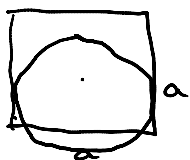


* U kvadrat stranice a upisan je krug. Kolika je URV. da se nasumično izabranu tačku iz kvadrata nalazi u krugu?



A - tačka u krugu

$$P(A) = \frac{P(\omega)}{P(\text{Površina } (\square))} = \frac{\frac{\pi}{4} a^2}{a^2} = \frac{\pi}{4}$$

* Bacamo kockicu n puta (n veliki broj)

A - pala 6

B - paran broj

up. $n = 1200$

1	2	3	4	5	6
205	196	193	195	207	204

stat. URV. : $P(A) = \frac{u_i}{n} = \frac{204}{1200} = 0,17 \approx \frac{1}{6} = 0.166\dots$

$$P(B) = \frac{196 + 195 + 204}{1200} = 0.49583\dots \approx \frac{1}{2}$$

* Bacamo 2 novčića $\{(P,P), (P,G), (G,P), (G,G)\}$ } $P(A)$
 A - baš 1 glava $\{(P,G), (G,P), (G,G)\}$ } $\frac{3}{4}$

0 glava, 1 glava, 2 glave (3) } A

$$P(\bar{A}) = \frac{1}{4}$$

$$P(A) = 1 - P(\bar{A}) = 1 - \frac{1}{4} = \frac{3}{4}$$

⊗ $A \subseteq B \Rightarrow P(A) \leq P(B)$



$$B = A \cup \overbrace{B \cdot A}^{\bar{A}}$$

$$P(B) = P(A) + P(\bar{A} \cdot B)$$

$$P(A) = P(B) - \underbrace{P(\bar{A} \cdot B)}_{\in [0,1] \geq 0} \leq P(B)$$

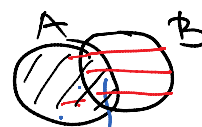
⊗

$$\emptyset \subseteq A \subseteq \Omega$$

$$P(\emptyset) \leq P(A) \leq P(\Omega)$$

$$0 \leq P(A) \leq 1$$

⊗ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

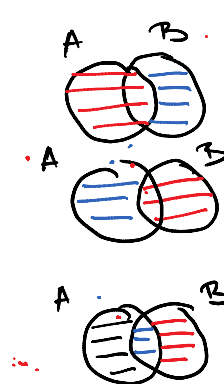


2 puta razuali

1) $A \cup B = A + \bar{A} \cdot B$

2) $A \cup B = \bar{A} \cdot B + A + \bar{A} \cdot \bar{B}$

3) $A \cup B = \bar{A} \cdot \bar{B} + \bar{A} \cdot B + A \cdot \bar{B} + A \cdot B$



⇓

1) $P(A \cup B) = P(A) + P(\bar{A} \cdot B)$

2) $P(A \cup B) = P(\bar{A} \cdot B) + P(A) + P(A \cdot \bar{B})$

3) $P(A \cup B) = P(\bar{A} \cdot \bar{B}) + P(\bar{A} \cdot B) + P(A \cdot \bar{B}) + P(A \cdot B)$

$$1 + 2 - 3 \Rightarrow P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

⊗

↑?

- * 1) $P(A|B) = P(A)$
 2) $P(B|A) = P(B)$
 3) $P(AB) = P(A) \cdot P(B)$

$1^\circ \Rightarrow 2^\circ$ $P(B|A) \stackrel{\text{def.}}{=} \frac{P(BA)}{P(A)} = \frac{P(B) \cdot \underbrace{P(A|B)}_{1^\circ = P(A)}}{P(A)} \stackrel{1^\circ}{=} \frac{P(B) \cdot P(A)}{P(A)} = P(B)$

$2^\circ \Rightarrow 3^\circ$ $P(AB) = P(A) \cdot \underbrace{P(B|A)}_{2^\circ = P(B)} \stackrel{2^\circ}{=} P(A) \cdot P(B)$

$3^\circ \Rightarrow 1^\circ$ $P(A|B) = \frac{P(BA)}{P(B)} = \frac{\underbrace{P(AB)}_{3^\circ = P(A) \cdot P(B)}}{P(B)} \stackrel{3^\circ}{=} \frac{P(A) \cdot P(B)}{P(B)} = P(A)$ B

* Bacamo 2 kockice. Ako je zbir obijetih brojeva 10 odrediti URV. da je na bare jednoj kockici broj 6.

A - zbir 10 $\{(4,6), (5,5), (6,4)\} \Rightarrow P(A) = \frac{3}{36}$

B - pojava 6 $\{(1,6), (2,6), \dots\}$

Ω - 2 kockice, po 6 brojeva $6 \cdot 6 = 36$ različitih ishoda

$P(B|A) = \frac{P(AB)}{P(A)}$

AB - 6 i zbir 10 : 6 i 6 $\{(4,6), (6,4)\} \Rightarrow P(AB) = \frac{2}{36}$

$P(B|A) = \frac{\frac{2}{36}}{\frac{3}{36}} = \frac{2}{3}$

* Bacawo 3 moneta:

A - pala 3 pisma ili 3 glavo

B - pala bar 2 pisma (2 ili 3)

C - pale napise 2 glavo. (0, 1, 2)

Koji od događaja su zavisni / nezavisni?

$$\Omega = 2 \cdot 2 \cdot 2 = 8$$

$$A = \{PPP, GGG\} \Rightarrow P(A) = \frac{2}{8}$$

$$B = \{PPG, PGP, GPP, PPP\} \Rightarrow P(B) = \frac{4}{8}$$

$$C = \{PPP, PPG, PGP, GPP, GGP, GPG, PGG\} \Rightarrow P(C) = \frac{7}{8}$$

$$AB = \{PPP\} \Rightarrow P(AB) = \frac{1}{8}$$

$$AC = \{PPP\} \Rightarrow P(AC) = \frac{1}{8}$$

$$BC = \{PPG, PGP, GPP, PPP\} \Rightarrow P(BC) = \frac{4}{8}$$

Nezavisni ako $P(AB) = P(A) \cdot P(B)$ (teorema 3.0)

$$P(AB) = \frac{1}{8} \stackrel{?}{=} P(A) \cdot P(B) = \frac{2}{8} \cdot \frac{4}{8} = \frac{1}{8} \quad \checkmark \Rightarrow A \text{ i } B \text{ nezavisni}$$

$$P(AC) = \frac{1}{8} \stackrel{?}{=} P(A) \cdot P(C) = \frac{2}{8} \cdot \frac{7}{8} = \frac{7}{32} \quad \neq \Rightarrow A \text{ i } C \text{ zavisni}$$

$$P(BC) = \frac{4}{8} \stackrel{?}{=} P(B) \cdot P(C) = \frac{4}{8} \cdot \frac{7}{8} = \frac{7}{16} \quad \neq \Rightarrow B \text{ i } C \text{ zavisni}$$

n ljudi ?

A - dvoje su roditelji istog deteta (365 dana)

$$p(A) > 0.5$$

$$n = 23$$

$$\binom{23}{2} = 253$$

$$n = 55$$

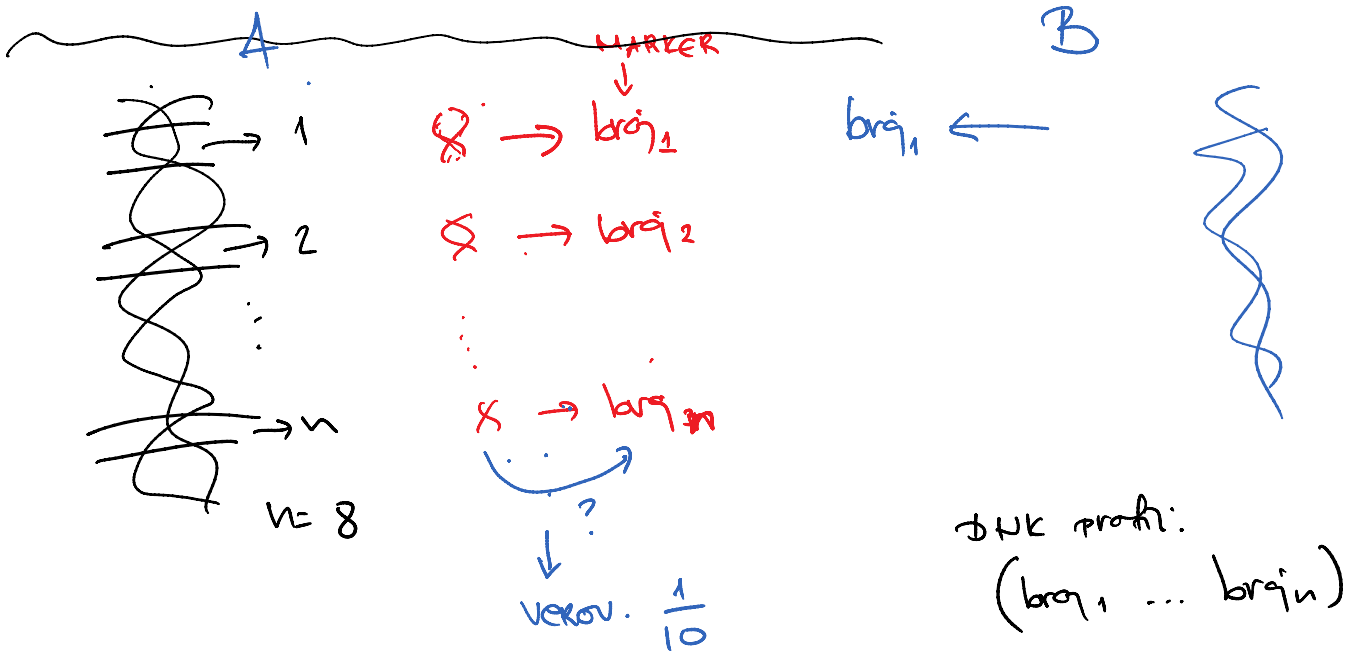
$$p = 0.99$$

99%

$$n = 68$$

$$p = 0.999$$

99.9%



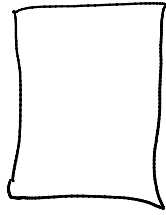
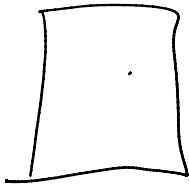
$$\text{poklapanje: } \left(\frac{1}{10}\right)^8$$

$$n = 13 \rightarrow \left(\frac{1}{10}\right)^{13}$$

65.000 stanovnika . Bilo koje drugo ima isti DNA profil?

DNA na 9 markera : $p = 0.05$ (5% šansa)

Wednesday, January 12, 2022
11:31 AM



\$	O	P
1)	∩	\$
2)	∩	\$
3)	\$	∩

$$\frac{1}{3}$$