Homework #6 – Due Oct. 22

STAT-UB.0103 – Statistics for Business Control and Regression Models

Data files for this assignment are available on the course webpage.

Problem 1

Sincich, Ex. 6.1.
(Note: if you have the 2nd edition of the textbook, then the problem number is 5.1)

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Problem 2

Sincich, Ex. 6.4.
(2nd edition: Ex. 5.4)

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Problem 3

Sincich, Ex. 6.9.
(2nd edition: Ex. 5.9)

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Problem 4

Sincich, Ex. 6.14. Wear-out of used display panels. *(2nd edition: Ex. 5.14)*

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Problem 5

Sincich, Ex. 6.17. Executive Compensation Scoreboard. Refer to *Forbes'* 2011 "Executive Compensation Scoreboard." Recall that the data file contains the 2011 salaries (in $ millions) of the 500 CEOs that participated in the *Forbes'* survey. Suppose you are interested in estimating the mean 2011 salary for these 500 CEOs.

(a) What is the target parameter?

(b) Obtain a random sample of 50 salaries from the `CEOPAY` dataset (available on the course webpage). To do this in Minitab, create a new column called "Sample," and then use Calc $\Rightarrow$ Random Data $\Rightarrow$ Sample from Columns. Set "Number of rows to sample" to 50, then choose the appropriate columns for "From columns" and "Store samples in."

(c) Find the mean of the 50 salaries from part (b).

(d) Verify that the standard deviation for the population of 500 salaries is $\sigma = \$9.84$ million.

(e) Use the information in parts (c) and (d) to form a 99% confidence interval for the true mean 2011 salary of the 500 CEOs in the *Forbes'* survey.

(f) Give a practical interpretation of the interval from part (e).

(g) Find the true mean salary of the 500 CEOs and check to see if this value falls within the 99% confidence interval from part (e).

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Problem 6

Sincich, Ex. 6.27. *(2nd edition: Ex. 5.25)*

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Problem 7

Sincich, Ex. 6.32. Hospital length of stay. Health insurers and the federal government are both putting pressure on hospitals to shorten the average length of stay (LOS) of their patients. The average LOS for men in the United States is 5.4 days, and the average for women is 4.6 days (*Statistical Abstract of the United States: 2012*). A random sample of 20 hospitals in one state had a mean LOS for women of 3.8 days and a standard deviation of 1.2 days.

(a) Use a 90% confidence interval to estimate the population mean LOS for women for the state's hospitals.

(b) Interpret the interval in terms of this application.

(c) What is meant by the phrase "90% confidence interval"?

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Problem 8

Obtain the dataset `NormTemp.CSV` from the course website. This gives data on body temperatures for 130 randomly selected subjects.

(a) What is a reasonable population for this dataset?

(b) Using Minitab, get a confidence interval for the population mean temperature. To do this, first read the data set into Minitab, and then use Stat⇒Basic Statistics ⇒ 1-Sample t. The variable you need to use is Temp. Ask for a confidence interval with level 95.0. Copy and paste the Minitab output.

(c) What assumptions do you need for the confidence interval to be valid?

(d) Are the results of the confidence interval surprising, in view of the fact that the population mean temperature is supposed to be 98.6 degrees?

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