Matematika IV - výber vzorcov

Tabuľka 1: Interval spoľahlivosti

1.	$\left(\overline{x} - u_{1-\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}; \overline{x} + u_{1-\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}\right)$	2.	$\left(\overline{x} - u_{1-\alpha} \frac{\sigma}{\sqrt{n}}; \infty\right)$
		3.	$\left(-\infty; \overline{x} + u_{1-\alpha} \frac{\sigma}{\sqrt{n}}\right)$
4.	$\left(\overline{x} - t_{1-\frac{\alpha}{2}}(n-1) \frac{s}{\sqrt{n}}; \overline{x} + t_{1-\frac{\alpha}{2}}(n-1) \frac{s}{\sqrt{n}}\right)$	5.	$\left(\overline{x} - t_{1-\alpha}(n-1) \frac{s}{\sqrt{n}}; \infty\right)$
		6.	$\left(-\infty; \overline{x} + t_{1-\alpha}(n-1) \frac{s}{\sqrt{n}}\right)$
7.	$\left(\frac{(n-1)\,s^2}{\chi^2_{1-\frac{\alpha}{2}}(n-1)}; \frac{(n-1)\,s^2}{\chi^2_{\frac{\alpha}{2}}(n-1)}\right)$	8.	$\left(\frac{(n-1)\,s^2}{\chi^2_{1-\alpha}(n-1)}; \infty\right)$
		9.	$\left(0; \frac{(n-1)\,s^2}{\chi^2_{\alpha}(n-1)}\right)$

Tabuľka 2: Parametrické testy

10.	$H_0 : m = m_0$	$H_1 : m \neq m_0$	$U = \frac{\overline{x}-m_0}{\sigma}\sqrt{n}$, $W_\alpha : \lvert U\rvert > u_{1-\frac{\alpha}{2}}$
11.	$H_0 : m = m_0$	$H_1 : m > m_0$	$U = \frac{\overline{x}-m_0}{\sigma}\sqrt{n}$, $W_\alpha : U > u_{1-\alpha}$
12.	$H_0 : m = m_0$	$H_1 : m < m_0$	$U = \frac{\overline{x}-m_0}{\sigma}\sqrt{n}$, $W_\alpha : U < -u_{1-\alpha}$
13.	$H_0 : m = m_0$	$H_1 : m \neq m_0$	$t = \frac{\overline{x}-m_0}{s}\sqrt{n}$, $W_\alpha : \lvert t\rvert > t_{1-\frac{\alpha}{2}}(n-1)$
14.	$H_0 : m = m_0$	$H_1 : m > m_0$	$t = \frac{\overline{x}-m_0}{s}\sqrt{n}$, $W_\alpha : t > t_{1-\alpha}(n-1)$
15.	$H_0 : m = m_0$	$H_1 : m < m_0$	$t = \frac{\overline{x}-m_0}{s}\sqrt{n}$, $W_\alpha : t < -t_{1-\alpha}(n-1)$
16.	$H_0 : \sigma^2 = \sigma_0^2$	$H_1 : \sigma^2 \neq \sigma_0^2$	$\chi^2 = \frac{(n-1)\,s^2}{\sigma_0^2}$, $W_\alpha : \chi^2 \notin \left\langle \chi^2_{\frac{\alpha}{2}}(n-1), \chi^2_{1-\frac{\alpha}{2}}(n-1)\right\rangle$
17.	$H_0 : \sigma^2 = \sigma_0^2$	$H_1 : \sigma^2 > \sigma_0^2$	$\chi^2 = \frac{(n-1)\,s^2}{\sigma_0^2}$, $W_\alpha : \chi^2 > \chi^2_{1-\alpha}(n-1)$
18.	$H_0 : \sigma^2 = \sigma_0^2$	$H_1 : \sigma^2 < \sigma_0^2$	$\chi^2 = \frac{(n-1)\,s^2}{\sigma_0^2}$, $W_\alpha : \chi^2 < \chi^2_{\alpha}(n-1)$
19.	$H_0 : m_1 = m_2$	$H_1 : m_1 \neq m_2$	$U = \frac{\overline{x}_1-\overline{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1}+\frac{\sigma_2^2}{n_2}}}$, $W_\alpha : \lvert U\rvert > u_{1-\frac{\alpha}{2}}$, poznáme σ_1 a σ_2
20.	$H_0 : m_1 = m_2$	$H_1 : m_1 \neq m_2$	$t = \frac{\overline{x}_1-\overline{x}_2}{s_0\cdot\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$, $s_0^2 = \frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{n_1+n_2-2}$, $W_\alpha : \lvert t\rvert > t_{1-\frac{\alpha}{2}}(n_1+n_2-2)$, predpoklad $\sigma_1 = \sigma_2$
21.	$H_0 : m_1 = m_2$	$H_1 : m_1 \neq m_2$	$t = \frac{\overline{x}_1-\overline{x}_2}{\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}}$, $n_0 = \frac{\left(\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}\right)^2}{\frac{1}{n_1-1}\left(\frac{s_1^2}{n_1}\right)^2+\frac{1}{n_2-1}\left(\frac{s_2^2}{n_2}\right)^2}$, $W_\alpha : \lvert t\rvert > t_{1-\frac{\alpha}{2}}(n_0)$, predpoklad $\sigma_1 \neq \sigma_2$
22.	$H_0 : \sigma_1^2 = \sigma_2^2$	$H_1 : \sigma_1^2 \neq \sigma_2^2$	$F = \frac{s_1^2}{s_2^2}$, $W_\alpha : F > F_{1-\frac{\alpha}{2}}(n_1-1; n_2-1)$, indexy $_1$ a $_2$ volíme tak, aby platilo $s_1 > s_2$

Tabuľka 3: Testy odľahlých hodnôt

23.	Grubbsov test	$T(n) = \frac{x_{(n)} - \overline{x}}{s}\sqrt{\frac{n}{n-1}}, \quad W_\alpha : T(n) > T_\alpha(n)$
		$T(1) = \frac{\overline{x} - x_{(1)}}{s}\sqrt{\frac{n}{n-1}}, \quad W_\alpha : T(1) > T_\alpha(n)$
24.	Dixonov test	$Q(n) = \frac{x_{(n)} - x_{(n-1)}}{x_{(n)} - x_{(1)}}, \quad W_\alpha : Q(n) > Q_\alpha(n)$
		$Q(1) = \frac{x_{(2)} - x_{(1)}}{x_{(n)} - x_{(1)}}, \quad W_\alpha : Q(1) > Q_\alpha(n)$

Tabuľka 4: Testy dobrej zhody

25.	Pearsonov test dobrej zhody	$\chi^2 = \sum_{i=1}^{k} \frac{(np_i - n_i)^2}{np_i}, \quad W_\alpha : \chi^2 > \chi^2_{1-\alpha}(k-r-1)$
		Cochranovo pravidlo: $np_i \geq 5$,
		resp. $np_i \geq 4$ pre $k-r-1 \geq 3$, $np_i \geq 1$ pre $k-r-1 \geq 6$
26.	Kolmogorovov test	$W_\alpha : D_1 \geq D_\alpha(n)$,
		$D_1 = \max\{\max\lvert F(x_{(i)}) - F_n(x_{(i)})\rvert, \max\lvert F(x_{(i)}) - F_n(x_{(i-1)})\rvert\}$
27.	Kolmogorovov-Smirnovov test	pre $n_1, n_2 \geq 30$
		$D_2 = \max\lvert F_{n_1}(x) - G_{n_2}(x)\rvert, \quad W_\alpha : D_2 \geq \frac{\lambda_\alpha}{\sqrt{n_0}}, \quad n_0 = \frac{n_1 n_2}{n_1 + n_2}$
		pre $n_1, n_2 < 30, \quad n_1 = n_2 = n$
		$d = n \max\lvert F_n(x) - G_n(x)\rvert, \quad W_\alpha : d \geq d_\alpha(n)$
		pre $n_1, n_2 < 30, \quad n_1 \neq n_2$
		$\Delta = n_1\, n_2 \max\lvert F_{n_1}(x) - G_{n_2}(x)\rvert, \quad W_\alpha : \Delta \geq \Delta_\alpha(n_1; n_2)$