

Comparison Between Wilcoxon and Least Squares Regression Methods

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Introduction

- ▶ Simulated data was used to compare two regression procedures
- ▶ Wilcoxon method and Least Squares method
- ▶ When error terms follow different distributions, how does this affect regression coefficient estimates?

The Least Squares Regression Method

- ▶ Parametric regression method
- ▶ Assumptions include independent error terms, homoscedasticity, normal error distribution
- ▶ Estimated by R function `lm`
- ▶ A linear model with one regressor:

$$y_i = \beta_0 + \beta_1 x_i + \epsilon_i$$

- ▶ The least square estimators:

$$\hat{\beta}_1 = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

$$\hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x}$$