1 Statistische Maßzahlen

empirische Kovarianz

$$\tilde{s}_{xy} = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})$$

empirische Varianz:

$$\sigma^2 = \tilde{s}^2 = \tilde{s}_x^2 := \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2 = \frac{1}{n-1}(\sum_{i=1}^{n} x_i^2 - n\bar{x}^2)$$

Standardabweichung

$$\sigma = \tilde{s} = \tilde{s}_x = \sqrt{\tilde{s}^2}$$

empirischer Korrelationskoeffizient (nach Bravais Pearson)

$$r_{xy} = \frac{\tilde{s}_{xy}}{\tilde{s}_x \cdot \tilde{s}_y}$$

Spearman'sche Rangkorrelationskoeffizient von X und Y

$$r_{SP}(x,y) = \frac{\sum\limits_{i=1}^{n}\Big(rg(x_i) - \overline{rg_x})(rg(y_i) - \overline{rg_y}\Big)}{\sqrt{\sum\limits_{i=1}^{n}(rg(x_i) - r\bar{g}_x)^2 \cdot \sum\limits_{i=1}^{n}(rg(y_i) - r\bar{g}_y)^2}} \tag{1}$$

1.1 Lineare Regression

optimale Ausgleichgerade:

$$y = f(x) = \hat{a}x + \hat{b}$$

$$\hat{a} = \frac{\tilde{s}_{xy}}{\tilde{s}_x^2}$$

$$\hat{b} = \bar{y} - \hat{a}\bar{x}$$

Bestimmtheitsmaß, Modellgüte:

$$R^2 = r_{xy}^2$$