Name-Vardhon Patil Date-30/01/23



Batch: 81 Roll No.: |60|042/079 Experiment / sesignment / tuborial No. 2 Grade: AA/AB/BB/BC/CC/CD/DD

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	ITC Jutorial 2	
Q.1	Errode the message "CAFFEINE"	using Shamor- Fano
Q.2	Compress the message "HEARTBEAT" u	soing 1) haffmaan encoding 2) Shannon Jano coding
	Calculate and compare the code efficient	viency in both cases
@3	Define Kraltis inequality theorem	Charle mather 1631
5387	Define Kraftis inequality theorem. satisfying in question 1 and 2	01200 3000 1000
0.1		
2-1	mi Pni word-"CAFFEINE"	
	New PCc) = 1	or will write
	8	
	PCA)=1	32-0
	•	32-0 3
	P CF) = 1	2010 6
	0/6/5	3410 4
	PCE)= 4	in I
	P(1)=1 8	
	8	
	P(N)=1	
	. 8	
	9	



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W	Pni	6011	col2	col3	code	Length
				34 /11	Link	
E	0.25	0	0		00	2
F	0.25	0	1		01	2
A	0125	- 1	0	0	100	3
6.	0.125	- 1	0	1	101	3
N	0.125	1	- 1	0	110	3
1	0.125	1	I .	ı	111	3
		Tall Local		District	- 4	100000
				- 0		-11
T= P)				0.0	The same	9 1
=	0.25X2+	0.25X2 .	+ 0.125 X3	+ 0.125)	3 + 0.12	5X3
	+ 0.125X3				11.00	3
		6				1/
	0.5+0.5	5+1.5		4	- 21.0	- N-
I	= 2.5 bits	1 symbol	4			
	The second second				2007.5	J
-		ALLYN	Para 120		+ 439-24-3	
H(n)	= 0.25 log	(4) + 0	0.25 log 4 +	0.125	Llog(L)) X4
					0125	
	H CH) = 1	x25	West	Mary 18	HE - I	
	1 2 7	2.5 bits sy	mbol		_	
				1200	4 2 - 1	
			1	4 1 1 1	174	
1	= HCS)	2	A STATE	Trans.	100	
Se II	一工	ALEXI		4260		
	= 2.5	1. 1.		300	155	
	25	Holly	100	4-23		
1	1 - 1			Are a	1	
	n.1 = 100					
		ney is 100				

0.2	b)u.o	Ld." UEA	PTOFAT	- By metho	d cheso	m Jane 1	odiso.		
			KIBEAL .	- By meens	E Shave	or 1 me	and a		
	P	CH) = 1	10	(R) = 1					
		9		9					
-	P	$(E) = \frac{2}{3}$	P	(B)=1 9	11.11				
-				2.11		14"			
-	P	(A) = 2	P	CT) = $\frac{2}{9}$		40(0)			
		0				10	1 11		
	A	Pn;	coli	0012	1013		codeword length		
	E	0.22	0	0	0	00	2		
	T	0.22	1	0	0	100	3		
	В	0.11		0	1	101	3		
	н	0.11	1		0	110	3		
	R	0.11	i			111	3		
		11.000			Name of Street				
	L	PXn							
	100	and the same of th	0.22X2+	0.22×3+	0-11×3+	0-11X3 + c	2-11X3		
	Ball		C 1882	0.66 + 0.3					
		BEITE !							
		T = 2.5	3 ~ 2.55		1 3 6	X2 = 0	18		
				hida	eta Milita	No.			
	Н	= 4 Px	log (I	1					
		L=1	Pu	1)					
		0:22-100	(L) +	n.22 la	0/1 \	+ 0.44	100 11 -		
		,	022	0122 00	(022)	4 0.11	022		
		$\frac{0.22 \log (\bot) + 0.22 \log (\bot) + 0.22 \log (\bot)}{+ 0.11 \log (\bot) + 0.11 \log (\bot) + 0.11 \log (\bot)}$							
		1 0.11	1 (o.1	1) + 0.11	erg (0.	11) + 0.1	169 (1)		
-			= 2 . 4						

Sometyar TRUST	Batch: Roll 5 Experiment / assignme Grade: AA/ AB / BB / B Signature of the Facul	est / tutorial No.
n a H		
V = H	0.78	26.5
n = 2.43		
255	1000	4 171
	1474	Fr.
= 0.976	44	7
	100	4 1
7 1. = 97.6% efficiency	Helk	10.00

		ar encoding		
n	Pry	code	codeword length	
E	0.22			
A	0.22			
Т	0.12			
В	0:11		The second second	
Н	0.11			
R	041			
κi	Pri		V 4 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4	N N
E	0.22 01	→ 0:22° C		50
A	0.2210	-> 0.210 0	0.3300	441
T	0.22 11	> 0.22-111 C	0 22	
В	0.11001	→ 0.22 T	22]	
н	0.11	- 0·11 J		
R	0.11	001	TENT LEAVE HELD	
	0001			
×i	Pruj	· coda	codewerd length	
E	0.22	01	1	
	0.22	10	2	
A	0.22	11	2	Al.
T	0.11	001	3	
В		0000	4	
Н	0.11	0001	4	7
R	0.11	0001		East
		ALEXAND UNIT		



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= 2.49

 $T = 0.22 \times 2 + 0.22 \times 2 + 0.22 \times 2 + 0.11 \times 3 + 0.11 \times 4$ 0.11×4 $0.44 \times 3 + 0.33 + 0.44 + 0.44$ 1.32 + 0.77 + 0.44

T = 2.53

 $1 = \frac{2.49}{2.53}$

0.384

1-1 - 98.41.

: The efficiency is 38.41.

K.J. Somaiya College of Engineering, Vidyavihar (E), Mumbai - 400 077.

Kraft!	a formula				
	o vegana	ty condition			
KARLL	la meatralih	is a society and sufficient			
in det	in to over	e existance of another code Curiquely			
dered	able endel	arms a remisel and li are no of			
bets	used to	represent a symbol for all i=1 ton			
	L= 2 2-1	461			
	li = coc	deword length			
4	4 6 L				
for i	al - Question	(1)			
24:	PM	codemord length			
1000	State of the state	9 - 1 - 1			
12810		2			
A		3			
C	0.125	3 100 - 1			
N	0.125	3			
1	0.125	3			
	n	E A F			
fo	unula = 2	2-451			
	1	+1 +1 +1 +1			
	27	12 22 23 23 23 23			
-	Vancous -	: 1+1+1+1+1			
		= 1+1+1+1+1 4 4 8 8 8 8			
-		=1+1			
= 1 +1					
=1					
		\ Ded			
	2.	2-4 = 1 conduction satisfied			
		ellows krafts irequality condition			
	: Q I F	onous krajus inequality condition			
	For A	## AL - Question **Xi			



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for	Q.2a)
100	of Tal

n;	Pni	co dervord	length
E	0.22	2	U
A	0.22	2_	
T	0.22	2	
B	0:11	3	
H	0.11	4	
R	0.11	4	

formula =
$$\frac{1}{2}$$
 $2^{-1i} \le 1$
 $i=1$

$$\frac{1}{2^2} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \frac{1}{2^4}$$

$$= \frac{3}{4} + \frac{1}{8} + \frac{1}{8}$$

$$= \frac{3}{4} + \frac{1}{4}$$

= |

: a.20) follows Kraft's inequality condition

for Q.26)

Ni	PNI	codemord Leigth
A	0.22	2.
Е	0 22	2
T	0.22	3
В	0.11	3
н	0.11	3
R	0.11	3

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

=1

:. Q.2 6) follows keafts inequality wordition