Ovaj PDF sadrži skenirane postupke nekih zadataka iz završnih ispita.

Zadaci su popisani redom kojim se pojavljuju.

1-ZI2013, 1-ZI2012, 5-1MI2007, 3-ZI2013 ,3-ZI2012, 2-PZI2007, 2-ZI2007, 3-ZI2007, 1-ZI2008, 2-ZI2011, 1-ZI2009, 10-ZI2010, 10-PZI2010, 4-ZI2013, 4-ZI2012, 9-ZI2009, 5-ZI2007, 4-ZI2007, 3-PZI2008, 10-ZI2007, 5-PZI2007, 6-ZI2007, 8-ZI2013, 8-ZI2012, 10-ZI2011, 6-ZI2010, 6-ZI2009, 6-ZI2008, 4-ZI2013, 5-ZI2013, 5-ZI2012, 3-ZI2009, 6-ZI2013, 7-ZI2013, 6-ZI2012, 7-ZI2012

Riješio i ustupio na skeniranje

fer0vac

skenirao

SipE

ZI-2013-1

$X \backslash Y$	0	1	
2	0	1/6	1/6
4	1/6	0	1/6
6	0	1/6	1/6
8	1/6	0	1/6
10	0	1/6	1/6
12	1/6	0	1/6
	3/6	3/6	1

$X \equiv 2 \cdot \square$ $\quad Y$: 0 parah, 1 neparah

$E(X) = 2 \cdot \frac{1}{6} + 4 \cdot \frac{1}{6} + \dots + 12 \cdot \frac{1}{6}$

$E(X) = 7$

$E(Y) = 0 \cdot \frac{3}{6} + 1 \cdot \frac{3}{6} = \frac{1}{2}$

$r(X,Y) = \frac{cov(X,Y)}{\sqrt{D(X)}\sqrt{D(Y)}}$

$D(X) = 2^2 \cdot \frac{1}{6} + 4^2 \cdot \frac{1}{6} + \dots - E(X)^2 = 35/3$

$D(Y) = 0^2 \cdot \frac{3}{6} + 1^2 \cdot \frac{3}{6} - \left(\frac{1}{2}\right)^2 = \frac{1}{4}$

$E(XY) = 2 \cdot 0 \cdot 0 + 2 \cdot 1 \cdot \frac{1}{6} + 4 \cdot 0 \cdot \frac{1}{6} + 6 \cdot 1 \cdot \frac{1}{6} + 10 \cdot 1 \cdot \frac{1}{6} = 3$

$r(X,Y) = \frac{E(XY) - E(X)E(Y)}{\sqrt{D(X)}\sqrt{D(Y)}} = \frac{3 - 7 \cdot \frac{1}{2}}{\sqrt{\frac{35}{3}}\sqrt{\frac{1}{4}}} = -\frac{\sqrt{105}}{35}$

ZI-2012-1

$X \backslash Y$	1	2	3	
1	1/6	1/8	0	7/24
2	1/8	1/6	1/8	10/24
3	0	1/8	1/6	7/24
	$\frac{7}{24}$	$\frac{10}{24}$	$\frac{7}{24}$	1

$E(X) = 1 \cdot \frac{7}{24} + 2 \cdot \frac{10}{24} + 3 \cdot \frac{7}{24} = 2$ $\quad E(Y) = $ isto $= 2$

$D(X) = 1^2 \cdot \frac{7}{24} + 2^2 \frac{10}{24} + 3^2 \frac{7}{24} - 2^2 = \frac{7}{12}$ $\quad D(Y) = \frac{7}{12}$

$E(XY) = 1 \cdot 1 \cdot \frac{1}{6} + 1 \cdot 2 \cdot \frac{1}{8} + 0 + 2 \cdot 1 \cdot \frac{1}{8} + 2 \cdot 2 \cdot \frac{1}{6} + 2 \cdot 3 \cdot \frac{1}{8} + 0 +$

$3 \cdot 2 \cdot \frac{1}{8} + 3 \cdot 3 \cdot \frac{1}{6} = \frac{13}{3}$

$r(X,Y) = \frac{cov(X,Y)}{\sqrt{D(X)D(Y)}} = \frac{E(XY) - E(X)E(Y)}{\sqrt{D(X)D(Y)}} = \frac{\frac{1}{3}}{\sqrt{\frac{7}{12}\frac{7}{12}}} = \frac{4}{7}$

$P(X=2 \mid Y \geq 2) = \frac{P(X=2, Y \geq 2)}{P(Y \geq 2)} = \frac{\frac{1}{6} + \frac{1}{8}}{\frac{1}{8} + \frac{1}{6} + \frac{1}{8} + \frac{1}{8} + \frac{1}{6}} = \frac{7}{17}$

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X\Y	0	1	
-1	1/12	1/12	2/12
0	1/12	1/4	4/12
1	1/6	1/3	6/12
	$\frac{4}{12}$	$\frac{8}{12}$	1

$U = X^2$

$$X \sim \begin{pmatrix} -1 & 0 & 1 \\ \frac{2}{12} & \frac{4}{12} & \frac{6}{12} \end{pmatrix} \qquad X^2 \sim \begin{pmatrix} 1 & 0 & 1 \\ \frac{2}{12} & \frac{4}{12} & \frac{6}{12} \end{pmatrix}$$

$$X^2 \sim \begin{pmatrix} 0 & 1 \\ \frac{4}{12} & \frac{8}{12} \end{pmatrix} \qquad E(X^2) = \frac{8}{12}$$

$V = X^2 + Y^2$ $\qquad$ $W = X\,Y$

vjr	X	Y	$V = X^2 + Y^2$	$W = X\,Y$	
1/12	-1	0	1	0	✓
1/12	-1	1	2	-1	✓
1/12	0	0	0	0	✓
1/4	0	1	1	0	✓
1/6	1	0	1	0	✓
1/3	1	1	2	1	✓

V : 0, 1, 2
W : -1, 0, 1

$Z(V, W)$

V\W	-1	0	1	
0	0	1/12	0	1/12
1	0	$\frac{1}{12}+\frac{1}{4}+\frac{1}{6}$	0	1/2
2	1/12	0	1/3	5/12
	$\frac{1}{12}$	$\frac{7}{12}$	$\frac{4}{12}$	1

ZI-2013-3

ČEB, MAR
CGT 1

$E(X)=75$ Mar

$P(X \leq 200) = \frac{5}{8}$

$P(X \leq 200) \geq 1 - \frac{E(X)}{\varepsilon}$

$\geq 1 - \frac{75}{200} = \frac{5}{8} \Rightarrow P(X \leq 200) = \frac{5}{8}$

ZI-2012-3 X = broj bodova

$E(X)=65$

$D(X)=81 \Rightarrow \sigma = \sqrt{D(X)} = \sqrt{81} = 9$

a) $P(55 < X < 75) > 0{,}19$

čeb

$P(-\varepsilon < X - E(X) < \varepsilon) > 1 - \frac{D(X)}{\varepsilon^2}$

$> 1 - \frac{81}{\varepsilon^2} = 0{,}19$

$-\frac{81}{\varepsilon^2} = 0{,}19 - 1 = -\frac{81}{100} = -\frac{81}{\varepsilon^2}$

$\varepsilon^2 = 100$

$\varepsilon = \pm 10 = 10$

$P(-10 < X - 65 < 10) > 1 - \frac{81}{100} = 0{,}19$

b) $P(60 < X < 70) > 0{,}95$ X = prosječan broj bodova CGT

$$\frac{\sum_{i=1}^{n} x_i - nm \,/ : n}{\sigma\sqrt{n} \,/ : (\sqrt{n})^2} = \frac{\overbrace{\sum_{i=1}^{n} \frac{x_i}{n}}^{X} - m}{\frac{\sigma}{\sqrt{n}}} = \frac{X - m}{\frac{\sigma}{\sqrt{n}}} = \frac{X - 65}{\frac{9}{\sqrt{n}}}$$

$$P\left(\frac{60-65}{\frac{9}{\sqrt{n}}} < \frac{X-65}{\frac{9}{\sqrt{n}}} < \frac{70-65}{\frac{9}{\sqrt{n}}}\right) > 0{,}95$$

$P\left(-\frac{5}{9}\sqrt{n} < X^* < \frac{5}{9}\sqrt{n}\right) > 0{,}95$ $\Phi^*\left(\frac{5}{9}\sqrt{n}\right) > 0{,}95$

$\frac{5}{9}\sqrt{n} > 1{,}96 \,/ \cdot \frac{9}{5}$ $\sqrt{n} > 3{,}528 \Rightarrow n \geq 12{,}44$ $\boxed{n=13}$

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ČEB, ПКЕ
CGT 1

$$P(-3\sigma < X - a < 3\sigma) > \frac{8}{9}$$

$$P(|X - E(X)| < \varepsilon) > 1 - \frac{D(X)}{\varepsilon^2} \qquad \varepsilon = 3\sigma$$

$$1 - \frac{D(X)}{9\sigma^2} = \frac{8}{9}$$

$$\frac{1}{9} = \frac{D(X)}{9\sigma^2} \Rightarrow D(X) = \frac{9\sigma^2}{9} = \sigma^2 = D(X)$$

$$P(|X - a| < 3\sigma) > 1 - \frac{\sigma^2}{9\sigma^2} = 1 - \frac{1}{9} = \frac{8}{9}$$

$\boxed{\text{ZI} \cdot 2007 - 2}$ $n = 100$ $\qquad P(9{,}9 < X < 10{,}1)$

$E(X) = 10 \quad D(X) = 4 \qquad$ CGT

aritm. sredina = prosjek

$$\frac{\sum_{k=1}^{n} \frac{X_k}{n} - m}{\frac{\sigma}{\sqrt{n}}} = \frac{\sum_{k=1}^{100} \frac{X_k}{100} - 10}{\frac{\sqrt{4}}{\sqrt{100}}} = \frac{\overbrace{\sum_{k=1}^{100} \frac{X_k}{100}}^{X} - 10}{\frac{2}{10}} \overset{D}{\sim} N(0,1)$$

$$P(9{,}9 < X < 10{,}1) = P\left(\frac{9{,}9 - 10}{\frac{1}{5}} < \frac{X - 10}{\frac{1}{5}} < \frac{10{,}1 - 10}{\frac{1}{5}}\right)$$

$$= P\left(-\frac{1}{2} < X^* < \frac{1}{2}\right) = \Phi^*\left(\frac{1}{2}\right) = 0{,}45149$$

KM1

KM1

$\boxed{2007-ZI-3}$ PISMO

5 puta → 3 piska

4 -||- → 2

3 → 2

$$p(X=k) = \binom{n}{k} p^k (1-p)^{n-k}$$

$$p(X=3) = \binom{5}{3} p^3 (1-p)^2 \qquad p(X=2) = \binom{4}{2} p^2 (1-p)^2$$

$$p(X=2) = \binom{3}{2} p^2 (1-p)^1$$

$$L(p) = \binom{5}{3} p^3 (1-p)^2 \binom{4}{2} p^2 (1-p)^2 \binom{3}{2} p^2 (1-p)^1$$

$$L(p) = \binom{5}{3}\binom{4}{2}\binom{3}{2} p^7 (1-p)^5 \quad / \ln$$

$$\ln L(p) = \ln\left(\binom{5}{3}\binom{4}{2}\binom{3}{2}\right) + \ln\left(p^7 (1-p)^5\right)$$

$$\ln L(p) = \ln\left(\binom{5}{3}\binom{4}{2}\binom{3}{2}\right) + 7\ln p + 5\ln(1-p) \quad / \frac{d}{dp}$$

$$\frac{d\ln L}{dp} = 0 + 7\frac{1}{p} + 5\frac{1}{1-p}(-1) = 0$$

$$\frac{7}{p} - \frac{5}{1-p} = 0 \Rightarrow \frac{7}{p} = \frac{5}{1-p} \Rightarrow 7 - 7p = 5p$$

$$7 = 12p$$

$$p = \frac{7}{12}$$

$\boxed{2008-ZI-1}$ $f(x) = 2\lambda^2 x e^{-\lambda^2 x^2}$

$$L(\lambda, x_1, \dots, x_n) = 2\lambda^2 x_1 e^{-\lambda^2 x_1^2} \cdots 2\lambda^2 x_n e^{-\lambda^2 x_n^2}$$

$$L = 2^n \lambda^{2n} \cdot (x_1 \cdots x_n) \cdot e^{-\lambda^2 (x_1^2 + \dots + x_n^2)} \quad / \ln$$

$$\ln L = \cancel{n \ln(2)} + 2n\ln(\lambda) + \ln(x_1 \cdots x_n) + (-\lambda^2) \cdot (x_1^2 + \dots + x_n^2) \ln(e) \quad / \frac{\partial}{\partial \lambda}$$

$$\frac{\partial \ln L}{\partial \lambda} = \frac{2n}{\lambda} - 2\lambda (x_1^2 + \dots + x_n^2) = 0$$

$$\frac{2n}{\lambda} = 2\lambda(x_1^2 + \dots + x_n^2) \Rightarrow 2\lambda^2 (x_1^2 + \dots + x_n^2) = 2n$$

$$\lambda = \sqrt{\frac{n}{(x_1^2 + \dots + x_n^2)}} \Leftarrow \lambda^2 = \frac{n}{x_1^2 + \dots + x_n^2}$$

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ZI-2011-2 $f(x)=\lambda x^{\lambda-1}$ $x\in(0,1)$ $\swarrow$ N^1_1

$L(\lambda, x_1,\dots,x_n) = \lambda x_1^{\lambda-1}\,\lambda x_2^{\lambda-1}\dots\lambda x_n^{\lambda-1}$

$L=\lambda^n\cdot(x_1 x_2\dots x_n)^{\lambda-1}$ $/\ln$

$\ln L = n\ln\lambda + (\lambda-1)\ln(x_1 x_2\dots x_n)$

$\ln L = n\ln\lambda + \lambda\ln(x_1\dots x_n) - \ln(x_1\dots x_n)$ $/\frac{\partial}{\partial\lambda}$

$\frac{\partial \ln L}{\partial\lambda} = n\frac{1}{\lambda} + 1\ln(x_1\dots x_n) - 0 = 0$

$\frac{n}{\lambda} + \ln(x_1\dots x_n) = 0$

$\frac{n}{\lambda} = -\ln(x_1\dots x_n)$ $/^{-1}$

$\frac{\lambda}{n} = -\frac{1}{\ln(x_1\dots x_n)}$

$\lambda = -\frac{n}{\ln(x_1\dots x_n)}$

ZI-2009-1 $f(x)=\frac{\lambda}{2\sqrt{x}}e^{-\lambda\sqrt{x}}$, $x\in(0,+\infty)$ $\lambda>0$

$L(\lambda, x_1, x_2,\dots,x_n) = \frac{\lambda}{2\sqrt{x_1}}e^{-\lambda\sqrt{x_1}}\dots\frac{\lambda}{2\sqrt{x_n}}e^{-\lambda\sqrt{x_n}}$

$L=\frac{\lambda^n\cdot e^{-\lambda(\sqrt{x_1}+\dots+\sqrt{x_n})}}{2^n\sqrt{x_1\dots x_n}}$ $/\ln$

$\ln L = n\ln\lambda + (-\lambda)(\sqrt{x_1}+\dots+\sqrt{x_n})\ln e$
$-n\ln 2^{\to 0} - \ln(\sqrt{x_1\dots x_n})^{\to 0}$ $/\frac{\partial}{\partial\lambda}$

$\frac{\partial\ln L}{\partial\lambda} = n\frac{1}{\lambda} + (-1)(\sqrt{x_1}+\dots+\sqrt{x_n}) = 0$

$\frac{\lambda}{n} - \frac{1}{\sqrt{x_1}+\dots+\sqrt{x_n}} = 0 \Rightarrow \lambda = \frac{n}{\sqrt{x_1}+\dots+\sqrt{x_n}}$

PI-2010-10 $[0,\alpha]$, $\alpha>0$ uzorak $X_1 \dots X_n$ α 1

$$Z = \frac{1}{2}\left(\max\{X_1, \dots X_n\}\right) \Rightarrow Z = \frac{1}{2} Z'$$

$$Z' = \max\{X_1, \dots X_n\}$$

$$F_{Z'}(x) = P(Z' < x) = P(\max\{X_1, \dots X_n\} < x)$$

$$= P(X_1 < x)\, P(X_2 < x) \dots P(X_n < x) = \left(\frac{x-0}{\alpha-0}\right)^n, \ z \in (0,\alpha)$$

$$f_Z(x) = \left(\frac{x}{\alpha}\right)^{n'} = \left(\frac{1}{\alpha^n} x^n\right)' = \frac{1}{\alpha^n} n x^{n-1}$$

$$E(x') = \int_0^\alpha x \frac{1}{\alpha^n} n x^{n-1} dx$$

$$= \frac{1}{\alpha^n}\int_0^\alpha x\, n x^n \frac{1}{x} dx = \frac{1}{\alpha^n}\left(n \frac{x^{n+1}}{n+1}\Big|_0^\alpha\right) = \frac{1}{\alpha^n}\left(\frac{n\alpha^{n+1}}{n+1} - 0\right)$$

$$E(x') = \frac{1}{\cancel{\alpha^n}} \frac{n \cancel{\alpha^n} \alpha}{n+1} = \frac{n}{n+1}\alpha$$

$$E(x) = \frac{1}{2}E(x') = \frac{1}{2}\frac{n}{n+1}\alpha \neq \frac{\alpha}{2}$$ nije nepristran treba pomnožiti s $\frac{n+1}{n}$

$\boxed{\text{PI-2010-10}}$ $[0,\alpha]$ $\alpha>0$ $z = \frac{n+1}{n}\max\{x_1, \dots x_n\}$

$$z = \frac{n+1}{n}\max\{x_1, \dots x_n\}$$

$$F_Z(z) = P(Z<z) = P\left(\left\{\frac{n+1}{n}\max\{x_1, \dots x_n\}\right\} < z\right)$$

$$= \frac{n+1}{n}\left(\frac{z}{\alpha}\right)^n, \ z \in (0,\alpha)$$

$$f_Z(z) = \frac{n+1}{n}\frac{1}{\alpha^n} n z^{n-1}$$

$$E(z) = \int_0^\alpha z \cdot \frac{n+1}{n}\frac{1}{\alpha^n} n z^{n-1} dz = \frac{n+1}{\cancel{n}}\frac{1}{\alpha^n}\int_0^\alpha z\, \cancel{n} z^n \frac{1}{z} dz =$$

$$= \frac{(n+1)}{1\,\alpha^n}\int_0^\alpha z^n dz = \frac{n+1}{\alpha^n}\left(\frac{z^{n+1}}{n+1}\right)\Big|_0^\alpha = \frac{\alpha^{n+1}}{\alpha^n} = \alpha$$ nepristran

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21 - 2013 - 4

$\alpha 2$

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

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

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

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

$$= \frac{1}{n-1}\left(\sum_{i=1}^{n} x_i^2 \underbrace{- 2\bar{x}(n\bar{x})}_{-2\bar{x}^2 n} + n\bar{x}^2\right) = \frac{1}{n-1}\left(\sum_{i=1}^{n} x_i^2 - n\bar{x}^2\right) \checkmark$$

21 - 2012 - 4 $[\alpha, 1]$, gdje je $\alpha < 1$

uzorak $X_1, X_2, \dots X_n$

inverzni suprotna

povoljno

$$Y = \underbrace{\min\{X_1, X_2, \dots X_n\}}_{Z} - \frac{1}{n+1}$$

α, X, 1 — cijeli interval

$$F_Z(x) = P(Z < z) = 1 - P(Z > z) = 1 - P(X_1 > x, X_2 > x, \dots, X_n > x)$$

$$= 1 - P(X_1 > x)P(X_2 > x)\dots P(X_n > x) = 1 - \left(\frac{1-x}{1-\alpha}\right)^n$$

povoljno / cijeli int

$$f_Z(x) = F_Z'(x) = 0 - n\left(\frac{1-x}{1-\alpha}\right)^{n-1}\cdot\left(-\frac{1}{1-\alpha}\right)$$

$$= \frac{n}{(1-\alpha)}\frac{(1-x)^{n-1}}{(1-\alpha)^{n-1}} = \frac{n(1-x)^{n-1}}{(1-\alpha)^n}$$

$$E(Z) = \int_{\alpha}^{1} x f_Z(x)\,dx = \frac{n}{(1-\alpha)^n}\int_{\alpha}^{1} x \underbrace{(1-x)}_{t}{}^{n-1}\,dx = \left| \begin{array}{l} 1-x = t \\ -dx = dt \end{array} \right.$$

$$= -\frac{n}{(1-\alpha)^n}\int_{1-\alpha}^{0}(1-t)t^{n-1}\,dt = \frac{n}{(1-\alpha)^n}\left[\frac{t^n}{n} - \frac{t^{n+1}}{n+1}\right]_0^{1-\alpha} =$$

$$= 1 - \frac{n}{(n+1)}(1-\alpha) \qquad E(Y) = 1 - \frac{n}{n+1} + \frac{\alpha n}{n+1} - \frac{1}{n+1} = \frac{n}{n+1}\alpha \neq \alpha$$

nije nepr

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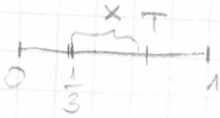
b) treba množiti $s\, E\left(\frac{n+1}{n}Y\right) = \alpha$ nepris.

5

21-2009-9 | T unutar intervala $[0,1] \Rightarrow Y$

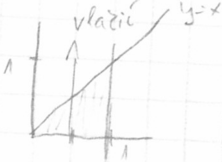
X udalj.

$0 \le y \le x \le 1$



$\underbrace{y \in [0,1] \quad x \in [y,1]}$

$f_Y(y) = \frac{1}{1-0} = 1, \quad y \in [0,1]$



$$f_{X|Y=y}(x) = \frac{f(x,y)}{f_Y(y)} = \frac{1}{\text{dulj. intervala}} = \frac{1}{1-y}, \quad x \in [y,1]$$

$$f_X(x) = \int_{-\infty}^{+\infty} f_Y(y)\, f_{X|Y=y}(x)\, dy = \int_0^x 1 \cdot \frac{1}{1-y}\, dy = \begin{vmatrix} 1-y=u \\ -dy=du \end{vmatrix} = \int_0^x -\frac{1}{u}\, du =$$

$$= -\ln|u|\Big|_0^y = -\left(\ln|1-y|\Big|_0^x\right) = -(\ln|1-x| - \ln|1|) = -\left(\ln\left|\frac{1-x}{1}\right|\right) = -\ln|1-x|$$

$x \in [0,1]$

$$E(X) = \int_{-\infty}^{+\infty} x\, f_X(x)\, dx = \int_0^{1/3} x\,(-\ln|1-x|)\,dx = -\int_0^1 x \underbrace{\ln|1-x|}_{u}\, dx$$

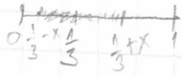
$$= \begin{vmatrix} u = \ln(1-x) & dv = x\,dx \\ du = \frac{1}{1-x}(-1)\,dx & v = \frac{x^2}{2} \end{vmatrix} = -\left(\ln(1-x)\frac{x^2}{2}\Big|_0^1 + \frac{1}{2}\int_0^1 \frac{x^2+1-1}{x-1}dx\right)$$

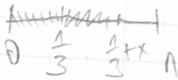
$$= -\left(0 + \frac{1}{2}\left(\int_0^1 \frac{\overbrace{x^2-1}^{(x-1)(x+1)}}{x-1}dx - \int_0^1 \frac{1}{x-1}dx\right)\right) =$$

$$= -\left(\frac{1}{2}\left(\left(\frac{1}{2}x^2 + x\right)\Big|_0^1 - \underbrace{\left(\ln|x-1|\Big|_0^1\right)}_{0}\right)\right)$$

$$= -\left(\frac{1}{2}\left(\underbrace{\frac{1}{2}+1}_{\frac{3}{2}}\right) + 0\right)$$

$\frac{1}{2}$





$F_X(x) = P(X < x)$

$x \in [0, \frac{1}{3}] \Rightarrow P(X<x) = \frac{\frac{1}{3}+x-\frac{1}{3}+x}{1}$

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$x \in [\frac{1}{3}, \frac{2}{3}] \Rightarrow P(X<x) = \frac{1}{3}+x$

X ... broj ~~ispravnih~~ ukupnih mobitela

$P(\text{mobitel neispravan}) = \frac{1}{4}$

$x + y \leq 2$

$y \leq 2 - x$

$z = \frac{y+1}{x}$

$zx = y + 1$

$zx - 1 = y$

$z = x^3 (z$

$\boxed{ZI-2007-5}$ $n = 100$ $X \sim N(\mu, 25)$ $\bar{x} = 27$

$\qquad\qquad\qquad\qquad\qquad\quad\;\; \overset{\shortparallel}{\sigma^2}$ $\qquad\quad \alpha = 0{,}05$

$H_0 \ldots \mu = 26$

$H_1 \ldots \mu \neq 26$ $\qquad \hat{u} = \dfrac{\bar{x} - a_0}{\sigma / \sqrt{n}} = \dfrac{27 - 26}{\sqrt{25} / \sqrt{100}} = 2$

$|\hat{u}| > u_{1-\frac{\alpha}{2}} = u_{1-\frac{0{,}05}{2}} = u_{0{,}975} = 1{,}95996$

$2 > 1{,}95996$ $\quad H_1$ se prihvaća, H_0 se odbacuje

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by ferQuac

2007-21-4

$\hat{p} = \frac{m}{n} = \frac{300}{400} = \frac{3}{4}$ $\qquad P = 0{,}9 \Rightarrow \alpha = 0{,}1$

$$P(p_1 \leq p \leq p_2) = 0{,}9$$

$$p_{1,2} = \hat{p} \mp u_{1-\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = \frac{3}{4} \mp \underbrace{u_{1-\frac{0{,}1}{2}}}_{0{,}95} \sqrt{\frac{\frac{3}{4}\left(1-\frac{3}{4}\right)}{400}}$$

1,64485

$$p_{1,2} = \frac{3}{4} \mp 0{,}03561$$

$$P(0{,}71439 \leq p \leq 0{,}78561) = P$$

MAN UTD
by fervac

PZI - 2008 - 3

x	20	22	24	26	28	30
n	3	2	5	7	3	2

a) $\bar{x} = 25$ $\quad n = 22$

$\hat{s} = 2,94392$ $\quad \hat{s}^2 = 8,66666$

b) 80 % za oček.

$p = 0,8 \quad \alpha = 0,2$

$$P\left(\bar{x} - t_{n-1,1-\frac{\alpha}{2}} \frac{\hat{s}}{\sqrt{n}} \leq a \leq \bar{x} + t_{n-1,1-\frac{\alpha}{2}} \frac{\hat{s}}{\sqrt{n}}\right) = 0,8$$

$$P\left(25 - \underbrace{t_{21,1-\frac{0,2}{2}}}_{1,323} \frac{2,94392}{\sqrt{22}} \leq a \leq 25 + \underbrace{t_{21,1-\frac{0,2}{2}}}_{1,323} \frac{2,94392}{\sqrt{22}}\right)$$

$$P(24,16962 \leq a \leq 25,830375) = 0,8$$

c) 80 % jednostrani za disp.

$p = 0,8 \quad \alpha = 0,2$

$$P\left(0 \leq \sigma^2 \leq \frac{(n-1)\hat{s}^2}{\chi^2_{n-1,\alpha}}\right) = p$$

$$P\left(0 \leq \sigma^2 \leq \frac{21 \cdot 8,66666}{\underbrace{\chi^2_{21,\,0.2}}_{15,445}}\right) = 0,8$$

$$P(0 \leq \sigma^2 \leq 11,78374) = 0,8$$

MAN UTD
by ferOvac

INTERVAL

$\boxed{21-2007-10}$

x	115	120	125	130	135	140
n	3	4	7	6	3	2

$\bar{x} = 126,6$ $\qquad$ $n = 25$

(a) točkasta $\quad \bar{x} = 126.6$

$$\hat{s}^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i-\bar{x})^2 = \frac{1}{25-1}\sum_{i=1}^{25}(x_i-\bar{x})^2 = 51,5$$

(b) $p = 90\%$ $\qquad 1-p = \alpha = 0,1$

90% interval za matem. očekiv.

$$P\left(\bar{x} - t_{n-1,1-\frac{\alpha}{2}}\frac{\hat{s}}{\sqrt{n}} \le a \le \bar{x} + t_{n-1,1-\frac{\alpha}{2}}\frac{\hat{s}}{\sqrt{n}}\right) = 90\%$$

$$P\left(126,6 - t_{24,0,95}\frac{51,5}{\sqrt{25}} \le a \le 126,6 + t_{24,0,95}\frac{51}{\sqrt{25}}\right)$$

$$P\left(126,6 - 1,711\cdot\frac{\sqrt{51,5}}{5} \le a \le 126,6 + 1,711\frac{\sqrt{51,5}}{5}\right)$$

$$P(124,14 \le a \le 129,06)$$

(c) 90% dvostrani interval za disperziju

$n=25$

$$P\left(\frac{(n-1)\hat{s}^2}{\chi^2_{n-1,1-\frac{\alpha}{2}}} \le \sigma^2 \le \frac{(n-1)\hat{s}^2}{\chi^2_{n-1,\frac{\alpha}{2}}}\right) = P$$

$$P\left(\frac{24\cdot 51,5}{\underbrace{\chi^2_{24,1-\frac{0,1}{2}}}_{\chi^2_{24,0,95}=36,415}} \le \sigma^2 \le \frac{24\cdot 51,5}{\underbrace{\chi^2_{24,\frac{0,1}{2}}}_{\chi^2_{24,0,05}=13,848}}\right)$$

$$P(33,94 \le \sigma^2 \le 89,25) = 0,9$$

PZI-2007-5 $n=17$ $X \sim N(\cancel{\mu}, \sigma^2)$ IZVOSTRANI INTERVAL POUJERENJA ZA PARAM. σ^2

$\sum_{i=1}^{17} x_i = 680$ $\sum_{i=1}^{n} x_i^2 = 34000$

$p = 0{,}9$ $\alpha = 0{,}1$

$$\hat{s}^2 = \frac{1}{n-1}\left(\sum_{i=1}^{n} x_i^2 - n\bar{x}^2\right) = \frac{1}{17-1}\left(34000 - 17\left(\frac{680}{17}\right)^2\right) = 425$$

$$P\left(\frac{(n-1)\hat{s}^2}{\chi^2_{n-1,1-\frac{\alpha}{2}}} \leq \sigma^2 \leq \frac{(\;)\hat{s}^2}{\chi^2_{n-1,\frac{\alpha}{2}}}\right) = p$$

$$P\left(\frac{16 \cdot 425}{\chi^2_{16,\underbrace{1-\frac{0{,}1}{2}}_{0{,}95}}} \leq \sigma^2 \leq \frac{16 \cdot 425}{\chi^2_{16,\frac{0{,}1}{2}}}\right) = p$$

$$P\left(\frac{6800}{26{,}296} \leq \sigma^2 \leq \frac{6800}{7{,}962}\right) = p$$

$$P(258{,}594 \leq \sigma^2 \leq 854{,}057) = p$$

$\boxed{\text{ZI-2007-10}}$

x_j	115	120	125	130	135	140	
n_j	3	4	7	6	3	2	$\Rightarrow n=25$

$\bar{x} = 126{,}6$

(a) $\hat{s}^2 = \frac{1}{24}(-34{,}8 - 26{,}4 - 11{,}2$

MAN UTD
by ferOvac

POISSONOVA RAZ

2880 s $n = 288$

broj vozila	0	1	2	3	4	5
broj intervala	154	93	31	7	3	0

$\Rightarrow \bar{X} = \dfrac{154 \cdot 0 + 93 \cdot 1 + \ldots + \ldots 5 \cdot 0}{288}$

$\bar{x} = 0{,}6527$

$\alpha = 0{,}05$

$$P\left(|\bar{X} - \lambda| < u_{1-\frac{\alpha}{2}} \sqrt{\frac{\lambda}{n}} \right) = p$$

$$u_{1-\frac{0{,}05}{2}} = u_{0{,}975} = 1{,}95996$$

$$|\bar{X} - \lambda| < 1{,}95996 \sqrt{\frac{\lambda}{n}} \quad /^2$$

$$(\bar{X} - \lambda)^2 < (1{,}95996)^2 \frac{\lambda}{n \to 288}$$

$$(0{,}6527)^2 - 2\bar{x}\lambda + \lambda^2 < 0{,}013338 \lambda$$

$$\lambda^2 - 1{,}29206 \lambda + 0{,}42601 < 0$$

$\lambda_{1,2} =$

ZI-2007-6

broj zvaničnih poziva	0	1	2	3	4	5	6	7	8
broj dana	95	140	73	31	16	7	2	0	1

$\alpha = 0{,}02$

$n = 365 \quad \bar{x} = 1{,}36438$

$$P\left(|\bar{X} - \lambda| < u_{1-\frac{\alpha}{2}} \sqrt{\frac{\lambda}{n}} \right) = p$$

MAN UTD
by ferdvac

21 - 2013 - 8 | $n = 128$ puta $\alpha = 0,05$ $B(5, \frac{1}{2})$ χ^2

$P(X=k) = \binom{n}{k} p^k (1-p)^{n-k}$

broj grbova x_j	n_j	p_j		np_j	χ_q^2
0	4 } 25	$k=0$; $\binom{5}{0}(\frac{1}{2})^0(\frac{1}{2})^5$	1/32	128/32 } 768/32	$\frac{1}{24}$
1	21 }	$k=1$; $\binom{5}{1}(\frac{1}{2})^1(\frac{1}{2})^4$	5/32	640/32 }	
2	43		10/32	1280/32	9/40
3	38		10/32	1280/32	1/10
4	17		5/32	640/32	9/20
5	5		1/32	128/32	1/4
Σ	$n=128$		$\Sigma = 1$	$=128$	$\frac{16}{15}$

$\chi_q^2 = \frac{16}{15}$ $\qquad \chi^2_{m-r-1, 1-\alpha}$

$\chi_q^2 > \chi^2_{4, 0.95}$ $\qquad \chi^2_{5-0-1, 1-0,05} = \chi^2_{4, 0.95} = 9,488$

NE VRIJEDI pa se H (ne) odbacuje

21 - 2012 - 8

$\alpha = 0,05$ Poisson $P(X=k) = \frac{\lambda^k}{k!} e^{-\lambda}$

$E(X) = \lambda = \bar{x}$

x_j	n_j	p_j	$n \cdot p_j$ $(60 \cdot p_j)$	χ_q^2
0	39	0,6065	36,39	0,1872
1	14	0,3032	18,192	0,9660
2	5 } 7	0,0758	4,548 } 5,304	0,5423
3	2 }	0,0126	0,756 }	
Σ	$n=60$	≈ 1	≈ 60	1,6955

$\bar{x} = \frac{1}{2} = \lambda$ $\qquad \chi^2_{m-r-1, 1-\alpha} = \chi^2_{3-1-1, 1-0,05} = \chi^2_{1, 0.95} = 3,841$

samo λ

$1,6955 > 3,8411$ ne vrijedi, pa se H

(ne) odbacuje

ravnaju se po Poiss.

MAN UTD by fer0vac

χ^2

EI - 2011 - 10 I

$[a,b]$	n_j	$\frac{a+b}{2}$	p_j	np_j	χ^2
0-25	87	12,5	0,613	91,99	0,271
25-50	46	37,5	0,237	35,576	3,054
50-75	14 } 17	62,5	0,092	13,76 } 19,08	0,227
75-100	3	87,5	0,035	5,32	
	$n=150$		≈ 1	≈ 150	3,552

$\lambda e^{-\lambda x}$

$\alpha = 0{,}05$ exp

$\lambda = \frac{1}{\bar{x}} = \frac{1}{\frac{79}{3}} = 0{,}03797 = \frac{3}{79}$

$F(b) - F(a) = p$

$1 - e^{-\lambda x_2} - (1 - e^{-\lambda x_1}) = e^{-\lambda x_1} - e^{-\lambda x_2}$

$e^{-\frac{3}{79}\cdot 0} - e^{-\frac{3}{79}\cdot 25} = 0{,}613$

$\chi^2_{m-r-1,\,1-\alpha} = \chi^2_{3-1-1,\,1-0{,}05} = \chi^2_{1,\,0{,}95} = 3{,}841$

$3{,}552 > 3{,}841$ ne vrijedi, pa se H ne odbacuje

ravnaju se po exp.

ZI - 2010 - 6

$\alpha = 0{,}05$

kocka 6-ica na sreću

x_j	n_j	p_j	np_j	χ^2
0	61	$\left(\frac{5}{6}\right)^3$	57,87	0,169
1	29	$\binom{3}{1}\frac{1}{6}\left(\frac{5}{6}\right)^2$	34,72	0,942
2	8 } 10	$\binom{3}{2}\left(\frac{1}{6}\right)^2\frac{5}{6}$	6,94 } 7,4	0,913
3	2	$\left(\frac{1}{6}\right)^3$	0,46	
Σ	$n=100$	1	≈ 100	2,024

$\chi^2_{m-r-1,\,1-\alpha} = \chi^2_{3-0-1,\,1-0{,}05} = \chi^2_{2,\,0{,}95} = 5{,}991$

$2{,}024 > 5{,}991$ ne vrijedi pa se H NE odbacuje

kocke su ispravne

jednolikoj

$\boxed{1-2009-6}$ $\alpha = 0,05$

x_j	n_j	p_j	np_j	χ^2
0	12	1/7	150/7	0,9152
1	22	1/7	150/7	0,0152
2	27	1/7	150/7	1,4486
3	24	1/7	150/7	0,3086
4	17	1/7	150/7	0,9152
5	18	1/7	150/7	0,5486
6	25	1/7	150/7	0,5952
	n=150	1	150	4,7466

$$\chi^2_{m-r-1,1-\alpha} = \chi^2_{7-0-1,1-0,05} = \chi^2_{6,0,95} = 12,592$$

$4,7466 > 12,592$ NE VRIJEDI, H se NE odbacuje
ravnaju se po jednolikoj

$\boxed{21-2008-6}$ $B(n,p)$, $n=5$, $p=\frac{1}{6}$ $\alpha = ?$

x_j	n_j	p_j		np_j	χ^2
0	75	$\binom{5}{0}\left(\frac{5}{6}\right)^5$	0,4018	76,342	0,0236
1	77	$\binom{5}{1}\frac{1}{6}\left(\frac{5}{6}\right)^4$	0,4018	76,342	0,0057
2	30	$\binom{5}{2}\left(\frac{1}{6}\right)^2\left(\frac{5}{6}\right)^3$	0,1607	30,533	0,0093
3	6 } 8	$\binom{5}{3}\left(\frac{1}{6}\right)^3\left(\frac{5}{6}\right)^2$	0,0321	6,099 } 6,731	0,2392
4	1	$\binom{5}{4}\left(\frac{1}{6}\right)^4\left(\frac{5}{6}\right)^1$	0,0032	0,608	
5	1	$\binom{5}{5}\left(\frac{1}{6}\right)^5$	0,0001	0,024	
	n=190		≈1	≈190	$\chi^2 = 0,2748$

$0,2748 > \chi^2_{3,1-\alpha}$

$$\chi^2_{m-r-1,1-\alpha} = \chi^2_{\underbrace{4-0-1}_{},1-\alpha}$$

$\alpha = 0,95$

$0,2748 > 0,352$ NE VRI

H se ne odbacuje $\boxed{\alpha = 0,95}$

TAN UTD
h. Ladhac

EI-2008-5 | jednoliko $\alpha = ?$ χ^2

x_j	n_j	p_j	np_j	χ^2	$n_j - np_j$
1	20	1/6	20	0	0
2	14	1/6	20	1,8	-6
3	23	1/6	20	0,45	3
4	12	1/6	20	3,2	-8
5	26	1/6	20	1,8	6
6	25	1/6	20	1,25	5
	n=120	1	120	$\chi^2_g = 8,5$	

$$\chi^2_{m-r-1,\,1-\alpha} = \chi^2_{r,\,1-\alpha}$$
$6-0-1$

$$8,5 > \chi^2_{5,\,1-\alpha} = 9,236 \Rightarrow \quad 1-\alpha = 0,9 \quad \alpha = 0,1$$

(6)

$\alpha = 0,2$ N

x_j a_j b_j	n_j	$\frac{a+b}{2}$	p_j	
0-5	15	2,5		
5-10	75	7,5		
10-15	100	12,5		
15-20	50	17,5		
20+	10	22,5		
	n=250			

N $\quad p_j =$

$\bar{x} = 11,8$

$\hat{\sigma} = 4,7008$

$\chi^2 = 0,73 \quad \hat{\sigma}_j = 3,22$

ZI-2013-4d $n=20$ $X \sim N(a, \cancel{\sigma})$

$\sum_{i=1}^{20} x_i = 160$ $\sum_{i=1}^{20} x_i^2 = 1451$

jednostrani
Jo- tni interval za disperziju

$$s^2 = \frac{1}{n-1}\left(\sum_{i=1}^{n} x_i^2 - n\bar{x}^2\right) = \frac{1}{20-1}\left(1451 - 20\cdot\left(\frac{160}{20}\right)^2\right)$$

$\hat{s}^2 = 9$ $p = 0{,}9$ $\alpha = 0{,}1$

$$P\left(0 \le \sigma^2 \le \frac{(n-1)\hat{s}^2}{\chi^2_{n-1,\alpha}}\right) = p = 1-\alpha$$

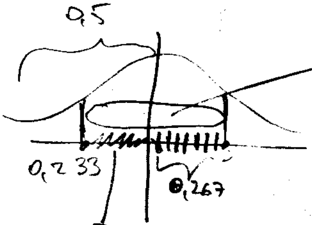
$$P\left(0 \le \sigma^2 \le \frac{19\cdot 9}{\boxed{\chi^2_{19,0,1}}}\right) = 0{,}9$$

$\chi^2_{19,0,1} \Longrightarrow 11{,}651$

$$P\left(0 \le \sigma^2 \le \frac{171}{11{,}651}\right) = 0{,}9 \qquad P\left(0 \le \sigma^2 \le 14{,}67685\right) = 0{,}9$$

ZI-2013-5c

$u_{0,233}$ (Φ^*)



$2\cdot 0{,}267 = 0{,}534$

$0{,}5 - 0{,}233 = 0{,}267$

MAN UTD
by ferlhac

21-2012-5 $\sigma = 0{,}3$ $N(a, \sigma^2)$

x	16	16.1	16.2	16.3	16.4	16.5
n	1	1	3	2	2	1

$\bar{x} = 16.26$
$n = 10$
duljina inter. $= 0{,}3123$

$$P\left(\bar{x} - u_{1-\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}} \le a \le \bar{x} + u_{1-\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}\right) = p$$

$$P\left(16{,}26 - u_{1-\frac{\alpha}{2}} \frac{0{,}3}{\sqrt{10}} \le a \le 16{,}26 + u_{1-\frac{\alpha}{2}} \frac{0{,}3}{\sqrt{10}}\right) = p$$

$$2 u_{1-\frac{\alpha}{2}} \frac{0{,}3}{\sqrt{10}} = 0{,}3123 \quad / : 2$$

$$u_{1-\frac{\alpha}{2}} = \frac{0{,}3123}{2} \cdot \frac{\sqrt{10}}{0{,}3}$$

$$u_{1-\frac{\alpha}{2}} = 1{,}64597$$

$$1 - \frac{\alpha}{2} = 0{,}95 \quad / \cdot 2$$

$$2 - \alpha = 1{,}9$$

$$2 - 1{,}9 = \alpha$$

$$\boxed{0{,}1 = \alpha}$$

$$p = 1 - \alpha = 1 - 0{,}1 = 0{,}9$$

$$P\left(16{,}26 - 1{,}64597 \frac{0{,}3}{\sqrt{10}} \le a \le 16{,}26 + 1{,}64597 \cdot \frac{0{,}3}{\sqrt{10}}\right) = 0{,}9$$

$$P(16{,}10385 \le a \le 16{,}41615) = 0{,}9$$

$\boxed{ZI-2005-5}$ 400 proizvoda, 44 loša

$p = 95\%$ 35%-tni neispravnih proizvoda $\hat{p} = \frac{m}{n}$

$\alpha = 0{,}05$

$$P(p_1 \le p \le p_2) = 1 - \alpha \qquad p_{1,2} = \hat{p} \mp u_{1-\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$n = 400 \qquad m = 44 \qquad \hat{p} = \frac{44}{400} = 0{,}11$

$$p_{1,2} = 0{,}11 \mp \boxed{u_{1-\frac{0{,}05}{2}}} \sqrt{\frac{0{,}11(1-0{,}11)}{400}} = 0{,}11 \mp 1{,}95996 \cdot \sqrt{\frac{0{,}11(1-0{,}11)}{400}}$$

$$u_{0{,}975} = 1{,}95996$$

$$p_{1,2} = 0{,}11 \mp 0{,}03066$$

$$P(0{,}07934 \le p \le 0{,}14066) = 0{,}95$$

$\boxed{ZI-2013-6}$ $\bar{x} = 66$ broj auto u malom satu jedan dan

$p = 0{,}90 \qquad \alpha = 0{,}10 \qquad$ Poissonova $\qquad \downarrow$

$n = 24$

$$P\left(|\bar{x} - \lambda| < u_{1-\frac{\alpha}{2}} \sqrt{\frac{\lambda}{n}}\right) = p$$

$$P\left(|66 - \lambda| < u_{1-\frac{0{,}1}{2}} \sqrt{\frac{\lambda}{24}}\right) = 0{,}90$$

$$|66 - \lambda| < \boxed{u_{0{,}95}} \sqrt{\frac{\lambda}{24}} \quad /^2$$

$$(66-\lambda)^2 < 1{,}64485^2 \cdot \frac{\lambda}{24}$$

$$\lambda^2 - 2\lambda \cdot 66 + 66^2 - \frac{1{,}64485^2}{24}\lambda < 0$$

$$\lambda^2 - 132{,}11273\lambda + 4356 < 0$$

$$\left.\begin{aligned} \lambda_1 &= 68{,}78461 \\ \lambda_2 &= 63{,}32811 \end{aligned}\right\} P(63{,}32811 < \lambda < 68{,}78461) = 0{,}9$$

MAN UTD

by Ferdvac

✓ - 2013 - 7 |

(a) $\sigma = 5\,ml$ boce od 1000 ml $a_0 = 1000$

$n = 100$ $\bar{x} = 997$ ml

$H_0 \ldots a = a_0 = 1000$ $\mathcal{N}(a, \sigma^2)$ $\alpha = 0{,}05$

$H_1 \ldots a < a_0$

$a < 1000$ $\hat{u} < -u_{1-\alpha}$

$$\hat{u} = \frac{\bar{x} - a_0}{\frac{\sigma}{\sqrt{n}}} = \frac{997 - 1000}{\frac{5}{\sqrt{100}}} = -6$$

$\hat{u} < -u_{1-\alpha}$ $u_{1-\alpha} = u_{1-0{,}05} = \boxed{u_{0{,}95}} = 1{,}64485$

$-6 < -1{,}64485$ ✓

odbacujemo H_0, prihvaćamo H_1

Proizvođač laže

(b) drugi uređaj

1000 ml i $\sigma = 5$ ml

$m = 80$ $\bar{y} = 1001$ $\alpha = 0{,}05$

Hipo. o jednakosti očekivanja uz poznate disp.

$H_0 \ldots \mu = \nu$

$H_1 \ldots \mu \neq \nu$

$$\sigma_z^2 = \frac{\sigma_x^2}{n} + \frac{\sigma_y^2}{m} = \frac{5^2}{100} + \frac{5^2}{80}$$

$$\sigma_z^2 = \frac{9}{16} \Rightarrow \sigma_z = \frac{3}{4}$$

$$\hat{u} = \frac{\bar{x} - \bar{y}}{\sigma_z} = \frac{997 - 1001}{\frac{3}{4}} = -5{,}33337$$

$|\hat{u}| > u_{1-\frac{\alpha}{2}}$ $u_{1-\frac{0{,}05}{2}} = u_{0{,}975} = 1{,}95996$

$|-5{,}33333| > 1{,}95996$ ✓

odbacujemo H_0 prihvaćamo H_1

Ova uređaja NE pune jednakom kol. vode.

ZI-2012-6

ispravno kavem 200(g)

$n=8$ 167, 171, 188, 187, 194, 204, 206, 210

$\alpha=0{,}1$

$\mathcal{N}(a, \sigma^2)$

$H_0 \ldots a=200$ (g)

$H_1 \ldots a<200$

$\bar{x} = \frac{167+171+\ldots+210}{8} = 190{,}25$

$s = \frac{1}{7}\sum_{i=1}^{8}(x_i - 190{,}25)^2$

$s = 16{,}10957$

$\hat{t} = \frac{\bar{x}-a_0}{\frac{s}{\sqrt{n}}} = \frac{190{,}25-200}{\frac{16{,}10957}{\sqrt{8}}} = -1{,}71238$

gledamo $\alpha=0{,}2$ jer je tablično $\frac{\alpha}{2}$

$\hat{t} < -t_{n-1,1-\alpha}$

$t_{n-1,1-\alpha} = t_{7}(0{,}2) = 1{,}415$

$-1{,}71238 < -1{,}415$ ✓

H_0 odbacujemo, H_1 prihvaćamo

Proizvođač laže

ZI-2012-7

$\alpha = 0{,}05$

	1	2	3	4	5			
A	1	6	8	10	7	$\Rightarrow$	$n_1 = 32$	$\bar{x}_1 = 3{,}5$
B	0	7	6	7	5	$\Rightarrow$	$n_2 = 25$	$\bar{x}_2 = 3{,}4$

$H_0 \ldots u = v$

$H_1 \ldots u \neq v$

$\hat{S}_1^2 = \frac{40}{31}$ $\hat{S}_2^2 = \frac{30{,}25}{24}$

$S_z^2 = \frac{1}{32+25-2}\left[31\cdot\frac{40}{31} + 24\cdot\frac{30{,}25}{24}\right]$

$|\hat{t}| > t_{n+m-2, 1-\frac{\alpha}{2}}$

$S_z^2 = \frac{281}{220}$ $S_z = \sqrt{\frac{281}{220}}$

$t_{55, 0{,}975} = 2.000$

$\hat{t} = \frac{\bar{x}-\bar{y}}{S_z}\sqrt{\frac{nm}{n+m}} = 0{,}33149$

0,3372 NIJE

MAN UTD H_1 se odbacuje, H_0 se prihvaća