

Agenda for Wednesday, Nov 13th 2024

More on Confidence Intervals	1
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Coming up

- Student Hours today 3:45pm-5pm in C162
- HW 17 posted
- Excel Assignment 4 due today

Recall: Confidence intervals

- Formula for a confidence interval for a population mean when σ is known, is:

$$CI = \bar{x} \pm z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}}$$

- Formula for a confidence interval for a population mean when σ is not known, is:

$$CI = \bar{x} \pm t^* \cdot \frac{s}{\sqrt{n}}$$

- Formula for finding a specific sample size, n to achieve a certain margin of error, ME:

– When σ is known:

$$n = \left(\frac{Z_{\alpha/2} \cdot \sigma}{ME} \right)^2$$

– When σ is not known:

$$n = \left(\frac{t^* \cdot s}{ME} \right)^2$$

Confidence interval for proportions

Example 1. For a class project, a political science student at a large university wants to estimate the percent of students who are registered voters. The student surveys 500 students and finds that 59.7% are registered voters. Compute a 90% confidence interval for the true percent of students who are registered voters, and interpret the confidence interval.

Calculator instructions:

Example 2. Suppose 250 randomly selected people are surveyed to determine if they own a tablet. Of the 250 surveyed, 98 reported owning a tablet. Using a 95% confidence level, compute a confidence interval estimate for the true proportion of people who own tablets. Find the 96% confidence interval.

Finding a specific sample size, n to achieve a certain margin of error, ME for proportion confidence intervals:

Example 3. Suppose a mobile phone company wants to determine the current percentage of customers aged 50+ who use text messaging on their cell phones. How many customers aged 50+ should the company survey in order to be 90% confident that the estimated (sample) proportion is within three percentage points of the true population proportion of customers aged 50+ who use text messaging on their cell phones?