Confidence Intervals (General)

Wednesday, March 11, 2020 8:45 PM

Remark: Steps to construct a confidence interval.

I. Read the scenario (problem statement) very carefully.
II. Re-read the scenario and decide what it is you are trying to estimate (a mean?, a proportion?, of what?).
III. Recall that the formula for a confidence interval is:
$(point\ estimate) \pm (critical\ value) * (S_E)$
IV. Re-read the scenario to identify the *point estimate*, which comes from the sample collected.
V. Use the Standard Error Decision Tree to identify how to compute the *standard error* (S_E)
VI. Identify the appropriate *critical value*.
    a. If the box containing your *Standard Error* formula **does not** contain information about "degrees of freedom" (*df*), then identify the *critical value* from the small table in the top center of the Standard Error Decision Tree.
    b. If the box containing your *Standard Error* formula **does contain** information about "degrees of freedom" use R's qt(area to the left of critical value, df) function to identify the appropriate critical value.
VII. Now that you have all three building blocks for the confidence interval formula, fill them in and simplify to compute the lower- and upper-bounds for your confidence interval (be mindful of *order of operations* -- you should multiply the critical value and standard error before doing any addition or subtraction).
VIII. Interpret your confidence interval in the appropriate context for your scenario:

> "*We are **[XX%]** confident that the true **[clearly insert what it is you are estimating here]** is between **[insert lower bound]** and **[insert upper bound]**.*"