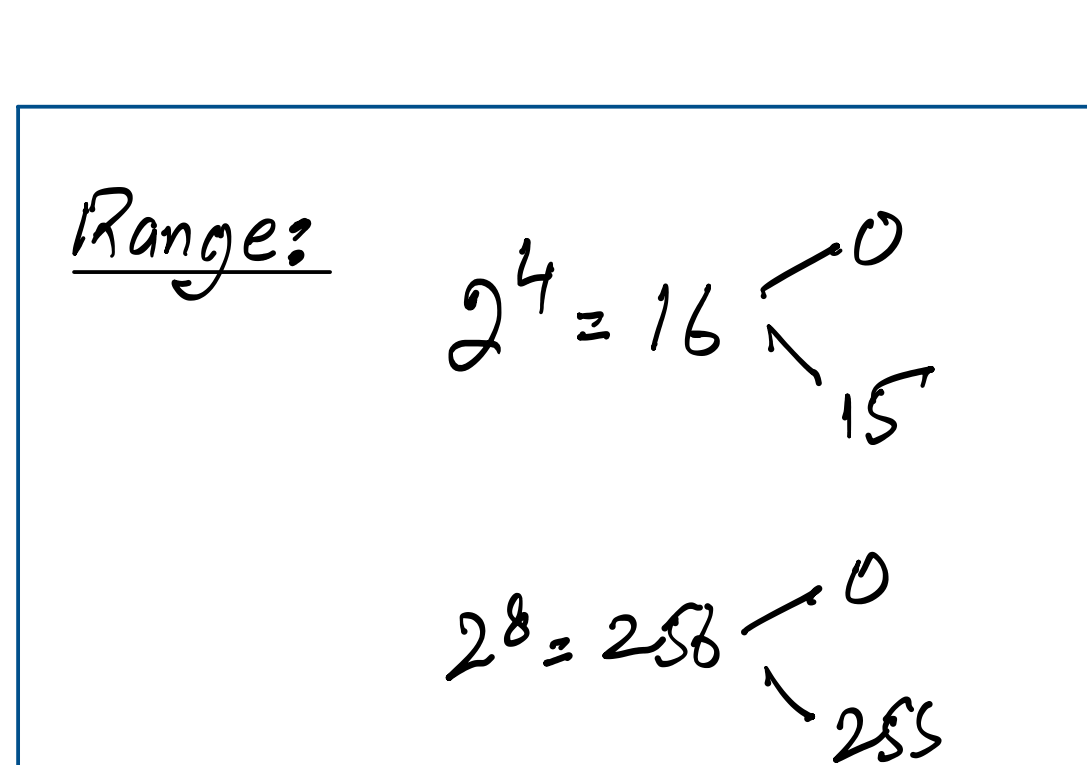


	msb most significant bit				lsb least significant bit				
Denary	128	64	32	16	8	4	2	1	0 = Even 1 = Odd
	8	4	2	1	8	4	2	1	Hex
100	0	1	1	0	0	1	0	0	64
200	1	1	0	0	1	0	0	0	C8
50	0	0	1	1	0	0	1	0	32
15	0	0	0	0	1	1	1	1	F 0F
20	0	0	0	1	0	1	0	0	14
31	0	0	0	1	1	1	1	1	1F
63	0	0	1	1	1	1	1	1	3F
127	0	1	1	1	1	1	1	1	7F
255	1	1	1	1	1	1	1	1	FF
169	1	0	1	0	1	0	0	1	A9
187	1	0	1	1	1	1	0	1	BD
95	0	1	0	1	1	1	1	1	5F
70	0	1	0	0	0	1	1	0	46



(Denary)
Hexa-Decimal
 $6 + 10 = 16$

0	A ¹⁰
1	B ¹¹
2	C ¹²
3	D ¹³
4	E ¹⁴
5	F ¹⁵
6	
7	
8	
9	

Q. How many minimum bits are required to store (F) = (15)?
A. 4 bits.
 $(1111)_2 = (15)_{10}$

0	10	20
1	11	21
2	12	22
3	13	
4	14 ✓	
5	15	
6	16	
7	17	
8	18	
9	19	
A	1A	
B	1B	
C	1C	
D	1D	
E	1E	
F	1F	

Count never changes; shape changes.

(14) ₁₀	=	14
(14) ₁₆	=	20
(64) ₁₆	=	100

	8	4	2	1	Den	Hex
0	0	0	0	0	0	0
1	0	0	0	1	1	1
2	0	0	1	0	2	2
3	0	0	1	1	3	3
4	0	1	0	0	4	4
5	0	1	0	1	5	5
6	0	1	1	0	6	6
7	0	1	1	1	7	7
8	1	0	0	0	8	8
9	1	0	0	1	9	9
10	1	0	1	0	10	A
11	1	0	1	1	11	B
12	1	1	0	0	12	C
13	1	1	0	1	13	D
14	1	1	1	0	14	E
15	1	1	1	1	15	F

0-9

Binary Coded Decimal: (BCD)

Every denary digit is converted to its 4-bits alternative.

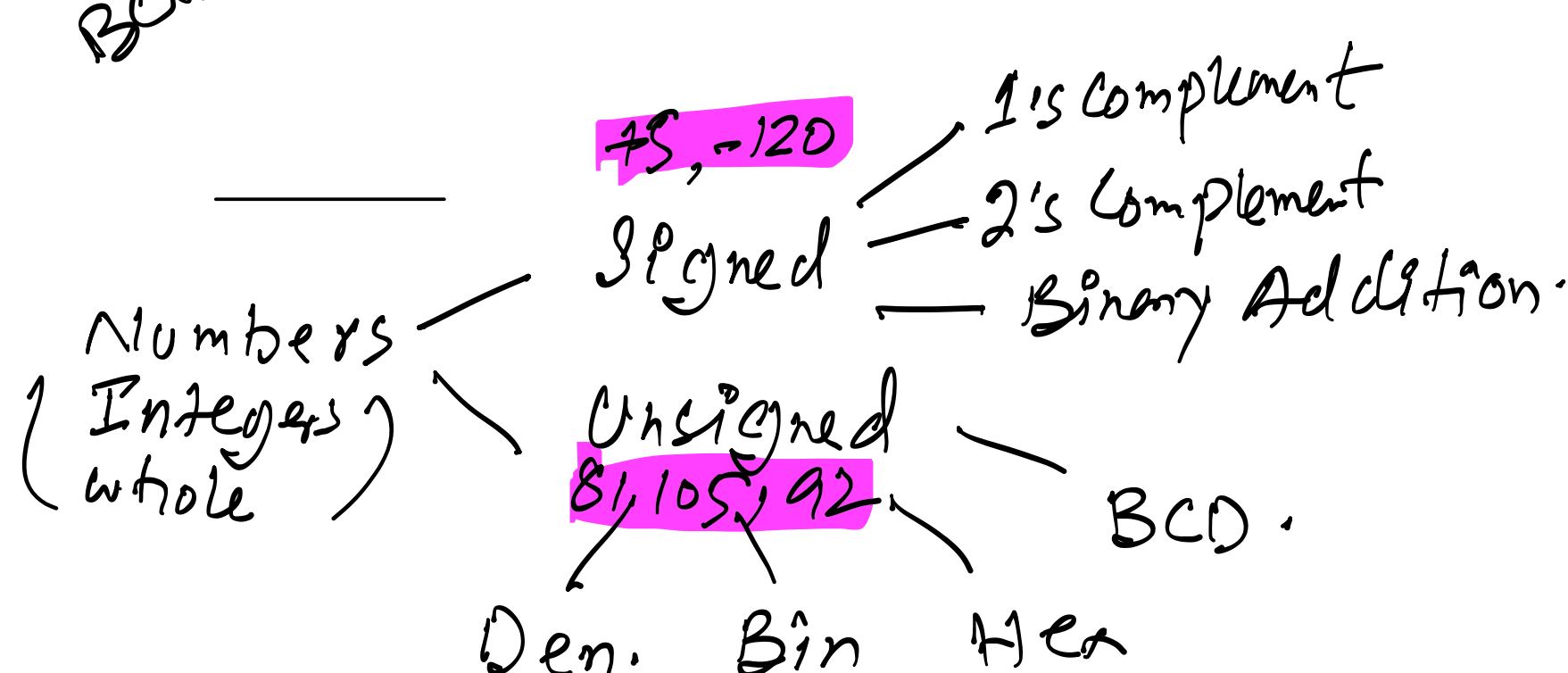
$$(29)_{10} = (00101001)_{BCD}$$

$$(158)_{10} = (0000000101011000)_{BCD}$$

Always complete the byte for BCD encoding.
Denary numbers made up of odd number of digits will always have a 0 (zero) in prefix.

$$(192)_{10} = (0000000110010010)_{BCD}$$

So, this number is not BCD.
(00111100)_{BCD} = 3 (12) ???



2's Complement:

-128	64	32	16	8	4	2	1
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-128 ——— +127
Range inclusive.

	64	32	16	8	4	2	1
+ve 0	0	0	0	0	1	0	1
-ve -1	1	1	1	1	0	1	0
+10	0	0	0	0	1	0	1
-10	1	1	1	1	0	1	0
+3	0	0	0	0	1	1	1
-3	1	1	1	1	0	1	1

01110111
 119 Bin
 77 hex
 77 bcd
 +119 2's

11111111
 255 bin
 FF hex
 Error bcd
 -1 2's