dec 4 ea

ZH Megoldások

(1)

$$\underset{3\times 5}{\overline{\overline{G}}} = \begin{pmatrix} 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 1 & 1 \end{pmatrix} \qquad C(5,3)$$

Nem Hamming kód, $n+1 = 2^{n-k}$ nem teljesül

d_{min}

	$\overline{u}$	$\overline{c}$
kódszavak:	000	00000
	001	00111
	010	01010
	011	01101
	100	10001
	101	10110
	110	11011
	111	11100

$d_{min} = w_{min} = 2$

hibacsoport: $E_s = \left\{ \overline{e} : \overline{\overline{H}} \cdot \overline{e}^T = \overline{s}^T \right\}$ $\qquad \overline{e}, \overline{e}' \in E_s$

$\overline{e} + \overline{c}' = \overline{c}$

Egy hibacsoportban 8 db elem van

$\overline{s}(11) \rightarrow E_s = ?$

$$\overline{\overline{H}}_{2\times 5} \begin{pmatrix} 0 & 1 & 1 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} \\ ? \\ \\ \end{pmatrix} = (1\ 1)$$

ezt fogjuk detektálni

egy mo: $\begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \\ 0 \end{pmatrix}$

$E_s = \{(00100), (00011), (01110), (01001), (10101), (10001), (11111), (11000)\}$

③

$x_1 \to p_1 = 0,444\ldots$ 0,444 0,444 1

$x_2 \to p_2 = 0,444\ldots$ 0,444 0,555 0

$x_3 \to p_3 = 0,055\ldots$ 0,111

$x_4 \to p_4 = 0,055\ldots$

$$H(X) = \sum_{x} p(x)\, ld \frac{1}{p(x)} = \underline{\underline{1,50323}}$$

Huffman kód:

$x_4 \to 000$

$x_3 \to 001$

$x_2 \to 01$

$x_1 \to 1$

$$L^{H} = 0,11 \cdot 3 + 2 \cdot 0,44 + 1 \cdot 0,44 =$$

$$= \underline{\underline{1,666}}$$

SF kód:

$$L^{SF} = p_1 \left\lceil ld \frac{1}{p_1} \right\rceil + p_2 \left\lceil ld \frac{1}{p_2} \right\rceil + p_3 \left\lceil ld \frac{1}{p_3} \right\rceil + p_4 \left\lceil ld \frac{1}{p_4} \right\rceil$$

$$= \underline{\underline{2,33}}$$

$$H(X) \leq \lambda^{(k)} \leq H(X) + \frac{1}{K}$$

$$\frac{1}{K} = 0,1 \cdot H(X)$$

$$K = \left\lceil \frac{1}{0,015} \right\rceil = \underline{\underline{67}}$$

kódtábla mérete $= 4^{67}$

④ LZ77 tömörítés

szótár alapú (rövidebb, mint ZH-n)

0100010100101000

Parsing:

1\. 2. 3. 4. 5. 6. 7. ← pointerek

0,1,00,01,010,0101,000

001 010 011 100 101 110 111

(000,0)(000,1)(001,0)(001,1)(100,0)(101,1)(011,0)

⑤ $4 * \alpha$, $\alpha, 4 \in GF(8)$

y

$$\alpha = a_0 + a_1 y + a_2 y^2 = \overset{1}{a_2} y^2 + \overset{0}{a_1} y + \overset{0}{a_0}$$

$$y^2(a_0 + a_1 y + a_2 y^2) = a_0 y^2 + a_1 y^3 + a_2 y^4 = a_0 y^2 + a_1(y+1) +$$

$$+ a_2(y^2+y) =$$

$$= a_0 y^2 + a_1 y + a_1 + a_2 y^2 + a_2 y =$$

$$= a_1 + (a_1 + a_2) y + (a_2 + a_0) y^2$$