IV122, vypocet bayesova veta

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Vypocet pomocou bayesovho vzorca
n - pocet kociek x - pocet hodov
D - padli same sestky
H_i - vybral som kocku i

- H_f - falosna kocka
- H_p - prava kocka

$P(H_i)$ - pravdepodobnost vyberu kocky i

- $P(H_f) - \frac{1}{n}$
- $P(H_p) - \frac{n-1}{n}$

$P(D|H_i)$ - padli same sestky za predpokladu vybratia kocky i, pri pocte pokusov x

- $P(D|H_f) = 1$
- $P(D|H_p) = \frac{1}{6^x}$

$P(H_p|D)$ - vybral som pravu kocku za predpokladu ze padli same sestky

$P(H_p|D) = \frac{P(D|H_p)*P(H_p)}{\sum P(D|H_i)*P(H_i)} = \frac{P(D|H_p)*P(H_p)}{P(D|H_f)*P(H_f)+(n-1)*P(D|H_p)*P(H_p)} = \frac{\frac{1}{6^x}*\frac{n-1}{n}}{1*\frac{1}{n}+(n-1)*\frac{1}{n}*\frac{1}{6^x}}$

- $n = 10, x = 5, \frac{\frac{1}{6^5}*\frac{10-1}{10}}{1*\frac{1}{10}+(10-1)*\frac{1}{10}*\frac{1}{6^5}} = \frac{1}{865} = 0.001156...$
- $n = 100, x = 3, \frac{\frac{1}{6^3}*\frac{100-1}{100}}{1*\frac{1}{100}+(100-1)*\frac{1}{100}*\frac{1}{6^3}} = \frac{11}{35} = 0.3143...$
- $n = 1000, x = 5, \frac{\frac{1}{6^5}*\frac{1000-1}{1000}}{1*\frac{1}{1000}+(1000-1)*\frac{1}{1000}*\frac{1}{6^5}} = \frac{37}{325} = 0.1138...$