

Zad 1

SAD - e - 03.02.2011 - v1.pdf

$$n=36 \quad k=4 \quad \hat{p} = \frac{k}{n} = \frac{4}{36} = \frac{1}{9} \quad 1-\alpha = 0,95 \quad \alpha = 0,05$$

$$\text{kwantyl } Z_{1-\frac{\alpha}{2}} = Z_{0,975} = 1,96$$

$$\left[ \hat{p} - Z_{1-\frac{\alpha}{2}} \cdot \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}, \hat{p} + Z_{1-\frac{\alpha}{2}} \cdot \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \right] = [0,00; 0,21]$$

$$P(X < 80) = P\left(\frac{X-90}{10} < \frac{80-90}{10}\right) = P(U < -1) = \Phi(-1) =$$

$$= 1 - \Phi(1) = 1 - 0,841 = 0,159$$

Zad 4

$$\bar{x} = 6,5 \quad s^2 = 1,44 \Rightarrow s = 1,2 \quad n=9 \quad \alpha = 0,1$$

$$\left[ \bar{x} - t_{1-\frac{\alpha}{2}; n-1} \cdot \frac{s}{\sqrt{n}}; \bar{x} + t_{1-\frac{\alpha}{2}; n-1} \cdot \frac{s}{\sqrt{n}} \right]$$

$$[6,5 - 0,7436; 6,5 + 0,7436]$$

Zad 5

$$P(X=k, Y=l) \stackrel{?}{=} P(X=k) \cdot P(Y=l)$$

$$P(X=0, Y=1) = 0,3$$

$$P(X=0) \cdot P(Y=1) = 0,5 \cdot 0,7 = 0,35$$

$$P(X=0, Y=1) \neq P(X=0) \cdot P(Y=1) \Rightarrow \text{są zależne}$$

$$P(Y \geq 2 | X=0) = \frac{P(Y=2 \wedge X=0) + P(Y=3 \wedge Y=0)}{P(X=0)} =$$

$$= \frac{0,1 + 0,1}{0,5} = \frac{2}{5} = 0,4$$

Zad 6.

$$n = 9 \quad s^2 = 9 \quad \bar{x} = 36 \quad \alpha = 0,05 \\ s = 3$$

$$\left[ \bar{x} - t_{1-\frac{\alpha}{2}; n-1} \cdot \frac{s}{\sqrt{n}} ; \bar{x} + t_{1-\frac{\alpha}{2}; n-1} \cdot \frac{s}{\sqrt{n}} \right] =$$

$$\left[ 36 - t_{0,975; 8} \cdot \frac{3}{\sqrt{9}} ; 36 + t_{0,975; 8} \cdot \frac{3}{\sqrt{9}} \right] =$$

$$= [36 - 2,306 ; 36 + 2,306] = [33,694 ; 38,306]$$

Zad 10

$$3 \quad 4 \quad \overset{Q_1}{5} \quad 5 \quad \overset{Q_2}{5} \quad 7 \quad 9 \quad \overset{Q_3}{10} \quad 15 \quad 25$$

$$M = Q_2 = 5 \quad \bar{x} = \frac{93}{11} = 8,45$$

$$\text{Lewy w\u0142: } Q_1 - 1,5 \cdot IQR$$

$$5 - 1,5 \cdot (Q_3 - Q_1) = (-2,5)$$

$$\text{Prawy w\u0142: } Q_3 + 1,5 \cdot IQR = 10 + 1,5 \cdot 5 = 17,5$$

$$25 \notin (-2,5 ; 17,5)$$

Odp: "25" nie w\u0142e\u017cy, do... eee... tzn. "25" jest elementem odstaj\u0105cym.