Confidence Intervals for Means and Proportions

A. Proportions: Let's say we took a SRS of 150 people (n = 150) and found 67% of the sample support President Bush ($\hat{p} = .67$). We want to form an interval of values, in which we are 95% confident that the true percentage of Bush supporters (in the population) lies.

Must check: 1. Is our sample an SRS?
2. Is $n\hat{p} > 5$ and $n(1-\hat{p}) > 5$?

Then we can find the 95 % CI: The formula is $\hat{p} \pm 1.96 * \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$. This gives us $.67 \pm 1.96 * .038 = .67 \pm .07$. So the 95% CI is from 60% to 74%. Our statement would be "we are 95% confident that the true percentage of Bush supporters is between 60% and 74%."

B. Means: Let's say we conducted an SRS of 150 (n = 150) people asking them how many drinks they had the previous Friday night. Assume the mean for our sample is 4 ($\bar{x} = 4$), with a standard deviation of 1.4 (s = 1.4).

Must check: 1. Is our sample an SRS?
2. Is $n > 30$?

Then we can find the 95 % CI: The formula is $\bar{x} \pm \frac{1.96 * s}{\sqrt{n}}$. This gives us $4 \pm \frac{1.96 * 1.4}{\sqrt{150}} = 4 \pm .22$. So the 95% CI is from 3.78 to 4.22. Our statement would be "we are 95% confident that the mean number of drinks (in our population) on the previous Friday night was between 3.78 and 4.22."