

Quiz 1: Understanding Paired Difference Tests

Question: What is the primary purpose of using paired difference tests in statistical analysis?

- A) To compare the means of two independent groups
- B) To assess the difference between two groups by comparing each subject or unit to its own matched counterpart
- C) To determine the variance between multiple groups
- D) To analyze large data sets without considering individual differences

Correct Answer: B) To assess the difference between two groups by comparing each subject or unit to its own matched counterpart

Quiz 2: Sign Test Application

Question: In a sign test, what is tested about the paired differences ($D_i = x_i - y_i$)?

- A) The mean of the differences
- B) The frequency that x_i is greater than y_i
- C) The variance of the differences
- D) The cumulative distribution function of the differences

Correct Answer: B) The frequency that x_i is greater than y_i

Quiz 3: Nonparametric Tests

Question: Which of the following statements best describes the nonparametric tests discussed in the context?

- A) They rely heavily on the distributional assumptions of the data.
- B) They are used when the data follows a normal distribution.
- C) They are suitable for testing whether differences in frequencies occur, such as the frequency of $x_i > y_i$.
- D) They are less powerful than parametric tests in all scenarios.

Correct Answer: C) They are suitable for testing whether differences in frequencies occur, such as the frequency of $x_i > y_i$.

Quiz 4: Alternative Hypotheses in Paired Tests

Question: Which alternative hypothesis corresponds to a situation where the median of the differences is expected to be greater than zero?

- A) $H_A: \text{median}[D] \neq 0$
- B) $H_A: \text{median}[D] > 0$
- C) $H_A: \text{median}[D] < 0$
- D) $H_A: \text{median}[D] = 0$

Correct Answer: B) $H_A: \text{median}[D] > 0$

Quiz 5: Using the Signed-Rank Test

Question: When would you use the Wilcoxon signed-rank test instead of the sign test?

- A) When the differences are symmetric and you are interested in the median rather than the frequency of one group being larger.
- B) When only the signs of the differences matter, not their magnitudes.
- C) When the sample size is very large, regardless of the data distribution.
- D) When the data requires a test that assumes normality.

Correct Answer: A) When the differences are symmetric and you are interested in the median rather than the frequency of one group being larger.

Quiz 6: Application of the Permutation Signed-Rank Test

Question: When is it appropriate to use the permutation version of the signed-rank test?

- A) When the differences between paired observations are assumed to be normally distributed.
- B) When the data is skewed or the distribution of differences does not follow normality.
- C) When the sample size is extremely large and exceeds computational capabilities.
- D) When the differences between pairs are perfectly symmetric.

Correct Answer: B) When the data is skewed or the distribution of differences does not follow normality.