Statistica per l'impresa - Formulario standard

Formule statistica descrittiva

$$\overline{x} = \frac{\sum_{i=1}^{n} x_i}{n} \qquad \overline{x} = \frac{\sum_{j=1}^{K} x_j n_j}{n} \qquad \overline{x} = \frac{\sum_{j=1}^{K} c_j n_j}{n}$$

$$\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - \overline{x})^2}{n} \qquad \sigma^2 = \frac{\sum_{j=1}^{K} (x_j - \overline{x})^2 n_j}{n} \qquad \sigma^2 = \frac{\sum_{j=1}^{K} (c_j - \overline{x})^2 n_j}{n}$$

$$CV = \frac{\sigma}{\overline{x}} \times 100$$

$$E_1 = 1 - \sum_{j=1}^{K} f_j^2 \qquad e_1 = \frac{K}{K-1} \cdot E_1$$

$$range = x_{(max)} - x_{(min)} \qquad dQ = Q_3 - Q_1$$

$$R = \frac{\sum_{i=1}^{n-1} (F_i - Q_i)}{\sum_{i=1}^{n-1} F_i} \qquad R = 1 - \sum_{j=0}^{K-1} (F_{j+1} - F_j)(Q_{j+1} + Q_j)$$

$$\beta = \frac{\sum_{i=1}^{n} (x_i - \overline{x})^3}{n\sigma^3} \qquad \beta = \frac{\sum_{j=1}^{K} (x_j - \overline{x})^3 n_j}{n\sigma^3} \qquad \beta = \frac{\sum_{j=1}^{K} (c_j - \overline{x})^3 n_j}{n\sigma^3}$$

$$\chi^2 = \sum_{i=1}^{H} \sum_{j=1}^{K} \frac{\left(n_{ij} - n'_{ij}\right)^2}{n'_{ij}} \qquad V = \sqrt{\frac{\chi^2/n}{min(H-1;K-1)}}$$

$$\sigma_{xy} = \frac{\sum_{i=1}^{n} (x_i - \overline{x})(y_i - \overline{y})}{n} \qquad \rho_{xy} = \frac{\sigma_{xy}}{\sigma_x \sigma_y}$$

$$\widehat{\beta}_1 = \frac{\sigma_{xy}}{\sigma_x^2} \qquad \widehat{\beta}_0 = \overline{y} - \widehat{\beta}_1 \overline{x}$$

$$R^2 = \frac{\sum_{i=1}^{n} (\hat{y}_i - \overline{y})^2}{\sum_{i=1}^{n} (y_i - \overline{y})^2} = \frac{\widehat{\beta}_1^2 \cdot \sum_{i=1}^{n} (x_i - \overline{x})^2}{\sum_{i=1}^{n} (y_i - \overline{y})^2} = 1 - \frac{\sum_{i=1}^{n} (y_i - \hat{y}_i)^2}{\sum_{i=1}^{n} (y_i - \overline{y})^2} = \rho_{xy}^2$$

$${}_pI_{t/0}^L = \frac{\sum_{m=1}^{M} p_{mt} q_{m0}}{\sum_{m=1}^{M} p_{m0} q_{m0}} \qquad {}_pI_{t/0}^P = \frac{\sum_{m=1}^{M} p_{mt} q_{mt}}{\sum_{m=1}^{M} p_{m0} q_{mt}}$$

$${}_qI_{t/0}^L = \frac{\sum_{m=1}^{M} p_{m0} q_{mt}}{\sum_{m=1}^{M} p_{m0} q_{m0}} \qquad {}_qI_{t/0}^P = \frac{\sum_{m=1}^{M} p_{mt} q_{mt}}{\sum_{m=1}^{M} p_{mt} q_{m0}}$$

Formule probabilità e statistica inferenziale

$P(x) = \frac{n!}{x! \cdot (n-x)!} \pi^x (1-\pi)^{n-x}$ $\qquad P(x) = \frac{\lambda^x}{x!} \cdot e^{-\lambda}$

$\overline{X} - z_{\frac{\alpha}{2}} \cdot \frac{\sigma}{\sqrt{n}} < \mu < \overline{X} + z_{\frac{\alpha}{2}} \cdot \frac{\sigma}{\sqrt{n}}$ $\qquad \overline{X} - t_{\frac{\alpha}{2}, n-1} \cdot \frac{S}{\sqrt{n}} < \mu < \overline{X} + t_{\frac{\alpha}{2}, n-1} \cdot \frac{S}{\sqrt{n}}$

$\overline{X} - z_{\frac{\alpha}{2}} \cdot \sqrt{\frac{\overline{x} \cdot (1-\overline{x})}{n}} < \pi < \overline{X} + z_{\frac{\alpha}{2}} \cdot \sqrt{\frac{\overline{x} \cdot (1-\overline{x})}{n}}$

$n = \left(z_{\frac{\alpha}{2}} \frac{\sigma}{\delta}\right)^2$ $\qquad n = \left(t_{\frac{\alpha}{2}} \frac{s}{\delta}\right)^2$ $\qquad n = z^2_{\frac{\alpha}{2}} \frac{\overline{x} \cdot (1-\overline{x})}{\delta^2}$

$z = \frac{\overline{x} - \mu_0}{\sigma / \sqrt{n}}$ $\qquad t_{n-1} = \frac{\overline{x} - \mu_0}{s / \sqrt{n}}$ $\qquad z = \frac{\overline{x} - \pi_0}{\sqrt{\pi_0 \cdot (1-\pi_0)/n}}$

$z = \frac{\overline{x}_1 - \overline{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$ $\qquad t_{n_1+n_2-2} = \frac{\overline{x}_1 - \overline{x}_2}{\sqrt{s_p^2 \cdot \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$, dove $s_p^2 = \frac{s_1^2(n_1-1) + s_2^2(n_2-1)}{n_1+n_2-2}$

$z = \frac{\overline{x}_1 - \overline{x}_2}{\sqrt{\overline{x}_p \cdot (1-\overline{x}_p) \cdot \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$, dove $\overline{x}_p = \frac{\overline{x}_1 n_1 + \overline{x}_2 n_2}{n_1+n_2}$

$DEV_{TRA} = \sum_{i=1}^{m} (\overline{x}_i - \overline{x})^2 n_i$ $\qquad DEV_{ENTRO} = \sum_{i=1}^{m} \sum_{j=1}^{n_i} (x_{ij} - \overline{x}_i)^2 = \sum_{i=1}^{m} s_i^2 (n_i - 1)$

$B_0 - t_{\frac{\alpha}{2}, n-2} \cdot s(B_0) < \beta_0 < B_0 + t_{\frac{\alpha}{2}, n-2} \cdot s(B_0)$

$B_1 - t_{\frac{\alpha}{2}, n-2} \cdot s(B_1) < \beta_1 < B_1 + t_{\frac{\alpha}{2}, n-2} \cdot s(B_1)$

$s(B_0) = \sqrt{s^2 \left(\frac{1}{n} + \frac{\overline{x}^2}{\sum_{i=1}^{n} (x_i - \overline{x})^2}\right)}$ $\qquad s(B_1) = \sqrt{\frac{s^2}{\sum_{i=1}^{n} (x_i - \overline{x})^2}}$ $\qquad s^2 = \frac{\sum_{i=1}^{n} (y_i - \hat{y}_i)^2}{n-2}$

$t_{n-2} = \frac{\hat{\beta}_0 - b_0}{s(B_0)}$ $\qquad t_{n-2} = \frac{\hat{\beta}_1 - b_1}{s(B_1)}$

$\hat{Y}_i \pm t_{\frac{\alpha}{2}, n-2} \cdot \sqrt{s^2 \left(\frac{1}{n} + \frac{(x_i - \overline{x})^2}{\sum_{h=1}^{n} (x_h - \overline{x})^2}\right)}$ $\qquad \hat{Y}_i \pm t_{\frac{\alpha}{2}, n-2} \cdot \sqrt{s^2 \left(1 + \frac{1}{n} + \frac{(x_i - \overline{x})^2}{\sum_{h=1}^{n} (x_h - \overline{x})^2}\right)}$