# Determining an Appropriate Statistical Test for Comparing Textbook Prices

To determine the appropriate statistical test for Rishi's project, I need to consider several key elements of the research design:

## Analysis of Research Design

1. \*\*Sample structure\*\*: Rishi has selected 10 specific textbooks and obtained the price for each book at two different Internet bookstores. This creates paired observations - each textbook has two corresponding prices.

2. \*\*Research question\*\*: Rishi wants to test if the average prices differ between the two bookstores.

3. \*\*Data type\*\*: The selling prices are continuous, ratio-scale data.

4. \*\*Sample size\*\*: The sample is relatively small (n=10).

## Recommended Test and Rationale

I recommend using a \*\*paired samples t-test\*\* (also called dependent samples t-test) for the following reasons:

- The observations are naturally paired - we have the same textbooks being compared across two different bookstores

- The research question concerns the difference in means between two groups

- We're dealing with continuous data (prices)

- We're working with the same 10 textbooks measured under two different conditions

This design creates dependency between the two sets of measurements since the textbook selection is identical. A paired test would account for this dependency by analyzing the differences in prices for each textbook pair, rather than treating them as independent samples.

## Alternative Considerations

If the assumptions for parametric testing cannot be met (particularly normality of the differences), the non-parametric Wilcoxon signed-rank test could be an appropriate alternative given the small sample size.

## Additional Advice

When implementing the test, Rishi should:

1. Check the assumptions of the paired t-test (particularly normality of the differences)

2. Calculate the differences in prices (e.g., Bookstore A minus Bookstore B) for each textbook

3. Perform the paired t-test on these differences

4. Consider the practical significance of any price differences in addition to statistical significance