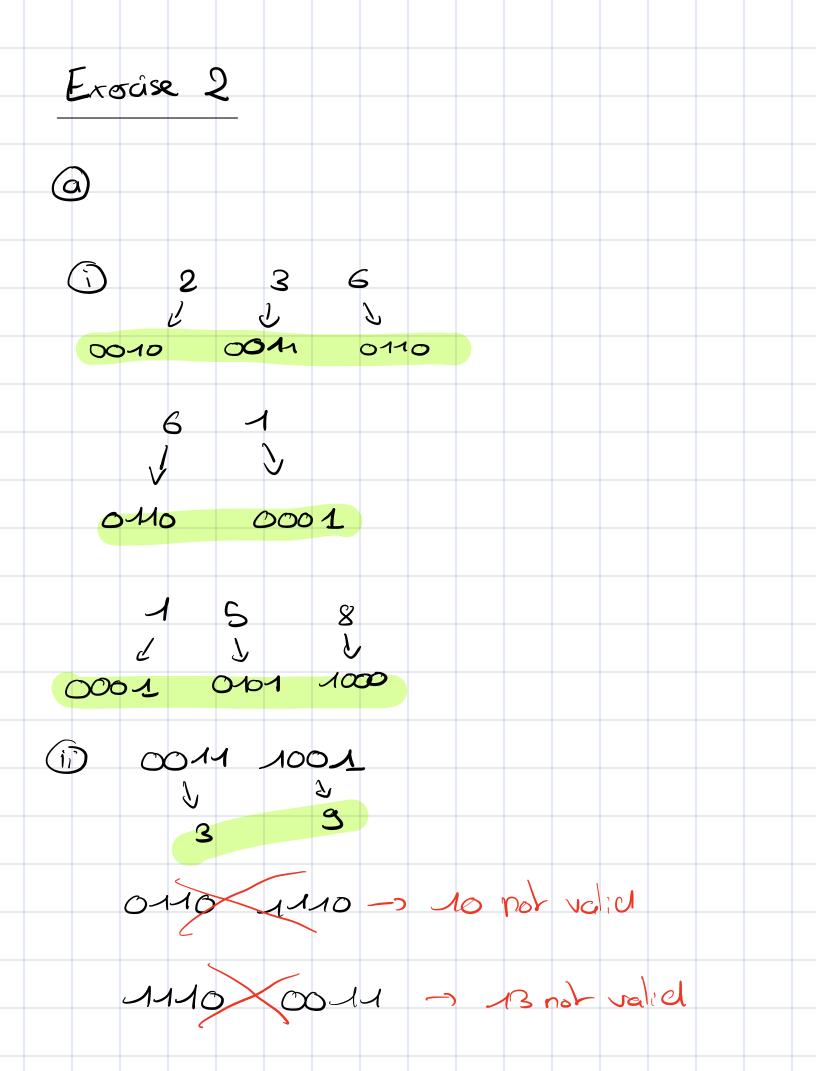
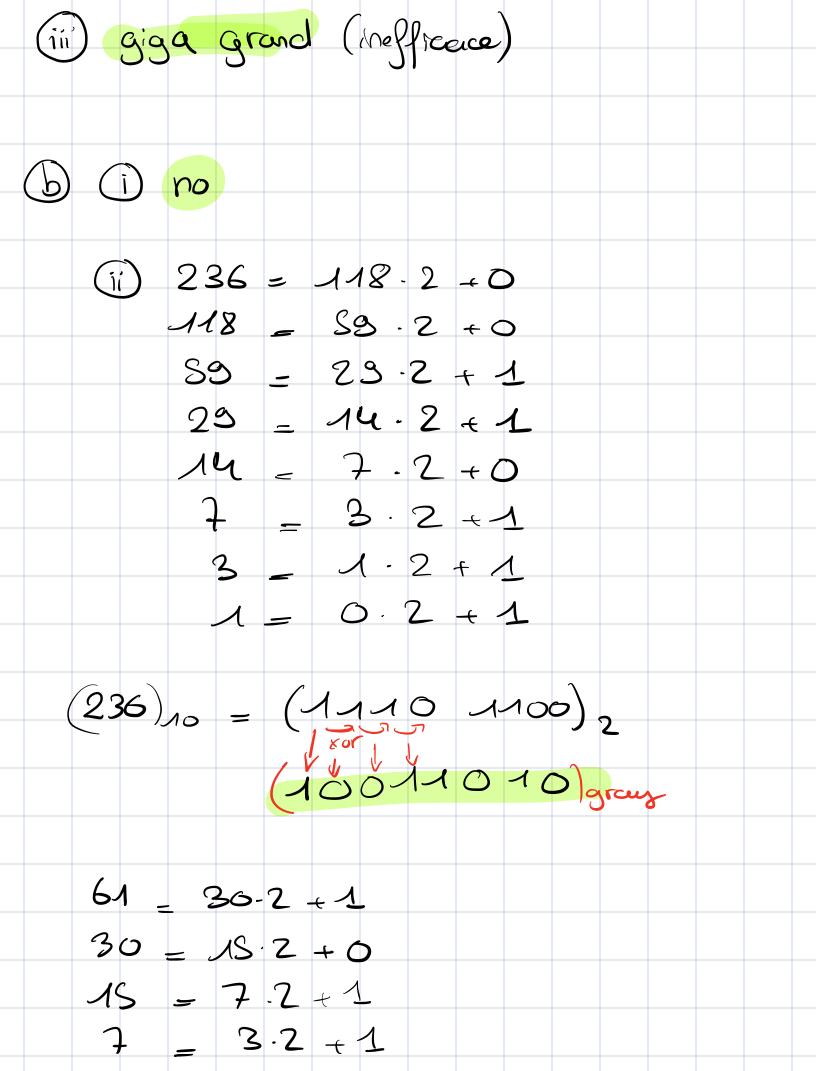


Decimal	Binary	Octal	Hexadecimal
139	100010-11	213	83
185	10111001	271	B9
S8	00111010	072	3A
201	011 ₀ 00 ₁ 1 ₀ 001	311	<u> </u>
S6	111000	70	38
211	auorpour	323	03
~ 2	00011011	33	1B
108	01/0/1100	154	6C

Table 1: Conversion between decimal, binary and hexadecimal formats.

23+24+23=8+16+32=56





$$3 = 1.2 + 1$$

$$1 = 0.2 + 1$$

$$(0)(0011101)_{2} = (61)_{2}$$

$$(0010001)_{3ray}$$

$$188 = 73.2 + 0$$

$$79 = 32.2 + 1$$

$$39 = 13.2 + 1$$

$$19 = 9.2 + 1$$

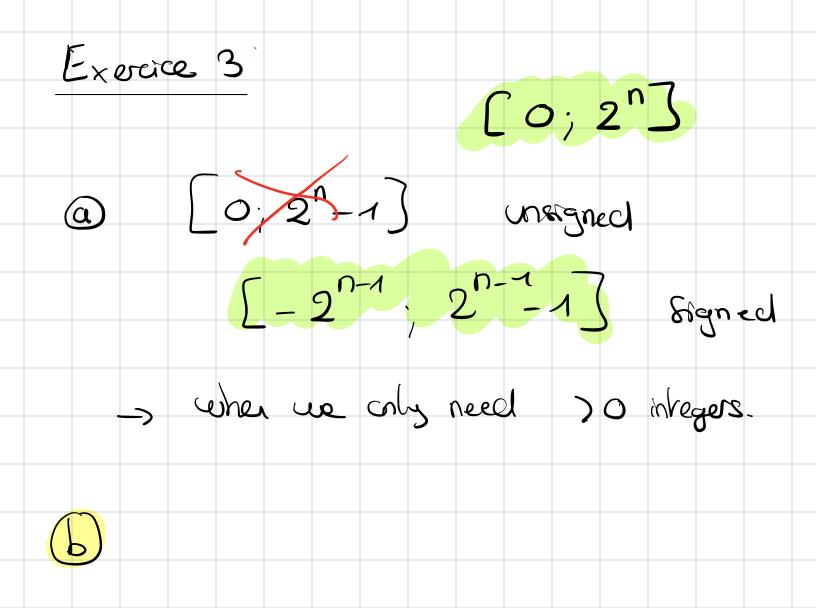
$$9 = 4.7 + 1$$

$$4 = 2.2 + 0$$

$$1 = 0.2 + 1$$

$$(1001110001)_{2} = (188)_{10}$$

$$(11010001)_{3ray}$$



Decimal	Sign-magnitude	Two's complement
-32	1010000	1110000
73	61001001	01001001
-98	01000010	10011110
47	0 0101111	0 0101111
-39	10100111	11011001
86	01010110	01010110

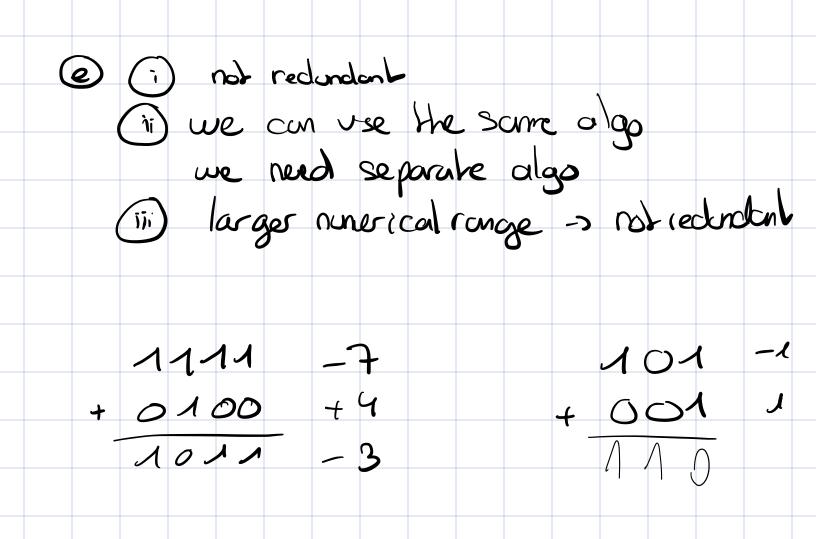
Table 2: Conversion of decimal numbers to signed binary formata

$$3 = 4.2 \times 1$$
 $4 = 2.2 \times 0$
 $2 = 1.2 \times 0$
 $1 = 0.2 \times 1$
 $1 = 0.2 \times 1$

d) Table 3 contains 4-bit binary numbers. Extend them to 8 bits and convert the 8-bit binary numbers to the different listed formats. -124 + 124 = -4

4-bit Sign-magnitude	8-bit Sign-magnitude	Hexadecimal	Decimal	8-bit Two's complement
0110	000000110	6	6	0000 0116
1100	10000100	?	- 4	1111 1011+
1111	10000111	?	-7	11111001
0001	0000001	1	1	0000 0001
4-bit Two's complement	8-bit Two's complement	Hexadecimal	Decimal	8-bit Sign-magnitude
1010	11111010	?	-8+2=-6	1000 0110
0101	0000 0101	3	S	0000 0101
1100	1111 1100	?	-4	2000 OOO
1000	1111 1000	?	-8	1000 1000

Table 3: Sign extension and conversion between different formats.

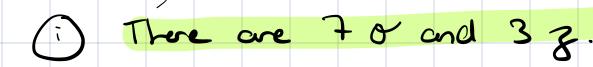


Exercise 5

A	HW(A)	В	HW(B)	HD(A, B)
01001010	3	1 10 1 1 1 10	6	3
00010100	2	01000000	1	3
01000010	2	01010101	4	4
11010110	S	10010000	2	3
10011111	6	01 01 00 10	3	5

Table 6: Table for hamming distance and hamming weight





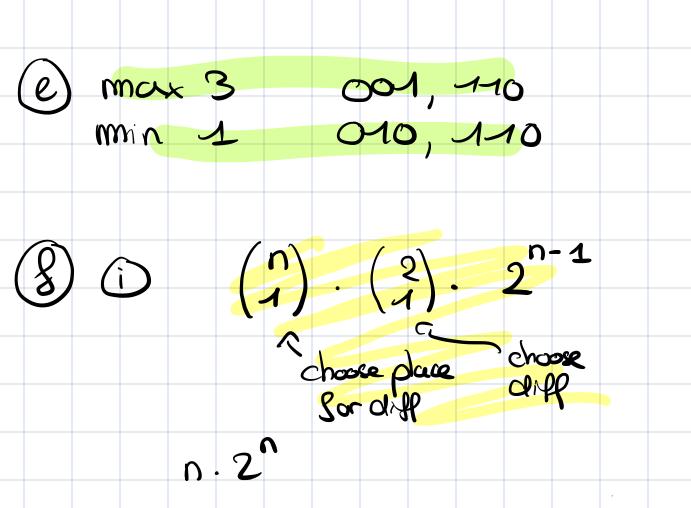
$$\begin{pmatrix} 10 \\ 7 \end{pmatrix} = 120.$$



max: 10 min 2



the hamming distance is 1



 $\frac{2^{n} \cdot 2^{n} - 2^{n}}{2^{n} \cdot 2^{n}}$ $\frac{2^{n} \cdot 2^{n} - 2^{n}}{2^{n} \cdot 2^{n}}$

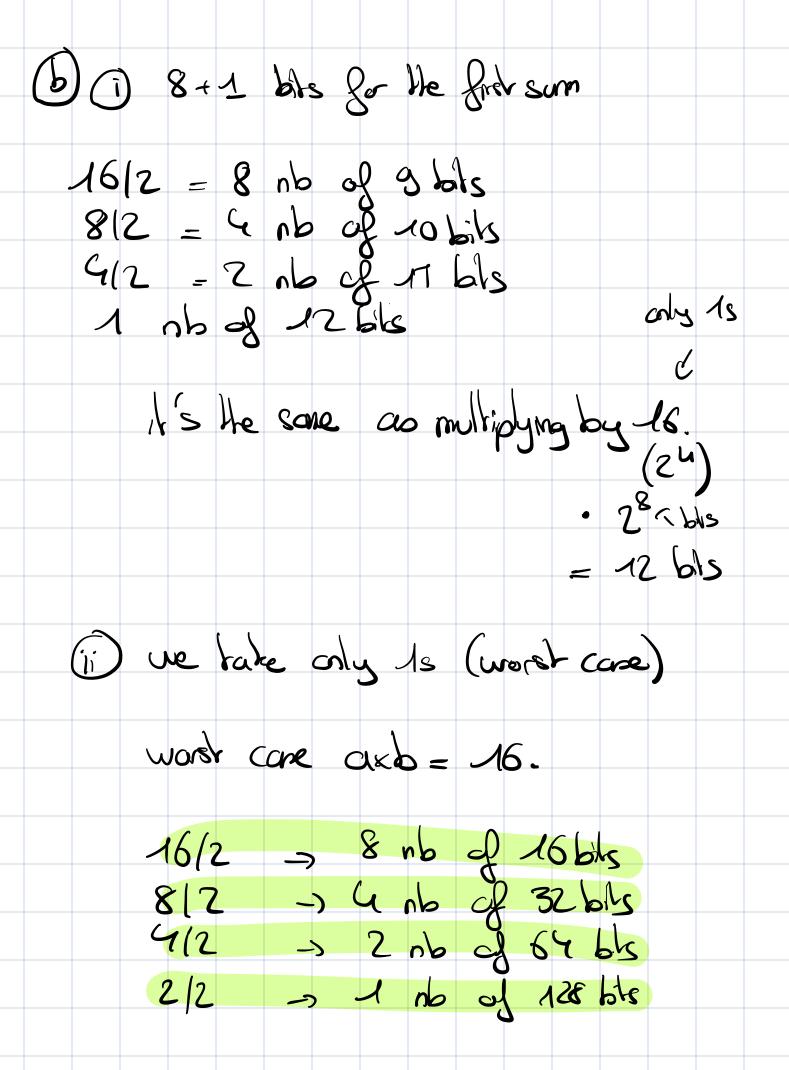
(i) 1...n => 0?

Exercise 4

	Unsigned									
Α	Bin(A)	A>>1	A>>3	A<<1	A<<3					
39 o c	1001M	000/00/1	000000	0100110	00141000					
192	10000C	01/10000	00011000	10000000	0000000					
75	01001011	00100101	NOONOGO	1001040	90N000					
	Sign	ed (two's	s comple	ment)						
96	01100000	CO-11 0000	80000	1100 0000	0000000					
-38	11011010	11101101	1111011	1011000	11010000					
49	N0001100	00011000	000040	01100010	10001000					
-106	100/01/0	1100011	moore	00/01/100	10110000					

Table 4: Binary Shift operations

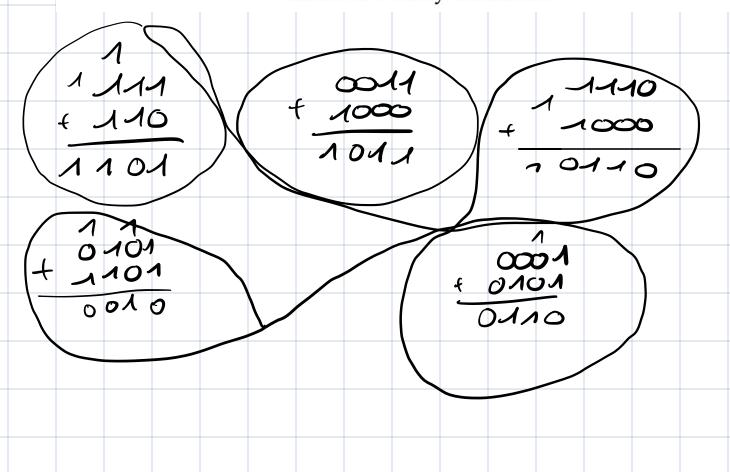
	1		/	0		1	3				260	20		
	7		1	a	1	0	1		-6	4+		- 36		
	4		0	ں ہ	0	0	ر 0			4+	20+1	2		
	16		0	0	1.	11		_	128	1 4 9	$Q - \ell$	S = -	106	
	32 64	1	<u>っ</u> ノ	ノ	1	ス _C ら C						· - ハ(_
_	128		0	٥		0								_
														_



Z

A	В	A+B	Bin(A)	Bin(B)	Bin(A)+Bin(B)
6	7	J3	110	111	1101
3	-8	-5	∞ 11	1000	1011
-2	-8	-10	1110	1000	Overflow
5	-3	2	0101	110-1	0040
1	5	6	0001	0101	0110

Table 5: Binary addition



(a)
$$(12)_{10} = (1100)_2$$

(b) $(12)_{10} = (0110)_2$

1100

Two's complement:

- · compute the first product
 · could the partient sum
- · cold on extra sign extension (1 or 0)

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		ろって	ada	! -	1 i	J	શ્ચની	8 0	ne (leve	b	
										' \$			