Formelsammlung Statistik 3

0 Einfache lineare Regression

$$b_1 = \frac{\hat{\sigma}_{XY}}{\hat{\sigma}_X^2} = r_{XY} * \frac{\hat{\sigma}_Y}{\hat{\sigma}_X} \qquad b_0 = \bar{y} - b_1 * \bar{x} \qquad R^2 = \frac{\hat{\sigma}_{\hat{Y}}^2}{\hat{\sigma}_Y^2} = \frac{s_{\hat{Y}}^2}{s_Y^2}$$

$$r = \frac{\hat{\sigma}_{XY}}{\hat{\sigma}_X * \hat{\sigma}_Y} \qquad \hat{\sigma}_{XY} = \frac{\sum_{i=1}^{N}(x_i - \bar{x}) * (y_i - \bar{y})}{N-1} \quad \hat{\sigma}_X^2 = \frac{\sum_{i=1}^{N}(x_i - \bar{x})^2}{N-1}$$

1 Clusteranalyse

$$\tau = \frac{C - D}{\sqrt{C + D + T_i} * \sqrt{C + D + T_j}} \qquad \tau = \frac{C - D}{C + D}$$

$$d_{Euklid} = \sqrt{\sum_{a=1}^{k}(x_{ai} - x_{aj})^2} \qquad d_{Manhatten} = \sum_{a=1}^{k}|x_{ai} - x_{aj}|$$

$$\Phi = \frac{a * d - b * c}{\sqrt{(a+b) * (c+d) * (a+c) * (b+d)}} \qquad J = \frac{a}{a+b+c} \qquad SMC = \frac{a+d}{a+b+c+d}$$

2 Faktorenanalyse

$$\mathrm{KMO} = \frac{\sum_{i=1}^{k}\sum_{j=i+1}^{k} r_{ij}^2}{\sum_{i=1}^{k}\sum_{j=i+1}^{k}\left(r_{ij}^2 + r_{ij\bullet \mathrm{Rest}}^2\right)} \qquad h_k^2 = \sum_{i=1}^{m} \lambda_{ik}^2$$

3 Partialkorrelation

$$r_{AB\bullet C_1,\ldots,C_k} = \frac{r_{AB\bullet C_1,\ldots,C_{k-1}} - r_{AC_k\bullet C_1,\ldots,C_{k-1}} * r_{BC_k\bullet C_1,\ldots,C_{k-1}}}{\sqrt[2]{1 - r_{AC_k\bullet C_1,\ldots,C_{k-1}}^2} * \sqrt[2]{1 - r_{BC_k\bullet C_1,\ldots,C_{k-1}}^2}}$$

$$r_{A(B\bullet C_1,\ldots,C_k)} = \frac{r_{A(B\bullet C_1,\ldots,C_{k-1})} - r_{A(C_k\bullet C_1,\ldots,C_{k-1})} * r_{B(C_k\bullet C_1,\ldots,C_{k-1})}}{\sqrt[2]{1 - r_{B(C_k\bullet C_1,\ldots,C_{k-1})}^2}}$$

$$F = \frac{r_{AB\bullet C_1,\ldots,C_k}^2}{1 - r_{AB\bullet C_1,\ldots,C_k}^2} * (N - k - 2)$$

4 Mehrebenenanalyse

$$r_{ICC} = \frac{\hat{\sigma}_{u_0}^2}{\hat{\sigma}_{u_0}^2 + \hat{\sigma}_e^2} = \frac{\hat{\sigma}_{u_0}^2}{\hat{\sigma}_Y^2}$$