Stat 6021: Notation in Simple Linear Regression

Read this before reading textbook.

1 Population Simple Linear Regression Model

The simple linear regression model based on the population is written as $y_i = \beta_0 + \beta_1 x_i + \epsilon_i$, where

- y_i: value of response variable for subject i

- x_i: value of predictor for subject i

- ϵ_i: value of the error for subject i

- β_0: intercept

- β_1: slope or coefficient for predictor

2 Estimated Simple Linear Regression Model

The estimated simple linear regression model based on the sample is written as $y_i = \hat{\beta}_0 + \hat{\beta}_1 x_i + e_i$, where

- y_i: value of response variable for subject i

- x_i: value of predictor for subject i

- e_i: value of the residual for subject i

- $\hat{\beta}_0$: estimated intercept

- $\hat{\beta}_1$: estimated slope or estimated coefficient for predictor

Notice the slightly different notation and terminology for the population and the sample.

3 Variance of Errors and Residuals

- σ^2: variance of the errors

- s^2: variance of the residuals