Laborator PS ALGORITMI DE COMPRESIE Algoritmul Huffman neadaptiv - exemplu

Prof. dr. ing. Dan STEFANOIU

As. Ing. Alexandru DUMITRASCU

Constructia arborelui binar

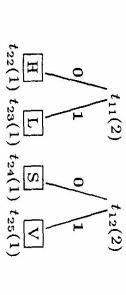
Setul de date D: IT IS BETTER LATER THAN NEVER. => N = 13 elem., nr. noduri=25, k=12

Nod	t ₁₃	t ₁₄	t ₁₅	t ₁₆	t ₁₇	t ₁₈	t ₁₉	t ₂₀	t ₂₁	t ₂₂	t ₂₃	t ₂₄	t ₂₅
A^0		E	Т	R	A	I	N		В	Н	L	S	V
N(s)	5	5	5	3	2	2	2	1	1	1	1	1	1

$$k = 1$$

$$0 / \begin{cases} t_{12}(2) \\ 1 \\ S & V \\ t_{24}(1) & t_{25}(1) \end{cases}$$

Ī	Nod	t ₁₃	t_{14}	t_{15}	t_{16}	t_{17}	t_{18}	t_{19}	t_{20}	t_{21}	t_{22}	t_{23}	t ₁₂
	$\mathcal{A}^{0,12}$	Ē	E	Т	R	A	I	N	•	В	Н	L_	
	$\mathcal{N}(s)$	5	5	5	3	2	2	2	1	1	1	1	2
1	. ,			ļ								<u> </u>	



$\mathcal{N}(s)$	$\mathcal{A}^{0,11}$	Nod t ₁₃ t ₁₄ t ₁₅ t ₁₆ t ₁₇ t ₁₈ t ₁₉ t ₂₀ t ₂₁
٥٦	ב	t_{13}
51	E	t14
5	T	t_{15}
3	R	t_{16}
2	Α	t17
2	I	t_{18}
2	Z	t ₁₉
1		t_{20}
1	В	I II
N		t ₁₁

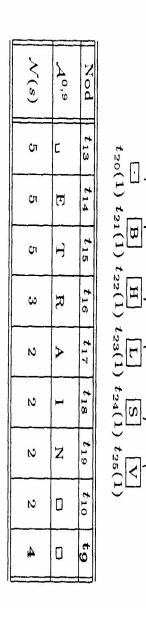
 t_{12}

2

k=3

$\mathcal{N}(s)$	A0.10	Nod	
57	С	t13	
IJ	E	114	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
5	T	t_{15}	$t_{10}(2)$ $t_{10}(2)$ $t_{21}(1)$
3	R	t_{16})
2	A	t17	0 11
2	I	t_{18}	$t_{11}(2)$ 1 1 $t_{23}(1) t_{23}$
2	Z	t_{19}	0 0
2	۵	t10	$t_{12}(2)$ $t_{12}(1)$ $t_{25}(1)$
2	٥	t_{11}	
2	۵	t_{12}	

k = 5



 $t_{11}(2)$

 $t_{12}(2)$

 $t_{9}(4)$

$\mathcal{N}(s)$	$\mathcal{A}^{\mathrm{o,8}}$	Nod	t 19
51	C	t_{13}	$0 / 1 \\ 1 \\ t_{19}(2) \\ 0 / 1 \\ t_{19}(1) \\ t_{20}(1) \\ t$
5	E	t_{14}	(4) (t ₁₀ (2) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1
5	${f T}$	t_{15}	0 $\frac{1}{1}$ $\frac{1}{t_{22}}$
3	R	t_{16}	0 $(1) t_2$
2	A	t_{17}	0 t ₁₁ (2) 1 L ₂₃ (1) t
2	I	t_{18}	1 1 1 1 1 24(1)
4		t8	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
4	0	t_9	

 $t_{9}(4)$

			0 t 17(2)	X	4	Z	
$\mathcal{N}(s)$	A0.6	Nod	1 (1)	$\mathcal{N}(s)$	A0,7	Nod	
<u>್</u>	6		1	ū	c	t_{13}	~
Ċī	c	t13		57	F	t14	20(1
۲	E	t14	$t_8(4)$ $t_{10}(2)$ $t_{10}(2)$ $t_{10}(2)$ $t_{10}(2)$ $t_{10}(2)$ $t_{20}(1)$ $t_{21}(1)$			┼╌╢) t_{21}
	H	t15		57	T	t_{15}	
		4-	$0 / t_{22}(1)$	ω	R	t16	$t_{22}($
4,		<i>t</i> ₇		ļ	_		1) t
4	۵	t8	0 1 1 1 1 1 1 1 23(1)	4		t7	L 23(1
7	0	t6	22 10	4	0	t_8	.) t_{2}
	 			4		<i>t</i> 9	4(1)
			$t_{16}(3)$ $t_{12}(2)$ $t_{25}(1)$	I L			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

k=7

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

 $\mathcal{N}(s)$

ט כ

10

00

7

Nod Nod

 t_{13}

_ t₅

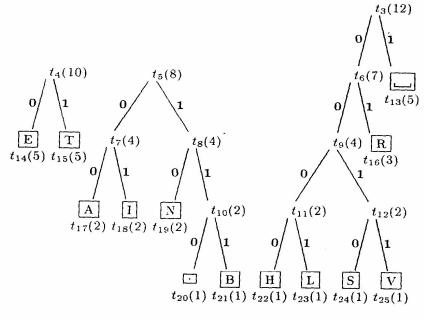
 t_6

$\mathcal{N}(s)$	$\mathcal{A}^{0,5}$	Nod
نا	С	t_{13}
υī	Ħ	t_{14}
υı	T	t_{15}
8		t5
7		t_6

k = 8

$0 / 1 \\ t_{7}(4) \qquad t_{8}(4) \\ 0 / 1 \qquad 0 / 1 \\ A \qquad II \qquad N \qquad t_{10}(2) \\ 17(2) \ t_{18}(2) \ t_{19}(2) \qquad 0 / 1 \\ \vdots \qquad B \qquad \vdots \\ t_{20}(1) \ t_{21}(1) \ t_{2}$	$t_{5}(8)$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$t_{6}(7)$

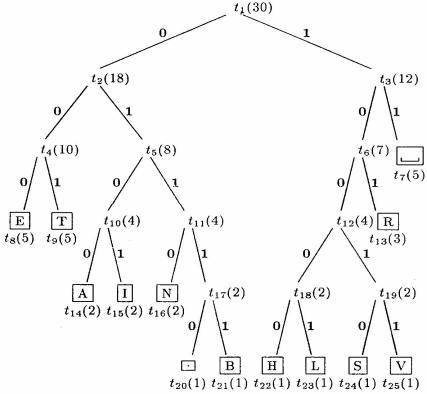




Nod	t4	t_5	t ₃	D
$\mathcal{A}^{0,3}$			0	
$\mathcal{N}(s)$	10	8	12	
(8)				1

Structura setului de date comprimate

 \mathcal{D} : $IT_{\cup}IS_{\cup}BETTER_{\cup}LATER_{\cup}THAN_{\cup}NEVER$.



Un arbore binar de tip HUFFMAN (alfabet static de ordin 0).



Informatia obtinuta pe fluxul de iesire este:

- ➤ Informatia auxiliara (identica cu cea de la alg. Shannon-Fano).
- > Informatia utila:

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Obs:

- ➤ Noile coduri ale simbolilor nu depasesc 5 biti in lungime.
- > Codurile simbolilor difera de cele obtinute prin metoda Shannon-Fano.
- > Analiza performantelor este similara cu cea de la algoritmul Shannon-Fano.
- > Pentru seturi mai lungi de date, metoda Huffman ofera o compresie mai mare decat metoda Shannon-Fano.