This quiz includes material from section ISI 2.3 and possibly from some preceding sections.

ISI ex. 2.CE.5, names, p.160

A sample of wedding announcements in the New York Times found that 18% of 600 brides who married between 2001 and 2005 kept their own names. Is this data consistent with the summary statement that 15% of brides keep their own names? See ISI ex. 2.CE.5-6 for more details.


We will develop a $z$ test for one proportion.

**HT**

1. **State the research question** (precisely enough to clearly determine the form of the alternative hypothesis).

2-4. Report the values of the sample statistics.

$n =

x =

\hat{p} = x/n =

5-8. Define $\pi$ in words, state the appropriate hypotheses, and report the value of $\pi$.

Define $\pi$.

$H_0 :$

$H_a :$

$\pi =$

**Validity conditions.** Are the appropriate validity conditions satisfied for justifying theory-based inference for this problem?

Calculate the expected number of successes and failures.

9. $\pi \ast n =$

10. $(1 - \pi) \ast n =$

12-13. Use the Theory-based Inference applet to determine the values of the standardized test statistic, \( z \), and \( p.value \). Send in a screenshot of the applet labeled 2.CE.5 names showing all appropriate values.

\( z = \)  

\( p.value = \)  

When the conditions hold for theory-based inference,

\[ Z \sim N(0, 1) \]

and the numerical value of \( p.value \) depends on the form of the alternative hypothesis:

- for an upper-tailed test, \( p.value = P(Z \geq z) \)
- for a lower-tailed test, \( p.value = P(Z \leq z) \)
- and for a two-tailed test, \( p.value = P(|Z| \geq |z|) \)

14. Which of the three formulas for \( p.value \) is the correct one to use for this particular investigation?

Possible answers for question 14 include

A. upper-tailed test  
B. lower-tailed test  
C. two-tailed test

15. Illustrate the appropriate null distribution and its relationship to \( z \) and \( p.value \).

This is usually included as part of an applet’s display.

16. Evaluate the strength of evidence against the null hypothesis indicated by \( p.value \).

strength of evidence (indicated by \( p.value \)) =  

\[ \text{not much} \quad 0.10 \quad \text{moderate} \quad 0.05 \quad \text{strong} \quad 0.01 \quad \text{very strong} \]

17. Evaluate the strength of evidence against the null hypothesis indicated by \( z \).

strength of evidence (indicated by \( z \)) =  

\[ \text{not much} \quad 1.5 \quad \text{moderate} \quad 2 \quad \text{strong} \quad 3 \quad \text{very strong} \]

18. Assume \( \alpha = 0.05 \).

State the formal conclusion of this HT.

( R ) I reject the null hypothesis  
( F ) I fail to reject the null hypothesis
19. State the relationship between \( p\text{-value} \) and \( \alpha \), and then justify your formal conclusion.

20. **Conclusion in context.** What does this HT tell you about the research question? Be sure to include your level of confidence in your statement.

21. Can we infer that this conclusion applies to any population larger than the sample? If so, to which population? Why?

22-23. Reserved for applet image(s).