)	0.79	0.71	0.82	0.82	0.73	0.77	0.72	0.79	0.72	0.91

- A. We want to test whether the mean fat content of the milk measured from Company A is greater than the mean fat content of the milk measured from the vendor. State the null and alternative hypotheses.
- B. What is the mean difference of the observed data?
- C. Is there statistical evidence that the mean fat content of milk measured from Company A is greater than the mean fat content of the milk measured from the vendor using a 5% level of significance? Include your output here.
- D. Compute a 95% confidence interval to estimate how much higher the mean fat content of the milk from Company A is than the vendor’s mean fat content and interpret.