

TUFTS UNIVERSITY
Medical School

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Course CMBA0264-01; Statistics with Applications; Summer 2009
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Assignment III

Data sets and other materials posted at the course web page:
<http://www.tufts.edu/~mbiancon/CMBA0264-2009.html>

Due date: Tuesday, July 14, 2009 (by 6:00PM via e-mail)

Please, to solve the problems below, read carefully the material on Interval Estimation (adapted from Newbold, *et al*) available at the course web page.

1. Consider the problem of estimating the mean yearly salaries of Northwest hospital administrators. Suppose the yearly salaries of administrators in the Northwest are $\mathcal{N}(\mu=?, \sigma = 12)$ in thousands of dollars.

Suppose we take a sample of $n=25$ administrators and $\bar{\mathbf{X}} = 82$.
Give a 95% confidence interval for the population mean.

2. Redo #1 for the case: $\mathcal{N}(\mu=?, \sigma = ?)$; $n=25$, $\bar{\mathbf{X}} = 82$, $s = 12$.
Explain the differences if any.

3. The amount of life insurance taken out by families earning \$50,000 a year is normally distributed. Based on a sample of $n=100$, we find we find: $\bar{\mathbf{X}} = 80,000$ and $s = 15,000$. What will be a 99% confidence interval for $\mu =$ true mean amount of life insurance?

4. Revisit the problem of estimating life insurance. You already found a confidence interval for the mean based on a sample of $n=100$ with the following statistics computed from the sample: $\bar{\mathbf{X}} = 80$ and $s = 15$ (\$000). Find a 95% confidence interval for the population variance of life insurance.

5. Suppose you'd like to do a survey poll asking whether or not individuals like a consumer product. What is the needed sample size for a margin of error of at most 4%? Please, explain briefly how you obtain your answer.