Stat Support Activity: One-Population Test Statistics

Notes on the one population proportion Z-test statistic

- **Categorical Data %**
- **Compare to the critical value in the standard normal Z distribution.**
- **Compares Random Sample Proportion $(\hat{p})$ to the Population Proportion $(\pi \text{ or } p)$ in the Null Hypothesis (H_0)**
- **Sentence: The sample proportion is _____ number of standard errors (above or below) the Population Proportion in the hull hypothesis.** *("Above" if positive. "Below" if negative.)*
- **Formula**

$$Z = \frac{(Sample\ Proportion - Population\ Proportion)}{Standard\ Error} = \frac{(\hat{p} - \pi)}{\sqrt{\frac{\pi(1-\pi)}{n}}}$$

Notes on the one population mean average T-test statistic

- **Quantitative Data Mean Average**
- **Degrees of Freedom df = n – 1**
- **Compare to the critical value in the student T distribution with n – 1 degrees of freedom.**
- **Compares Random Sample Mean $(\overline{x})$ to the Population Mean (μ) in the Null Hypothesis (H_0)**
- **Sentence: The sample mean is _____ number of standard errors (above or below) the population mean in the hull hypothesis.** *("Above" if positive. "Below" if negative.)*
- **Formula**

$$T = \frac{(Sample\ Mean - Population\ Mean)}{Standard\ Error} = \frac{(\overline{x} - \mu)}{\left(\frac{s}{\sqrt{n}}\right)}$$

Problems

(#1-3) Directions: Calculate the one-population proportion Z test statistic and write a sentence explaining the meaning of the Z test statistic.

1.

Sample Proportion $(\hat{p})$ = 0.872

Population Proportion (π) in H_0 = 0.8

Sample Size *(n) = 47*

$$Z = \frac{(\hat{p} - \pi)}{\sqrt{\frac{\pi(1-\pi)}{n}}} =$$

Z-test statistic sentence: The sample proportion is _____ number of standard errors (above or **below) the population proportion in the hull hypothesis.**

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2.

Sample Proportion $(\hat{p})$ = 0.333

Population Proportion (π) in H_0 = 0.4

Sample Size *(n) = 39*

$$Z = \frac{(\hat{p} - \pi)}{\sqrt{\frac{\pi(1-\pi)}{n}}} =$$

Z-test statistic sentence: The sample proportion is _____ number of standard errors (above or **below) the population proportion in the hull hypothesis.**

3.

Sample Proportion $(\hat{p})$ = 0.118

Population Proportion (π) in H_0 = 0.25

Sample Size *(n) = 85*

$$Z = \frac{(\hat{p} - \pi)}{\sqrt{\frac{\pi(1-\pi)}{n}}} =$$

Z-test statistic sentence: The sample proportion is _____ number of standard errors (above or **below) the population proportion in the hull hypothesis.**

(#4-6) Directions: Calculate the one-population mean average T test statistic and write a sentence explaining the meaning of the T test statistic.

4.

Sample Mean $(\bar{x})$ = $56.72

Population Mean (μ) in H_0 = $50

Sample Standard Deviation *(s) = $9.31*

Sample Size *(n) = 26*

$$T = \frac{(\bar{x} - \mu)}{\left(\frac{s}{\sqrt{n}}\right)} =$$

T-test statistic sentence: The sample mean is _____ number of standard errors (above or **below) the population mean in the hull hypothesis.**

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5.

Sample Mean $(\overline{x})$ **=** $98.26^{\circ}F$

Population Mean (μ) **in** H_0 **=** $98.6^{\circ}F$

Sample Standard Deviation *(s)* **=** $0.765^{\circ}F$

Sample Size *(n)* **= *50***

$$T = \frac{(\overline{x} - \mu)}{\left(\frac{s}{\sqrt{n}}\right)} =$$

T-test statistic sentence: The sample mean is _____ number of standard errors (above or **below) the population mean in the hull hypothesis.**

6.

Sample Mean $(\overline{x})$ **= 12.3 cm**

Population Mean (μ) **in** H_0 **= 10 cm**

Sample Standard Deviation *(s)* ***= 2.4 cm***

Sample Size *(n)* **= *36***

$$T = \frac{(\overline{x} - \mu)}{\left(\frac{s}{\sqrt{n}}\right)} =$$

T-test statistic sentence: The sample mean is _____ number of standard errors (above or **below) the population mean in the hull hypothesis.**