Math 247: Relating <u>Confidence Intervals</u> and <u>Hypothesis Tests</u>   (Section 8.3)

First, the significance level (for a Two-Tailed Test!) and the confidence level always add up to 1.

     If we want a .05 level of significance, then we should construct a _____ confidence interval.

     If we have a 99% confidence interval, we would relate that to a _____ level of significance.

     A _____ (*choose a number*) level of significance corresponds to a _____% confidence level.

Now let's see how **hypothesis tests** and **confidence intervals** relate when actually doing some statistical analysis.

Marijuana grows and salmon. The boom in marijuana grows in Northern California may be having a negative effect on salmon habitat due to water use and polluted run-off.   Suppose in 2010, it was found that 8% of small streams that usually support salmon had no juvenile salmon. In 2016, a random sample 100 small streams that support salmon found that 13 of the them had no juvenile salmon.

Use the <u>data</u> and <u>StatCrunch</u> to find a 95% confidence interval for the proportion of streams ALL small streams that would have no juvenile salmon.

95% confidence interval results:

Proportion	Count	Total	Sample Prop.	Std. Err.	L. Limit	U. Limit

Confidence Interval:

Interpretation:

Does the 2016 data suggest that the proportion of streams where juvenile salmon dying off is different from the proportion in 2010? Explain.

If we did a hypothesis test on whether the proportion of streams where juvenile salmon were dying off had changed since 2010, based on the 2016 data, what would the hypotheses be?

Would the confidence interval tell you to reject the null or to not reject the null at the .05 significance level?

Now use the StatCrunch to perform the hypothesis test to check your answer to the question above. Reflect on what you found.

One sample proportion summary hypothesis test:

Hypothesis test results:

Proportion	Count	Total	Sample Prop.	Std. Err.	Z-Stat	P-value

Step 4: Interpret