2.1: A … 5 bodů $\mathbb{P}$(A celkově vyhraje) = ?
B … 3 body $\mathbb{P}$(B celkově vyhraje) = ?

$\mathbb{P}$(A celkově vyhraje) = $1 - \left(\frac{1}{2}\right)^3 = 1 - \mathbb{P}$(B celkově vyhraje) = $\frac{7}{8}$

Ω: BBB BAB ABB AAB
BBA BAA ABA AAA

$\mathbb{P}$(BBB) = $\mathbb{P}$(3× za sebou vyhraje B) = $\frac{1}{8}$

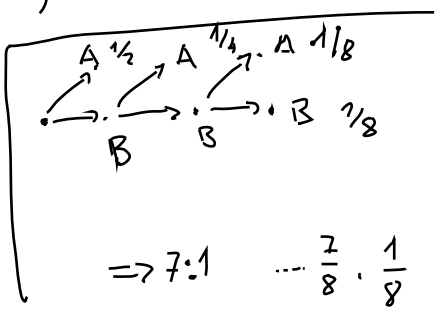
} el. jevy … mají stejnou pst. = $\frac{1}{8}$ (klasická pst.)

$\mathbb{P}$(výhra A) = $\frac{7}{8}$

$\tilde{\Omega}$: BBB → 1/8
BBA → 1/8
BA → 1/4
A → 1/2

$\mathbb{P}$(výhra A) = $\frac{1}{8} + \frac{1}{4} + \frac{1}{2} = \frac{7}{8}$

(není klasická pst.)



⇒ 7 : 1 … $\frac{7}{8} : \frac{1}{8}$

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nekonečné Ω: házíme mincí, dokud nepadne líc

Ω: L, RL, RRL, RRRL, … , $(R)^n L$, … $n = 0, 1, 2, \ldots$, $(R)^\infty$

$\frac{1}{2}$ $\frac{1}{4}$ $\left(\frac{1}{2}\right)^{n+1}$

→ $\tilde{\Omega}$: $\{1, 2, 3, \ldots\} \cup \{\infty\}$ $\mathbb{P}(\{k\}) = \left(\frac{1}{2}\right)^k$ = $\mathbb{P}$(potřebujeme k hodů), $k = 1, 2, \ldots$

$\sum_{k=1}^{\infty} \mathbb{P}(\{k\}) = 1 \Rightarrow \mathbb{P}(\{\infty\}) = 0$

$\Omega = \left(\bigcup_{k=1} \{k\}\right) \cup \{\infty\}$

$1 = \mathbb{P}(\Omega) = \sum_{k=1}^{\infty} \mathbb{P}(\{k\}) + \mathbb{P}(\{\infty\})$

(i) $\mathbb{P}(\emptyset) = 0$ … $\mathbb{P}(\Omega) = 1$, $\Omega = \Omega \cup \emptyset$, $\mathbb{P}(\Omega) = \mathbb{P}(\Omega) + \mathbb{P}(\emptyset) \Rightarrow \mathbb{P}(\emptyset) = 0$ ✓ ($\mathbb{P}(\Omega) = 1$)

(ii) $\mathbb{P}(A) + \mathbb{P}(A^c) = 1$ … $\mathbb{P}(A) + \mathbb{P}(A^c) = \mathbb{P}(A \cup A^c) = \mathbb{P}(\Omega) = 1$ ($\Omega, \emptyset$ disj. ✓ splněno, $\Omega \cap \emptyset = \emptyset$)

(iii) $0 \le \mathbb{P}(A) \le \mathbb{P}(B)$ … $A \subset B$, $A, B \in \mathcal{A}$ … $B = A \cup (B \setminus A)$ … disjunktní

$\mathbb{P}(B) = \mathbb{P}(A) + \mathbb{P}(B \setminus A)$

(iv) $0 \le \mathbb{P}(A) \le 1$ … $A \in \mathcal{A}$ … $A \subseteq \Omega \overset{(iii)}{\Rightarrow} \mathbb{P}(A) \le \mathbb{P}(\Omega) = 1$ ($\mathbb{P}(B \setminus A) \ge 0$)

(z definice)

2.2. a) $1 / \binom{49}{6} = \frac{1}{13\,983\,816}$

b) $\left(\frac{1}{2}\right)^{24} = \frac{1}{16\,777\,216}$

c) $\frac{\binom{20}{13}}{\binom{52}{13}} = \frac{1}{81\,91\,609}$

d) $\left(\frac{1}{37}\right)^6 + \left(\frac{1}{37}\right)^5 \cdot \frac{36}{37} \cdot \binom{6}{1} =$

(6× 0) (5× 0)

$= \frac{1}{11\,823\,624}$.