

N 2

$$i = 1, \dots, 2^n$$

$$p_i = \frac{1}{2^n}$$

$$H = \sum_{i=1}^{2^n} \frac{1}{2^n} \log_2 \frac{1}{2^{-n}} = \frac{1}{2^n} \sum_{i=1}^{2^n} \log_2 2^n = \frac{1}{2^n} \cdot 2^n \cdot \log_2 2^n = \log_2 2^n =$$

$$= n \log_2 2 = n$$

N 1 K₁: w czterech rzutach wyrzucony dokładnie trzy razy orza

K₂: w czterech rzutach wyrzucono dokładnie trzy razy reszke

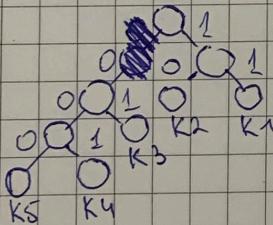
$$K = \log_2 \frac{1}{P} \quad p_i = \frac{1}{2^n}$$

$$\frac{1}{2^4} + \frac{1}{2^4} + \frac{1}{2^4} + \frac{1}{2^4} = \frac{4}{2^4} = \frac{4}{16} = \frac{1}{4}$$

$$K_1 = \log_2 1 : \frac{1}{4} = \log_2 4 = 2$$

$$K_2 = K_1 \Rightarrow K_2 = 2$$

N 3

K₅ K₄ K₃ K₂ K₁

$$\frac{1}{16} \quad \frac{2}{16} \quad \frac{3}{16} \quad \frac{5}{16} \quad \frac{5}{16}$$

$$R = L - H$$

$$L = \frac{1}{16} \cdot 3 + \frac{2}{16} \cdot 3 + \frac{3}{16} \cdot 2 + \frac{5}{16} \cdot 2 + \frac{5}{16} \cdot 2 = \frac{3}{16} + \frac{6}{16} +$$

K₅ - 000

$$+ \frac{6}{16} + \frac{10}{16} + \frac{10}{16} = \frac{35}{16} \approx 2,187$$

K₄ - 001

$$R = \frac{1}{16} \log_2 \left(1 : \frac{1}{16} \right) + \frac{2}{16} \log_2 \left(1 : \frac{2}{16} \right) + \frac{3}{16} \log_2 \left(1 : \frac{3}{16} \right) +$$

K₂ - 10

$$+ \frac{5}{16} \log_2 \left(1 : \frac{5}{16} \right) + \frac{5}{16} \log_2 \left(1 : \frac{5}{16} \right) = \frac{1}{16} \log_2 16 + \frac{2}{16} \log_2 8 +$$

K₁ - 11

$$+ \frac{3}{16} \log_2 \frac{16}{3} + \frac{5}{16} \log_2 \frac{16}{5} + \frac{5}{16} \log_2 \frac{16}{5} = \frac{1}{4} + \frac{6}{16} + \frac{7,245}{16} +$$

$$+ \frac{8,39}{16} + \frac{8,39}{16} = \frac{34,325}{16} \approx 2,126$$

$$R = 2,187 - 2,126 = 0,061$$