Homework #5 – Due Monday, Nov. 13
COR1-GB.1305 – Statistics and Data Analysis

Problem 1

For each of the following values of α, and n, find $t_{\alpha/2,n-1}$. Round the answer to two digits after the decimal point.

(a) $\alpha = 0.10$, $n = 25$.

(b) $\alpha = 0.02$, $n = 10$.

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Problem 2

Consider the time it takes for a call center to answer its calls. A random sample of 7 calls revealed a sample mean time of 191 seconds and a sample standard deviation of 11.4 seconds.

(a) What is the sample?

(b) What is the population?

(c) Explain what the population mean represents in this problem.

(d) Construct a 95% confidence interval for the population mean.

(e) Construct a 99% confidence interval for the population mean.

(f) State any assumptions you needed to do this problem. Do you think that the assumptions are reasonable? Why or why not?

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Problem 3

A study of 80 students who used a private tutor to help them improve their SAT scores revealed that their score on the mathematical section improved by an average of 11 points, with a sample standard deviation of 65 points.

(a) What is the sample?

(b) What is the population?

(c) Explain what the population mean represents in this problem.

(d) Provide a 95% confidence interval for the population mean.

(e) Does the interval suggest that the tutoring is beneficial? Why or why not?

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Problem 4

Consider the excess market returns (the variable called `MarketReturn` in the file `MARKET.CSV`).

(a) Use *Stat ⇒ Basic Statistics ⇒ 1-Sample t*, and choose *Samples in Columns:* `MarketReturn` to create a 95% confidence interval for the population mean.

(b) What does this population mean represent, and why might it be of interest to a stock investor?

(c) Use the Minitab output to check the calculation of the confidence interval in (a). Also verify the calculation of `SE Mean`, the (estimated) standard error for the sample mean.

(d) Get a 99% confidence interval for the population mean, proceeding as in (a) but adding *Options ⇒ Confidence Level:* 99.0.

(e) What do the confidence intervals from (a) and (d) suggest about the long-term value of investing in the US stock market?

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Problem 5

Recall the data set `NormTemp.CSV`, which you studied in Homework 1. This gives data on body temperatures for 130 randomly selected subjects. Using Minitab, get a 95% confidence interval for the population mean temperature. 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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