

Sistema de Numeração DECIMAL

Pro. Luciana

U.M.	C	D	U
4	3	2	1
↓	↓	↓	↓
	3	0	0
4	0	0	0

$$4000 + 300 + 20 + 1$$

Base do Sistema = 10 = DEZ

U.M.	C	D	U
1000	100	10	1
10^3	10^2	10^1	10^0
4	3	2	1

Notação Posicional

$$4 \cdot 10^3 + 3 \cdot 10^2 + 2 \cdot 10^1 + 1 \cdot 10^0 =$$

$$4 \cdot 1000 + 3 \cdot 100 + 2 \cdot 10 + 1 \cdot 1 =$$

$$4000 + 300 + 20 + 1 = \underline{4321}$$

$$\begin{array}{r} 10^2 \quad 10^1 \quad 10^0 \\ 105 \\ \downarrow \quad \downarrow \quad \downarrow \\ 1 \cdot 10^2 + 0 \cdot 10^1 + 5 \cdot 10^0 = \\ 1 \cdot 100 + 0 \cdot 10 + 5 \cdot 1 = \\ 100 + 0 + 5 = \\ \underline{105} \end{array}$$

Algarismos válidos:

0, 1, 2, 3, 4, 5, 6, 7, 8 e 9.

Dez \rightarrow 10
2 algarismos!

Sistema Binário

Base 2 (dois)

Algarismos válidos: 0 e 1

128	64	32	16	8	4	2	1
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
1	0	1	1	1	0	1	1

\rightarrow 4 dígitos binários

S	V	L	0	0
N	F	D	0	1

$$\begin{aligned} & \underline{1} \cdot 2^3 + 0 \cdot 2^2 + 0 \cdot 2^1 + \underline{1} \cdot 2^0 = \quad \underline{b.1} \\ & 1 \cdot 8 + 0 \cdot 4 + 0 \cdot 2 + 1 \cdot 1 = \\ & 8 + 0 + 0 + 1 = 9 = \text{nove} \end{aligned}$$

1 bit \rightarrow 0 binary digit
1

86 = LB

8 GB

$$4 \text{ bits} = 1 \text{ nibble}$$

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0000000000000000000000000000000000000000000000000000000000000000
0101010101010101010101010101010101010101010101010101010101010101
000000001111111111110000000000000011111111110000000110101010

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} Legível?



Como resolver?

$$2^4 = 16 = 16^1$$

Sistema Hexadecimal (Hexa)

Base 16

16 algarismos

Algarismos válidos:

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

A vale 10

F vale 15

10 vale 16

8 4 2 1
1 0 1 0

8 4 2 1
2³ 2² 2¹ 2⁰
1 1 1 1 = quinze

binário	hexa	decimal
0 0 0 0	0	0
0 0 0 1	1	1
0 0 1 0	2	2
⋮	⋮	⋮
1 0 1 0	A	10
⋮	⋮	⋮
1 1 1 1	F	15
1 0 0 0 0	10	16

— 11 —

No "papel" zero = 0

No "hardware" de 8 bits = 0000 0000

Físico
"e fixo"

— 11 —

10 = dois
dez
dezesseis !

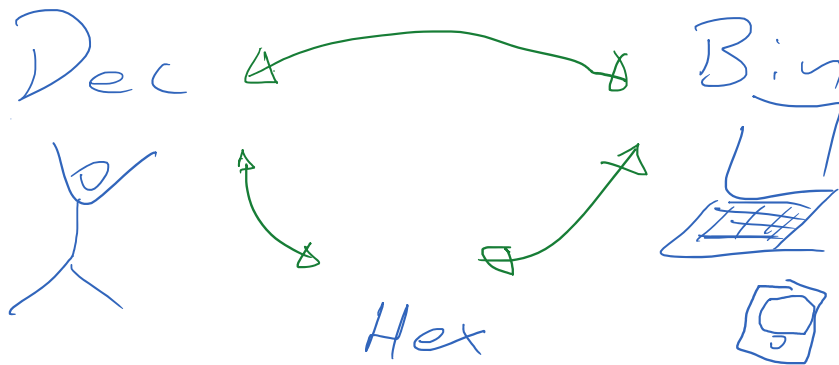
$10_2 = 10_{bin} = \text{dois}$

$10_{10} = 10_{dec} = \text{dez}$

$10_{16} = 10_{hex} = \text{dezesseis}$

É respeitar o idioma!

— 11 —



O hexa serve para
tornar o sistema binário
legível para humanos