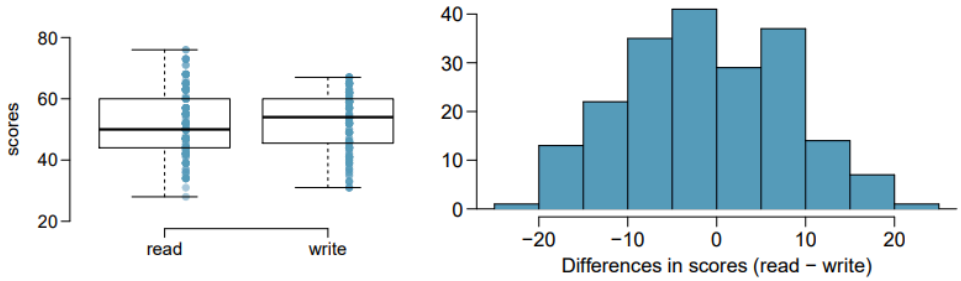
To do: Make a submission

Opened: Thursday, 1 May 2025, 1:05 PM
Due: Friday, 9 May 2025, 12:55 PM

You are required to complete Part 1 and Part 2 of the assignment.

Part 1



A survey of high school seniors was conducted by the National Center of Education Statistics. They were collecting test data on reading, writing, and several other subjects. A random sample of 250 students was examined from the survey. Side-by-side box plots of reading and writing scores as well as a histogram of the differences in scores are shown below.

(a) Create hypotheses appropriate for the following research question: is there an evident difference in the average scores of students in the reading and writing exam?

(b) Check the conditions required to complete this test.

c) The average observed difference in scores is and $\overline{x}_{read-write=-0.545,}$ and the standard deviation of the differences is 8.887 points. Do these data provide convincing evidence of a difference between the average scores on the two exams?

- Calculate the T-test.
- Calculate the degrees of freedom.
- Given the p-value of 0.39, provide the conclusion.

(d) What type of error might we have made? Explain what the error means in the context of the application.

(e) Based on the results of this hypothesis test, would you expect a confidence interval for the average difference between the reading and writing scores to include 0? Explain your reasoning.

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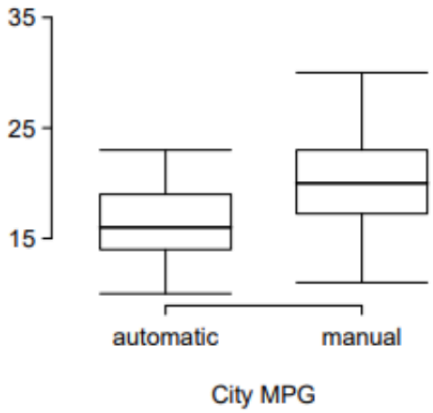
	City MPG	
	Automatic	Manual
Mean	16.12	19.85
SD	3.58	4.51
n	26	26



Part 2

Each year the US Environmental Protection Agency (EPA) releases fuel economy data on cars manufactured in that year. Below are summary statistics on fuel efficiency (in miles/gallon) from random samples of cars with manual and automatic transmissions.

Do these data provide strong evidence of a difference between the average fuel efficiency of cars with manual and automatic transmissions in terms of their average city mileage? Assume that conditions for inference are satisfied.

(1) State the hypothesis.

(2) Calculate the T-statistics.

(3) Calculate the degrees of freedom.

(4) Given the p-value of 0.0029, provide a conclusion to the hypothesis test.

This assignment will be assessed by your instructor using the rubric below.

Note: Always prioritize using JASP to retrieve values, as it will be a key tool for the final exam.

Add submission

Submission status

Attempt number	This is attempt 1.
Submission status	No submissions have been made yet
Grading status	Not graded
Time remaining	4 days 19 hours remaining

Grading criteria

Part 1- Testing of Hypothesis	Accurately describes all 5 steps (a) –(e), providing formulae at required steps and arrived at correct conclusion ***40 points***	Accurately describes all 5 steps (a) –(e), providing formulae at each step and arrived at incorrect conclusion ***25 points***	Incorrectly explained providing required formulae at all steps (a) - (e) and arrived at incorrect conclusion. ***10 points***	Unable to meet any of the preceding levels. ***0 points***
Part II- Developing a model for testing of hypothesis and test	Accurately describes all 4 aspects (1) – (4) , providing formulae at required steps and arrived at correct conclusion ***60 points***	Accurately describes all 4 steps (1) –(4), providing for mulae at required step and arrived at incorrect conclusion ***40 points***	Correctly describes (1) and (4). However, fails to calculate (2) and (3) ***15 points***	Unable to meet any of the preceding levels. ***0 points***