

Least Squares Estimation

Given a set of training data

$(x_{i1}, \dots, x_{ip}, y_i)_{i=1}^n$, we estimate the regression coefficients $(\beta_0, \beta_1, \dots, \beta_p)$ by minimizing the **residual sum of squares (RSS)**

$$\begin{aligned} & \text{RSS}(\beta_0, \beta_1, \dots, \beta_p) \\ = & \sum_{i=1}^n (y_i - \beta_0 - \beta_1 x_{i1} - \dots - \beta_p x_{ip})^2. \end{aligned}$$

