Business Statistics Mr. Nelson

Step I Identify Procedure: CLICK HERE   *for background on completing Step One of Procedure*

We want to test the evidence against the claim that the proportion of students who have downloaded videos

illegally in the population of Granada Hills Charter High School female students (ρ) is equal to 35% (ρ_0).

The null and alternative hypotheses are:

$$H_0: \rho = 35\%$$

$$H_A: \rho < 35\%$$

Step II Check Conditions: Just list conditions below.   CLICK HERE   *for more information on Inference Conditions.*

* Random Sample: A random sample was conducted to insure every member of the population was equally likely
      to be selected.

* Normal Sampling Distribution: The sampling distribution of all possible sample proportions has an approximately
      normal shape because:

$$n*\rho > 10 \qquad\qquad n*(1-\rho) > 10$$

$$36 * .35 > 10 \qquad\qquad 36 * .65 > 10$$

* Independence: The lack of replacement is not a problem in this case because the number of subjects in the
      population is more than ten times the sample size.

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Step III Perform Procedure:

Leave room for a sketch of the Sampling Distribution.

Sampling Distribution: Proportion = 35% Standard Deviation = $\dfrac{\sqrt{\rho(1-\rho)}}{\sqrt{n}}$ = $\dfrac{\sqrt{.35(1-.35)}}{\sqrt{36}}$ = **7.9%**

Shape: Approximately Normal

P-Value = P($\hat{\rho}$ < 19.4% | ρ = 35%) = **2.4%** **compared to the Significance Level (α) of 5%**

Notice the calculation above considers a Z statistic because we can calculate the population standard deviation using ρ.

Use NORM.DIST to calculate the P-value. Since this probability calculation involves <, we can directly use the NORM.DIST %.

Step IV Interpretation: Determine whether to "Reject Null Hypothesis" or "Fail To Reject Null Hypothesis"

Use the appropriate paragraph from the Inference Outline, Step Four.

We reject the null hypothesis at the 5% significance level (α). The P-value of 2.4% falls well below the significance level, thus there is strong evidence that the alternative hypothesis is true, the proportion of students who have downloaded videos illegally in the population of Granada Hills Charter High School female students (ρ) is less than 35%.

Notice we rejected the null hypothesis because the P-value (the probability of getting a sample proportion of 20% if the population had an actual proportion of 35% was only 2.9%, lower than the cut-off significance level selected of 5%. This scenario is too rare to continue with the assumption that population proportion is 35%, thus we reject the original hypothesis, and conclude that the actual proportion must be lower.

CLICK HERE *to review the final draft of this two-page, four-step inference procedure*
CLICK HERE *for Statistics Greek Letters (μ , ρ, α) go to Insert Symbols: Under Greek & Coptic*