FORMLER

VT2013

Räkneregler för väntevärden och varianser (a, b och c är konstanter och X och Y är stokastiska variabler)

$E(c) = c$ $\qquad V(c) = 0$

$E(X + c) = E(X) + c$ $\qquad V(X + c) = V(X)$

$E(aX) = aE(X)$ $\qquad V(aX) = a^2V(X)$

$E(aX + bY + c) = aE(X) + bE(Y) + c$ $\qquad V(aX + bY + c) = a^2V(X) + b^2V(Y) + 2abCov(X,Y)$

Ändlighetskorrektion: $\dfrac{N-n}{N-1}$

Stickprovsvarians: $s^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2 = \frac{1}{n-1}\left(\sum_{i=1}^{n} x_i^2 - n\bar{x}^2\right)$

Stickprovskovarians: $s_{xy} = \sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y}) = \frac{1}{n-1}\left(\sum_{i=1}^{n} x_i y_i - n\bar{x}\bar{y}\right)$

Binomialfördelningen: $f(x) = \binom{n}{x} p^x(1-p)^{n-x} = \frac{n!}{x!(n-x)!} p^x(1-p)^{n-x}$

Poissonfördelningen: $f(x) = \frac{\lambda^x e^{-\lambda}}{x!}$

Diverse konfidensintervall och enkelsidiga testvariabler (*f.g.* = frihetsgrader):

$\bar{x} \pm z_{\alpha/2}\dfrac{\sigma}{\sqrt{n}}$ $\qquad Z = \dfrac{\bar{X} - \mu_0}{\sigma/\sqrt{n}} \geq z_\alpha$

$\bar{x} \pm t_{\alpha/2}^{(f.g.)}\dfrac{s}{\sqrt{n}}$ $\qquad T = \dfrac{\bar{X} - \mu_0}{S/\sqrt{n}} \geq t_\alpha^{(f.g.)}$

$\bar{x} \pm z_{\alpha/2}\dfrac{s}{\sqrt{n}}$ $\qquad Z = \dfrac{\bar{X} - \mu_0}{S/\sqrt{n}} \geq z_\alpha$

$\bar{x}_1 - \bar{x}_2 \pm z_{\alpha/2}\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}$ $\qquad Z = \dfrac{\bar{X}_1 - \bar{X}_2 - 0}{\sqrt{\sigma_1^2/n_1 + \sigma_2^2/n_2}} \geq z_\alpha$

$\bar{x}_1 - \bar{x}_2 \pm t_{\alpha/2}^{(f.g.)} \cdot s_p\sqrt{\dfrac{1}{n_1} + \dfrac{1}{n_2}}$ $\qquad T = \dfrac{\bar{X}_1 - \bar{X}_2 - 0}{S_p\sqrt{1/n_1 + 1/n_2}} \geq t_\alpha^{(f.g.)}$

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

$\bar{x}_1 - \bar{x}_2 \pm z_{\alpha/2}\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}$ $\qquad Z = \dfrac{\bar{X}_1 - \bar{X}_2 - 0}{\sqrt{S_1^2/n_1 + S_2^2/n_2}} \geq z_\alpha$

Forts. konfidensintervall och enkelsidiga testvariabler (*f.g.* = frihetsgrader):

$$\bar{d} \pm t_{\alpha/2}^{(f.g.)} \frac{s_d}{\sqrt{n}}$$

$$T = \frac{\bar{D} - 0}{S_D/\sqrt{n}} \geq t_{\alpha}^{(f.g.)}$$

$$\frac{y}{n} \pm z_{\alpha/2}\sqrt{(y/n)(1 - y/n)/n}$$

$$Z = \frac{Y/n - \pi_0}{\sqrt{\pi_0(1 - \pi_0)/n}} \geq z_{\alpha}$$

$$\hat{p}_1 - \hat{p}_2 \pm z_{\alpha/2}\sqrt{\frac{\hat{p}_1(1 - \hat{p}_1)}{n_1} + \frac{\hat{p}_2(1 - \hat{p}_2)}{n_2}}$$

$$Z = \frac{Y_1/n_1 - Y_2/n_2 - 0}{\sqrt{\left(\frac{Y_1+Y_2}{n_1+n_2}\right)\left(1 - \frac{Y_1+Y_2}{n_1+n_2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \geq z_{\alpha}$$

$$\chi^2 = \sum \frac{(n_i - n\pi_i)^2}{n\pi_i} \geq \chi_{\alpha}^2(f.g.)$$

$$\chi^2 = \sum\sum \frac{(n_{ij} - n_{i}.n._{j}/n)^2}{n_{i}.n._{j}/n} \geq \chi_{\alpha}^2(f.g.)$$