Zadanie domowe, Zuzanna Grzebieniko

zad 1

$\underset{O}{\underline{2}} \cdot \underset{O}{\underline{2}} \cdot \underset{O}{\underline{2}} \cdot \underset{O}{\underline{2}} = 16 = |\Omega|$

$\underset{R}{} \quad \underset{R}{} \quad \underset{R}{} \quad \underset{R}{}$

Zdanenie A → dokładnie 3 razy orła

Zdanenie B → dokładnie 3 razy reszkę

Zdenenie A:

OOOR
OORO
OROO
ROOO

} 4 $\quad P(A) = \frac{4}{16} = \frac{1}{4}$

Zdenenie B

RRRO
RROR
RORR
ORRR

} 4 $\quad P(B) = \frac{4}{16} = \frac{4}{4}$

$I(A) = \log_2 4 = 2\ b$

$I(B) = \log_2 4 = 2\ b$

Te komunikaty niosą dokładnie tyle samo informacji.

zad 2

$$M = \sum_k P_k \cdot \gamma(k) = \sum_{i=1}^{2^n} \frac{1}{2^n} \cdot \log_2 2^n = 2^n \cdot \frac{1}{2^n} \cdot \log_2 2^n =$$

$$= n$$

zad 3

$k_1 = \frac{5}{16}$
$k_2 = \frac{5}{16}$
$k_3 = \frac{3}{16}$
$k_4 = \frac{2}{16}$
$k_5 = \frac{1}{16}$

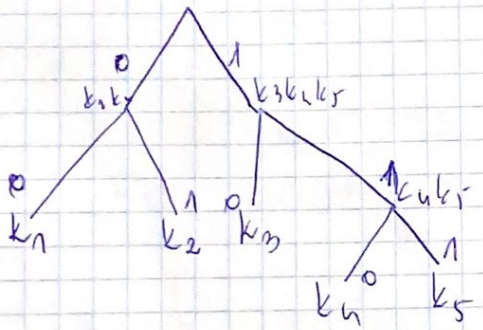
1r. $k_1 = \frac{5}{16}$ $k_2 = \frac{5}{16}$ $k_3 = \frac{3}{16}$ $k_4 = \frac{2}{16}$ $k_5 = \frac{1}{16}$

2r $k_1 = \frac{5}{16}$ $k_2 = \frac{5}{16}$ $k_3 = \frac{3}{16}$ $k_4 k_5 = \frac{3}{16}$

3r $k_1 = \frac{5}{16}$ $k_2 = \frac{5}{16}$ $k_3 k_4 k_5 = \frac{6}{16}$

4r $k_1 k_2 = \frac{10}{16}$ $k_3 k_4 k_5 = \frac{6}{16}$

5r $k_1 k_2 k_3 k_4 k_5 = 1$



$k_1 = 00$
$k_2 = 01$
$k_3 = 10$
$k_4 = 110$
$k_5 = 111$

$$L = \frac{5}{16} \cdot 2 + \frac{5}{16} \cdot 2 + \frac{3}{16} \cdot 2 + \frac{2}{16} \cdot 3 + \frac{1}{16} \cdot 3 = \frac{35}{16} = 2{,}1875\ b$$

$$H = \left(\frac{5}{16} \cdot \log_2 \frac{16}{5}\right) \cdot 2 + \frac{3}{16} \cdot \log_2 \frac{16}{3} + \frac{2}{16} \cdot \log_2 8 + \frac{1}{16} \cdot \log_2 16$$

$$= 2{,}12661\ b$$

$$R = L - H = 2{,}1875 - 2{,}12661 = \underline{0{,}06089}$$