**Last Name: First Name:**

**Lab 8: Ch 6 Introduction to Inference**

1. Save then Import data set “Beer2” from my Website. Consider this to be your population.

a) What is the population mean and population standard deviation for number of carbohydrates per bear? This is μ and σ, respectively.

A: The population mean is 11.96013 and the population standard deviation is 4.905587.

b) Generate a sample of 20 beers and find the average number of carbohydrates in your sample. This is x-bar.

A: The average number of carbohydrates is 11.9405.

c) Using from part (c), construct a 90% confidence interval for the true mean number of carbohydrates. Interpret.

A: We are 90% confident that the true mean number of carbohydrates lies between 11.64176 and 12.23924.

d) Using from part (c), construct a 95% confidence interval for the true mean number of carbohydrates. Interpret.

A: We are 95% confident that the true mean number of carbohydrates lies between 11.55707 and 12.32393.

e) Is the true population mean, μ, in your intervals? That is, did you construct intervals in part (c) and (d) that contain the true population mean?

A: The true population mean lies within the intervals.

f) What is the sample size needed if we want to estimate the mean within ±3 carbohydrates using a 95% confidence level?

A: In order to estimate the mean within 3 carbohydrates with a 95% confidence level, the sample size should be at least 11.

2. The level of calcium in the blood in healthy young adults varies with mean about 9.5 milligrams per deciliter and standard deviation about 0.4. A clinic in rural Guatemala measures the blood calcium level of 120 healthy pregnant women at their first visit for prenatal care. The mean based on this sample is 9.57. Is this an indication that the mean calcium level in the population from which these women come differs from 9.5?

a) State and .

For the null hypothesis, the mean calcium level for the Guatemalan women is 9.5.

For the alternative hypothesis, the mean calcium level for the Guatemalan women is different from 9.5.

b) Find the z-statistic. A: The z-statistic is 1.917.

c) Give the P-value. A: The P-value is 0.0552.

d) Report your conclusion in context using a significance level of 10%.

A: There is sufficient evidence to support the claim that the mean calcium level for the Guatemalan women is different from 9.5.

e) Give a 90% confidence interval for the mean calcium level μ in this population. Interpret result.

A: We are 90% confident that the mean calcium level in the population is between 9.44 and 9.56.

f) Is part (d) and part (e) gives you the same result?

Yes, the confidence interval and the hypothesis testing remain the same.

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