STA 501 Week #6 Assignment

Due: 11:30 PM, 03/10/2021

3/3/2021

Please study the examples in the class note and complete the following problems. Please note that you are expected to interpret each of the confidence intervals you obtained. You can modified my code to calculate confidence intervals.

Problem 1

We wish to estimate the mean serum indirect bilirubin level of 4-day-old infants. The mean for a sample of 16 infants was found to be 5.98 mg/100 cc. Assume that bilirubin levels in 4-day-old infants are approximately normally distributed with a standard deviation of 3.5 mg/100 cc. Construct a 95% confidence interval of the mean serum indirect bilirubin level of 4-day-old infants (μ) and interpret the interval.

Problem 2

The subjects of a study were 10 obstetrics and gynecology interns at the University of Colorado Health Sciences Center. The researchers wanted to assess competence in performing clinical breast examinations. One of the baseline measurements was the number of such examinations performed. The following data give the number of breast examinations performed for this sample of 10 interns.

30, 40, 8, 20, 26, 35, 35, 20, 25, 20

Construct a 95% confidence interval for the number of breast examinations and give an interpretation of the confidence interval.

Problem 3

Punctuality of patients in keeping appointments is of interest to a research team. In a study of patient flow through the offices of general practitioners, it was found that a sample of 35 patients was 17.2 minutes late for appointments, on the average. Previous research had shown the standard deviation to be about 8 minutes. The population distribution was felt to be non-normal. Find the 90 percent confidence interval for μ, the true mean amount of time late for appointments and interpret the confidence interval.

Problem 4

The following are the activity values (micromoles per minute per gram of tissue) of a certain enzyme measured in normal gastric tissue of 35 patients with gastric carcinoma.

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0.360, 1.189, 0.614, 0.788, 0.273, 2.464, 0.571, 1.827, 0.537, 0.374, 0.449, 0.262, 0.448,
0.971, 0.372, 0.898, 0.411, 0.348, 1.925, 0.550, 0.622, 0.610, 0.319, 0.406, 0.413, 0.767,
0.385, 0.674, 0.521, 0.603, 0.533, 0.662, 1.177, 0.307, 1.499
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We wish to construct a 95 percent confidence interval for the population mean and interpret the confidence interval. It is not necessary to assume that the sampled population of values is normally distributed.

Problem 5

In a study 136 subjects with syncope or near syncope were studied. Syncope is the temporary loss of consciousness due to a sudden decline in blood flow to the brain. Of these subjects, 75 also reported having cardiovascular disease. Construct a 99 percent confidence interval for the population proportion of subjects with syncope or near syncope who also have cardiovascular disease and interpret the interval.

Problem 6

In a study of factors thought to be responsible for the adverse effects of smoking on human reproduction, cadmium level determinations (nanograms per gram) were made on placenta tissue of a sample of 14 mothers who were smokers and an independent random sample of 18 nonsmoking mothers. The results were as follows:

Nonsmokers: 10.0, 8.4, 12.8, 25.0, 11.8, 9.8, 12.5, 15.4, 23.5, 9.4, 25.1, 19.5, 25.5, 9.8, 7.5, 11.8, 12.2, 15.0

Smokers: 30.0, 30.1, 15.0, 24.1, 30.5, 17.8, 16.8, 14.8, 13.4, 28.5, 17.5, 14.4, 12.5, 20.4

Assume that both smokers and non-smokers populations are normally distributed and have equal variance.

Does it appear likely that the mean cadmium level is higher among smokers than nonsmokers? Why do you reach this conclusion? [Hint: answer the above questions by constructing a 95% confidence interval of the difference between population means.]