

Varbūtība

04.02.2026 | Praktiskā nodarbība | Aija Pola

↗ 1.6. uzdevums

T_1 – I procesa sākuma moments

T_2 – II ...

T_1 un T_2 sadalīti vienmērīgi $[0; 24]$

Darbības intervāli: $[T_1; T_1 + 2]$ un $[T_2; T_2 + 3]$

Spiests gaidīt, ja $\begin{cases} T_2 < T_1 + 2 \\ T_1 < T_2 + 3 \end{cases} \Rightarrow T_1 - 3 < T_2 < T_1 + 2$

☒ Desmos

$$S_q = 24^2 = 576$$

A – procesi spiesti gaidīt

$$S_A = 576 - (22^2 : 2 + 21^2 : 2) = 576 - (484 : 2 + 441 : 2) = 113.5$$

$$P(A) = \frac{S_A}{S_q} = \frac{113.5}{576} \approx 19.7\%$$

↗ 1.7. uzdevums

$\overline{A} = \{ \text{"neviena no 4 pārb. det. neatbilst standartam"} \}$

$\overline{B} = \{ \text{"vismaz viena no 10 pārb. det. neatbilst standartam"} \}$

$\overline{C} = \{ \text{"vismaz 9 no 10 pārb. det. atbilst standartam"} \}$

$\overline{D} = \{ \text{"3 vai mazāk no 5 pārb. det. atbilst standartam"} \}$

$\overline{E} = \{ \text{"no 10 pārb. det. neatbilst standartam, ka to skaits nav 1"} \}$

↗ 1.8. uzdevums

· Nav svarīga secība

$A = \{ \text{"ne vairāk kā uz 2 no 5 ir progr."} \}$

$$|\Omega| = C_{20}^5 = \frac{20!}{5!(20-5)!} = 15504$$

$$P(A) = \frac{C_8^0 \cdot C_{12}^5}{|\Omega|} + \frac{C_8^1 \cdot C_{12}^4}{|\Omega|} + \frac{C_8^2 \cdot C_{12}^3}{|\Omega|} \approx 70.38\%$$

$B = \{ \text{"vismaz 1 no 5 ir progr."} \}$

$\overline{B} = \{ \text{"nevienam nav progr."} \}$

$$P(\overline{B}) = \frac{C_{12}^5}{|\Omega|} \approx 5.11\%$$

$$P(B) = 1 - P(\overline{B}) = 94.89\%$$

↗ 1.9. uzdevums

$$P(S_1) = 0.9$$

$$P(S_2) = 0.8$$

$$P((S_1 \wedge \overline{S_2}) \vee (\overline{S_1} \wedge S_2)) = 0.9 \cdot 0.2 + 0.1 \cdot 0.8 = 26\%$$

Ja $n \leq 100$, tad lieto Bernulli formulu;

Ja $n > 100$, $(p < 0.1 \wedge np < 10) \vee (p > 0.9 \wedge nq < 10)$ izmanto Puasona

↗ 2.1. uzdevums

$$P(\{ \text{"}n \text{ neatkar. mēg. } m \text{ reizes iestāsies } A\text{"} \}) = \\ = P_n(m) = C_n^m \cdot p^m \cdot \underbrace{(1-p)}_q^{n-m}$$

$$P(\{ \text{"}10 \text{ neatkar. mēg. } 3 \text{ reizes iestāsies } A\text{"} \}) = \\ = P_{10}(3) = C_{10}^3 \cdot 0.4^3 \cdot (1-0.4)^{10-3} \approx 21.5\%$$

$$P(\{ \text{"}10 \text{ neatkar. mēg. vismaz } 3 \text{ reizes iestāsies } A\text{"} \}) = \\ = 1 - (P_{10}(0) + P_{10}(1) + P_{10}(2)) = 0.833$$

↗ 2.2. uzdevums

$$P(\{ \text{no } 140 \text{ kl. } 21 \text{ saņem spec. piedāv.} \}) = \\ = [n = A = 140, m = B = 21, p = C = 0.15] = 9.4\%$$

Pēc MLLF: $P(A) = 9.44\%$

$$P(20 \leq m \leq 40) = \varphi\left(\frac{40-21}{\sqrt{17.85}}\right) - \varphi\left(\frac{20-21}{\sqrt{17.85}}\right) = \varphi(4.5) - \varphi(-0.24) = \\ = 0.999997 - (1 - \varphi(0.24)) = \dots$$