POPISNÁ ŠTATISTIKA

$$\bar{x}_h = \frac{\sum_{i=1}^{k} n_i}{\sum_{i=1}^{k} \frac{n_i}{x_i}}$$

$$\bar{x}_g = \sqrt[n]{\prod_{i=1}^{k} x_i^{n_i}}$$

$$\hat{x} = a + h \cdot \frac{d_0}{d_0 + d_1}$$

$$\tilde{x}_{\left(k/\alpha\right)} = a + h \cdot \frac{\frac{k}{\alpha} n - N_{\tilde{x}-1}}{n_{\tilde{x}}} = a + h \cdot \frac{\frac{k}{\alpha} - F_{\tilde{x}-1}}{f_{\tilde{x}}}$$

$$R_Q^4 = Q_3^4 - Q_1^4$$

$$Q = \frac{Q_3^4 - Q_1^4}{2} = \frac{R_Q^4}{2}$$

$$V_x = \frac{s}{\bar{x}} \cdot 100$$

$$RQ_x = \frac{Q}{\tilde{x}} \cdot 100$$

$$S_P = \frac{\bar{x} - \hat{x}}{s}$$

$$S_{Q^4} = \frac{\left(Q_3^4 - Q_2^4\right) - \left(Q_2^4 - Q_1^4\right)}{\left(Q_3^4 - Q_2^4\right) + \left(Q_2^4 - Q_1^4\right)} = \frac{Q_3^4 + Q_1^4 - 2Q_2^4}{2Q}$$

$$\gamma_1 = \frac{\frac{1}{n} \sum_{i=1}^{k} \left(x_i - \bar{x}\right)^3 n_i}{s^3}$$

$$\gamma_2 = \frac{\frac{1}{n} \sum_{i=1}^{k} \left(x_i - \bar{x}\right)^4 n_i}{s^4} - 3$$

INTERVALOVÉ ODHADY

$$P\left(\bar{x} - z_{1-\frac{\alpha}{2}} \cdot \frac{\sigma}{\sqrt{n}} < \mu < \bar{x} + z_{1-\frac{\alpha}{2}} \cdot \frac{\sigma}{\sqrt{n}} \right) = 1 - \alpha$$

$$P\left(\bar{x} - t_{1-\frac{\alpha}{2}} \cdot \frac{\tilde{s}}{\sqrt{n}} < \mu < \bar{x} + t_{1-\frac{\alpha}{2}} \cdot \frac{\tilde{s}}{\sqrt{n}} \right) = 1 - \alpha$$

$$P\left(p - z_{1-\frac{\alpha}{2}} \cdot \sqrt{\frac{p(1-p)}{n}} < \pi < p + z_{1-\frac{\alpha}{2}} \cdot \sqrt{\frac{p(1-p)}{n}} \right) = 1 - \alpha$$

$$P\left(\frac{(n-1) \cdot \tilde{s}^2}{\chi^2_{1-\frac{\alpha}{2}}} < \sigma^2 < \frac{(n-1) \cdot \tilde{s}^2}{\chi^2_{\frac{\alpha}{2}}} \right) = 1 - \alpha$$

TESTOVANIE HYPOTÉZ

$$F = \frac{MSA}{MSE} = \frac{\frac{SSA}{k-1}}{\frac{SSE}{n-k}} = \frac{\frac{\sum_{i=1}^{k} \left(\bar{y}_i - \bar{y}\right)^2 n_i}{k-1}}{\frac{\sum_{i=1}^{k} \sum_{j=1}^{n_i} \left(y_{ij} - \bar{y}_i\right)^2}{n-k}}$$

$$\bar{y} = \frac{\sum_{i=1}^{k} \sum_{j=1}^{n_i} y_{ij}}{n} = \frac{\sum_{i=1}^{k} \bar{y}_i n_i}{n}$$

$$F > F_{1-\alpha}\left(k-1; n-k\right)$$

$$\chi^2 = \sum_{i=1}^{k} \frac{\left(O_i - E_i\right)^2}{E_i}$$

$$\chi^2 > \chi^2_{1-\alpha}\left(k-1-p\right)$$

TESTOVANIE HYPOTÉZ

Nulová hypotéza	Alternatívna hypotéza	Testovacia charakteristika	Kritická oblasť
$H_0 : \mu = \mu_0$	$H_1 : \mu \neq \mu_0$	$z = \dfrac{\overline{x} - \mu_0}{\dfrac{\sigma}{\sqrt{n}}}$	$\lvert z \rvert > z_{1-\frac{\alpha}{2}}$
	$H_1 : \mu > \mu_0$		$z > z_{1-\alpha}$
	$H_1 : \mu < \mu_0$		$z < -z_{1-\alpha}$
$H_0 : \mu = \mu_0$	$H_1 : \mu \neq \mu_0$	$t = \dfrac{\overline{x} - \mu_0}{\dfrac{\tilde{s}}{\sqrt{n}}}$	$\lvert t \rvert > t_{1-\frac{\alpha}{2}}(n-1)$
	$H_1 : \mu > \mu_0$		$t > t_{1-\alpha}(n-1)$
	$H_1 : \mu < \mu_0$		$t < -t_{1-\alpha}(n-1)$
$H_0 : \pi = \pi_0$	$H_1 : \pi \neq \pi_0$	$z = \dfrac{p - \pi_0}{\sqrt{\dfrac{\pi_0(1-\pi_0)}{n}}}$	$\lvert z \rvert > z_{1-\frac{\alpha}{2}}$
	$H_1 : \pi > \pi_0$		$z > z_{1-\alpha}$
	$H_1 : \pi < \pi_0$		$z < -z_{1-\alpha}$
$H_0 : \sigma^2 = \sigma_0^2$	$H_1 : \sigma^2 \neq \sigma_0^2$	$\chi^2 = \dfrac{(n-1)\cdot \tilde{s}^2}{\sigma_0^2}$	$\chi^2 \in \left(0, \chi^2_{\frac{\alpha}{2}}(n-1)\right) \cup \left(\chi^2_{1-\frac{\alpha}{2}}(n-1), \infty\right)$
	$H_1 : \sigma^2 > \sigma_0^2$		$\chi^2 > \chi^2_{1-\alpha}(n-1)$
	$H_1 : \sigma^2 < \sigma_0^2$		$\chi^2 < \chi^2_{\alpha}(n-1)$
$H_0 : \mu_1 = \mu_2$	$H_1 : \mu_1 \neq \mu_2$	$z = \dfrac{(\overline{x}_1 - \overline{x}_2)}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}}$	$\lvert z \rvert > z_{1-\frac{\alpha}{2}}$
	$H_1 : \mu_1 > \mu_2$		$z > z_{1-\alpha}$
	$H_1 : \mu_1 < \mu_2$		$z < -z_{1-\alpha}$
$H_0 : \mu_1 = \mu_2$	$H_1 : \mu_1 \neq \mu_2$	$z = \dfrac{(\overline{x}_1 - \overline{x}_2)}{\sqrt{\dfrac{\tilde{s}_1^2}{n_1} + \dfrac{\tilde{s}_2^2}{n_2}}}$	$\lvert z \rvert > z_{1-\frac{\alpha}{2}}$
	$H_1 : \mu_1 > \mu_2$		$z > z_{1-\alpha}$
	$H_1 : \mu_1 < \mu_2$		$z < -z_{1-\alpha}$
$H_0 : \mu_1 = \mu_2$	$H_1 : \mu_1 \neq \mu_2$	$t = \dfrac{(\overline{x}_1 - \overline{x}_2)\cdot \sqrt{\dfrac{n_1 n_2}{n_1 + n_2}.(n_1 + n_2 - 2)}}{\sqrt{(n_1 - 1)\cdot \tilde{s}_1^2 + (n_2 - 1)\cdot \tilde{s}_2^2}}$	$\lvert t \rvert > t_{1-\frac{\alpha}{2}}(n_1 + n_2 - 2)$
	$H_1 : \mu_1 > \mu_2$		$t > t_{1-\alpha}(n_1 + n_2 - 2)$
	$H_1 : \mu_1 < \mu_2$		$t < -t_{1-\alpha}(n_1 + n_2 - 2)$
$H_0 : \pi_1 = \pi_2$	$H_1 : \pi_1 \neq \pi_2$	$z = \dfrac{p_1 - p_2}{\sqrt{\dfrac{p_1(1-p_1)}{n_1} + \dfrac{p_2(1-p_2)}{n_2}}}$	$\lvert z \rvert > z_{1-\frac{\alpha}{2}}$
	$H_1 : \pi_1 > \pi_2$		$z > z_{1-\alpha}$
	$H_1 : \pi_1 < \pi_2$		$z < -z_{1-\alpha}$
$H_0 : \sigma_1^2 = \sigma_2^2$	$H_1 : \sigma_1^2 \neq \sigma_2^2$	$F = \dfrac{\tilde{s}_1^2}{\tilde{s}_2^2}$	$F \in \left(0, F_{\frac{\alpha}{2}}\right) \cup \left(F_{1-\frac{\alpha}{2}}, \infty\right)$
	$H_1 : \sigma_1^2 > \sigma_2^2$		$F > F_{1-\alpha}(n_1 - 1, n_2 - 1)$
	$H_1 : \sigma_1^2 < \sigma_2^2$		$F < F_{\alpha}(n_1 - 1, n_2 - 1)$