4. Linear Regression

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Equation of Linear Relation b/w X & Y

$$Y = \hat{\beta}_0 + \hat{\beta}_1 x$$

x → independent variable

Regression line of y on x

Regression analysis

- Used to make predictions
- Finds the line that best fits the data ⟶ line of least squares (Legendre - 1805, Gauss - 1809)

$$\text{Error at } i^{th} \text{ node} = y_{observed} - y_{predicted} = e_i$$

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

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