This quiz includes material from section ISI 3.5 and possibly from some preceding sections.

ISI 3.CE.23, marriage ages, p.227

A student went to the local county courthouse (in Cumberland County, Pennsylvania, in June and July of 1993) to gather data on ages of soon-to-be husbands and wives who had recently applied for marriage licenses. He gathered age data on a sample of 100 couples and calculated the difference in age (husband – wife) for each couple. The results can be found in the file MarriageAges on the textbook website. Do the data support the conclusion that on the average husbands and wives are the same age?


We will conduct a t-test for a population mean and calculate a 95% confidence interval for the appropriate population parameter.

HT

1. State the research question.

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

\[ \bar{x} = \]

\[ s = \]

\[ n = \]

5-8. Define \( \mu \), state the appropriate hypotheses, and report the value of \( \mu \).

Define \( \mu \).

\[ H_0 : \]

\[ H_a : \]

\[ \mu = \]
9-10. Use the Theory-based Inference applet to determine the values of the standardized test statistic, \( t \), and \( p \)-value. Send in a screenshot of the applet labeled ages showing all appropriate values.

\[ t = \]

\[ p \text{-value} = \]

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

\[ \text{strength} = \]

not much 0.10 moderate 0.05 strong 0.01 very strong

12-13. 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

Justify your formal conclusion.

14. What does this HT tell you about the research question?

95% CI

15. Use the Theory-based Inference applet to construct a 95% CI for the appropriate population parameter. Send in a screenshot of the applet labeled ages showing all appropriate values.

\[ 95\% \text{ CI} = \]

16. Interpret this CI.

Hint: With how much confidence? ... what? ... is where?

HT and CI

17. Are the conclusions of the HT and CI consistent with each other?

Specifically, does your 95% CI support your formal conclusion to the HT?
Why or why not?
18. Calculate and report a 99% CI for the appropriate population parameter. At this new 99% level of confidence, do you reject (R) or fail to reject (F) the null hypothesis? Why?

19-20. Reserved for applet image(s).