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CSE 620

9/19/2024

3. Decode the following binary code

01001111	01101110	01100011	
upper x	lower x x	lower x x x	
$2^3+2^2+2^1+2^0$	$2^3+2^2+2^1$	2^1+2^0	
$8+4+2+1=15$	$8+4+2=14$	$2+1=3$	
O	n	c	
01100101	00100000	01111001	
lower x x x x		lower x x x x	
2^2+2^0		$2^4+2^3+2^0$	
$4+1=5$		$16+8+1=25$	
e	space	y	
01101111	01110101	00100000	
lower x x x x	lower x x x x		
$2^3+2^2+2^1+2^0$	$2^4+2^2+2^0$		
$8+4+2+1=15$	$16+4+1=21$		
o	u	space	
01101000	01100001	01110110	
lower x x x x	lower x x x x	lower x x x x	
2^3	2^0	$2^4+2^2+2^1$	
8	1	$16+4+2=22$	
h	a	v	
01100101	00100000	01100001	
lower x x x x		lower x x x x	
2^2+2^0		2^0	
$4+1=5$		1	
e	blank	a	

Once you have a

	0 01000000	01010000	01101000
		upper 2^4 2^3 2^2 2^1 2^0 x x y y	lower 2^4 2^3 2^2 2^1 2^0 x x x x
		2^4	2^3
		16	8
	blank	P	h
PhD			
	01000100	00100000	01100101
	upper 2^4 2^3 2^2 2^1 2^0 x x x x		lower 2^4 2^3 2^2 2^1 2^0 x x x
	2^2		2^2+2^0
	4		4+1=5
	D	blank	e
	01110110	01100101	01110010
	lower 2^4 2^3 2^2 2^1 2^0 x x x	lower 2^4 2^3 2^2 2^1 2^0 x x x	lower 2^4 2^3 2^2 2^1 2^0 x x x
	$2^4+2^2+2^1$	2^2+2^0	2^4+2^1
	16+4+2=22	4+1=5	16+2=18
every	v	e	r
	01111001	00100000	01101101
	lower 2^4 2^3 2^2 2^1 2^0 x x		lower 2^4 2^3 2^2 2^1 2^0 x x x
	$2^4+2^3+2^0$		$2^3+2^2+2^0$
	16+8+1=25		8+4+1=13
	y	blank	m
	01100101	01100101	01110100
	lower 2^4 2^3 2^2 2^1 2^0 x x x x	lower 2^4 2^3 2^2 2^1 2^0 x x x	lower 2^4 2^3 2^2 2^1 2^0 x x x
	2^2+2^0	2^2+2^0	2^4+2^2
	4+1=5	4+1=5	16+4=20
	e	e	t

meeting

01101001	01101110	01100111
lower x x x	lower x x x	lower x x x
2^3+2^0	$2^3+2^2+2^1$	$2^2+2^1+2^0$
$8+1=9$	$8+4+2=14$	$4+2+1=7$
i	n	g
00100000	01100010	01100101
	lower x x x x	lower x x x
	2^1	2^2+2^0
	2	$4+1=5$
blank	b	e
01100011	01101111	01101101
lower x x x	lower x	lower x x x
2^1+2^0	$2^3+2^2+2^1+2^0$	$2^3+2^2+2^0$
$2+1=3$	$8+4+2+1=15$	$8+4+1=13$
c	o	m

becomes

01100101	01100011	00100000
lower x x x	lower x x	
2^2+2^0	$2^4+2^1+2^0$	
$4+1=5$	$16+2+1=19$	
e	s	blank
01100001	00100000	01100100
lower x x x x		lower x x x x
2^0		2^2
1		4
a	blank	d

a

doctors

01101111	01100011	01110100
lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X
$2^3+2^2+2^1+2^0$	2^1+2^0	2^4+2^2
$8+4+2+1=15$	$2+1=3$	$16+4=20$
o	c	t
01101111	~~01100001~~ 01100010	01100111
lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X
$2^3+2^2+2^1+2^0$	$2^4+2^1=16+2=18$	$2^4+2^1+2^0$
$8+4+2+1=15$	r	$16+2+1=19$
o		s
00100000	01100001	01100000
	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X X
	$2^0=1$	$2^4=16$
	a	p
01110000	01101111	01101001
lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X
$2^4=16$	$2^3+2^2+2^1+2^0=8+4+2+1=15$	$2^3+2^0=8+1=9$
p	o	i
01101110	01110100	01101101
lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X
$2^3+2^2+2^1=8+4+2=14$	$2^4+2^2=16+4=20$	$2^3+2^2+2^0=8+4+1=13$
n	t	m
01100101	01101110	01110100
lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X	lower $2^4\ 2^3\ 2^2\ 2^1\ 2^0$ X X X X
$2^2+2^1=4+1=5$	$2^3+2^2+2^1=8+4+2=14$	$2^4+2^2=16+4=20$
e	n	t

Once you have a PhD everything becomes a doctors appointment