

ECO 230: Business Communication and Research

Instructor: Dr. James Murray

Fall 2018

Name (4 points): _____

Practice Exam 2

Directions: Write your answers in the space provided. Please include the following in every answer the one line of code that produced the output needed to answer the question, or if using a plot, write down the plot title. The dataset `jobsat.RData` includes the following variables related to job satisfaction for Jewish public workers:

- **Satisfaction:** ratio scale, measure of overall job satisfaction
- **Age:** Age of the worker in years
- **Education:** Categorical variable, education level of worker

1. Answer the following questions regarding **overall job satisfaction** and **age**

(a) (8 points) Is there statistical evidence that age and overall job satisfaction are monotonically related to one another? How would you describe the relationship? Is it positive, negative, or not related? Use both a plot and a statistical test to answer the question.

(b) (8 points) Using one or more of the given plots, is there visual evidence that age and overall job satisfaction are *linearly related* to one another?

(c) (8 points) Suppose assuming a linear relationship between overall job satisfaction and age is appropriate. What is the estimate for the linear correlation coefficient?

(d) (8 points) Suppose assuming a monotonic relationship between overall job satisfaction and age is appropriate. What is the estimate for the linear correlation coefficient?

(e) (8 points) On average, how much does job satisfaction change when age increases by one year.

2. Answer the following questions regarding **overall job satisfaction** and **education level**.

(a) (8 points) Is there statistical evidence that the mean overall job satisfaction is different for workers with different education levels? If so, how would you describe the relationship between these two variables?

(b) (8 points) What is the mean level of overall job satisfaction for workers with graduate degrees?

(c) (8 points) At what level of education do workers have the highest level of job satisfaction as measured by the sample interpolated median? Is this statistically significantly different than the interpolated medians for other levels of education?

3. (8 points) Describe when it is appropriate to compute the median, but not the mean.

4. (8 points) Describe the difference of the influence that extremely large values have on the mean versus the median.

5. (8 points) Describe the definition and purpose of the interpolated median.

6. (8 points) Describe why one would estimate a Spearman correlation coefficient versus a Pearson correlation coefficient.