

① Turcevoc Nina 33/22 A Biljina proizvodnja

③ 11.3 11.9 12.5 11.7 11.1 11.5 11.8 12.3 12 11.3 11.8 11.5

$$d = 0.03$$

$$\bar{x} = 11.72 \text{ kg}$$

$$s = 3 \text{ kg}$$

Test o očekivanju!

$$H_0: \mu = 10 \text{ kg} \quad H_1: \mu < 10 \text{ kg}$$

① Računanje parametara

$$\bar{x} = 11.72 \text{ kg} \quad \bar{x} = \frac{11.3 + 11.9 + 12.5 + 11.7 + 11.1 + 11.5 + 11.8 + 12.3 + 12 + 11.3 + 11.8 + 11.5}{12}$$

$$s = 3 \text{ kg}$$

$$n = 12$$

$$\bar{x} = \frac{140.7}{12} \Rightarrow \bar{x} = 11.72$$

② Test statistika

$$Z = \frac{\bar{x} - \mu}{s} \cdot \sqrt{n}$$

$$Z = \frac{11.72 - 10}{3} \cdot \sqrt{12}$$

$$Z = \frac{1.72}{3} \cdot 3.4$$

$$Z = 1.93$$

③ Kritična vrijednost

$$Z_{0.03} = 1.9$$

Odbacujemo H_0 Prinjavamo H_0 !

10

$$S_2 = \sqrt{V_2} \Rightarrow \underline{5.1}$$

$$n_1 = 12 \\ n_2 = 10$$

$$s_1^2 = 3.8 \\ s_2^2 = 5.1$$

① Test statistika

$$S^2 = \frac{1}{n_1 + n_2 - 2} \left((n_1 - 1)s_1^2 + (n_2 - 1)s_2^2 \right) \Rightarrow$$

$$S^2 = \frac{1}{12 + 10 - 2} \left((12 - 1)(3.8) + (10 - 1)(5.1) \right) \Rightarrow$$

$$S^2 = \frac{1}{20} (41.8 + 45.9) (158.4 + 234.9)$$

$$S^2 = \frac{1}{20} \cdot 392.49$$

$$\underline{S^2 = 19.6}$$

$$T = \frac{\bar{X}_1 - \bar{X}_2}{S^2} \cdot \frac{1}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \Rightarrow$$

$$T = \frac{12.4 - 8.6}{19.6} \cdot \frac{1}{\sqrt{\frac{1}{12} + \frac{1}{10}}} \Rightarrow$$

$$T = \frac{3.8}{19.6} \cdot \frac{1}{\sqrt{\frac{11}{60}}}$$

$$T = 0.19 \cdot \frac{1}{0.42}$$

$$\underline{T = 0.45}$$

③ Kritična vrednost

$$t_{0.05}(12+10-2) \Rightarrow t_{0.05}(20) = 1.725$$

$$T < t_{0.05}(20)$$

Prinhamo H_0 !

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Durdevac Nina 33/22 Agrupa Biljna provodnja

④ Podgorica: 11 12 13 14 15 17 16 8 11 14 19 5

Budva: 6 7 4 5 3 8 10 20 9 12

$$\alpha = 0.05$$

Test uporedivanja 2 populacije!

$$H_0: \mu_1 = \mu_2 \quad H_1: \mu_1 \neq \mu_2$$

① Racunanje parametara

$$\bar{X}_1 = \frac{11 + 12 + 13 + 14 + 15 + 17 + 16 + 8 + 11 + 14 + 19 + 5}{12} = \frac{149}{12} = \underline{12.4}$$

$$V_1 = \frac{(11-12.4)^2 + (12-12.4)^2 + (13-12.4)^2 + (14-12.4)^2 + (15-12.4)^2 + (17-12.4)^2 + (16-12.4)^2 + (8-12.4)^2 + (11-12.4)^2 + (14-12.4)^2 + (19-12.4)^2 + (5-12.4)^2}{12-1}$$

$$= \frac{(11-12.4)^2 + (14-12.4)^2 + (19-12.4)^2 + (5-12.4)^2}{12-1} \Rightarrow \frac{1.96 + 0.16 + 0.36 + 2.56 + 5.76 + 21.16}{11}$$

$$= \frac{5.76 + 19.36 + 1.96 + 2.56 + 43.56 + 54.76}{11} = \frac{159.86}{11} \Rightarrow \underline{V_1 = 14.5}$$

$$S_1 = \sqrt{V_1} = \underline{3.8}$$

$$\bar{X}_2 = \frac{6 + 7 + 4 + 5 + 3 + 8 + 10 + 20 + 9 + 14}{10} = \frac{86}{10} = \underline{\bar{X} = 8.6}$$

$$V_2 = \frac{(6-8.6)^2 + (7-8.6)^2 + (4-8.6)^2 + (5-8.6)^2 + (3-8.6)^2 + (8-8.6)^2 + (10-8.6)^2 + (20-8.6)^2 + (9-8.6)^2 + (14-8.6)^2}{10-1}$$

$$= \frac{(9-8.6)^2 + (14-8.6)^2}{10-1} \Rightarrow \frac{6.76 + 2.56 + 21.16 + 12.96 + 31.36 + 0.36 + 1.96 + 129.96 + 0.16 + 29.16}{9}$$

$$\Rightarrow \frac{236.4}{9} \Rightarrow \underline{V_2 = 26.2}$$

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

parametri

$$\bar{x}_{n_1} = \frac{\sum x}{n} = \frac{11+12+13+14+15+17+10+8+11+14+19+5}{12} = \frac{149}{12} \approx 12,4$$

$$V_1 = \frac{(11-12,4)^2 + (12-12,4)^2 + (13-12,4)^2 + (14-12,4)^2 + (15-12,4)^2 + (17-12,4)^2 + \dots + (5-12,4)^2}{12-1}$$

$$V_1 = \frac{1,96 + 0,16 + 0,36 + 2,56 + 6,76 + 21,16 + 5,76 + 19,36 + 1,96 + 2,56 + 43,56 + 54,76}{11}$$

$$V_1 = \frac{160,92}{11} = 14,63$$

$$S_1 = \sqrt{V_1} = \sqrt{14,63} = 3,82 \quad \checkmark \text{ podgorica}$$

Budva ↘

$$\bar{x}_{n_2} = \frac{6+7+4+5+3+8+10+20+9+12}{10} = \frac{84}{10} = 8,4$$

$$V_2 = \frac{(6-8,4)^2 + (7-8,4)^2 + (4-8,4)^2 + (5-8,4)^2 + (3-8,4)^2 + \dots + (12-8,4)^2}{10-1}$$

$$V_2 = \frac{5,76 + 1,96 + 19,36 + 11,56 + 29,16 + 0,16 + 2,56 + 129,96 + 1,96 + 12,96}{9}$$

$$V_2 = \frac{215,4}{9} = 23,93$$

$$S_2 = \sqrt{V_2} = \sqrt{23,93} = 4,89 \quad \checkmark$$

Test statistika

$$T = \frac{\bar{x}_1 - \bar{x}_2}{S^2} \cdot \frac{1}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{4}{\sqrt{17,07}} \cdot \frac{1}{\sqrt{\frac{1}{60}}} = 4,13 = \sqrt{\frac{17}{60}}$$

$$S^2 = \left(\frac{1}{n_1+n_2} \right) \cdot ((n_1-1)S_1^2 + (n_2-1)S_2^2)$$

$$S^2 = \frac{1}{22} \cdot (160,49 + 215,19)$$

$$S^2 = 17,07 \quad \checkmark$$

kaže?

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2,3

Anastasia Jokovic 11/22 (A)
Bigna proizvođača

3. $\mu = 10 \text{ kg}$

$H_0: \mu = 10 \text{ kg}$

$H_1: \mu < 10 \text{ kg}$

$\sigma = 3 \text{ kg}$

$n = 12$

$\bar{x} = ?$

$$\bar{x} = \frac{\sum x_i}{n}$$

$$\bar{x} = \frac{11,3 + 11,9 + 12,5 + 11,7 + 11,1 + 11,5 + 11,8 + 12,3 + 12 + 11,3 + 11,8 + 11,5}{12}$$

$$\bar{x} = \frac{140,7}{12}$$

$$\bar{x} = 11,72$$

test statistika

$$Z = \frac{\bar{x} - \mu_0}{\sigma} \cdot \sqrt{n}$$

$$Z = \frac{11,72 - 10}{3} \cdot \sqrt{12}$$

$$Z = 0,57 \cdot 3,46$$

$$Z = 1,97$$

kritična vrijednost

 ~~$Z_{0,03}$~~

$Z_{0,03} = 1,89$

$1 - 0,03 = 0,97$

$Z > Z_{0,03}$

odbacujemo H_0 .

w

10/10

w

$T < t_{\alpha, n} \rightarrow$ prihvatamo $H_0: \bar{x}_1 = \bar{x}_2$

$$H_1: \bar{x}_1 > \bar{x}_2$$

3. $H_0: \mu = 10 \text{ kg}$ $H_1: \mu < 10 \text{ kg}$

(1) $\mu = 10 \text{ kg}$

$\sigma = 3 \text{ kg}$

$n = 12$

$$\bar{x} = \frac{11,3 + 11,9 + 12,5 + 11,7 + 11,1 + 11,5 + 11,8 + 12,3 + 12 + 11,5 + 11,8 + 11,5}{12}$$

$\bar{x} = 10,89$

(2) $Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}} \cdot \sqrt{n}$

$Z = \frac{10,89 - 10}{3} \cdot \sqrt{12}$

$Z = 0,29 \cdot \sqrt{12} = 0,29 \cdot 3,46 = \underline{1,003}$

po ovom je T manje od $Z_{0,03}$?

(3) $Z_{0,03} = 1,89$

$|T| > Z_{0,03}$ Odbacujemo H_0

$1,003 < 1,89$ (?)

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4. $T = \frac{\bar{x}_1 - \bar{x}_2}{s} \cdot \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$

$\bar{x}_1 = \frac{149}{12} = 12,4$

$\bar{y}_1 = \frac{84}{10} = 8,4$

$S_2^2 = \frac{\sum x_2^2 - n_2 \bar{x}_2^2}{n_2 - 1}$

$S_1 = \frac{\sum x_1^2 - n_1 \bar{x}_1^2}{n_1 - 1}$

$S_2^2 = \frac{5,76 + 1,96 + 19,36 + 11,56 + 29,16 + \dots}{9}$

$S_1^2 = \frac{(11-12,4)^2 + (12-12,4)^2 + (13-12,4)^2 + \dots}{11}$

$S_1^2 = \frac{1,96 + 0,16 + 0,36 + 2,56 + 0,76 + 20,16 + \dots}{11}$

$S_2^2 = \frac{208,3}{9} = 23,14$

$S_2 = \sqrt{23,14} = 4,8$

$S_1^2 = \frac{533,53}{11}$

$S_1^2 = 48,50$

$S_1 = \sqrt{48,50} = 6,9$

~~$T = \frac{12,4 - 8,4}{4,8} \cdot \sqrt{\frac{1}{12} + \frac{1}{10}}$
 $T = \frac{4}{4,8} \cdot \sqrt{\dots}$
 $T = 0,83$~~

$$4) T = \frac{\bar{x}_1 - \bar{x}_2}{S} \cdot \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$

$$S = \sqrt{\frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1 + n_2 - 2}}$$

$$S_1^2 = \frac{\sum x^2 - n_1 \cdot \bar{x}_1^2}{n_1 - 1}$$

$$S_2^2 = \frac{\sum x^2 - n_2 \bar{x}_2^2}{n_2 - 1}$$

$$\bar{x}_1 = \frac{149}{12} = 12,41$$

$$\bar{x}_2 = \frac{84}{10} = 8,4$$

$$S_1^2 = \frac{\sum x_1^2 - n_1 \cdot \bar{x}_1^2}{n_1 - 1} = \frac{1815 - 12 \cdot (12,41)^2}{11} = \frac{1815 - 1452}{11} = \frac{363}{11} = 33$$

$$S_2^2 = \frac{\sum x_2^2 - n_2 \bar{x}_2^2}{n_2 - 1}$$

$$\sum x_2^2 = 36 + 49 + 16 + 25 + 9 + 64 + 100 + 400 + 81 + 144 = 924$$

$$S_2^2 = \frac{924 - 10 \cdot 8,4^2}{9} = 93,33$$

$$S = \sqrt{\frac{11 \cdot 33 + 9 \cdot 93,33}{9}} = \sqrt{\frac{363 + 839,7}{9}} = 11,559$$

$$T = \frac{12,41 - 8,4}{11,559} \cdot \sqrt{\frac{1}{12} + \frac{1}{10}}$$

W
= ?

ambična vrijednost?

99/15

$$121 + 144 + 169 + 196 +$$

$$225 + 289 +$$

$$400 + 64 + 121 +$$

$$186 + 361 + 25$$

Agrupas

Rakocvic
Andriana 21/22

$$4. \bar{X}_1 = \frac{149}{12} = \boxed{12,41}$$

$$\bar{X}_2 = \frac{84}{10} = 8,4$$

$$S_1^2 = \frac{\sum X_1^2}{n_1} - \frac{(\sum X_1)^2}{n_1^2}$$

?

-

4. Podgorica	11	12	13	14	15	17	10	8	11	14	19	5
Budva	6	7	4	5	3	8	10	20	9	12	X	X

$$\bar{x}_1 = \frac{11+12+13+14+15+17+10+8+11+14+19+5}{12} = \frac{149}{12} = 12.41$$

Podgorica

$$\bar{x}_2 = \frac{6+7+4+5+3+8+10+20+9+12}{10} = \frac{84}{10} = 8.4$$

$$S_n^2 = 2019 = \sum x_i^2 - n \bar{x}^2$$

$$S_n^2 = \frac{2019 - 12 \cdot (12.41)^2}{11} = \frac{-1.846}{11} = -0.16$$

nemoguće; var je uvijek > 0!

Budva

$$S_2^2 = 924$$

$$S_2^2 = \frac{924 - 10 \cdot (8.4)^2}{9} = \frac{218.4}{9} = 24.26$$

$$S_2^2 = 24.26$$

$$S = \sqrt{\frac{11 \cdot (-0.16) + 9 \cdot 24.26}{20}} = \sqrt{\frac{216.58}{20}} = 0.73$$

$$\text{Test statistika: } T = \frac{12.41 - 8.4}{0.73} \cdot \sqrt{\frac{1}{12} + \frac{1}{10}} =$$

$$= \frac{4.01}{0.73} \cdot \sqrt{0.18} = 5.49 \cdot \sqrt{0.18} = 2.32$$

$$T = 2.32$$

~~8/10~~ 93/15

$$t_{0.05}(n_1+n_2-2) = t_{0.05}(20)$$

$$T > t_{0.05}(20) \text{ - neprihvatamo } H_0: \bar{x}_1 = \bar{x}_2$$

$$t_{0.05}(20) = 1.725 \Rightarrow |T| > t_{0.05}(20) \Rightarrow \text{Ne prihvatamo } H_0$$

(2) Test statistika

$$T = \frac{\bar{X}_1 - \bar{X}_2}{s} \cdot \frac{1}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{12.4 - 8.4}{s^2} \cdot \frac{1}{\sqrt{\frac{1}{12} + \frac{1}{10}}} =$$

$$s^2 = \frac{1}{n_1 + n_2 - 2} \cdot ((n_1 - 1) S_1^2 + (n_2 - 1) S_2^2) =$$

$$= \frac{1}{12 + 10 - 2} \cdot ((12 - 1) \cdot 14.6 + (10 - 1) \cdot 24.2) = 7.56$$

=

$$\sqrt{\frac{4}{7.56}} \cdot \frac{1}{\sqrt{0.18}} = 3.42 \quad \checkmark$$

(3) Upoređivanje s kritičnom vrijednošću

$$T_{0.05}(12 + 10 - 2) = T_{0.05}(20) = 2.086$$

$$|T| < T_{0.05} \Rightarrow \text{prihvatamo } H_0!$$

↑
kako?

$$3.42 > 2.086!$$

~~šta?~~ 14/15

3) Zadatak
 $H_0: \mu = 10 \text{ kg}$
 $H_1: \mu < 10 \text{ kg}$

1) Test o očekivanju normalno raspoređene proporcije varijansa je poznata *nemoguć!*

(1) Računanje parametra

$$\bar{X} = \frac{11.3 + 11.9 + 12.5 + 11.7 + 11.1 + 11.5 + 11.8 + 12.3 + 12 + 11.3 + 11.8 + 11.5}{12} = 140.7$$

brojevi su izmesti 10:12!

(2) Test statistika

$$Z = \frac{\bar{X} - \mu}{\sigma} \cdot \sqrt{n} = \frac{140.7 - 10}{3} \cdot \sqrt{12} = 150.9$$

(3) Upoređivanje s kritičnom vrijednošću

$$Z_{0.03} = 1.88$$

100-3=97

$|Z| > Z_{0.02} \Rightarrow$ odbacujemo $H_0!$

9/10

- $\sigma = 3$
- $n = 12$
- $\alpha = 0.03$
- $\mu = 10$

4) Zadatak
 $n_1 = 12$
 $n_2 = 10$

4) Test 2 normalno raspoređene populacije

$H_0: \mu = \mu_2$
 $H_1: \mu < \mu_2$

(1) Računanje parametra

$$\bar{X}_1 = \frac{11 + 12 + \dots + 5}{12} = 12.4$$

$$S_1^2 = \frac{(11 - 12.4)^2 + (12 - 12.4)^2 + \dots + (5 - 12.4)^2}{12 - 1} = 14.6$$

$$S_1 = \sqrt{14.6} = 3.8$$

$$\bar{X}_2 = \frac{6 + 7 + 4 + \dots + 12}{10} = 8.4$$

$$S_2^2 = \frac{(6 - 8.4)^2 + \dots + (12 - 8.4)^2}{10 - 1} = 24.2$$

$$S_2 = \sqrt{24.2} = 4.9$$

$$S = \frac{1}{12+10-2} \cdot \left((12-1) \cdot (0,38)^2 + (10-1) \cdot (8)^2 \right)$$

$$S = \frac{1}{20} \cdot (11 \cdot 0,14 + (9 \cdot 64))$$

$$S = \frac{1}{20} \cdot (1,54 + 576)$$

$$S = \frac{1}{20} \cdot (577,5)$$

$$S = 28,8$$

$$T = \frac{12-10}{28,8} = \frac{1}{\sqrt{\frac{1}{12} + \frac{1}{10}}}$$

$$T = \frac{2}{28,8} = \frac{1}{\sqrt{0,08 + 0,1}} \Rightarrow 0,42$$

$$T = 0,6 \cdot 2,38$$

$$T = 1,42$$

③ Kritička vrijednost

$$t_{\frac{0,05}{2}} \Rightarrow 0,025 \quad (12+10-2)$$

$$t = 2,086$$

$$|T| < t_L$$

~~odbačeno~~ Ho? odbacujemo

ovo je tačno :-)

4. Zadatak

Anastasiya Vukovic → 4/22

Ovo je test o usporedivanju očekivanja 2 populacije

$$n_1 = 12 \text{ Podgorica}$$

Prag značajnosti

$$n_2 = 10 \text{ Budva}$$

$$\alpha = \frac{0,05}{2}$$

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Hipoteza

~~8/10~~

$$\alpha = 0,025$$

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 > \mu_2$$

$$V_1 = \frac{(11 + 12,4)^2 + (12 + 12,4)^2 + \dots + (-5 + 2,4)^2}{n-1}$$

① računanje parametara

$$\bar{x}_1 = \frac{11 + 12 + 13 + 14 + \dots + 19 + 5}{12}$$

$$V_1 = \frac{1,687}{11}$$

$$\bar{x}_1 = \frac{149}{12}$$

$$V_1 = 0,15$$

$$\bar{x}_1 = 12,4$$

$$S = \sqrt{V}$$

prevelo!

$$\bar{x}_2 = \frac{6 + 7 + 4 + 5 + \dots + 9 + 12}{10}$$

$$S = 0,38$$

$$\bar{x}_2 = \frac{84}{10}$$

$$V_2 = \frac{577}{9}$$

$$\bar{x}_2 = 8,4$$

$$V_2 = 64,1$$

$$S = \sqrt{V} = 8,0$$

② Test statistika

$$T = \frac{\bar{x}_1 - \bar{x}_2}{S} \cdot \frac{1}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$S = \frac{1}{n_1 + n_2 - 2} \cdot ((n_1 - 1)S_1^2 + (n_2 - 1)S_2^2)$$

$$\sigma = \sqrt{24,26}$$

$$\sigma = 4,925$$

② Test statistika:

$$T = \frac{\bar{X}_1 - \bar{X}_2}{S} \cdot \frac{1}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$S^2 = \frac{1}{n_1 + n_2 - 2} \cdot ((n_1 - 1) \cdot S_1^2 + (n_2 - 1) \cdot S_2^2)$$

$$S^2 = \frac{1}{12 + 10 - 2} \cdot (11 \cdot 14,625 + 9 \cdot 24,26) = 153$$

$$T = \frac{12,4 - 8,4}{\sqrt{153}} \cdot \frac{1}{\sqrt{\frac{1}{12} + \frac{1}{10}}} = 0,76 \text{ prihvato}$$

③ Kritična vrijednost:

$$t_{0,05} (12+10) - 2 = t_{0,05} = 20 = 1,725 \quad 14/15$$

$$|T| < t_{0,05} (20) \text{ prihvatao } H_0$$

OK.

4. Upoređivanje očekivanja dvije populacije

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

1. Računanje parametara:

$$\bar{X}_1 = \frac{12 + 11 + 13 + 14 + 15 + 17 + 10 + 8 + 11 + 14 + 19 + 5}{12} = 12,4$$

$$V_1 = \frac{(12-12,4)^2 + (11-12,4)^2 + (13-12,4)^2 + (14-12,4)^2 + (15-12,4)^2 + (17-12,4)^2 + (10-12,4)^2 + (8-12,4)^2 + (11-12,4)^2 + (14-12,4)^2 + (19-12,4)^2 + (5-12,4)^2}{12-1}$$

$$V = \frac{0,16 + 1,96 + 0,36 + 2,56 + 6,76 + 21,16 + 5,76 + 19,36 + 1,96 + 2,56 + 43,56 + 54,76}{12-1}$$

$$s_1^2 = \boxed{V = 14,629} \quad \checkmark$$

$$\sigma = \sqrt{14,629}$$

$$\sigma = 3,82$$

$$\bar{X}_2 = \frac{6 + 7 + 4 + 5 + 3 + 8 + 10 + 20 + 9 + 12}{10-1} = 8,4$$

$$V_2 = \frac{(6-8,4)^2 + (7-8,4)^2 + (4-8,4)^2 + (5-8,4)^2 + (3-8,4)^2 + (8-8,4)^2 + (10-8,4)^2 + (20-8,4)^2 + (9-8,4)^2 + (12-8,4)^2}{10-1}$$

$$s_2^2 = \boxed{V = 24,26} \quad \checkmark$$

$$\sigma = 3 \text{ kg}$$

$$H_0 = \mu = 10 \text{ kg}$$

$$H_1 = \mu < 10 \text{ kg}$$

$$\mu = 10 \text{ kg}$$

$$n = 12$$

$$\alpha = 0.03$$

$$\bar{x} = 10 \text{ kg}$$

value?

Treba izračunati iz
podataka!
Test je pogrešan.

(2) Test statistika:

$$z = \frac{\bar{x} - \mu}{\sigma} \cdot \sqrt{n}$$

$$z = \frac{10 - 10}{3} \cdot \sqrt{12}$$

$$z = 23,09$$

5/10

(3) Kritična vrijednost:

$$z = 0,03$$

$$|z| > z = 0,03$$

odbacujemo

nestatistika (c)

$$s_2^2 V_2 = \frac{5.26 + 1.96 + 19.36 + 20.16 + 0.16 + 2.56 + 134.56 + 6.36 + 12.96}{9}$$

$$V_2 = 22.98$$

$$s_2 = \sqrt{22.98} = 4.79$$

(2) Test statistika

$$T = \frac{\bar{X}_1 - \bar{X}_2}{S} \cdot \frac{1}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$s^2 = \frac{1}{12+10-2} \cdot ((12-1) \cdot 21.99 + (10-1) \cdot 22.98) = 22$$

$$s^2 = 236.39 + 206.82$$

$$s^2 = 443.21$$

$$s^2 = 218.63 \text{ novo}$$

$$s = 14.7$$

$$s = 21.05$$

$$T = \frac{12.41 - 8.4}{21.05} \cdot \frac{1}{\sqrt{\frac{1}{12} + \frac{1}{10}}}$$

$$T = 0.27 \cdot 2.38$$

$$T = 0.64$$

14/15

$$T = \frac{12.41 - 8.4}{14.7} \cdot \frac{1}{\sqrt{\frac{1}{12} + \frac{1}{10}}}$$

$$T = 0.27 \cdot 2.38$$

$$T = 0.64$$

(3) Kritična vrednost

$$t_{0.05} (12-10-2)$$

$$t_{0.05} (20) = 2.086$$

$$|T| < t_{0.05}$$

prihvatamo H_0

4.

P6	11	12	13	14	15	17	10	8	11	14	19	5
BD	6	7	4	5	3	8	10	20	9	12	x	x

$$n_1 = 12$$

$$n_2 = 10$$

$$\alpha = 0,05$$

Konstanta uporeditvene očekivanja 2 populacije (4)

$$H_0: \mu_1 = \mu_2 \quad H_1: \mu_1 \neq \mu_2$$

Procunavanje parametara

$$\bar{X}_1 = \frac{11+12+13+14+15+17+10+8+11+14+19+5}{12}$$

$$\bar{X}_1 = \frac{149}{12} = 12,41$$

$$\bar{X}_2 = \frac{6+7+4+5+3+8+10+20+9+12}{10}$$

$$\bar{X}_2 = \frac{84}{10} = 8,4$$

$$S_1^2 = V_1 = \frac{(11-12,41)^2 + (12-12,41)^2 + (13-12,41)^2 + (14-12,41)^2 + (15-12,41)^2 + (17-12,41)^2 + (10-12,41)^2 + (8-12,41)^2 + (11-12,41)^2 + (14-12,41)^2 + (19-12,41)^2 + (5-12,41)^2}{12-1}$$

$$+ \frac{(6-8,4)^2 + (7-8,4)^2 + (4-8,4)^2 + (5-8,4)^2 + (3-8,4)^2 + (8-8,4)^2 + (10-8,4)^2 + (20-8,4)^2 + (9-8,4)^2 + (12-8,4)^2}{9}$$

$$V_1 = \frac{1,98 + 0,16 + 0,34 + 2,52 + 6,70 + 96,7 + 5,80 + 19,4 + 1,98 + 2,52 + 143,4 + 54,9}{11}$$

$$V_1 = \frac{236,7}{11} = 21,49$$

$$S_1 = \sqrt{21,49} = 4,63$$

$$V_2 = \frac{(6-8,4)^2 + (7-8,4)^2 + (4-8,4)^2 + (5-8,4)^2 + (3-8,4)^2 + (8-8,4)^2 + (10-8,4)^2 + (20-8,4)^2 + (9-8,4)^2 + (12-8,4)^2}{9}$$

3. $\mu = 10 \text{ kg}$

11.3 11.9 12.5 11.7 11.1 11.5 11.8 12.3 12 11.3 11.8 11.5

$\sigma = 3$

$n = 12$

$\alpha = 0,03$

$\mu = 10$

Koristimo test očekujuće populacije (zadane su st. devijacije poznate Li varijance) (1)

$H_0: \mu = 10 \text{ kg}$

$H_1: \mu < 10 \text{ kg}$

(1) Računamo parametre

$\mu = 10$

$\sigma = 3$

$\alpha = 0,03$

$n = 12$

$$\bar{x} = \frac{11.3 + 11.9 + 12.5 + 11.7 + 11.1 + 11.5 + 11.8 + 12.3 + 12 + 11.3 + 11.8 + 11.5}{12}$$

$$\bar{x} = \frac{140.7}{12}$$

$\bar{x} = 11.72$

(2) Test statistika

$$Z = \frac{\bar{x} - \mu}{\sigma} \sqrt{n}$$

$$Z = \frac{11.72 - 10}{3} \cdot \sqrt{12}$$

$Z = \cancel{1.97} 1,97$

$Z = 1,97$

(3) Kritična vrijednost

$Z_{0,03} =$

$Z > Z_{0,03}$

odbacujemo H_0

✓ 10/10

$$\bar{X}_2 = \frac{84}{10} = 8.4$$

$$S_2^2 = \frac{5.76 + 1.96 + 19.36 + 11.56 + 29.16 + 0.16 + 134.56 + 0.36 + 12.96}{10-1}$$

$$S_2^2 = 215.84$$

2. test statistika

$$S^2 = \frac{1}{n_1+n_2-2} \cdot ((n_1-1)S_1^2 + (n_2-1)S_2^2) = 105.169$$

$$S = \sqrt{S^2} = 10.25$$

$$T = \frac{\bar{X}_1 - \bar{X}_2}{S} \cdot \frac{1}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = 0.92$$

dydelenje malo ...
ali ne vidim gresku

3. Usporednauje

$$t_{\alpha}(n_1+n_2-2) = t_{\alpha}(20) = 2.086$$

$$|T| < t_{\alpha} \text{ Prihvataemo } H_0$$

✓

15/15

3. $H_0: \mu = 10$ $n = 12$
 $H_1: \mu < 10$ $\sigma = 3$
 $\alpha = 0.03$

Test o očekivanoj
 1. računanje parametara

$$\bar{X} = \frac{11.3 + 11.9 + \dots + 11.5}{12} = \frac{140.7}{12} = 11.725$$

2. Test statistika

$$Z = \frac{\bar{X} - \mu}{\sigma} \cdot \sqrt{n} = \frac{11.725 - 10}{3} \cdot \sqrt{12} = \frac{1.725}{3} \cdot 3.464 = 1.97$$

3. Upoređivanje s kritičnom vrijednošću

$$Z_{1-\alpha} = Z_{0.97} = 1.88$$

$$|Z| > Z_{1-\alpha} \text{ Odbacujemo } H_0$$

10/10

4. Upoređivanje dvije normalno distribuirane populacije

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 > \mu_2$$

1. računanje parametara

$$\bar{X}_1 = \frac{11 + 12 + \dots + 5}{12} = \frac{149}{12} = 12.4$$

$$S_1^2 = \frac{1.96 + 0.16 + 0.36 + 2.56 + 6.76 + 21.16 + 5.76 + 19.36 + 1.96 + 2.56 + 43.56}{12-1} = \frac{106.92}{11} = 9.72$$

$$S_1^2 = \frac{106.92}{11} = 9.72$$

~~0.87~~

$$S_1 \sqrt{0.87} \quad S_2 \sqrt{1.43} =$$

$$S_1^2 = \frac{(6-8.4)^2 + (7-8.4)^2 + (4-8.4)^2 + (5-8.4)^2}{6-8.4)^2}$$

$$(3-8.4)^2 + (10-8.4)^2 + (20-8.4)^2 + (9-8.4)^2$$

$$(12-8.4)^2$$

$$= \frac{-5.76 + 1.96 - 19.36 - 11.56 - 29.16}{8}$$

$$-0.16 + 2.56 + 134.56 + 0.36$$

$$12.96$$

$$= \frac{824.8}{8} = 8$$

$$S \sqrt{10.81} = 3.21$$

Test

$$T = \frac{\bar{X}_1 - \bar{X}_2}{S}$$

$$\frac{1}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

1/15

date?

4.

Majra Hablovic

Uporedivanja ocenivanja dvije populacije

$$\bar{X}_1 = \frac{11 + 12 + 13 + 14 + 15 + 17 + 10 + 8 + 11 + 14 + 12 + 8}{12}$$

$$\bar{X}_1 = \frac{149}{12} = 12.4$$

$$\bar{X}_2 = \frac{6 + 7 + 4 + 5 + 3 + 8 + 10 + 20 + 9 + 12}{10}$$

$$\bar{X}_2 = \frac{84}{10} = 8.4$$

$$S_1^2 = U_1 = \frac{(11 - 12.4)^2 + (12 - 12.4)^2 + (13 - 12.4)^2 + (14 - 12.4)^2 + (15 - 12.4)^2 + (17 - 12.4)^2 + (10 - 12.4)^2 + (8 - 12.4)^2 + (11 - 12.4)^2 + (14 - 12.4)^2 + (12 - 12.4)^2}{12 - 1}$$

$$= \frac{(15 - 12.4)^2 + (17 - 12.4)^2 + (10 - 12.4)^2 + (8 - 12.4)^2 + (11 - 12.4)^2 + (14 - 12.4)^2 + (19 - 12.4)^2 + (5 - 12.4)^2}{11}$$

$$= \frac{2.56 + 6.76 + (-0.16) + 0.36 + 2.56 + 26.24 + 20.25 + (-5.76) + (-4.4)^2 + (-9.96)}{11} = \frac{15.76}{11} = 1.43$$