O IN EVIDENCO LR SLOVENIJE

LJUBLJANI - SEMINAR ZA STATISTIKO

D. Vogelnik in M. Blejec

STATISTIČNI REPERTORIJ

Ljubljana 1953

POPRAVKI

stran	obrazec	napačno	pravilno
5	33	$\sigma^2_{X.K}$ = povprečna	$\overline{\sigma^2_{X.K}}$ = povprečna
12	95	$r_s = 1 - \frac{6\sum(x-y)}{n(n^2-1)}$	$r_s = 1 - \frac{6\sum(x-y)^2}{n(n^2-1)}$
13	102	$R^2_{1.23} = 1\,\frac{\sigma^2_{1.23}}{\sigma^2_1}$	$R^2_{1.23} = 1 - \frac{\sigma^2_{1.23}}{\sigma^2_1}$
15	115	Tekoča ponderacija	Tekoča ponderacija (Paasche-jeve formule)
28	220	$\varphi(\chi)^2$	$\varphi(\chi^2)$
29	230	$s^2_q =$	$s^2_1 =$
44-48		v glavah tabel mora stati m namesto n.	

ZAVOD ZA STATISTIKO IN EVIDENCO LR SLOVENIJE

EKONOMSKA FAKULTETA V LJUBLJANI - SEMINAR ZA STATISTIKO

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A - obrazci

1. FREKVENČNE DISTRIBUCIJE

X_K - grupna vrednost - sredina razreda

f_K - frekvenca

n - obseg mase

d_K - širina razreda

relativna frekvemca

$$p_K = \frac{f_K}{n} \tag{1}$$

gostota frekvence

$$g_K = \frac{f_K}{d_K} \tag{2}$$

gostota relativne frekvence

$$\varphi_K = \frac{p_K}{d_K} = \frac{f_K}{n d_K} \tag{3}$$

stavki o vsotah

$$\sum f_K = n \quad \sum p_K = 1 \quad \sum \varphi_K d_K = 1 \tag{4}$$

komponente frekvence

$$f_K = n \varphi_K d_K \tag{5}$$

2. SREDNJE VREDNOSTI

21. ARITMETIČNA SREDINA

21.1 negrupirani podatki:

$$M = \bar{x} = \frac{1}{n} \sum_{i=1}^{n} x_i \qquad (6)$$

izračun s pomočjo pogojne sredine

$$\bar{x} = A + \bar{u} \qquad u = x - A \qquad (7)$$

21.2 grupirani podatki

ponderirana-tehtana sredina

$$\bar{x} = \frac{1}{n} \sum f_k x_k \qquad (8)$$

izračun s pomočjo pogoje sredine

$$\bar{x} = A + d\bar{u} \qquad u = \frac{x - A}{d} \qquad (9)$$

izračun s pomočjo kumulativnih serij

$K_0 = n =$ obseg mase

$K_1 =$ vsota prve kumulative

$$\bar{x} = A + da \qquad \frac{K_1}{K_0} = a \qquad (10)$$

21.3 Aritmetična sredina aritmetičnih sredin

$n_k =$ obsegi delnih mas

$$\bar{x} = \frac{1}{n} \sum_{k} n_k \bar{x}_k \qquad (11)$$

22. GEOMETRIJSKA SREDINA

navadna

$$G_x = \sqrt[n]{x_1 \, x_2 \cdot \cdot \cdot \cdot \, x_n} \qquad (12)$$

ponderirana

$$G_x = \sqrt[\Sigma w]{X_1^{w_1} \; X_2^{w_2} \cdot \ldots \cdot X_r^{w_r}} \qquad W_k = \text{ponder} \tag{13}$$

$$\log G_x = \frac{1}{n} \sum_i \log X_i = \overline{\log X} \tag{14}$$

Iz časovne serije:

$$X_i = k_i = \frac{Y_{i+1}}{Y_i}$$

$$G_K = \sqrt[n-1]{\frac{Y_n}{Y_1}} \tag{15}$$

23. HARMONIČNA SREDINA:
navadna

$$H_x = \frac{n}{\sum_i \frac{1}{X_i}} \tag{16}$$

tehtana

$$H_x = \frac{n}{\sum_K \frac{n_K}{X_K}} \tag{17}$$

24. MEDIANA
grupirani podatki

$$Me = X_{Me} + \left(\frac{n+1}{2} - K_{Me}\right) \frac{d_{Me}}{f_{Me}} \tag{18}$$

X_{Me} = spodnja meja
K_{Me} = kumulativa
d_{Me} = širina razreda
f_{Me} = frekvenca razreda v katerem leži mediana

25. MODUS - najpogostejša vrednost intervalne serije

p = razred z največjo frekvenco

$$Mo = X_p + d \frac{n_p - n_{p-1}}{2n_p - n_{p+1} - n_{p-1}} \tag{19}$$

3. MERE VARIACIJE

31. INTERKVARTILNA VREDNOST

Q_3, Q_1 kvartili $\qquad Q_3 - Q_1$ (20)

32. SEMIINTERKVARTILNA VREDNOST

$$\frac{Q_3 - Q_1}{2} \tag{21}$$

33. POVPREČEN ABSOLUTNI ODKLON

navaden

$$\delta_{Me} = \frac{1}{n}\sum_i |x_i - Me| \tag{22}$$

tehtan

$$\delta_{Me} = \frac{1}{n}\sum_k n_k |x_k - Me| \tag{23}$$

34. VARIANCA - povprečen kvadratični odklon

σ^2 = varianca $\sigma = \sqrt{\sigma^2}$ = standardna deviacija (24)

34.1 Negrupirani podatki

$$\sigma_x^2 = \frac{1}{n}\sum_i (x_i - \bar{x})^2 \tag{25}$$

1. skrajšani postopki

$$\sigma_x^2 = \frac{1}{n}\sum_i x_i^2 - \bar{x}^2 \tag{26}$$

2. pogojna sredina

$$\sigma_u^2 = \sigma_x^2 \qquad u = x - A \tag{27}$$

34.2 Grupirani podatki

$$\sigma_x^2 = \frac{1}{n}\sum_k f_k (x_k - \bar{x})^2 \qquad (28)$$

skrajšani postopki

a) $$\sigma_x^2 = \frac{1}{n}\sum_k f_k \, x_k^2 - \bar{x}^2 \qquad (29)$$

b) pogojna sredina

$$\sigma_x^2 = d^2 \sigma_u^2 \qquad u = \frac{x-A}{d} \qquad (30)$$

c) kumulative:

K_0 = obseg mase

K_1 = vsota prve kumulative

K_2 = vsota druge kumulative

$$\frac{K_1}{K_0} = a \qquad \frac{K_2}{K_0} = b$$

$$\sigma_x^2 = d^2 \left[2b - a(a-1) \right] \qquad (31)$$

34.3 Sheppardova korektura
za zvezne unimodalne distribucije

$$\sigma_{x,cor}^2 = \sigma_x^2 - \frac{d^2}{12} \qquad (32)$$

34.4 Skupna varianca iz grupnih varianc

$$\sigma_x^2 = \overline{\sigma_{x.k}^2} + \sigma_{\bar{x}}^2 \qquad (33)$$

σ_x^2 = skupna varianca

$\sigma_{x.k}^2$ = povprečna grupna varianca

$\sigma_{\bar{x}}^2$ = varianca med sredinami grup

$$\sigma_x^2 = \frac{1}{n}\sum_{Ki} x_{Ki}^2 - \bar{x}^2 \tag{34}$$

$$\overline{\sigma_{x.K}^2} = \frac{1}{n}\sum_{K} n_K \sigma_K^2 = \frac{1}{n}\sum_{Ki} x_{Ki}^2 - \frac{1}{n}\sum_{K} n_K \bar{x}_K^2 \tag{35}$$

$$\sigma_{\bar{x}}^2 = \frac{1}{n}\sum_{K} n_K (\bar{x}_K - \bar{x})^2 = \frac{1}{n}\sum_{K} n_K \bar{x}_K^2 - \bar{x}^2 \tag{36}$$

34.5 Normiran odklon

$$t_x = \frac{x - \bar{x}}{\sigma} \tag{37}$$

$$\bar{t}_x = 0 \tag{38}$$

$$\sigma_t^2 = 1 \tag{39}$$

35. RELATIVNE MERE VARIACIJE

$$\frac{Q_3 - Q_1}{Me} \tag{40}$$

$$\frac{Q_3 - Q_1}{2Me} \tag{41}$$

(40) (41)

$$\frac{Q_3 - Q_1}{Q_3 + Q_1} \tag{42}$$

koeficient variacije

$$\frac{\delta_{Me}}{Me}, \frac{\delta_{\bar{x}}}{\bar{x}} \tag{43}$$

(42) (43)

$$V_x = \frac{\sigma_x}{\bar{x}} \tag{44}$$

odstotni

$$V_x = \frac{\sigma_x}{\bar{x}} 100 \tag{45}$$

4. MOMENTI

41. CENTRALNI MOMENTI

navaden način računanja

$$\mu_1 = 0$$

$$\mu_2 = \frac{1}{n}\sum_i (x_i - \bar{x})^2$$

$$\mu_3 = \frac{1}{n}\sum_i (x_i - \bar{x})^3$$

$$\mu_4 = \frac{1}{n}\sum_i (x_i - \bar{x})^4$$

splošno

$$\mu_r = \frac{1}{n}\sum_i (x_i - \bar{x})^r \qquad (46)$$

tehtan način računanja

$$\mu_1 = 0$$

$$\mu_2 = \frac{1}{n}\sum_k f_k (x_k - \bar{x})^2$$

$$\mu_3 = \frac{1}{n}\sum_k f_k (x_k - \bar{x})^3$$

$$\mu_4 = \frac{1}{n}\sum_k f_k (x_k - \bar{x})^4$$

splošno

$$\mu_r = \frac{1}{n}\sum_k f_k (x_k - \bar{x})^r \qquad (47)$$

42. MOMENTI OKROG IZHODIŠČA

navaden način računanja

$$\nu_1 = \frac{1}{n}\sum_i x_i$$

$$\nu_2 = \frac{1}{n}\sum_i x_i^2$$

$$\nu_3 = \frac{1}{n}\sum_i x_i^3$$

$$\nu_4 = \frac{1}{n}\sum_i x_i^4$$

splošno

$$\nu_r = \frac{1}{n}\sum_i x_i^r \qquad (48)$$

tehtan način računanja

$$\nu_1 = \frac{1}{n}\sum_k f_k x_k$$
$$\nu_2 = \frac{1}{n}\sum_k f_k x_k^2$$
$$\nu_3 = \frac{1}{n}\sum_k f_k x_k^3$$
$$\nu_4 = \frac{1}{n}\sum_k f_k x_k^4$$

splošno $$\nu_r = \frac{1}{n}\sum_k f_k x_k^r \qquad (49)$$

43. ZVEZE MED μ IN ν

$$\mu_2 = \nu_2 - \nu_1^2 \qquad (50)$$

$$\mu_3 = \nu_3 - 3\nu_2\nu_1 + 2\nu_1^3 \qquad (51)$$

$$\mu_4 = \nu_4 - 4\nu_3\nu_1 + 6\nu_2\nu_1^2 - 3\nu_1^4 \qquad (52)$$

skrajšan način računanja

negrupirani $$x - A = u$$
$$\mu_{x,r} = \mu_{u,r} \qquad (53)$$

grupirani

$$\frac{x-A}{d} = u \qquad \mu_{x,r} = d^r \mu_{u,r} \qquad (54)$$

44. MOMENTI IZ NORMIRANIH ODKLONOV

$$\mu_{t,1} = \frac{\mu_1}{\sigma} = \alpha_1 = 0 \qquad (55)$$

$$\mu_{t,2} = \frac{\mu_2}{\sigma^2} = \alpha_2 = 1 \qquad (56)$$

$$\mu_{t,3} = \frac{\mu_3}{\sigma^3} = \alpha_3 = \sqrt{\beta_1}$$

splošno $$\mu_{t,r} = \frac{\mu_r}{\sigma^r} \qquad (57)$$

$$\mu_{t,4} = \frac{\mu_4}{\sigma^4} = \alpha_4 = \beta_2 \qquad (58)$$

45. SHEPPARDOVA KOREKCIJA za centralne momente unimodalnih zveznih distribucij

$$\mu_{2,cor} = \mu_2 - \frac{1}{12} d^2 \tag{59}$$

$$\mu_{3,cor} = \mu_3 \tag{60}$$

$$\mu_{4,cor} = \mu_4 - \frac{1}{2} d^2 \mu_2 + \frac{7}{240} d^4 \tag{61}$$

46. MERE NESOMERNOSTI (asimetrije):

$$\frac{(Q_3 - Me) - (Me - Q_1)}{Q_3 - Q_1} \tag{62}$$

$$\frac{\bar{X} - Mo}{\sigma} \tag{63}$$

$$\frac{3(\bar{X} - Me)}{\sigma} \tag{64}$$

$$\beta_1 = \frac{\mu_3^2}{\mu_2^3} \tag{65}$$

$$\frac{\sqrt{\beta_1}(\beta_2 + 3)}{2(5\beta_2 - 6\beta_1 - 9)} \tag{66}$$

47. MERE SPLOŠČENOSTI

$$\gamma_2 = \beta_2 - 3 \tag{67}$$

5. KORELACIJA

51. KORELACIJA MED DVEMA ZNAKOMA

51.1 Splošno

regresijska črta

$$y' = af_1(x) + bf_2(x) + cf_3(x) + \cdots \quad (68)$$

preostala varianca - nepojasnjen del variance

$$\sigma^2_{y\cdot x} = \frac{1}{n}\sum(y - y')^2 \quad (69)$$

Indeks determinacije

$$I^2_{y\cdot x} = 1 - \frac{\sigma^2_{y\cdot x}}{\sigma^2_y} \quad (70)$$

Indeks korelacije

$$I_{y\cdot x} = \sqrt{1 - \frac{\sigma^2_{y\cdot x}}{\sigma^2_y}} \quad (71)$$

Standardna pogreška ocene

$$\sigma_{y\cdot x} = \sigma_y\sqrt{1 - I^2_{y\cdot x}} \quad (72)$$

Normalne enačbe parametrov a, b, c

$$\begin{aligned}
\sum yf_1(x) &= a_1\sum f_1^2(x) + b\sum f_2(x)f_1(x) + c\sum f_3(x)f_1(x)\\
\sum yf_2(x) &= a_1\sum f_1(x)f_2(x) + b\sum f_2^2(x) + c\sum f_3(x)f_2(x)\\
\sum yf_3(x) &= a\sum f_1(x)f_3(x) + b\sum f_2(x)f_3(x) + c\sum f_3^2(x)
\end{aligned} \quad (73)$$

51.2 Linearna korelacija

kovarianca

$$C_{xy} = \frac{1}{n}\sum(x - \bar{x})(y - \bar{y}) = \frac{1}{n}\sum xy - \bar{x}\bar{y} \quad (74)$$

korelacijski koeficient

$$r_{xy} = \frac{C_{xy}}{\sigma_x\sigma_y} = \frac{n\sum xy - \sum x\sum y}{\sqrt{n\sum x^2 - (\sum x)^2}\sqrt{n\sum y^2 - (\sum y)^2}} \quad (75)$$

$$r_{xy} = \sqrt{b_1 b_2} \tag{76}$$

regresijska koeficienta

$$b_1 = \frac{c_{xy}}{\sigma_x^2} = r_{xy}\frac{\sigma_y}{\sigma_x} \qquad b_2 = \frac{c_{xy}}{\sigma_y^2} = r_{xy}\frac{\sigma_x}{\sigma_y} \tag{77}$$

regresijski premici

$$y' = \bar{y} + b_1(x - \bar{x}) \qquad x' = \bar{x} + b_2(y - \bar{y}) \tag{78}$$

$$\frac{y' - \bar{y}}{\sigma_x} = r_{xy}\frac{x - \bar{x}}{\sigma_x} \qquad \frac{x' - \bar{x}}{\sigma_x} = r_{xy}\frac{y - \bar{y}}{\sigma_y} \tag{79}$$

Koeficient determinacije

$$I_{y.\bar{x}}^2 = 1 - \frac{\sigma_{y.x}^2}{\sigma_y^2} = r_{xy}^2 \tag{80}$$

Koeficient alienacije

$$\sqrt{1 - r_{xy}^2} \tag{81}$$

Skrajšani postopki

a) negrupirani podatki

$$x - A = u \qquad y - B = v$$

$$c_{xy} = c_{uv} \ (82) \qquad r_{xy} = r_{uv} \ (83) \qquad b_{1,xy} = b_{1,uv} \ (84) \qquad b_{2,xy} = b_{2,uv} \ (85)$$

b) grupirani podatki $\frac{x - A}{d_x} = u \qquad \frac{y - B}{d_y} = v$

$$c_{xy} = d_x d_y c_{uv} \tag{86}$$

$$r_{xy} = r_{uv} \tag{87}$$

$$b_{1,xy} = \frac{d_y}{d_x} b_{1,uv} \tag{88}$$

$$b_{2,xy} = \frac{d_x}{d_y} b_{2,uv} \tag{89}$$

51.3 Krivuljna korelacije

regresijska krivulja (parabola druge stopnje kot primer)

$$y' = a + bx + cx^2 \tag{90}$$

normalne enačbe

$$\sum y = na + b\sum x + c\sum x^2$$

$$\sum xy = a\sum x + b\sum x^2 + c\sum x^3$$

$$\sum x^2 y = a\sum x^2 + b\sum x^3 + c\sum x^4 \tag{91}$$

preostala varianca

$$\sigma_{yx}^2 = \frac{1}{n}\sum (y - y')^2 = \frac{1}{n}\sum y^2 - a\frac{1}{n}\sum y - b\frac{1}{n}\sum xy - c\frac{1}{n}\sum x^2 y \tag{92}$$

Indeks korelacije

$$I_{yx}^2 = 1 - \frac{\sigma_{yx}^2}{\sigma_y^2} \tag{93}$$

Standardna pogreška ocene

$$\sigma_{yx} = \sigma_y \sqrt{1 - I_{yx}^2} \tag{94}$$

51.4 Korelacija ranga

X = zaporedna številka vrste urejene po prvem znaku

y = " " " " " drugem "

$$r_s = 1 - \frac{6\sum (x-y)}{n(n^2-1)}$$ Spearmanova formula (95)

51.5 Korelacijsko razmerje

$$\eta_{x.K}^2 = \frac{\sigma_x^2 - \sigma_{x.K}^2}{\sigma_x^2} = \frac{\sigma_{\bar{x}}^2}{\sigma_x^2} = \frac{\sum_K n_K \bar{x}_K^2 - n\bar{x}^2}{\sum_{Ki} x_{Ki}^2 - n\bar{x}^2} \tag{96}$$

51.6 Razredna - intraklasna korelacija

$$r_I = \frac{K\eta^2 - 1}{K - 1} \tag{97}$$

K = število razredov

η^2 = korelacijsko razmerje

52. KORELACIJA MED VEČ ZNAKI

52.1 Multipla (mnogoterna) korelacije

regresijska ravnina

$$Z' = a + bX + cY \tag{98}$$

enačba regresijske ravnine v normiranih odklonih znaki

$$\frac{X_1' - \bar{X}_1}{\sigma_1} = \beta_{1,2,3} \frac{X_2 - \bar{X}_2}{\sigma_2} + \beta_{13,2} \frac{X_3 - \bar{X}_3}{\sigma_3} \tag{99}$$

koeficienta regresijske ravnine

$$\beta_{12,3} = \frac{r_{12} - r_{13}\, r_{23}}{1 - r_{23}^2}$$

$$\beta_{13,2} = \frac{r_{13} - r_{12}\, r_{23}}{1 - r_{23}^2} \tag{100}$$

preostala varianca

$$\sigma_{1.23}^2 = \frac{1}{n} \sum (x_1 - x_1')^2 \tag{101}$$

koeficient determinacije

$$R_{1.23}^2 = 1 \frac{\sigma_{1.23}^2}{\sigma_1^2} \tag{102}$$

koeficient multiple korelacije

$$R_{1.23} = \sqrt{\frac{r_{12}^2 + r_{13}^2 - 2 r_{12}\, r_{13}\, r_{23}}{1 - r_{23}^2}} \tag{103}$$

standardna pogreška ocene

$$\sigma_{1.23} = \sigma_1 \sqrt{1 - R_{1.23}^2} \tag{104}$$

52.2 Parcielna (delna) korelacija

$$r_{12.3} = \frac{r_{12} - r_{13}\, r_{23}}{\sqrt{1-r_{13}^2}\,\sqrt{1-r_{23}^2}} \qquad (105)$$

$$r_{12.34} = \frac{r_{12.4} - r_{13.4}\, r_{23.4}}{\sqrt{1-r_{13.4}^2}\,\sqrt{1-r_{23.4}^2}}$$

Kontingenca atributivnih znakov

kontingenčna tabela

n_{kl}	$n.l$
$n_{k.}$	n

n_{kl} = frekvenca v polju k -te kolone in l-te linije

$n_{k.}$ = vsota frekvenc k-te kolone (106)

$n.l$ = vsota frekvenc l-te linije

n = skupna masa

Kriterij neodvisnosti med K in G

teoretična distribucija

$$n'_{kg} = \frac{n_{k.}\, n_{.g}}{n} \quad (107) \qquad n'_{kg} = n_{kg} \quad (108) \qquad (107)(108)$$

Merilo odvisnoati

$$\chi^2 = \sum_k \sum_g \frac{(n_{kg} - n'_{kg})^2}{n'_{kg}} = \sum_k \sum_g \frac{n_{kg}^2}{n'_{kg}} - n \qquad (109)$$

K. Pearsonov koeficient odvisnosti

$$C = \sqrt{\frac{\chi^2}{\chi^2 + n}} \qquad (110)$$

6. INDEKSI

p_0 = bazične cene q_0 = bazične količine

p_1 = tekoče cene q_1 = tekoče količine

p = stalne cene q = stalne količine

I_p = indeks cen I_q = indeks količin

61. AGREGATNI INDEKSI

61.1 Splošni formuli

$$I_p = \frac{\sum p_1 q}{\sum p_0 q} \tag{111}$$

$$I_q = \frac{\sum p q_1}{\sum p q_0} \tag{112}$$

61.2 Bazična ponderacija (Laspeyresove formule)

$$I_p = \frac{\sum p_1 q_0}{\sum p_0 q_0} \tag{113}$$

$$I_q = \frac{\sum p_0 q_1}{\sum p_0 q_0} \tag{114}$$

61.3 Tekoča ponderacija

$$I_p = \frac{\sum p_1 q_1}{\sum p_0 q_1} \tag{115}$$

$$I_q = \frac{\sum p_1 q_1}{\sum p_1 q_0} \tag{116}$$

61.4 Fischerjeva "idealna" formula

$$I_p = \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \cdot \frac{\sum p_1 q_1}{\sum p_0 q_1}} \tag{117}$$

$$I_q = \sqrt{\frac{\sum p_0 q_1}{\sum p_0 q_0} \cdot \frac{\sum p_1 q_1}{\sum p_1 q_0}} \tag{118}$$

61.5 Zveze med indeksi cen in količin

$$\frac{\sum p_1 q_1}{\sum p_0 q_0} = \frac{\sum p_1 q_1}{\sum p_0 q_1} \frac{\sum p_0 q_1}{\sum p_0 q_0} = I_p \; I_q \qquad (119)$$

$$\frac{\sum p_1 q_1}{\sum p_0 q_0} = \frac{\sum p_1 q_0}{\sum p_0 q_0} \frac{\sum p_1 q_1}{\sum p_1 q_0} = I_p \; I_q \qquad (120)$$

62. SREDNJI INDEKSI

$W = p\,q$ = ponder - teža

62.1 Splošna oblika

$$I_p = \frac{\sum \frac{p_1}{p_0} W}{\sum W} \qquad (121)$$

$$I_q = \frac{\sum \frac{q_1}{q_0} W}{\sum W} \qquad (122)$$

62.2 Aritmetična sredina

bazična ponderacija

$$I_p = \frac{\sum \frac{p_1}{p_0} p_0 q_0}{\sum p_0 q_0} = \frac{\sum p_1 q_0}{\sum p_0 q_0} \qquad (123)$$

$$I_q = \frac{\sum \frac{q_1}{q_0} p_0 q_0}{\sum p_0 q_0} = \frac{\sum p_0 q_1}{\sum p_0 q_0} \qquad (124)$$

mešana ponderacija

$$I_p = \frac{\sum \frac{p_1}{p_0} p_0 q_1}{\sum p_0 q_1} = \frac{\sum p_1 q_1}{\sum p_0 q_1} \qquad (125)$$

$$I_q = \frac{\sum \frac{q_1}{q_0} p_1 q_0}{\sum p_1 q_0} = \frac{\sum p_1 q_1}{\sum p_1 q_0} \qquad (126)$$

62.3 Harmonična sredina

$$I_p = \frac{\sum p_1 q_1}{\sum \frac{p_1 q_1}{p_1}} = \frac{\sum p_1 q_1}{\sum p_0 q_1} \qquad (127)$$

$$I_q = \frac{\sum p_1 q_1}{\sum \frac{p_1 q_1}{q_1}} = \frac{\sum p_1 q_1}{\sum p_1 q_0} \qquad (128)$$

62.4 Geometrijska sredina

$$I_p = \sqrt[\Sigma w]{\left(\frac{p_1'}{p_0'}\right)^{w'} \times \left(\frac{p_1''}{p_0''}\right)^{w''} \times \cdots} \quad w = p_0 q \qquad (129)$$

$$I_q = \sqrt[\Sigma w]{\left(\frac{q_1'}{q_0'}\right)^{w'} \times \left(\frac{q_1''}{q_0''}\right)^{w''} \times \cdots} \quad w = q_0 p \qquad (130)$$

63. INDEKSI PROIZVODNOSTI DELA

$$V_0 = \frac{q_0 p}{T_0} \qquad V_1 = \frac{q_1 p}{T_1} \qquad (131)$$

$$t_0 = \frac{T_0}{q_0} \qquad t_1 = \frac{T_1}{q_1} \qquad (132)$$

63.1 Stalni sestav

a) količin

$$I = \frac{\sum \frac{V_1}{V_0} T_1}{\sum T_1} = \frac{\sum q_1 t_0}{\sum q_1 t_1} \qquad (133)$$

b) časa

$$I = \frac{\sum V_1 T_1}{\sum V_0 T_1} \qquad (134)$$

63.2 Spremenljivi sestav

$$I = \frac{\sum q_1 p}{\sum T} : \frac{\sum q_0 p}{\sum T_0} = \frac{\sum q_1 p}{\sum q_0 p} : \frac{\sum T_1}{\sum T_0} = I_q : I_T \qquad (135)$$

7. ČASOVNE SERIJE

N = število členov časovne serije

71. IZRAČUNAVANJE TRENDA

71.1 Linearni trend

enačba premice

$$y' = a + b\,x \tag{136}$$

normalni enačbi

$$\sum y = aN + b\sum x \tag{137}$$

$$\sum xy = a\sum x + b\sum x^2$$

parametra

$$a = \frac{\sum y}{N} \tag{138}$$

$$b = \frac{\sum xy}{\sum x^2} \tag{139}$$

71.2 Parabolični trend druge stopnje

enačba

$$y' = a + bx + cx^2 \tag{140}$$

normalne enačbe

$$\sum y = aN + b\sum x + c\sum x^2$$

$$\sum xy = a\sum x + b\sum x^2 + c\sum x^3$$

$$\sum x^2 y = a\sum x^2 + b\sum x^3 + c\sum x^4 \tag{141}$$

parametri

$$a = \frac{\sum x^4 \sum y - \sum x^2 y \sum x^2}{N\sum x^4 - (\sum x^2)^2} \tag{142}$$

$$b = \frac{\sum xy}{\sum x^2} \tag{143}$$

$$c = \frac{N\sum x^2 y - \sum x^2 \sum y}{N\sum x^4 - (\sum x^2)^2} \tag{144}$$

71.3 Eksponencialni trend

$$y = a\,b^{x} \tag{145}$$

$$\log y = \log a + x \log b \tag{146}$$

71.4 Gompertzova krivulja

$$y = k a^{b^{x}} \tag{147}$$

$$\log y = \log k + b^{x} \log a \tag{148}$$

71.5 Pearl - Reed - ova krivulja

$$y = \frac{k}{1+m} \qquad m = e^{a+bx} \tag{149}$$

8. VZORČENJE

Σ = vsota v celotni masi

S = vsota v vzorcu

oznaka $_0$ Količina osnovne mase

oznaka / ocena količine

N = obseg celotne mase n = obseg vzorca

$\frac{n}{N} = f$ = vzorčni delež

8.1 VELIKI VZORCI

81.1 Prave vrednosti in ocene parametrov

aritmetična sredina

$$\bar{X}_0 = \frac{1}{N}\sum x_i \tag{150}$$

$$\bar{X}_0' = \frac{1}{n} S x = \bar{x} \tag{151}$$

vsota vrednosti znakov

$$\sum x = N\bar{x}_0 \quad (152) \qquad \sum' x = N\bar{x} \quad (153) \qquad (152)\ (153)$$

strukturni delež

$$p_0 = \frac{N_a}{N} \quad (154) \qquad p_0' = \frac{n_a}{n} = p \quad (155) \qquad (154)\ (155)$$

število enot z a

$$N_a = Np_0 \quad (156) \qquad N_a' = Np \quad (157) \qquad (156)\ (157)$$

standardna deviacija

$$\sigma_0 = \sqrt{\frac{\sum(x-\bar{x}_0)^2}{N}} \qquad (158)$$

$$\sigma_0' = \sqrt{\frac{S(x-\bar{x})^2}{n-1}} = s \qquad (159)$$

korelacijski koeficient

$$r_0 = \frac{\frac{1}{N}\sum(x-\bar{x}_0)(y-\bar{y}_0)}{\sqrt{\frac{1}{N}\sum(x-\bar{x}_0)^2 \frac{1}{N}\sum(y-\bar{y}_0)^2}} \qquad (160)$$

$$r_0' = \frac{\frac{1}{n-1} S(x-\bar{x})(y-\bar{y})}{s_x s_y} \qquad (161)$$

regresijski koeficient

$$b_0 = \frac{\sigma_{y0}}{\sigma_{x0}} r_0 \qquad (162)$$

$$b_0' = \frac{s_y}{s_x} r \qquad (163)$$

81.2 Prave vrednosti in ocene standardne pogreške

a. Končna osnovna masa

standardna pogreška aritmetične sredine

$$\sigma_{\bar{x}} = \frac{\sigma_0}{\sqrt{n}} \sqrt{\frac{N-n}{N-1}} \tag{164}$$

$$\sigma'_{\bar{x}} = \frac{s}{\sqrt{n}} \sqrt{1 - \frac{n}{N}} \tag{165}$$

standardna pogreška vsote

$$\sigma_{\Sigma'_x} = N \sigma_{\bar{x}} \tag{166}$$

$$\sigma'_{\Sigma'_x} = N \sigma'_{\bar{x}} \tag{167}$$

standardna pogreška strukturnega deleža

$$\sigma_p = \frac{\sqrt{p_0(1-p_0)}}{\sqrt{n}} \sqrt{\frac{N-n}{N-1}} \tag{168}$$

$$\sigma'_p = \frac{p(1-p)}{\sqrt{n-1}} \sqrt{\frac{N-n}{N}} \tag{169}$$

standardna pogreška števila enot z a

$$\sigma_{N'_a} = N \sigma_p \tag{170}$$

$$\sigma'_{N'_a} = N \sigma'_p \tag{171}$$

b. Neskončne osnovne mase

standardna pogreška aritmetične sredine

$$\sigma_{\bar{x}} = \frac{\sigma_0}{\sqrt{n}} \tag{172}$$

$$\sigma'_{\bar{x}} = \frac{s}{\sqrt{n}} \tag{173}$$

standardna pogreška strukturnega deleža

$$\sigma_p = \frac{\sqrt{p_o(1-p_o)}}{\sqrt{n}} \tag{174}$$

$$\sigma'_p = \frac{\sqrt{p(1-p)}}{\sqrt{n-1}} \tag{175}$$

standardna pogreška standardne deviacije

$$\sigma_s = \frac{\sigma_o}{\sqrt{2n}} \tag{176}$$

$$\sigma'_s = \frac{s}{\sqrt{2n}} \tag{177}$$

standardna pogreška korelacijskega koeficienta

$$\sigma_r = \frac{1-r_o^2}{\sqrt{n-1}} \tag{178}$$

$$\sigma'_r = \frac{1-r^2}{\sqrt{n-1}} \tag{179}$$

standardna pogreška regresijskega koeficienta

$$\sigma_b = \frac{\sigma_{y,o}}{\sigma_{x,o}} \sqrt{\frac{1-r_o^2}{n-2}} \tag{18o}$$

$$\sigma'_b = \frac{s_y}{s_x} \sqrt{\frac{1-r^2}{n-2}} \tag{181}$$

standardna pogreška diference

$$\sigma_{R_2-R_1} = \sqrt{\sigma_{R_1}^2 + \sigma_{R_2}^2} \tag{182}$$

82. MALI VZORCI

82.1 Testiranje hipotez za male vzorce

m = stopinje prostosti

X = normalna distribucija

$t = t$ distribucija

$F = F$ distribucija

$\chi^2 = \chi^2$ distribucija

aritmetična sredina

$$t = \frac{\bar{x} - \bar{x}_H}{s_x}\sqrt{n} \qquad m = n-1 \tag{183}$$

strukturni delež

$$t = \frac{p - p_H}{\sqrt{p(1-p)}}\sqrt{n-1} \qquad m = n-1 \tag{184}$$

varianca

$$F = \frac{s_x^2}{\sigma_H^2} \qquad \begin{matrix} m_1 = n-1 \\ m_2 = \infty \end{matrix} \tag{185}$$

korelacijski koeficient:

$$X = (Z - Z_H)\sqrt{n-3} \tag{186}$$

$$Z = \frac{1}{2} \ln \frac{1+r}{1-r} \tag{187}$$

$$Z = 1{,}15129 \log \frac{1+r}{1-r} \tag{188}$$

test nepovezanosti

$$t = \frac{r}{\sqrt{1-r^2}}\sqrt{n-2} \qquad m = n-2 \tag{189}$$

regresijski koeficient

$$t = \frac{b - b_H}{\frac{s_y}{s_x}\sqrt{1-r^2}}\sqrt{n-2} \qquad m = n-2 \tag{190}$$

82.2 Testiranje diferenc za male vzorce

aritmetična sredina

$$t = \frac{\bar{x}_2 - \bar{x}_1}{s_d}\sqrt{\frac{n_1+n_2}{n_1 n_2}} \qquad m = n_1 + n_2 - 2 \tag{191}$$

$$s_d^2 = \frac{S(x_1 - \bar{x}_1)^2 + S(x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2} \tag{192}$$

strukturni delež

$$t = \frac{p_2 - p_1}{s_d} \sqrt{\frac{n_1 + n_2}{n_1 n_2}} \qquad m = n_1 + n_2 - 2 \tag{193}$$

$$s_d^2 = \frac{(n_1 - 1)p_1 q_1 + (n_2 - 1)p_2 q_2}{n_1 + n_2 - 2} \tag{194}$$

varianca:

$$F = \frac{s_1^2}{s_2^2} \qquad m_1 = n_1 - 1 \qquad m_2 = n_2 - 1 \tag{195}$$

$$s_1^2 = \frac{S(x_1 - \bar{x}_1)^2}{n_1 - 1} \qquad s_2^2 = \frac{S(x_2 - \bar{x}_2)^2}{n_2 - 1} \tag{196}$$

korelacijski koeficient

$$X = \frac{z_2 - z_1}{\sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}} \tag{197}$$

$$z_1 = \frac{1}{2} \ln \frac{1 + r_1}{1 - r_1} \qquad z_2 = \frac{1}{2} \ln \frac{1 + r_2}{1 - r_2} \tag{198}$$

regresijski koeficient

$$t = \frac{b_2 - b_1}{s_d} \qquad m = n_1 + n_2 - 4 \tag{199}$$

$$s_d^2 = \frac{(n_1 - 2)\sigma_{b_1}^{2\prime} + (n_2 - 2)\sigma_{b_2}^{2\prime}}{n_1 + n_2 - 4} \cdot \frac{s_{x_1}^2 + s_{x_2}^2}{s_{x_1}^2 \; s_{x_2}^2} \tag{200}$$

83. TEST χ^2

n_k = empirična frekvenčna distribucija
n'_k = teoretična frekvenčna distribucija

$$\chi^2 = \sum_k \frac{(n_k - n'_k)^2}{n'_k} = \sum_k \frac{n_k^2}{n'_k} - n \qquad m = k - 1 \tag{201}$$

Testiranje neodvisnosti med k in g

$$n'_{kl} = \frac{n_k . \, n . l}{n} \qquad \begin{array}{c|c} n_{kl} & n.l \\ \hline n_k. & n \end{array} \tag{202}$$

$$\chi^2 = \sum_{kg} \frac{(n_{kg} - n'_{kg})^2}{n'_{kg}} \qquad m = (k - 1)(g - 1) \tag{203}$$

84. ANALIZA VARIANCE

84.1 Testiranje učinka enega faktorja (A)

Faktor variacije	Vsota kvadratov	Vsota kvadratov razvita	Stopinje prostosti	Varianca
A med grupami	$\sum_A n_A(\bar{x}_A-\bar{x})^2=Q_A$	$\sum_A n_A\bar{x}_A^2-n\bar{x}^2=Q_A$	$a-1$	$s_A^2=\frac{Q_A}{a-1}$
O znotraj grup	$\sum_A\sum_i(x_{Ai}-\bar{x}_A)^2=Q_O$	$\sum_A\sum_i x_{Ai}^2-\sum_A n_A\bar{x}_A^2=Q_O$	$n-a$	$s_O^2=\frac{Q_O}{n-a}$
A+O skupni	$\sum_A\sum_i(x_{Ai}-\bar{x})^2=Q_A+Q_O$	$\sum_A\sum_i x_{Ai}^2-n\bar{x}^2=Q_A+Q_O$	$n-1$	

(204)

$$s_A^2 < s_O^2 \qquad A \text{ ne vpliva na } x$$

$$s_A^2 > s_O^2 \qquad \frac{s_A^2}{s_O^2}=F \qquad \begin{matrix} m_1=a-1 \\ m_2=n-a \end{matrix} \qquad F>F_T \text{ učinek faktorja } A \text{ značilen} \quad (205)$$

84.2. Testiranje učinka dveh neodvisnih faktorjev (A,B)

Faktor variacije	Vsota kvadratov	Vsota kvadratov razvita	Stopinje prostosti	Varianca
A med grupami A	$\sum_A n_A(\bar{x}_A-\bar{x})^2=Q_A$	$\sum_A n_A\bar{x}_A^2-n\bar{x}^2=Q_A$	$a-1$	$s_A^2=\frac{Q_A}{a-1}$
B med grupami B	$\sum_B n_B(\bar{x}_B-\bar{x})^2=Q_B$	$\sum_B n_B\bar{x}_B^2-n\bar{x}^2=Q_B$	$b-1$	$s_B^2=\frac{Q_B}{b-1}$
0 znotraj grup ostali	$\sum_A\sum_B\sum_i(x_{ABi}-\bar{x}_A-\bar{x}_B+\bar{x})^2=Q_0$	$\sum_A\sum_B\sum_i x_{ABi}^2-\sum_A n_A\bar{x}_A^2-\sum_B n_B\bar{x}_B^2+n\bar{x}^2=Q_0$	$n-a-b+1$	$s_0^2=\frac{Q_0}{n-a-b+1}$
A+B+0 skupni	$\sum_A\sum_B\sum_i(x_{ABi}-\bar{x})^2=Q_A+Q_B+Q_0$	$\sum_A\sum_B\sum_i x_{ABi}^2-n\bar{x}^2$	$n-1$	

(206)

preizkus na enak način kot 84,1:

$$\frac{s_A^2}{s_0^2} \qquad \frac{s_B^2}{s_0^2}$$

85. TEORETIČNE FREKVENČNE DISTRIBUCIJE

Binomialna distribucija

$$B(x) = \binom{n}{x} p_0^x q_0^{n-x} \qquad q_0 = 1 - p_0 \tag{207}$$

$$\bar{X} = np_0 \tag{208}$$

$$\sigma_x^2 = np_0 q_0 \tag{209}$$

Poissonova distribucija

$$p_0 \to 0 \qquad n \to \infty \qquad np_0 = \alpha \tag{210}$$

$$P(x) = e^{-\alpha} \frac{\alpha^x}{x!} \tag{211}$$

$$\bar{X} = \alpha \tag{212}$$

$$\sigma_x^2 = \alpha \tag{213}$$

Normalna distribucija

$$\varphi(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\bar{x}_0)^2}{2\sigma_0^2}} \tag{214}$$

$$\bar{X} = \bar{X}_0 \tag{215}$$

$$\sigma^2 = \sigma_0^2 \tag{216}$$

$$\varphi(t_x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{t_x^2}{2}} \qquad t_x = \frac{X - \bar{X}}{\sigma_x} \tag{217}$$

Studentova - t distribucija

$$\varphi(t) = \frac{k_t}{(1 + \frac{t^2}{n-1})^n} \tag{218}$$

k_t = konstanta odvisna od n

$$\bar{t} = 0$$

F - distribucija

$$\varphi(F) = k_F \frac{F^{\frac{n_1-2}{2}}}{(n_2+n_1F)^{\frac{n_1+n_2}{2}}} \qquad k_F = \text{konstanta odvisna od } n_1 \text{ in } n_2 \qquad (219)$$

χ - distribucija

$$\varphi(\chi)^2 = k_{\chi^2} \left(\frac{\chi^2}{2}\right)^{\frac{n-2}{2}} e^{-\frac{\chi^2}{2}} \qquad k_{\chi^2} = \text{konstanta odvisna od } n \qquad (220)$$

$$\overline{\chi^2} = n$$

86. DODATEK . VZORČENJE PRI POPISIH

86.1 Enostavno vzorčenje

Glej poglavje 81. veliki vzorci

86.2 Uporaba dodatnih podatkov

86.21 Metoda razmerij

$$\mathcal{S}_q^2 = \left[\frac{\mathcal{S}_y^2}{\bar{y}^2} - \frac{2C_{xy}}{\bar{x}\,\bar{y}} + \frac{\mathcal{S}_x^2}{\bar{x}^2}\right] \qquad (221)$$

$$C_{xy} = \frac{1}{n-1} S(x-\bar{x})(y-\bar{y}) \qquad (222)$$

$$\bar{x} = \frac{1}{n} Sx \qquad (223)$$

ocena parametrov
aritmetična sredina $\bar{Y}_0$

$$\bar{Y}_0' = \frac{Sy}{Sx} \bar{X}_0 \tag{224}$$

vsota vrednosti $\sum y$

$$\sum' y = \frac{Sy}{Sx} \sum x \tag{225}$$

razmerje $\bar{r}_0 = \frac{\bar{Y}_0}{\bar{X}_0}$

$$\bar{r}_0' = \frac{Sy}{Sx} \tag{226}$$

ocena standardne pogreške
aritmetična sredina

$$\sigma'_{\bar{Y}_0'} = \frac{\bar{X}_0}{\bar{X}} \mathcal{S}_q \sqrt{\frac{1-f}{n}} \tag{227}$$

vsota vrednosti

$$\sigma'_{\sum' y} = \frac{\sum x}{\bar{X}} \mathcal{S}_q \sqrt{\frac{1-f}{n}} \tag{228}$$

razmerje

$$\sigma'_{\bar{r}_0'} = \frac{1}{\bar{X}} \mathcal{S}_q \sqrt{\frac{1-f}{n}} \tag{229}$$

.22 Metoda regresij

$$\mathcal{S}_q^2 = \frac{(n-1)\mathcal{S}_y^2 [1-r_{xy}^2]}{n-2} \tag{230}$$

$$b = \frac{C_{xy}}{\mathcal{S}_x^2} \tag{231}$$

Ocena parametrov
aritmetična sredina $\bar{Y}_0$

$$\bar{y}_0' = \bar{y} + b(\bar{X}_0 - \bar{x}) \tag{232}$$

vsota vrednosti ΣY

$$\Sigma' y = N\bar{y}' \tag{233}$$

razmerje $\bar{r}_0 = \frac{\bar{Y}_0}{\bar{X}_0}$

$$\bar{r}_0' = \frac{\bar{y}'}{\bar{X}_0} + b(1 - \frac{\bar{x}}{\bar{X}_0}) \tag{234}$$

Ocena standardne pogreške
aritmetična sredina

$$\sigma'_{\bar{y}_0'} = S_1 \sqrt{\frac{1-f}{n}} \tag{235}$$

vsota vrednosti

$$\sigma'_{\Sigma' y} = N S_1 \sqrt{\frac{1-f}{n}} \tag{236}$$

razmerje

$$\sigma'_{\bar{r}_0'} = \frac{S_1}{\bar{X}_0} \sqrt{\frac{1-f}{n}} \tag{237}$$

23.23 Metoda izbora z verjetnostjo, proporcionalno X in ponavljanjem

$$S_r^2 = \frac{S(\frac{y}{x} - \bar{r}')^2}{n-1} \tag{238}$$

Ocena parametrov
aritmetična sredina

$$\bar{y}_0' = \bar{x}_0 \frac{1}{n} S \frac{y}{x} \tag{239}$$

vsota vrednosti Σy

$$\Sigma' y = \Sigma x \; \frac{1}{n} S \frac{y}{x} \tag{240}$$

razmerje $\bar{r}_0 = \frac{\bar{y}_0}{\bar{x}_0}$

$$\bar{r}' = \frac{1}{n} S \frac{y}{x} \tag{241}$$

Ocena standardne pogreške
aritmetična sredina

$$\sigma'_{\bar{y}'_0} = \bar{x}_0 \, s_r \sqrt{\frac{1}{n}} \tag{242}$$

vsota vrednosti

$$\sigma'_{\Sigma' y} = \Sigma x \, s_r \sqrt{\frac{1}{n}} \tag{243}$$

razmerje

$$\sigma'_{\bar{r}'} = s_r \sqrt{\frac{1}{n}} \tag{244}$$

86.3 Stratificirano vzročenje

N_k - obseg stratuma k-količine v stratumih

.31 ocena parametrov
aritmetična sredina

$$\bar{x}'_0 = \frac{1}{N} \sum_k N_k \bar{x}_k \tag{245}$$

vsota vrednosti

$$\Sigma' x = \Sigma N_k \bar{x}_k \tag{246}$$

strukturni delež

$$p_0' = \frac{1}{N}\sum N_k p_k \tag{247}$$

obseg delne mase

$$N_a' = \sum N_k p_k \tag{248}$$

86.32 Ocena standardne pogreške

aritmetična sredina

$$\sigma_{\bar{x}}^{2\prime} = \frac{1}{N^2}\sum_k N_k^2\, \sigma_{\bar{x}}^{2\prime} \tag{249}$$

vsota vrednosti

$$\sigma_{\sum x}^{2\prime} = \sum_k N_k^2\, \sigma_{\bar{x}_k}^{2\prime} \tag{250}$$

strukturni delež

$$\sigma_p^{2\prime} = \frac{1}{N^2}\sum N_k^2\, \sigma_{p_k}^2 \tag{251}$$

obseg celotne mase

$$\sigma_{N_a}^{2\prime} = \sum_k N_k^2\, \sigma_{p_k}^2 \tag{252}$$

86.33 Razmestitev enot po stratumih

proporcionalna

$$n_k = n\,\frac{N_k}{N} \tag{253}$$

najugodnejša

$$n_k = n\,\frac{N_k \sigma_k}{\sum N_k \sigma_k} \tag{254}$$

86.4 Vzorčenje v dveh fazah

prva faza $x \quad n_1 \quad S_1$

druga faza $y \quad n_2 \quad S_2$

86.44 ocena parametrov

aritmetična sredina

$$\bar{y}_0' = \bar{x}_1 \frac{S_{2y}}{S_{2x}} \tag{255}$$

vsota vrednosti

$$\Sigma' y = N \bar{y}_0' \tag{256}$$

razmerje

$$\bar{r}_0' = \frac{S_{2y}}{S_{2x}} \tag{257}$$

86.45 Ocena standardne pogreške

aritmetična sredina

$$\sigma^{2\prime}_{\bar{y}_0'} = \frac{1}{n_2}\left(1 - \frac{n_1}{n_2}\right)\frac{\bar{x}_1^2}{\bar{x}_2^2}\delta^2_{q_2} + \frac{1-f_1}{n_1}\delta^2_{y_2} \tag{258}$$

δ^2_q glej metodo razmerij

vsota vrednosti

$$\sigma^{2\prime}_{\Sigma' y} = N^2 \sigma^{2\prime}_{\bar{y}_0'} \tag{259}$$

razmerje

$$\sigma^{2\prime}_{\bar{r}'} = \frac{\sigma^{2\prime}_{\bar{y}_0'}}{\bar{x}_1^2} \tag{260}$$

86.5 Vzorčenje v dveh stopnjah (s ponavljanjem)

M = število enot prve stopnje m = število izbranih enot prve stopnje
N_k = število enot druge stopnje v k-ti enoti prve stopnje
n_k = število izbranih enot druge stopnje v k-ti enoti

86.51 verjetnost izbora enot prve stopnje enaka

ocena aritmetične sredine

$$\bar{X}_0' = \frac{M}{N}\frac{1}{m}\sum_k N_k \frac{\sum_i x_{ki}}{n_k} \qquad (261)$$

računsko enostavno

$$\frac{n_k}{N_k} = f_k = f \qquad \bar{X}_0' = \frac{M}{Nfm}\sum_k\sum_i x_{ki} \qquad (261a)$$

ocena standardne pogreške

$$\sigma^{2\prime}_{\bar{X}'} = \frac{M^2}{N^2}\left[\frac{\sum_k (X_k - \bar{X})^2}{m(m-1)}\left(1-\frac{m}{M}\right) + \right.$$
$$\left. + \frac{1}{Mm}\sum_k N_k^2 \frac{\sum_i (x_{ki}-\bar{x})^2}{n_k(n_k-1)}\left(1-\frac{n_k}{N_k}\right)\right] \qquad (262)$$

$$X_k = N_k \frac{\sum_i x_{ki}}{n_k}$$

86.52 verjetnost izbora enot prve stopnje proporcionalna številu enot druge stopnje

ocena aritmetične sredine

$$\bar{X}_0' = \frac{1}{m}\sum_k \frac{1}{n_k}\sum_i x_{ki} \qquad (263)$$

računsko enostavno $n_k = \bar{n}$ $\qquad \bar{X}' = \frac{1}{m\bar{n}}\sum_k\sum_i x_{ki} \qquad (264)$

ocena standardne pogreške $\bar{X}_0'$

$$\sigma^{2\prime}_{\bar{X}_0'} = \frac{1}{m}\left[\frac{\sum_k (\bar{X}_k - \bar{X})^2}{m-1} + \frac{1}{N}\sum_k \left(\frac{N_k}{n_k} - 1\right) s_k^2\right] \qquad (265)$$

$$s_k^2 = \frac{\sum_i (x_{ki} - \bar{X}_k)^2}{n_k - 1} \qquad (266)$$

B-tablice

ŠTIRIMESTNI LOGARITMI

N	0	1	2	3	4	5	6	7	8	9	Part. prop. 1	2	3	4	5	6	7	8	9
·00	1000	1002	1005	1007	1009	1012	1014	1016	1019	1021	0	0	1	1	1	1	2	2	2
·01	1023	1026	1028	1030	1033	1035	1038	1040	1042	1045	0	0	1	1	1	1	2	2	2
·02	1047	1050	1052	1054	1057	1059	1062	1064	1067	1069	0	0	1	1	1	1	2	2	2
·03	1072	1074	1076	1079	1081	1084	1086	1089	1091	1094	0	0	1	1	1	1	2	2	2
·04	1096	1099	1102	1104	1107	1109	1112	1114	1117	1119	0	1	1	1	1	2	2	2	2
·05	1122	1125	1127	1130	1132	1135	1138	1140	1143	1146	0	1	1	1	1	2	2	2	2
·06	1148	1151	1153	1156	1159	1161	1164	1167	1169	1172	0	1	1	1	1	2	2	2	2
·07	1175	1178	1180	1183	1186	1189	1191	1194	1197	1199	0	1	1	1	1	2	2	2	2
·08	1202	1205	1208	1211	1213	1216	1219	1222	1225	1227	0	1	1	1	1	2	2	2	3
·09	1230	1233	1236	1239	1242	1245	1247	1250	1253	1256	0	1	1	1	1	2	2	2	3
·10	1259	1262	1265	1268	1271	1274	1276	1279	1282	1285	0	1	1	1	1	2	2	2	3
·11	1288	1291	1294	1297	1300	1303	1306	1309	1312	1315	0	1	1	1	2	2	2	2	3
·12	1318	1321	1324	1327	1330	1334	1337	1340	1343	1346	0	1	1	1	2	2	2	2	3
·13	1349	1352	1355	1358	1361	1365	1368	1371	1374	1377	0	1	1	1	2	2	2	3	3
·14	1380	1384	1387	1390	1393	1396	1400	1403	1406	1409	0	1	1	1	2	2	2	3	3
·15	1413	1416	1419	1422	1426	1429	1432	1435	1439	1442	0	1	1	1	2	2	2	3	3
·16	1445	1449	1452	1455	1459	1462	1466	1469	1472	1476	0	1	1	1	2	2	2	3	3
·17	1479	1483	1486	1489	1493	1496	1500	1503	1507	1510	0	1	1	1	2	2	2	3	3
·18	1514	1517	1521	1524	1528	1531	1535	1538	1542	1545	0	1	1	1	2	2	2	3	3
·19	1549	1552	1556	1560	1563	1567	1570	1574	1578	1581	0	1	1	1	2	2	3	3	3
·20	1585	1589	1592	1596	1600	1603	1607	1611	1614	1618	0	1	1	1	2	2	3	3	3
·21	1622	1626	1629	1633	1637	1641	1644	1648	1652	1656	0	1	1	2	2	2	3	3	3
·22	1660	1663	1667	1671	1675	1679	1683	1687	1690	1694	0	1	1	2	2	2	3	3	3
·23	1698	1702	1706	1710	1714	1718	1722	1726	1730	1734	0	1	1	2	2	2	3	3	4
·24	1738	1742	1746	1750	1754	1758	1762	1766	1770	1774	0	1	1	2	2	2	3	3	4
·25	1778	1782	1786	1791	1795	1799	1803	1807	1811	1816	0	1	1	2	2	2	3	3	4
·26	1820	1824	1828	1832	1837	1841	1845	1849	1854	1858	0	1	1	2	2	3	3	3	4
·27	1862	1866	1871	1875	1879	1884	1888	1892	1897	1901	0	1	1	2	2	3	3	3	4
·28	1905	1910	1914	1919	1923	1928	1932	1936	1941	1945	0	1	1	2	2	3	3	4	4
·29	1950	1954	1959	1963	1968	1972	1977	1982	1986	1991	0	1	1	2	2	3	3	4	4

N	0	1	2	3	4	5	6	7	8	9	Part. prop. 1	2	3	4	5	6	7	8	9
,30	1995	2000	2004	2009	2014	2018	2023	2028	2032	2037	0	1	1	2	2	3	3	4	4
,31	2042	2046	2051	2056	2061	2065	2070	2075	2080	2084	0	1	1	2	2	3	3	4	4
,32	2089	2094	2099	2104	2109	2113	2118	2123	2128	2133	0	1	1	2	2	3	3	4	4
,33	2138	2143	2148	2153	2158	2163	2168	2173	2178	2183	0	1	1	2	2	3	3	4	4
,34	2188	2193	2198	2203	2208	2213	2218	2223	2228	2234	1	1	2	2	3	3	4	4	5
,35	2239	2244	2249	2254	2259	2265	2270	2275	2280	2286	1	1	2	2	3	3	4	4	5
,36	2291	2296	2301	2307	2312	2317	2323	2328	2333	2339	1	1	2	2	3	3	4	4	5
,37	2344	2350	2355	2360	2366	2371	2377	2382	2388	2393	1	1	2	2	3	3	4	4	5
,38	2399	2404	2410	2415	2421	2427	2432	2438	2443	2449	1	1	2	2	3	3	4	4	5
,39	2455	2460	2466	2472	2477	2483	2489	2495	2500	2506	1	1	2	2	3	3	4	5	5
,40	2512	2518	2523	2529	2535	2541	2547	2553	2559	2564	1	1	2	2	3	4	4	5	5
,41	2570	2576	2582	2588	2594	2600	2606	2612	2618	2624	1	1	2	2	3	4	4	5	5
,42	2630	2636	2642	2649	2655	2661	2667	2673	2679	2685	1	1	2	2	3	4	4	5	6
,43	2692	2698	2704	2710	2716	2723	2729	2735	2742	2748	1	1	2	3	3	4	4	5	6
,44	2754	2761	2767	2773	2780	2786	2793	2799	2805	2812	1	1	2	3	3	4	4	5	6
,45	2818	2825	2831	2838	2844	2851	2858	2864	2871	2877	1	1	2	3	3	4	5	5	6
,46	2884	2891	2897	2904	2911	2917	2924	2931	2938	2944	1	1	2	3	3	4	5	5	6
,47	2951	2958	2965	2972	2979	2985	2992	2999	3006	3013	1	1	2	3	3	4	5	5	6
,48	3020	3027	3034	3041	3048	3055	3062	3069	3076	3083	1	1	2	3	4	4	5	6	6
,49	3090	3097	3105	3112	3119	3126	3133	3141	3148	3155	1	1	2	3	4	4	5	6	6
,50	3162	3170	3177	3184	3192	3199	3206	3214	3221	3228	1	1	2	3	4	4	5	6	7
,51	3236	3243	3251	3258	3266	3273	3281	3289	3296	3304	1	2	2	3	4	5	5	6	7
,52	3311	3319	3327	3334	3342	3350	3357	3365	3373	3381	1	2	2	3	4	5	5	6	7
,53	3388	3396	3404	3412	3420	3428	3436	3443	3451	3459	1	2	2	3	4	5	6	6	7
,54	3467	3475	3483	3491	3499	3508	3516	3524	3532	3540	1	2	2	3	4	5	6	6	7
,55	3548	3556	3565	3573	3581	3589	3597	3606	3614	3622	1	2	2	3	4	5	6	7	7
,56	3631	3639	3648	3656	3664	3673	3681	3690	3698	3707	1	2	3	3	4	5	6	7	8
,57	3715	3724	3733	3741	3750	3758	3767	3776	3784	3793	1	2	3	3	4	5	6	7	8
,58	3802	3811	3819	3828	3837	3846	3855	3864	3873	3882	1	2	3	4	4	5	6	7	8
,59	3890	3899	3908	3917	3926	3936	3945	3954	3963	3972	1	2	3	4	5	5	6	7	8
,60	3981	3990	3999	4009	4018	4027	4036	4046	4055	4064	1	2	3	4	5	6	6	7	8
,61	4074	4083	4093	4102	4111	4121	4130	4140	4150	4159	1	2	3	4	5	6	7	8	9
,62	4169	4178	4188	4198	4207	4217	4227	4236	4246	4256	1	2	3	4	5	6	7	8	9
,63	4266	4276	4285	4295	4305	4315	4325	4335	4345	4355	1	2	3	4	5	6	7	8	9
,64	4365	4375	4385	4395	4406	4416	4426	4436	4446	4457	1	2	3	4	5	6	7	8	9

N	0	1	2	3	4	5	6	7	8	9	Part prop. 1	2	3	4	5	6	7	8	9
,65	4467	4477	4487	4498	4508	4519	4529	4539	4550	4560	1	2	3	4	5	6	7	8	9
,66	4571	4581	4592	4603	4613	4624	4634	4645	4656	4667	1	2	3	4	5	6	7	9	10
,67	4677	4688	4699	4710	4721	4732	4742	4753	4764	4775	1	2	3	4	5	7	8	9	10
,68	4786	4797	4808	4819	4831	4842	4853	4864	4875	4887	1	2	3	4	6	7	8	9	10
,69	4898	4909	4920	4932	4943	[illegible]	4966	4977	4989	5000	1	2	3	5	6	7	8	9	10
,70	5012	5023	5035	5047	5058	5070	5082	5093	5105	5117	1	2	4	5	6	7	8	9	11
,71	5129	5140	5152	5164	5176	5188	5200	5212	5224	5235	1	2	4	5	6	7	8	10	11
,72	5248	5260	5272	5284	5297	5309	5321	5333	5346	5358	1	2	4	5	6	7	9	10	11
,73	5370	5383	5395	5408	5420	5433	5445	5458	5470	5483	1	3	4	5	6	8	9	10	11
,74	5495	5508	5521	5534	5546	5559	5572	5585	5598	5610	1	3	4	5	6	8	9	10	12
,75	5623	5636	5649	5662	5675	5689	5702	5715	5728	5741	1	3	4	5	7	8	9	10	12
,76	5754	5768	5781	5794	5808	5821	5834	5848	5861	5875	1	3	4	5	7	8	9	11	12
,77	5888	5902	5916	5929	5943	5957	5970	5984	5998	6012	1	3	4	5	7	8	10	11	12
,78	6026	6039	6053	6067	6081	6095	6109	6124	6138	6152	1	3	4	6	7	8	10	11	13
,79	6166	6180	6194	6209	6223	6237	6252	6266	6281	6295	1	3	4	6	7	9	10	11	13
,80	6310	6324	6339	6353	6368	6383	6397	6412	6427	6442	1	3	4	6	7	9	10	12	13
,81	6457	6471	6486	6501	6516	6531	6546	6561	6577	6592	2	3	5	6	8	9	11	12	14
,82	6607	6622	6637	6653	6668	6683	6699	6714	6730	6745	2	3	5	6	8	9	11	12	14
,83	6761	6776	6792	6808	6823	6839	6855	6871	6887	6902	2	3	5	6	8	9	11	13	14
,84	6918	6934	6950	6966	6982	6998	7015	7031	7047	7063	2	3	5	6	8	10	11	13	15
,85	7079	7096	7112	7129	7145	7161	7178	7194	7211	7228	2	3	5	7	8	10	12	13	15
,86	7244	7261	7278	7295	7311	7328	7345	7362	7379	7396	2	3	5	7	8	10	12	13	15
,87	7413	7430	7447	7464	7482	7499	7516	7534	7551	7568	2	3	5	7	9	10	12	14	16
,88	7586	7603	7621	7638	7656	7674	7691	7709	7727	7745	2	4	5	7	9	11	12	14	16
,89	7762	7780	7798	7816	7834	7852	7870	7889	7907	7925	2	4	5	7	9	11	13	14	16
,90	7943	7962	7980	7998	8017	8035	8054	8072	8091	8110	2	4	6	7	9	11	13	15	17
,91	8128	8147	8166	8185	8204	8222	8241	8260	8279	8299	2	4	6	8	9	11	13	15	17
,92	8318	8337	8356	8375	8395	8414	8433	8453	8472	8492	2	4	6	8	10	12	14	15	17
,93	8511	8531	8551	8570	8590	8610	8630	8650	8670	8690	2	4	6	8	10	12	14	16	18
,94	8710	8730	8750	8770	8790	8810	8831	8851	8872	8892	2	4	6	8	10	12	14	16	18
,95	8913	8933	8954	8974	8995	9016	9036	9057	9078	9099	2	4	6	8	10	12	15	17	19
,96	9120	9141	9162	9183	9204	9226	9247	9268	9290	9311	2	4	6	8	11	13	15	17	19
,97	9333	9354	9376	9397	9419	9441	9462	9484	9506	9528	2	4	7	9	11	13	15	17	20
,98	9550	9572	9594	9616	9638	9661	9683	9705	9727	9750	2	4	7	9	11	13	16	18	20
,99	9772	9795	9817	9840	9863	9886	9908	9931	9954	9977	2	5	7	9	11	14	16	18	20

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	0	1	2	3	4	5	6	7	8	9
0	0	1	4	9	16	25	36	49	64	81
1	100	121	144	169	196	225	256	289	324	361
2	400	441	484	529	576	625	676	729	784	841
3	900	961	1024	1089	1156	1225	1296	1369	1444	1521
4	1600	1681	1764	1849	1936	2025	2116	2209	2304	2401
5	2500	2601	2704	2809	2916	3025	3136	3249	3364	3481
6	3600	3721	3844	3969	4096	4225	4356	4489	4624	4761
7	4900	5041	5184	5329	5476	5625	5776	5929	6084	6241
8	6400	6561	6724	6889	7056	7225	7396	7569	7744	7921
9	8100	8281	8464	8649	8836	9025	9216	9409	9604	9801
10	10000	10201	10404	10609	10816	11025	11236	11449	11664	11881
11	12100	12321	12544	12769	12996	13225	13456	13689	13924	14161
12	14400	14641	14884	15129	15376	15625	15876	16129	16384	16641
13	16900	17161	17424	17689	17956	18225	18496	18769	19044	19321
14	19600	19881	20164	20449	20736	21025	21316	21609	21904	22201
15	22500	22801	23104	23409	23716	24025	24336	24649	24964	25281
16	25600	25921	26244	26569	26896	27225	27556	27889	28224	28561
17	28900	29241	29584	29929	30276	30625	30976	31329	31684	32041
18	32400	32761	33124	33489	33856	34225	34596	34969	35344	35721
19	36100	36481	36864	37249	37636	38025	38416	38809	39204	39601
20	40000	40401	40804	41209	41616	42025	42436	42849	43264	43681
21	44100	44521	44944	45369	45796	46225	46656	47089	47524	47961
22	48400	48841	49284	49729	50176	50625	51076	51529	51984	52441
23	52900	53361	53824	54289	54756	55225	55696	56169	56644	57121
24	57600	58081	58564	59049	59536	60025	60516	61009	61504	62001
25	62500	63001	63504	64009	64516	65025	65536	66049	66564	67081
26	67600	68121	68644	69169	69696	70225	70756	71289	71824	72361
27	72900	73441	73984	74529	75076	75625	76176	76729	77284	77841
28	78400	78961	79524	80089	80656	81225	81796	82369	82944	83521
29	84100	84681	85264	85849	86436	87025	87616	88209	88804	89401

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	0	1	2	3	4	5	6	7	8	9
30	90000	90601	91204	91809	92416	93025	93636	94249	94864	95481
31	96100	96721	97344	97969	98596	99225	99856	100489	101124	101761
32	102400	103041	103684	104329	104976	105625	106276	106929	107584	108241
33	108900	109561	110224	110889	111556	112225	112896	113569	114244	114921
34	115600	116281	116964	117649	118336	119025	119716	120409	121104	121801
35	122500	123201	123904	124609	125316	126025	126736	127449	128164	128881
36	129600	130321	131044	131769	132496	133225	133956	134689	135424	136161
37	136900	137641	138384	139129	139876	140625	141376	142129	142884	143641
38	144400	145161	145924	146689	147456	148225	148996	149769	150544	151321
39	152100	152881	153664	154449	155236	156025	156816	157609	158404	159201
40	160000	160801	161604	162409	163216	164025	164836	165649	166464	167281
41	168100	168921	169744	170569	171396	172225	173056	173889	174724	175561
42	176400	177241	178084	178929	179776	180625	181476	182329	183184	184041
43	184900	185761	186624	187489	188356	189225	190096	190969	191844	192721
44	193600	194481	195364	196249	197136	198025	198916	199809	200704	201601
45	202500	203401	204304	205209	206116	207025	207936	208849	209764	210681
46	211600	212521	213444	214369	215296	216225	217156	218089	219024	219961
47	220900	221841	222784	223729	224676	225625	226576	227529	228484	229441
48	230400	231361	232324	233289	234256	235225	236196	237169	238144	239121
49	240100	241081	242064	243049	244036	245025	246016	247009	248004	249001
50	250000	251001	252004	253009	254016	255025	256036	257049	258064	259081
51	260100	261121	262144	263169	264196	265225	266256	267289	268324	269361
52	270400	271441	272484	273529	274576	275625	276676	277729	278784	279841
53	280900	281961	283024	284089	285156	286225	287296	288369	289444	290521
54	291600	292681	293764	294849	295936	297025	298116	299209	300304	301401
55	302500	303601	304704	305809	306916	308025	309136	310249	311364	312481
56	313600	314721	315844	316969	318096	319225	320356	321489	322624	323761
57	324900	326041	327184	328329	329476	330625	331776	332929	334084	335241
58	336400	337561	338724	339889	341056	342225	343396	344569	345744	346921
59	348100	349281	350464	351649	352836	354025	355216	356409	357604	358801
60	360000	361201	362404	363609	364816	366025	367236	368449	369664	370881
61	372100	373321	374544	375769	376996	378225	379456	380689	381924	383161
62	384400	385641	386884	388129	389376	390625	391876	393129	394384	395641
63	396900	398161	399424	400689	401956	403225	404496	405769	407044	408321
64	409600	410881	412164	413449	414736	416025	417316	418609	419904	421201

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	0	1	2	3	4	5	6	7	8	9
65	422500	423801	425104	426409	427716	429025	430336	431649	432964	434281
66	435600	436921	438244	439569	440896	442225	443556	444889	446224	447561
67	448900	450241	451584	452929	454276	455625	456976	458329	459684	461041
68	462400	463761	465124	466489	467856	469225	470596	471969	473344	474721
69	476100	477481	478864	480249	481636	483025	484416	485809	487204	488601
70	490000	491401	492804	494209	495616	497025	498436	499849	501264	502681
71	504100	505521	506944	508369	509796	511225	512656	514089	515524	516961
72	518400	519841	521284	522729	524176	525625	527076	528529	529984	531441
73	532900	534361	535824	537289	538756	540225	541696	543169	544644	546121
74	547600	549081	550564	552049	553536	555025	556516	558009	559504	561001
75	562500	564001	565504	567009	568516	570025	571536	573049	574564	576081
76	577600	579121	580644	582169	583696	585225	586756	588289	589824	591361
77	592900	594441	595984	597529	599076	600625	602176	603729	605284	606841
78	608400	609961	611524	613089	614656	616225	617796	619369	620944	622521
79	624100	625681	627264	628849	630436	632025	633616	635209	636804	638401
80	640000	641601	643204	644809	646416	648025	649636	651249	652864	654481
81	656100	657721	659344	660969	662596	664225	665856	667489	669124	670761
82	672400	674041	675684	677329	678976	680625	682276	683929	685584	687241
83	688900	690561	692224	693889	695556	697225	698896	700569	702244	703921
84	705600	707281	708964	710649	712336	714025	715716	717409	719104	720801
85	722500	724201	725904	727609	729316	731025	732736	734449	736164	737881
86	739600	741321	743044	744769	746496	748225	749956	751689	753424	755161
87	756900	758641	760384	762129	763876	765625	767376	769129	770884	772641
88	774400	776161	777924	779689	781456	783225	784996	786769	788544	790321
89	792100	793881	795664	797449	799236	801025	802816	804609	806404	808201
90	810000	811801	813604	815409	817216	819025	820836	822649	824464	826281
91	828100	829921	831744	833569	835396	837225	839056	840889	842724	844561
92	846400	848241	850084	851929	853776	855625	857476	859329	861184	863041
93	864900	866761	868624	870489	872356	874225	876096	877969	879844	881721
94	883600	885481	887364	889249	891136	893025	894916	896809	898704	900601
95	902500	904401	906304	908209	910116	912025	913936	915849	917764	919681
96	921600	923521	925444	927369	929296	931225	933156	935089	937024	938961
97	940900	942841	944784	946729	948676	950625	952576	954529	956484	958441
98	960400	962361	964324	966289	968256	970225	972196	974169	976144	978121
99	980100	982081	984064	986049	988036	990025	992016	994009	996004	998001

x	Površine	Ordinate	x	Površine	Ordinate	x	Površine	Ordinate	x	Površine	Ordinate
.00	.0000	.3989	.30	.1179	.3814	.60	.2258	.3332	.90	.3159	.2661
.01	.0040	.3989	.31	.1217	.3802	.61	.2291	.3312	.91	.3186	.2637
.02	.0080	.3989	.32	.1255	.3790	.62	.2324	.3292	.92	.3212	.2613
.03	.0120	.3988	.33	.1293	.3778	.63	.2357	.3271	.93	.3238	.2589
.04	.0160	.3986	.34	.1331	.3765	.64	.2389	.3251	.94	.3264	.2565
.05	.0199	.3984	.35	.1368	.3752	.65	.2422	.3230	.95	.3289	.2541
.06	.0239	.3982	.36	.1406	.3739	.66	.2454	.3209	.96	.3315	.2516
.07	.0279	.3980	.37	.1443	.3726	.67	.2486	.3187	.97	.3340	.2492
.08	.0319	.3977	.38	.1480	.3712	.68	.2518	.3166	.98	.3365	.2468
.09	.0359	.3973	.39	.1517	.3697	.69	.2549	.3144	.99	.3389	.2444
.10	.0398	.3970	.40	.1554	.3683	.70	.2580	.3123	1.00	.3413	.2420
.11	.0438	.3965	.41	.1591	.3668	.71	.2612	.3101	1.01	.3438	.2396
.12	.0478	.3961	.42	.1628	.3653	.72	.2642	.3079	1.02	.3461	.2371
.13	.0517	.3956	.43	.1664	.3637	.73	.2673	.3056	1.03	.3485	.2347
.14	.0557	.3951	.44	.1700	.3621	.74	.2704	.3034	1.04	.3508	.2323
.15	.0596	.3945	.45	.1736	.3605	.75	.2734	.3011	1.05	.3531	.2299
.16	.0636	.3939	.46	.1772	.3589	.76	.2764	.2989	1.06	.3554	.2275
.17	.0675	.3932	.47	.1808	.3572	.77	.2794	.2966	1.07	.3577	.2251
.18	.0714	.3925	.48	.1844	.3555	.78	.2823	.2943	1.08	.3599	.2227
.19	.0754	.3918	.49	.1879	.3538	.79	.2852	.2920	1.09	.3621	.2203
.20	.0793	.3910	.50	.1915	.3521	.80	.2881	.2897	1.10	.3643	.2179
.21	.0832	.3902	.51	.1950	.3503	.81	.2910	.2874	1.11	.3665	.2155
.22	.0871	.3894	.52	.1985	.3485	.82	.2939	.2850	1.12	.3686	.2131
.23	.0910	.3885	.53	.2019	.3467	.83	.2967	.2827	1.13	.3708	.2107
.24	.0948	.3876	.54	.2054	.3448	.84	.2996	.2803	1.14	.3729	.2083
.25	.0987	.3867	.55	.2088	.3429	.85	.3023	.2780	1.15	.3749	.2059
.26	.1026	.3857	.56	.2123	.3411	86	.3051	.2756	1.16	.3770	.2036
.27	.1064	.3847	.57	.2157	.3391	87	.3079	.2732	1.17	.3790	.2012
.28	.1103	.3836	.58	.2190	.3372	88	.3106	.2709	1.18	.3810	.1989
.29	.1141	.3825	.59	.2224	.3352	89	.3133	.2685	1.19	.3830	.1965

X	Površine	Ordinate	X	Površine	Ordinate	X	Površine	Ordinate	X	Površine	Ordinate
1.20	.3849	.1942	1.55	.4394	.1200	1.90	.4713	.0656	2.25	.4878	.0317
1.21	.3869	.1919	1.56	.4406	.1182	1.91	.4719	.0644	2.26	.4881	.0310
1.22	.3888	.1895	1.57	.4418	.1163	1.92	.4726	.0632	2.27	.4884	.0303
1.23	.3907	.1872	1.58	.4430	.1145	1.93	.4732	.0620	2.28	.4887	.0297
1.24	.3925	.1849	1.59	.4441	.1127	1.94	.4738	.0608	2.29	.4890	.0290
1.25	.3944	.1827	1.60	.4452	.1109	1.95	.4744	.0596	2.30	.4893	.0283
1.26	.3962	.1804	1.61	.4463	.1092	1.96	.4750	.0584	2.31	.4896	.0277
1.27	.3980	.1781	1.62	.4474	.1074	1.97	.4756	.0573	2.32	.4898	.0271
1.28	.3997	.1759	1.63	.4485	.1057	1.98	.4762	.0562	2.33	.4901	.0264
1.29	.4015	.1736	1.64	.4495	.1040	1.99	.4767	.0551	2.34	.4904	.0258
1.30	.4032	.1714	1.65	.4505	.1023	2.00	.4773	.0540	2.35	.4906	.0252
1.31	.4049	.1692	1.66	.4515	.1006	2.01	.4778	.0529	2.36	.4909	.0246
1.32	.4066	.1669	1.67	.4525	.0989	2.02	.4783	.0519	2.37	.4911	.0241
1.33	.4082	.1647	1.68	.4535	.0973	2.03	.4788	.0508	2.38	.4913	.0235
1.34	.4099	.1626	1.69	.4545	.0957	2.04	.4793	.0498	2.39	.4916	.0229
1.35	.4115	.1604	1.70	.4554	.0941	2.05	.4798	.0488	2.40	.4918	.0224
1.36	.4131	.1582	1.71	.4564	.0925	2.06	.4803	.0478	2.41	.4920	.0219
1.37	.4147	.1561	1.72	.4573	.0909	2.07	.4808	.0468	2.42	.4922	.0213
1.38	.4162	.1540	1.73	.4582	.0893	2.08	.4812	.0459	2.43	.4925	.0208
1.39	.4177	.1518	1.74	.4591	.0878	2.09	.4817	.0449	2.44	.4927	.0203
1.40	.4192	.1497	1.75	.4599	.0863	2.10	.4821	.0440	2.45	.4929	.0198
1.41	.4207	.1476	1.76	.4608	.0848	2.11	.4826	.0431	2.46	.4931	.0194
1.42	.4222	.1456	1.77	.4616	.0833	2.12	.4830	.0422	2.47	.4932	.0189
1.43	.4236	.1435	1.78	.4625	.0818	2.13	.4834	.0413	2.48	.4934	.0184
1.44	.4251	.1415	1.79	.4633	.0804	2.14	.4838	.0404	2.49	.4936	.0180
1.45	.4265	.1394	1.80	.4641	.0790	2.15	.4842	.0396	2.50	.4938	.0175
1.46	.4279	.1374	1.81	.4649	.0775	2.16	.4846	.0387	2.51	.4940	.0171
1.47	.4292	.1354	1.82	.4656	.0761	2.17	.4850	.0379	2.52	.4941	.0167
1.48	.4306	.1334	1.83	.4664	.0748	2.18	.4854	.0371	2.53	.4943	.0163
1.49	.4319	.1315	1.84	.4671	.0734	2.19	.4857	.0363	2.54	.4945	.0159
1.50	.4332	.1295	1.85	.4678	.0721	2.20	.4861	.0355	2.55	.4946	.0155
1.51	.4345	.1276	1.86	.4686	.0707	2.21	.4865	.0347	2.56	.4948	.0151
1.52	.4357	.1257	1.87	.4693	.0694	2.22	.4868	.0339	2.57	.4949	.0147
1.53	.4370	.1238	1.88	.4700	.0681	2.23	.4871	.0332	2.58	.4951	.0143
1.54	.4382	.1219	1.89	.4706	.0669	2.24	.4875	.0325	2.59	.4952	.0139

NORMALNA DISTRIBUCIJA

x	Površine	Ordinate	x	Površine	Ordinate	x	Površine	Ordinate	x	Površine	Ordinate
2,60	,4953	,0136	2,95	,4984	,0051	3,30	,4995	,0017	3,65	,4999	,0005
2,61	,4955	,0132	2,96	,4985	,0050	3,31	,4995	,0017	3,66	,4999	,0005
2,62	,4956	,0129	2,97	,4985	,0049	3,32	,4996	,0016	3,67	,4999	,0005
2,63	,4957	,0126	2,98	,4986	,0047	3,33	,4996	,0016	3,68	,4999	,0005
2,64	,4959	,0122	2,99	,4986	,0046	3,34	,4996	,0015	3,69	,4999	,0004
2,65	,4960	,0119	3,00	,4987	,0044	3,35	,4996	,0015	3,70	,4999	,0004
2,66	,4961	,0116	3,01	,4987	,0043	3,36	,4996	,0014	3,71	,4999	,0004
2,67	,4962	,0113	3,02	,4987	,0042	3,37	,4996	,0014	3,72	,4999	,0004
2,68	,4963	,0110	3,03	,4988	,0041	3,38	,4996	,0013	3,73	,4999	,0004
2,69	,4964	,0107	3,04	,4988	,0039	3,39	,4997	,0013	3,74	,4999	,0004
2,70	,4965	,0104	3,05	,4989	,0038	3,40	,4997	,0012	3,75	,4999	,0004
2,71	,4966	,0101	3,06	,4989	,0037	3,41	,4997	,0012	3,76	,4999	,0003
2,72	,4967	,0099	3,07	,4989	,0036	3,42	,4997	,0012	3,77	,4999	,0003
2,73	,4968	,0096	3,08	,4990	,0035	3,43	,4997	,0011	3,78	,4999	,0003
2,74	,4969	,0094	3,09	,4990	,0034	3,44	,4997	,0011	3,79	,4999	,0003
2,75	,4970	,0091	3,10	,4990	,0033	3,45	,4997	,0010	3,80	,4999	,0003
2,76	,4971	,0089	3,11	,4991	,0032	3,46	,4997	,0010	3,81	,4999	,0003
2,77	,4972	,0086	3,12	,4991	,0031	3,47	,4997	,0010	3,82	,4999	,0003
2,78	,4973	,0084	3,13	,4991	,0030	3,48	,4998	,0009	3,83	,4999	,0003
2,79	,4974	,0081	3,14	,4992	,0029	3,49	,4998	,0009	3,84	,4999	,0003
2,80	,4974	,0079	3,15	,4992	,0028	3,50	,4998	,0009	3,85	,4999	,0002
2,81	,4975	,0077	3,16	,4992	,0027	3,51	,4998	,0008	3,86	,4999	,0002
2,82	,4976	,0075	3,17	,4992	,0026	3,52	,4998	,0008	3,87	,5000	,0002
2,83	,4977	,0073	3,18	,4993	,0025	3,53	,4998	,0008	3,88	,5000	,0002
2,84	,4977	,0071	3,19	,4993	,0025	3,54	,4998	,0008	3,89	,5000	,0002
2,85	,4978	,0069	3,20	,4993	,0024	3,55	,4998	,0007	3,90	,5000	,0002
2,86	,4979	,0067	3,21	,4993	,0023	3,56	,4998	,0007	3,91	,5000	,0002
2,87	,4980	,0065	3,22	,4994	,0022	3,57	,4998	,0007	3,92	,5000	,0002
2,88	,4980	,0063	3,23	,4994	,0022	3,58	,4998	,0007	3,93	,5000	,0002
2,89	,4981	,0061	3,24	,4994	,0021	3,59	,4998	,0006	3,94	,5000	,0002
2,90	,4981	,0060	3,25	,4994	,0020	3,60	,4998	,0006	3,95	,5000	,0002
2,91	,4982	,0058	3,26	,4994	,0020	3,61	,4999	,0006	3,96	,5000	,0002
2,92	,4983	,0056	3,27	,4995	,0019	3,62	,4999	,0006	3,97	,5000	,0002
2,93	,4983	,0055	3,28	,4995	,0018	3,63	,4999	,0006	3,98	,5000	,0002
2,94	,4984	,0053	3,29	,4995	,0018	3,64	,4999	,0005	3,99	,5000	,0002

t - DISTRIBUCIJA

n	P=0,05	P=0,01	P=0,001	n	P=0,05	P=0,01	P=0,001
1	12,706	63,657	636,619	26	2,056	2,779	3,707
2	4,303	9,925	31,598	27	2,052	2,771	3,690
3	3,182	5,841	12,941	28	2,048	2,763	3,674
4	2,776	4,604	8,610	29	2,045	2,756	3,659
5	2,571	4,032	6,859	30	2,042	2,750	3,646
6	2,447	3,707	5,959	35	2,030	2,724	3,592
7	2,365	3,499	5,405	40	2,021	2,704	3,551
8	2,306	3,355	5,041	45	2,014	2,689	3,521
9	2,262	3,250	4,781	50	2,008	2,678	3,496
10	2,228	3,169	4,587				
				60	2,000	2,660	3,460
11	2,201	3,106	4,437	70	1,994	2,648	3,435
12	2,179	3,055	4,318	80	1,990	2,638	3,416
13	2,160	3,012	4,221	90	1,987	2,631	3,402
14	2,145	2,977	4,140	100	1,984	2,626	3,390
15	2,131	2,947	4,073				
				120	1,980	2,617	3,373
16	2,120	2,921	4,015	140	1,977	2,611	3,361
17	2,110	2,898	3,965	160	1,975	2,607	3,352
18	2,101	2,878	3,922	180	1,973	2,603	3,346
19	2,093	2,861	3,883				
20	2,086	2,845	3,850	200	1,972	2,601	3,340
				300	1,968	2,592	3,324
21	2,080	2,831	3,819	400	1,966	2,588	3,315
22	2,074	2,819	3,792	500	1,965	2,586	3,310
23	2,069	2,807	3,767				
24	2,064	2,797	3,745	1000	1,962	2,581	3,300
25	2,060	2,787	3,725				
				∞	1,960	2,576	3,291

χ^2 - DISTRIBUCIJA

n	P=0,999	P=0,99	P=0,95	P=0,05	P=0,01	P=0,001
1	0,000 001 57	0,000 157	0,003 93	3,841	6,635	10,827
2	0,002 00	0,0201	0,103	5,991	9,210	13,815
3	0,0243	0,115	0,352	7,815	11,341	16,268
4	0,0908	0,297	0,711	9,488	13,277	18,465
5	0,210	0,554	1,145	11,070	15,086	20,517
6	0,381	0,872	1,635	12,592	16,812	22,457
7	0,599	1,239	2,167	14,067	18,475	24,322
8	0,857	1,646	2,733	15,507	20,090	26,125
9	1,152	2,088	3,325	16,919	21,666	27,877
10	1,479	2,558	3,940	18,307	23,209	29,588
11	1,834	3,053	4,575	19,675	24,725	31,264
12	2,214	3,571	5,226	21,026	26,217	32,909
13	2,617	4,107	5,892	22,362	27,688	34,528
14	3,041	4,660	6,571	23,685	29,141	36,123
15	3,483	5,229	7,261	24,996	30,578	37,697
16	3,942	5,812	7,962	26,296	32,000	39,252
17	4,416	6,408	8,672	27,587	33,409	40,790
18	4,905	7,015	9,390	28,869	34,805	42,312
19	5,407	7,633	10,117	30,144	36,191	43,820
20	5,921	8,260	10,851	31,410	37,566	45,315
21	6,447	8,897	11,591	32,671	38,932	46,797
22	6,983	9,542	12,338	33,924	40,289	48,268
23	7,529	10,196	13,091	35,172	41,638	49,728
24	8,085	10,856	13,848	36,415	42,980	51,179
25	8,649	11,524	14,611	37,652	44,314	52,620
26	9,222	12,198	15,379	38,885	45,642	54,052
27	9,803	12,879	16,151	40,113	46,963	55,476
28	10,391	13,565	16,928	41,337	48,278	56,893
29	10,986	14,256	17,708	42,557	49,588	58,302
30	11,588	14,953	18,493	43,773	50,892	59,703

F - DISTRIBUCIJA

n_2	P	$n_1=1$	$n_1=2$	$n_1=3$	$n_1=4$	$n_1=5$	$n_1=6$	$n_1=8$	$n_1=12$	$n_1=24$	$n_1=\infty$
1	0,05	161,45	199,50	215,72	224,57	230,17	233,97	238,89	243,91	249,04	254,32
	0,01	4052,1	4999,0	5403,5	5625,1	5764,1	5859,4	5981,4	6105,8	6234,2	6366,5
	0,001	405303	500019	536701	562530	576424	585956	598293	610535	623433	636539
2	0,05	18,512	18,999	19,163	19,248	19,298	19,329	19,371	19,414	19,453	19,496
	0,01	98,495	99,008	99,167	99,247	99,305	99,325	99,365	99,425	99,464	99,504
	0,001	998,44	999,04	999,24	999,24	999,24	999,24	999,45	999,45	999,45	999,45
3	0,05	10,129	9,552	9,276	9,118	9,014	8,941	8,844	8,744	8,638	8,527
	0,01	34,117	30,815	29,459	28,709	28,236	27,910	27,489	27,053	26,597	26,122
	0,001	167,46	148,50	141,11	137,08	134,58	132,84	130,61	128,30	125,94	123,49
4	0,05	7,710	6,945	6,591	6,388	6,257	6,164	6,041	5,912	5,774	5,628
	0,01	21,200	18,001	16,693	15,978	15,521	15,208	14,800	14,374	13,930	13,464
	0,001	74,126	61,240	56,181	53,428	51,706	50,521	48,998	47,407	45,768	44,052
5	0,05	6,607	5,786	5,410	5,192	5,050	4,950	4,818	4,678	4,527	4,365
	0,01	16,258	13,274	12,059	11,391	10,966	10,672	10,266	9,888	9,467	9,019
	0,001	47,039	36,612	33,201	31,087	29,748	28,835	27,638	26,416	25,143	23,783
6	0,05	5,987	5,143	4,756	4,534	4,388	4,284	4,147	4,000	3,841	3,669
	0,01	13,744	10,924	9,779	9,149	8,746	8,465	8,101	7,718	7,313	6,880
	0,001	35,509	26,998	23,702	21,902	20,809	20,029	19,029	17,909	16,891	15,746
7	0,05	5,591	4,737	4,347	4,121	3,972	3,866	3,725	3,574	3,410	3,230
	0,01	12,246	9,546	8,452	7,846	7,460	7,191	6,840	6,469	6,074	5,650
	0,001	29,218	21,688	18,772	17,188	16,206	15,521	14,634	13,708	12,733	11,695
8	0,05	5,317	4,459	4,067	3,838	3,688	3,580	3,438	3,284	3,116	2,928
	0,01	11,259	8,649	7,591	7,006	6,631	6,371	6,029	5,667	5,279	4,859
	0,001	25,416	18,493	15,828	14,388	13,485	12,858	12,044	11,194	10,302	9,335
9	0,05	5,117	4,256	3,863	3,633	3,482	3,374	3,230	3,073	2,900	2,707
	0,01	10,561	8,022	6,992	6,423	6,057	5,802	5,467	5,111	4,730	4,311
	0,001	22,855	16,385	13,901	12,561	11,714	11,127	10,369	9,570	8,723	7,813
10	0,05	4,965	4,103	3,708	3,478	3,326	3,217	3,072	2,913	2,737	2,538
	0,01	10,044	7,560	6,552	5,994	5,636	5,386	5,057	4,706	4,327	3,909
	0,001	21,039	14,906	12,553	11,282	10,481	9,924	9,204	8,445	7,637	6,762
11	0,05	4,844	3,982	3,587	3,357	3,204	3,094	2,948	2,788	2,609	2,405
	0,01	9,647	7,205	6,217	5,668	5,317	5,069	4,745	4,397	4,021	3,602
	0,001	19,687	13,813	11,560	10,346	9,577	9,047	8,354	7,625	6,847	5,998

F-DISTRIBUCIJA

n_2	p	$n_1=1$	$n_1=2$	$n_1=3$	$n_1=4$	$n_1=5$	$n_1=6$	$n_1=8$	$n_1=12$	$n_1=24$	$n_1=$
12	0,05	4,747	3,885	3,490	3,259	3,106	2,999	2,848	2,686	2,505	2,296
	0,01	9,330	6,927	5,953	5,412	5,064	4,820	4,500	4,156	3,780	3,361
	0,001	18,641	12,972	10,805	9,633	8,892	8,378	7,711	7,005	6,248	5,419
13	0,05	4,667	3,805	3,410	3,179	3,025	2,915	2,767	2,604	2,420	2,207
	0,01	9,074	6,701	5,740	5,205	4,862	4,620	4,302	3,961	3,586	3,165
	0,001	17,814	12,312	10,208	9,072	8,354	7,855	7,206	6,519	5,782	4,967
14	0,05	4,600	3,739	3,344	3,112	2,958	2,848	2,699	2,534	2,349	2,131
	0,01	8,862	6,514	5,563	5,035	4,695	4,456	4,140	3,800	3,427	3,005
	0,001	17,143	11,780	9,730	8,623	7,922	7,435	6,802	6,130	5,408	4,604
15	0,05	4,543	3,683	3,287	3,056	2,901	2,790	2,641	2,475	2,288	2,066
	0,01	8,683	6,359	5,417	4,893	4,556	4,318	4,004	3,668	3,294	2,869
	0,001	16,586	11,338	9,335	8,253	7,567	7,092	6,470	5,812	5,101	4,307
16	0,05	4,494	3,634	3,239	3,007	2,853	2,741	2,591	2,424	2,235	2,010
	0,01	8,532	6,227	5,292	4,772	4,437	4,201	3,889	3,553	3,181	2,753
	0,001	16,119	10,970	9,005	7,944	7,272	6,804	6,195	5,548	4,846	4,059
17	0,05	4,451	3,592	3,197	2,965	2,810	2,699	2,548	2,381	2,190	1,961
	0,01	8,400	6,112	5,185	4,669	4,336	4,102	3,791	3,455	3,083	2,653
	0,001	15,721	10,659	8,727	7,683	7,022	6,563	5,962	5,324	4,631	3,850
18	0,05	4,414	3,555	3,160	2,928	2,773	2,661	2,510	2,342	2,150	1,917
	0,01	8,285	6,013	5,092	4,579	4,248	4,015	3,706	3,370	2,999	2,566
	0,001	15,379	10,389	8,487	7,459	6,807	6,355	5,763	5,132	4,448	3,671
19	0,05	4,381	3,522	3,127	2,895	2,740	2,629	2,477	2,308	2,114	1,878
	0,01	8,184	5,926	5,010	4,501	4,170	3,939	3,631	3,296	2,925	2,489
	0,001	15,080	10,157	8,280	7,264	6,609	6,176	5,590	4,967	4,286	3,515
20	0,05	4,351	3,493	3,098	2,866	2,711	2,599	2,447	2,278	2,083	1,843
	0,01	8,096	5,849	4,938	4,431	4,103	3,871	3,565	3,231	2,859	2,421
	0,001	14,820	9,952	8,098	7,102	6,461	6,018	5,440	4,823	4,150	3,378
21	0,05	4,325	3,467	3,072	2,840	2,685	2,573	2,421	2,250	2,054	1,812
	0,01	8,017	5,780	4,875	4,368	4,042	3,811	3,506	3,173	2,801	2,360
	0,001	14,588	9,773	7,937	6,946	6,318	5,880	5,308	4,697	4,026	3,257
22	0,05	4,301	3,443	3,049	2,817	2,661	2,549	2,397	2,226	2,028	1,783
	0,01	7,944	5,719	4,816	4,314	3,988	3,759	3,453	3,121	2,749	2,305
	0,001	14,379	9,612	7,796	6,814	6,192	5,758	5,190	4,583	3,918	3,151

F-DISTRIBUCIJA

n_2	P	$n_1=1$	$n_1=2$	$n_1=3$	$n_1=4$	$n_1=5$	$n_1=6$	$n_1=8$	$n_1=12$	$n_1=24$	$n_1=\infty$
23	0,05	4,279	3,422	3,028	2,795	2,640	2,528	2,375	2,203	2,005	1,757
	0,01	7,881	5,663	4,765	4,264	3,939	3,710	3,406	3,074	2,702	2,256
	00,001	14,194	9,469	7,669	6,695	6,079	5,648	5,086	4,482	3,822	3,054
24	0,05	4,260	3,403	3,009	2,777	2,621	2,508	2,355	2,183	1,984	1,733
	0,01	7,823	5,614	4,718	4,218	3,895	3,666	3,363	3,031	2,659	2,210
	0,001	14,027	9,339	7,555	6,589	5,976	5,550	4,991	4,393	3,735	2,968
25	0,05	4,242	3,385	2,991	2,759	2,603	2,490	2,337	2,165	1,965	1,711
	0,01	7,770	5,568	4,676	4,177	3,855	3,627	3,324	2,993	2,620	2,169
	0,001	13,875	9,222	7,450	6,493	5,885	5,462	4,907	4,311	3,657	2,890
26	0,05	4,225	3,369	2,975	2,743	2,587	2,474	2,321	2,148	1,947	1,691
	0,01	7,722	5,527	4,637	4,140	3,818	3,591	3,288	2,958	2,585	2,132
	0,001	13,738	9,116	7,356	6,406	5,802	5,382	4,829	4,238	3,586	2,820
27	0,05	4,210	3,354	2,961	2,728	2,572	2,459	2,305	2,132	1,930	1,672
	0,01	7,677	5,488	4,601	4,106	3,785	3,558	3,256	2,925	2,551	2,096
	0,001	13,612	9,020	7,272	6,326	5,726	5,308	4,759	4,170	3,521	2,754
28	0,05	4,196	3,340	2,947	2,714	2,558	2,445	2,292	2,118	1,915	1,654
	0,01	7,636	5,453	4,568	4,074	3,754	3,528	3,226	2,896	2,522	2,064
	0,001	13,498	8,930	7,194	6,253	5,656	5,240	4,694	4,109	3,462	2,695
29	0,05	4,183	3,328	2,934	2,702	2,545	2,432	2,278	2,104	1,901	1,638
	0,01	7,597	5,421	4,538	4,045	3,726	3,499	3,198	2,869	2,494	2,034
	0,001	13,391	8,852	7,121	6,187	5,592	5,179	4,645	4,053	3,407	2,640
30	0,05	4,171	3,316	2,922	2,690	2,534	2,421	2,266	2,092	1,887	1,622
	0,01	7,563	5,390	4,510	4,018	3,699	3,474	3,173	2,843	2,469	2,006
	0,001	13,292	8,774	7,054	6,124	5,533	5,122	4,581	4,000	3,358	2,589
40	0,05	4,085	3,232	2,839	2,606	2,449	2,336	2,180	2,004	1,793	1,509
	0,01	7,314	5,179	4,312	3,828	3,513	3,291	2,993	2,665	2,287	1,805
	0,001	12,614	8,251	6,600	5,698	5,128	4,731	4,207	3,642	3,012	2,233
60	0,05	4,001	3,151	2,758	2,525	2,368	2,254	2,097	1,918	1,700	1,389
	0,01	7,077	4,978	4,126	3,649	3,339	3,119	2,823	2,496	2,115	1,601
	0,001	11,972	7,765	6,172	5,307	4,757	4,373	3,865	3,315	2,694	1,896
120	0,05	3,946	3,072	2,680	2,447	2,290	2,175	2,016	1,834	1,608	1,254
	0,01	6,851	4,786	3,949	3,479	3,173	2,956	2,663	2,336	1,950	1,380
	0,001	11,377	7,312	5,793	4,947	4,415	4,041	3,546	3,016	2,396	1,561
∞	0,05	3,841	2,996	2,605	2,372	2,214	2,098	1,938	1,752	1,517	1,000
	0,01	6,635	4,605	3,782	3,320	3,017	2,802	2,511	2,182	1,791	1,000
	0,001	10,826	6,908	5,423	4,616	4,103	3,743	3,265	2,742	2,132	1,000

03 47 43 73 86	36 96 47 36 61	46 98 63 71 62	33 26 16 80 45
97 74 24 67 62	42 81 14 57 20	42 53 32 37 32	27 07 36 07 51
16 76 62 27 66	56 50 26 71 07	32 90 79 78 53	13 55 38 58 59
12 56 85 99 26	96 96 68 27 31	05 03 72 93 15	57 12 10 14 21
55 59 56 35 64	38 54 82 46 22	31 62 43 09 90	06 10 14 32 53
16 22 77 94 39	49 54 43 54 82	17 37 93 23 78	87 35 20 96 43
84 42 17 53 31	57 24 55 06 88	77 04 74 47 67	21 76 33 50 25
63 01 63 78 59	16 95 55 67 19	98 10 50 71 75	12 86 73 58 07
33 21 12 34 29	78 64 56 07 82	52 42 07 44 38	15 51 00 13 42
18 18 07 92 46	44 17 16 58 09	79 83 86 19 62	06 76 50 03 10
26 62 38 97 75	84 16 07 44 99	83 11 46 32 24	20 14 85 88 45
23 42 40 64 74	82 97 77 77 81	07 45 32 14 08	32 98 95 07 72
52 36 28 19 95	50 92 26 11 97	00 56 76 31 38	80 22 02 53 53
37 85 94 35 12	83 39 50 08 30	42 34 07 96 88	54 42 06 87 98
70 29 17 12 13	40 33 20 38 26	13 89 51 03 74	17 76 37 13 04
56 62 18 37 35	96 83 50 87 75	97 12 24 93 47	70 33 24 03 54
99 49 57 22 77	88 42 95 45 72	16 64 36 16 00	04 43 18 66 79
16 08 15 04 72	33 27 14 34 09	45 59 34 68 49	12 72 07 34 45
31 16 93 32 43	50 27 89 87 19	20 15 37 00 49	52 85 66 60 44
68 34 30 13 70	55 74 30 77 40	44 22 78 84 26	04 33 46 09 52
74 57 25 65 76	59 29 97 68 60	71 91 38 67 54	14 58 18 24 76
00 39 68 29 61	66 37 32 20 30	77 84 57 03 29	96 46 92 42 45
29 94 98 94 24	68 49 69 10 82	53 75 91 93 32	34 25 20 57 27
16 90 82 66 59	83 62 64 11 12	67 19 60 71 74	60 47 21 29 68
11 27 94 75 06	06 09 19 74 66	02 94 37 34 02	76 70 90 30 86
35 24 10 16 20	33 32 51 26 38	79 78 45 04 91	16 92 53 56 16
38 23 16 86 38	42 38 97 01 50	87 75 66 81 41	40 01 74 91 62
31 96 25 91 47	96 44 33 49 13	34 86 82 53 91	00 52 43 48 95
66 67 40 67 14	64 05 71 95 86	11 05 65 09 68	76 83 20 37 90
14 90 84 45 11	75 73 88 05 90	52 27 41 14 86	22 98 12 22 08
68 05 51 18 00	33 96 02 75 19	07 60 62 93 55	59 33 82 43 90
20 46 78 73 90	97 51 40 14 02	04 02 33 31 08	39 54 16 49 36
64 19 58 97 79	15 06 15 93 20	01 90 10 75 06	40 78 78 89 62
05 26 93 70 60	22 35 85 15 13	92 03 51 59 77	59 56 78 06 83
07 97 10 88 23	09 98 42 99 04	61 71 62 99 15	06 51 29 16 93
68 71 86 85 85	54 87 66 47 54	73 32 08 11 12	44 95 92 63 16
26 99 61 65 53	58 37 78 80 70	42 10 50 67 42	32 17 55 83 74
14 65 52 68 75	87 59 36 22 41	26 78 63 06 55	13 08 27 01 50

C - viri

1. JUGOSLOVENSKI

1.1 Pred 1918

a) S r b i j a (Publikacije Državne statistike, Beograd):

Državopis Srbije, zvezek I do XX (objavljeno od 1863 do 1894)
Statistika Kraljevine Srbije, knjiga I do XXXII (1892 do 1913)
Statistički Godišnjak Kraljevine Srbije, za leta 1893 do 1907
Prilozi za statistiku Kralj. Srbije, zvezek I do VII (1895 do 1913)
Razne publikacije (11 zvezkov)

b) H r v a t s k a i n S l a v o n i j a (Publikacije statističnega urada v Zagrebu):

Statistični zborniki, knjiga I do LXXII (1876 - 1917)
Glavni izveštaji o stanju useva i o gospodarskim prilikama uopće 26 številk (1893 do 1918)
Mjesečni statistički izveštaji, 19 številk (1899 do 1917)

c) B o s n a i n H e r c e g o v i n a (Publikacije Statističnega urada v Sarajevu):

Rezultati popisov prebivalstva iz 1879, 1885, 1895 in 1910
Rezultati popisa živine iz 1895 in 1910
Glavni rezultati izvanjskog prometa robe; za leta 1898 do 1909 (letne publikacije)
Das Sanitaetswesen in Bosnien und Herzegovina, 1878 - 1901
Das Veterinarwesen in Bosnien und Herzegovina, 1878 - 1898
Statistische Tabellen fuer Bosnien und Herzegovina. I. Landwirtschaft 1895)
Die Landwirtschaft in Bosnien und Herzegovina (1899)

č) S l o v e n i j a i n D a l m a c i j a: Publikacije avstrijske Centralne statistične komisije na Dunaju

d) V o j v o d i n a, Medjimurje in Prekmurje: Publikacije ogrskega Statističnega urâda v Pešti.

1.2 1918 do 1941

A) Področje stare J u g o s l a v i j e:

1. Publikacije Splošne državne statistike:

Statistički godišnjaci, knjiga I do X (1929 do 1941)
Rezultati popisa prebivalstva iz 1921: Predhodni rezultati(1924)-Statistički pregled kr. Jugoslavije po banovinama (1930) - Defitivni rezultati (1932)
Rezultati popisa domače stoke iz 1921 (1927)
Rezultati popisa prebivalstva iz 1931: Predhodni rezultati (1931)-Definitivni rezultati , knjiga I do IV
Kriminalna statistika za 1922 i 1923 god. (1932)
Splošni pregled Dravske banovine. Glavni statistični podatki. Upravna, sodna in cerkvena razdelitev ter imenik krajev. Izdala banska u - prava dravske banovine (1939)
Upravno, sudsko i crkveno razdjeljenje i imenik prebivališta Savske banovine (1937)
Upravno, sudsko i crkveno razdeljenje i imenik prebivališta Primor - ske banovine (1938)

2. Najvažnejše publikacije posebnih statistik:

Poljedelstvo. Publikacije Ministrstva poljedelstva: Obradjena zemlja i žetveni prinos (letno); Poljoprivredna godišnja statistika(letno)
Gozdarstvo. Publikacije Min. za gozdove in rudnike: Šume u kraljevini SHS (1926); Statistika šuma i šumske privrede za 1938 godinu
Ribarstvo. Direkcija pomorskog saobraćaja u Splitu. Statistika mor - skog ribarstva (letna publikacija)
Industrija. Ministrstvo za gozdove in rudnike: Rudarska i topionička statistika kr. Jugoslavije (letno). - Min. trgovine in industrije: Statistika industrije kr. Jugoslavije (1941)
Gradbeništvo. Ministrstvo za zgradbe: Statistika izvršenih tehničkih radova (letno)
Promet. Ministrstvo za promet: Statistika jugoslovenskih železnica - (letno); Statistika plovidbe na rekama i kanalima - (letno); Trg. i obrtnička komora u Splitu: Pomorska statistika (letno) Ministrstvo za pošte (kasneje Min. za promet): Statistika pošta, telegrafa i telefona (letno)
Trgovina in cene. Ministrstvo za finance: Statistika spoljne trgovine (letno). - Narodna Banka; Odeljenje za ekonomska izučavanja:Narodna privreda (tromesečno)
Zdravstvo. Centralni higienski zavod: Socialno - medicinski pregled. - Glasnik Centralnog higienskog zavoda
Zaščita in zavarovanje delavcev. Poslovna poročila: Inspekcija dela in parnih kotlov; Javnih borz dela in Centralnega odbora za posredo - vanje dela; Glavne bratinske blagajne; Pokojninskega zavoda za nameščence: Centralne uprave bolezenskega fonda državnega prometnega osebja. - SUZOR: (Središnji ured za osiguranje radnika,Zagreb):

Statistika radničkog osiguranja (letno).- Središnja uprava za posredovanje rada, Beograd: Socialni arhiv (časopis s stat.dodatkom)
Šolstvo. Ministrstvo za prosveto: Statistika škola pod Min. prosvete u školskoj godini (1925/26. - Isto: na dan 15. maja 1932

b) Slovensko P r i m o r j e i n I s t r a . Publikacije Centralnega statističnega instituta v Rimu

1.3 Po letu 1945

Publikacije Zveznega Zavoda za statistiko in evidenco

1. Serija A. V tej seriji se publicirajo rezultati velikih popisov in anket. Doslej izšlo:
Spoljna trgovina FNRJ za 1950 leto; isto za 1951; isto za 1952 l.
Imenik naseljenih mesta u FNRJ (1951)
Popis stanovništva FNRJ iz 1948. Do sedaj so izšle tri knjige
Popis stoke u FNRJ 1949 god. - Isto 1950 god.- Isto 1951 god.

2. Serija B. V tej seriji izhaja Statistički Bilten, ki publicira monografične statistične preglede iz raznih oblasti. Do sedaj je izšlo 14 številk

3. Serija M. V tej seriji izhajajo v obliki malih brošuric metodološki materiali za posedine vrste statističnih služb. Doslej je izšlo 7 zvezkov.

4. Serija G. je rezervirana za statistične letopise (Godišnjake).Do sedaj letopis še ni izšel.

5. Serija P. V tej seriji izhaja Indeks, mesečni pregled gospodarske statistike FLRJ. Indeks je začel izhajati aprila 1952.

2) M e d n a r o d n i

a) Uradni statistični letopisi (Jahrbuch, Handbuch, Annuaire, Abstract, Yearbook itd.) posedinih držav.

b) Statistične publikacije mednarodnih ustanov, zlasti:
Društva Narodov (Annuaire Statistique International),
Organizacije Združenih narodov (Annuaire Statistique in Annuaire Demographique), Mednarodnega Urada za delo (ILO) v Ženevi,
Mednarodne organizacije za prehrano in poljedelstvo (FAO) v Rimu.
Mednarodne organizacije za zdravstvo (WHO) v Ženevi

D - literatura

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a) Splošna

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Serdar V. Udžbenik statistike. Zagreb, 1950
Vogelnik D. Kurs opšte statistike, Beograd 1950
Vogelnik D. Osnovi statistike, Beograd 1950.

b) Posebna

Blejec M. Kmetijska statistika. Ljubljana, 1950
Grdjić G. Industriska statistika. Beograd 1950
Musulin A. Statistika i evidencija industriske proizvodnje, Beograd, 1948
Obradović S. Statistika, opšta i ekonomska.Beograd, 1952
Šifrer: Demografska statistika. Ljubljana, 1952
Žarković S. Statističke metode u industriskim istraživanjima. Beograd, 1949
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Žarković S. Kvalitativna kontrola proizvodnog procesa. Beograd, 1951

Serdar V. Privredna statistika - Statistika unutarnje trgovine. Zagreb, 1949
Serdar V. Privredna statistika - Statistika industrije,Zagreb 1949
Serdar V. Uvod u demografsku statistiku. Zagreb, 1950

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