



MATH232 Week 05 Assignment

Confidence Intervals for One Population Mean and Proportion

Guidelines

- Your work must be organized neatly and typed
- Clearly indicate your name and the assignment number in the file name
- Electronic copies of your work can be submitted as an attachment to the drop box
- You need to hand in individual work. You may talk with each other about the problems
- However, everything in the assignment must be your own work. You are not allowed to use classmate's Minitab Express output. Using Minitab Express output that is not your own is a violation of academic integrity
- No late assignments will be accepted

Example Solution

You measure the weights of a random sample of 24 male runners 18 to 24 years old. The sample mean is 60kg and sample standard deviation is 5kg. A local gym advertises that the mean weight for this group of men is 62kg. Calculate a 95% confidence interval for the mean weight for male runners 18 to 24 years old.

WORK YOU NEED TO SUBMIT:

1-Sample t

Descriptive Statistics

N	Mean	StDev	SE Mean	95% CI for μ
24	60.000	5.000	1.021	(57.889, 62.111)

μ : mean of Sample

I am 95% confident that the true mean weight for male runners 18 to 24 years old is between 57.9 and 62.1 kgs.

- 1) (5 points) The increasing cost of health care is an important issue today. Suppose that a random sample of 36 small companies that offer paid health insurance as a benefit was selected. The mean health insurance cost per worker per month was \$124 with a standard deviation of \$32. Construct a 99% confidence interval for the average health cost per worker per month for all small companies.



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- 2) (5 points) **Salmon Farming.** Researchers tested 150 farm-raised salmon for organic contaminants. They found the mean concentration of the carcinogenic insecticide mirex to be 0.0913 parts per million, with standard deviation 0.0495 ppm. As a safety recommendation to recreational fishers, the Environmental Protection Agency's (EPA) recommended "screening value" for mirex is 0.08 ppm. Calculate a 99% confidence interval for the mean concentration of mirex. Based upon your confidence interval, are farmed salmon contaminated beyond the level permitted by the EPA? Justify your answer.
- 3) (5 points) In a survey of 284 smokers, 197 smokers reported that they wanted to quit smoking. Compute a 90% confidence interval for the true proportion of smokers that want to quit smoking. (Adapted from the American Lung Association)
- 4) (5 points) When 460 junior college students were surveyed, 100 said they have a passport. Construct a 95% confidence interval for the proportion of junior college students that have a passport. Round to the nearest thousandth.
- 5) **Housing Starts** The attached data set represents the number of housing starts predicted for the 2nd quarter of 2014 for a random sample of 40 economists.
 - a) Draw a histogram of the data. Comment on the shape of the distribution.
 - b) Draw a boxplot of the data. Are there any outliers?
 - c) Discuss the need for a large sample size in order to use the Student's t -distribution to obtain a confidence interval for the population mean forecast of the number of housing starts in the second quarter of 2014.