

FREC 408 Assignment 5

Issued: October 20, 2003

Due: November 3, 2003

Be sure to:

- Put your name and the Assignment # on the front
- Answer as completely as you can. All I can go on is what you give me, so show your work.
- Be as neat as possible. You can write it out, but please be neat.
- Staple or place in a folder

- 1. Confidence Interval for employee participation rate (a file is available: rate401k.xls). 25 pts**
 401(k) plans permit employees to shift part of their before-tax salaries into investments such as mutual funds. Employers typically match 50% of the employee's contribution up to 6% of salary. One company, concerned with what it believed was a low employee participation rate in its 401(k) plan, sampled 30 other companies with similar plans and asked for their 401(k) participation rates. The following rates (in percentages) were obtained (the file is also on the web page):

Statistics	
Sample Size	30
Mean	79.73
Median	80
Std. Deviation	5.96
Minimum	60
Maximum	90

Participation Rate
Stem unit: 10

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6|0
7|0 2 5 5 5 6 7 7 8 9 9
8|0 0 0 0 0 1 2 2 2 3 4 4 5 5 6 7 8
9|0
  
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- a. Use Excel to give the descriptive statistics of the participation rates. Briefly (one paragraph) describe the data using the summary statistics
 - b. Construct a 95 percent confidence interval for the mean participation rate. You can use a z-value or a t-value for this problem.
 - c. Interpret the confidence interval in the context of this problem
 - d. If the company that conducted the study had a 71% participation rate, can it safely conclude that its rate is below the population mean rate for all companies with 401(k) plans? Explain your answer.
 - e. One data point is very low compared to the others - 60%. Suppose this value was entered incorrectly and it really was 80%. How would that affect your confidence interval (redo the mean and standard deviation and recalculate the confidence interval)?
- 2. Answer Problem 7.13 on page 350 in Chapter 7 (chickens pecking at objects) 15 pts**
You must show your work to get credit.
- 3. Answer Problem 7.23 on page 357 in Chapter 7 (hormones and sleep) 15 pts**
You must show your work to get credit.

4. Checkout scanners

20 pts

The Federal Trade Commission (FTC) conducted a study in 1998 of checkout scanners. The FTC inspected 1,669 scanners at retail stores and supermarkets by scanning a sample of items at each store and determining if the scanned price was accurate. The FTC gave a store a passing grade if 98% or more of the items are priced correctly. Of the 1,669 stores in the study, 1,185 passed inspection.

- a. Find a 90% Confidence Interval for the true proportion of retail stores and supermarkets with electronic scanners that pass the FTC price-check test. Interpret the result.
- b. In 1996, the FTC found that 45% of the stores passed inspection. Use the interval in part a to determine whether the proportion of stores that pass inspection in 1998 exceeds .45.

6. Speeders on the highway

25 pts

On the web site is an Excel File which contains a random sample of 63 motorists on a Federal highway where the speed limit is 65 mph. The data can be found on an Excel file on the web.

- a. Use Excel to give the descriptive statistics of the speed of drivers. Briefly (one paragraph) describe the data using the summary statistics.
- b. Calculate a 99% Confidence Interval for the data.
- c. Conduct a Hypothesis Test where the null hypothesis is that the average speed is 65 mph. Use an α level of .01.