

STA 3180 Statistical Modelling: Nonparametric Tests

Nonparametric Tests

Nonparametric tests are statistical tests that do not assume that the data follows a normal distribution. They are used to analyze data when the assumptions of parametric tests are not met. Nonparametric tests are also known as distribution-free tests, as they do not require any assumptions about the underlying distribution of the data.

Key Concepts

- Nonparametric tests are used when the assumptions of parametric tests are not met.
- Nonparametric tests do not assume that the data follows a normal distribution.
- Nonparametric tests are also known as distribution-free tests, as they do not require any assumptions about the underlying distribution of the data.
- Nonparametric tests are less powerful than parametric tests, meaning that they require larger sample sizes to detect differences between groups.
- Nonparametric tests are more robust than parametric tests, meaning that they are less affected by outliers and other violations of assumptions.

Definitions

- Nonparametric Test: A statistical test that does not assume that the data follows a normal distribution.
- Parametric Test: A statistical test that assumes that the data follows a normal distribution.
- Distribution-Free Test: A nonparametric test that does not require any assumptions about the underlying distribution of the data.
- Robust Test: A test that is less affected by outliers and other violations of assumptions.

Rules

- Nonparametric tests should be used when the assumptions of parametric tests are not met.
- Nonparametric tests are less powerful than parametric tests, so larger sample sizes are required to detect differences between groups.
- Nonparametric tests are more robust than parametric tests, so they are less affected by outliers and other violations of assumptions.

Examples

- The Mann-Whitney U Test is a nonparametric test used to compare two independent groups. It is used when the assumptions of the t-test are not met.
- The Wilcoxon Signed-Rank Test is a nonparametric test used to compare two related groups. It is used when the assumptions of the paired t-test are not met.
- The Kruskal-Wallis Test is a nonparametric test used to compare more than two independent groups. It is used when the assumptions of the ANOVA are not met.