Data Compression Tutorial

Sreenivas
Jayanth Yadhav
AM.EN.U4CSE17[illegible]

(1) Turbulent

"data" $2^3 = 8$

Max & Code attribs

$P(d) = 0.25$

$P(a) = 0.5 \rightarrow$ higher

$P(t) = 0.25$

d

a

t

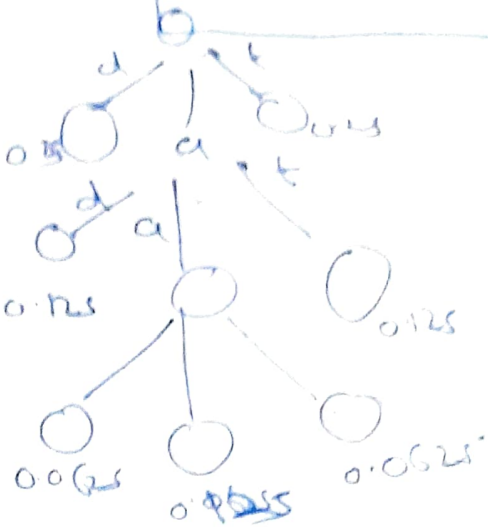
d

ad

aa

at

t



Code: d - 000, ad - 001, at : 0[illegible]

t : 011

aad - 110, aa[illegible] - 110

aat - 111

(2) $n = 25$, $m = 7$

$q = \lfloor \frac{25}{7} \rfloor = 3 \Rightarrow r = 25 - 21 = 4$

$n = qm + r$

$\Rightarrow 25 = 3 \times 7 + 4$

So we ~~got~~ have: $\underbrace{1110}_{q}$

Now, $m = 7$

$\lceil \log_2 7 \rceil = 3$

$\lfloor \log_2 7 \rfloor = 2$

$2^3 - 7 = 1 \rightarrow 2$ bit

$4 + 2^3 - 7 = 5 \rightarrow 3$ bit

Code	r
1110000	0
1110001	1
1110010	2
1110111	3
1110100	4

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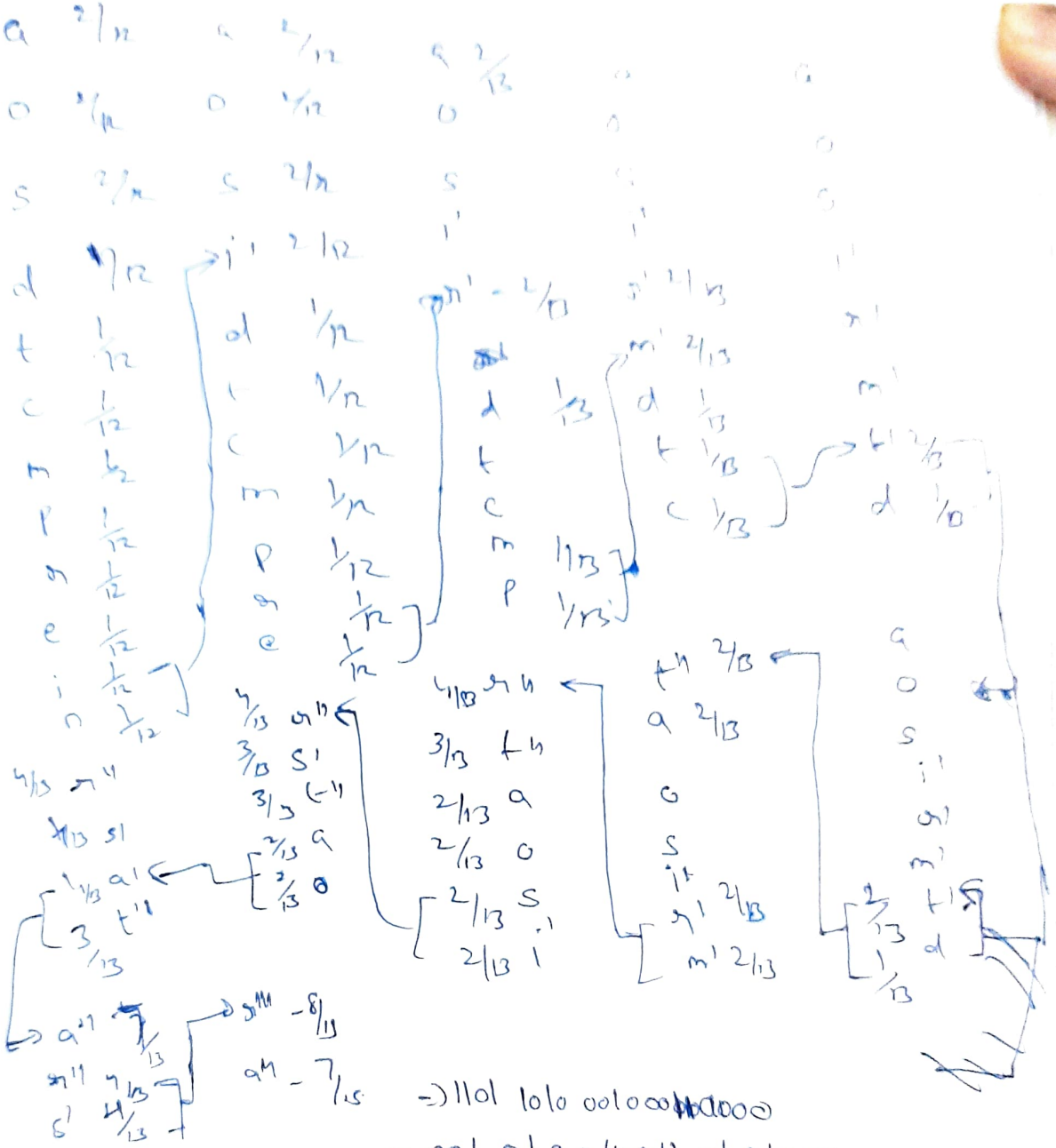
(3) ~~data~~ Huffman Coding

a	2/12	a	2/12	a	2/13	a		a			
o	2/12	o	2/12	o		o		o			
s	2/12	s	2/12	s		s		s			
d	1/12	i'	2/12	i'		i'		i'			
t	1/12	d	1/12	r'	2/13	s'	2/13	r'			
c	1/12	t	1/12	d	1/13	m'	2/13	m'			
m	1/12	c	1/12	t		d	1/13	t'	2/13		
p	1/12	m	1/12	c		t	1/13	d	1/13		
r	1/12	p	1/12	m	1/13	c	1/13				
e	1/12	r	1/12	p	1/13						
i	1/12	e	1/12								
n	1/12										



4/13	r''	4/13	r''	4/13	r''	t''	2/13	a			
4/13	s'	3/13	s'	3/13	t''	a	2/13	o			
1/13	a'	3/13	t''	2/13	a	o		s			
3/13	t''	2/13	a	2/13	o	s		i'			
		2/13	o	2/13	s	i'		r'			
				2/13	i'	r'	2/13	m'			
						m'	2/13				

a''	7/13	r'''	8/13								
r''	4/13	a''	7/13								
s'	4/13										

=> 1101 1010 0010001101000

0 001 0100100110101 0111

0110 0111 0101 0101 0111 0101 0101 0011 0001 0001 0001 0001

=> 1111 0011 0010 0

(b) Adaptive Huffman Coding

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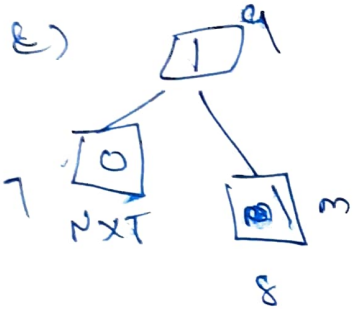
Str: "Malayalam"

$m = 2^e + r$ (let) , $0 \le r < 2^6$

$26 = 2^4 + 10$

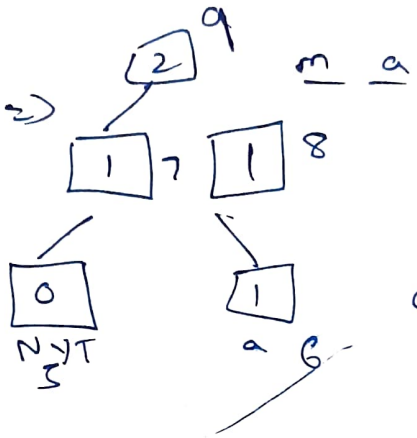
$e = 4$, $r = 10$

code : 01100



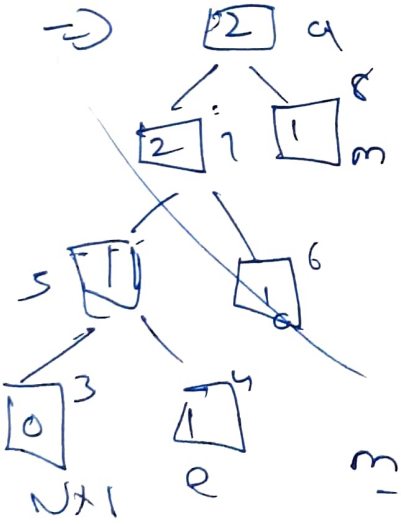
m

K=13

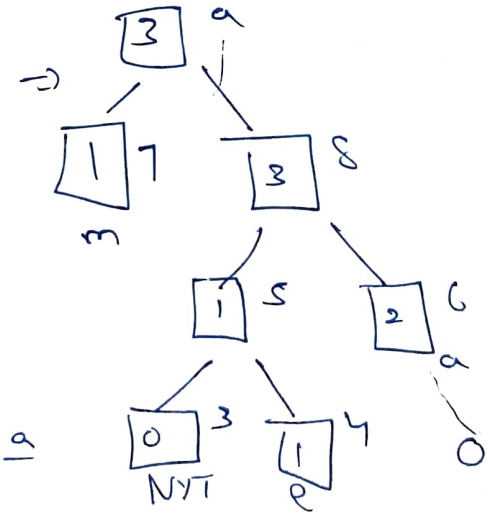


0 11 000 00000

m NY T



m a l a

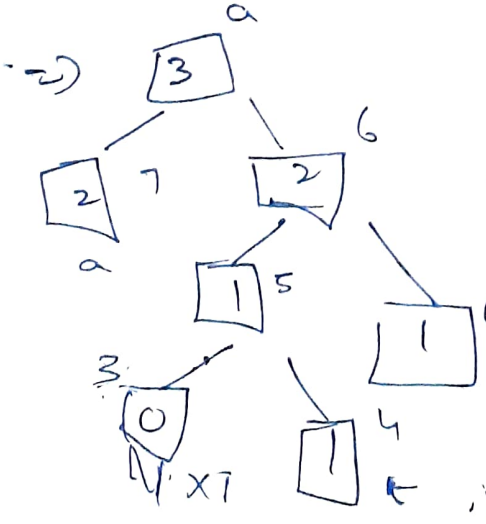


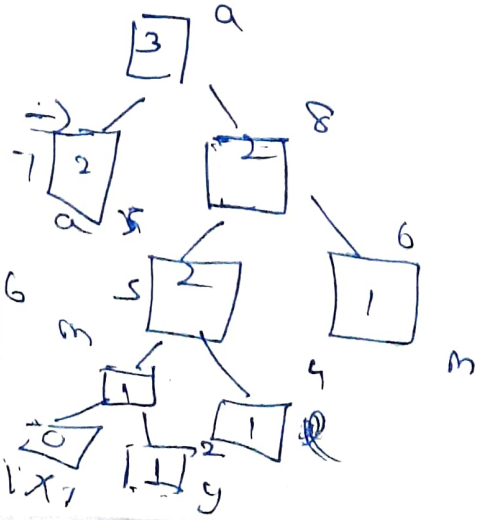
01100 0 00000 0

m a

010100 11

e a





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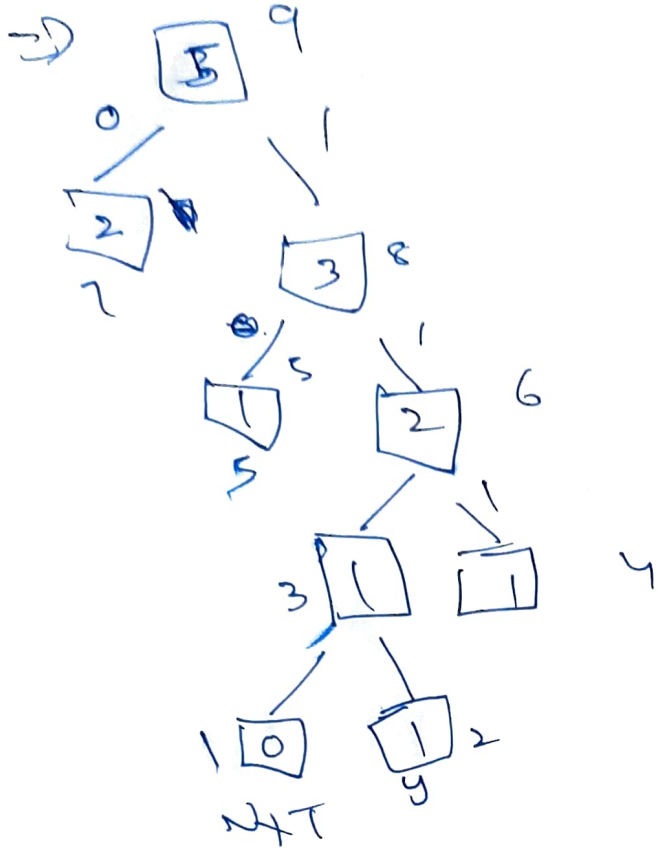
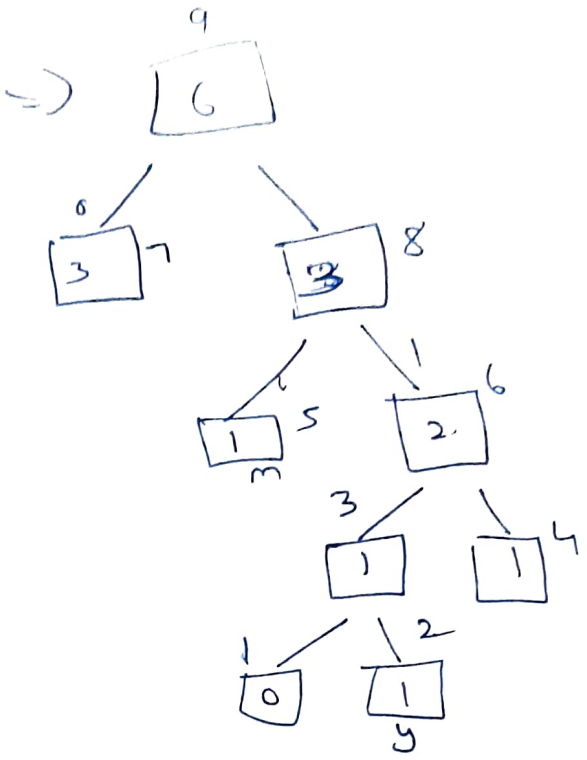
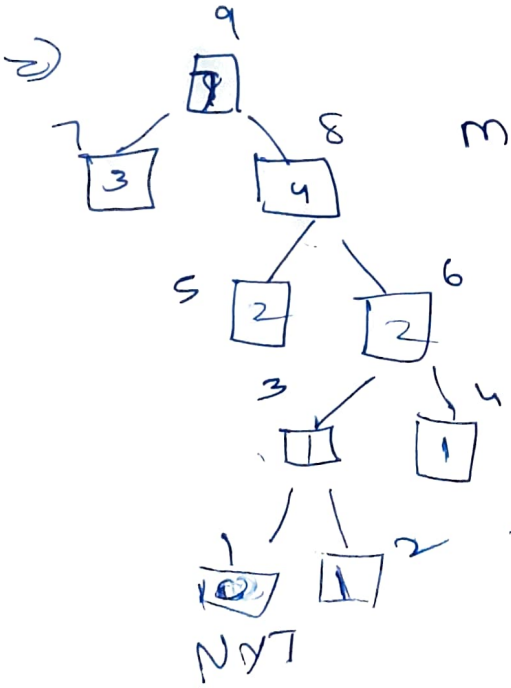
2) malay → 01100 0 00000 0 0101c 0 110 1110





malayr

01100 0 00000 0 0101c 0 110 111000



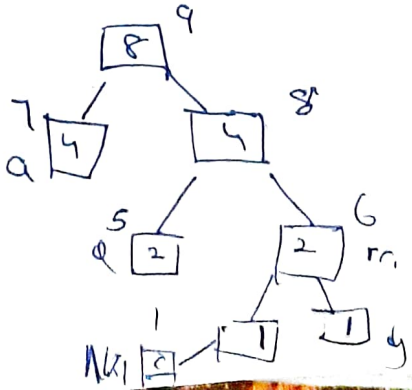
malayala

→ 01100 0 00000 0 01010 0 11. c

1110 0 0 0111.

→ ~~Prata~~

→ malayala a → 0

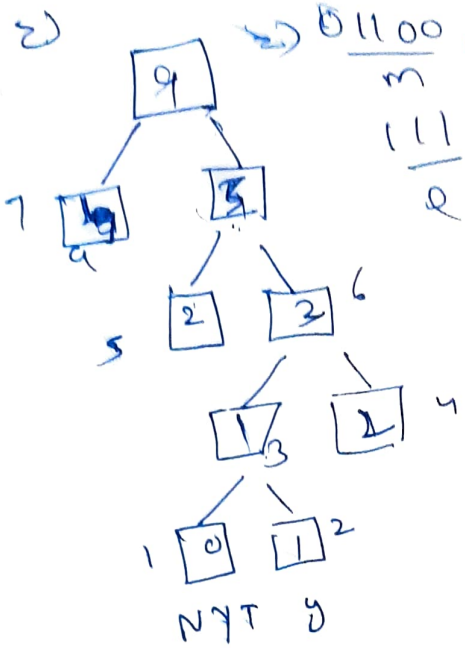


m a la ya la m.

⇒ m → 111

⇒ 01100 0 00000 0 01010 0 11 0 111 000
m a l a y a

111 000 111
l a m



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