Inference Guide – C…
Proportio…

4-steps needed for inference problems:

1. Parameters/Hypotheses
   - define parameters
   - Write the null hypothesis
   - Write the alternative hypothesis and if 1 or 2-tailed test
2. Plan - **Think**
   - Decide what inference procedure.
   - List the assumptions and check the conditions.
   - Specify the model / name the test *"Because the conditions are satisfied, I can model the sampling distribution of the __________ with a _______ model and perform a __________________."*
3. Mechanics - **Show**
   - Write down the statistics
   - Draw curve showing sampling model - mark parameters & statistics & shade tail(s).
   - Calculate the value of the test statistic - show the formula, substitute all the proper values, and give the final result.
   - Find the Confidence Interval, P-Value, etc.
4. Conclusion – **Tell** what you've learned w/ "4Cs")
   - Interpret the confidence interval in context - *"I'm 95% confident, based on this sample, that the proportion of all auto accidents that involve teenage drivers is between 12.7% and 18.6%."*
   - Link the P-value to the decision about the null hypothesis and interpret that decision in the proper context – *"The high P-value indicates that these results could be reasonably explained by sampling error, so I fail to reject the null hypothesis. We do not have evidence of a change in the percentage of ________."*

One Sample

XX% Confidence Interval

$H_0: p = p_0$

$H_A: p \neq p_0$ (2 Tailed)

$H_A: p >or< p_0$ (1 Tailed)

A1 Individuals/data independent.

C1 SRS and n < 10% population.

A2 Sample large enough to approximate SDM w/ Normal model.

C2 Successes ≥ 10 and Failures ≥ 10.

proportion, Normal model

One-proportion

<u>*z*-interval</u>

n = , $\hat{p}$ =

$$SE(\hat{p}) = \sqrt{\frac{\hat{p}\hat{q}}{n}}$$

$$z^* = \left| invNorm\left(\frac{1 - confidence\ level}{2}\right) \right|$$

ME

$$\hat{p} \pm z^* \times SE(\hat{p})$$

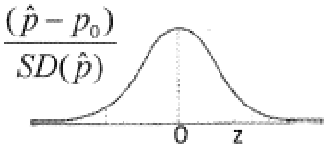
<u>*z*-test</u>

n = , $\hat{p}$ = , p_0 =

$$SD(\hat{p}) = \sqrt{\frac{p_0 q_0}{n}}$$

$$N\left(p_0, \sqrt{\frac{p_0 q_0}{n}}\right)$$

$$z = \frac{(\hat{p} - p_0)}{SD(\hat{p})}$$



P-value = normalcdf(,)