



AULA – Representação da informática a nível de máquina

$$23457_{(10)} = 2 \cdot 10^4 + 3 \cdot 10^3 + 4 \cdot 10^2 + 5 \cdot 10^1 + 7 \cdot 10^0$$

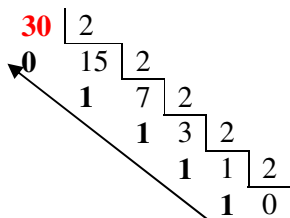
1bit = 0 ou 1 => menor componente físico

8bits = 1Byte => armazena um caracter

1 KiloByte	1024 Bytes	1×10^3 Bytes
1 MegaByte	1024 KBytes	1×10^6 Bytes
1 GigaByte	1024 MBytes	1×10^9 Bytes
1 TeraByte	1024 GBytes	1×10^{12} Bytes

Código ASCII – American Standard Code for Information Interchange

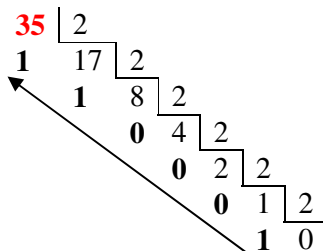
A = 65	01000001 41
B = 66	01000010 42
a = 97	01100001 61
b = 98	01100010 62
+ = 43	00101011 2B
espaço = 32	00100000 20



$$30_{(10)} = 11110_{(2)}$$

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

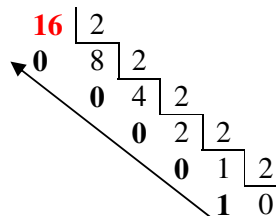
$$16 + 8 + 4 + 2 + 0 = 30$$



$$35_{(10)} = 100011_{(2)}$$

$$1 \cdot 2^5 + 0 \cdot 2^4 + 0 \cdot 2^3 + 0 \cdot 2^2 + 1 \cdot 2^1 + 1 \cdot 2^0$$

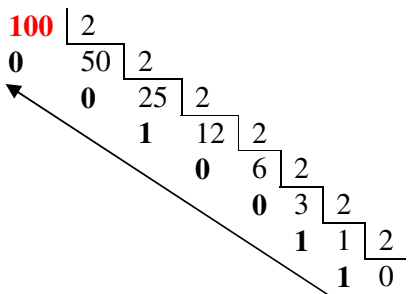
$$32 + 0 + 0 + 0 + 2 + 1 = 35$$



$$16_{(10)} = 10000_{(2)}$$

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

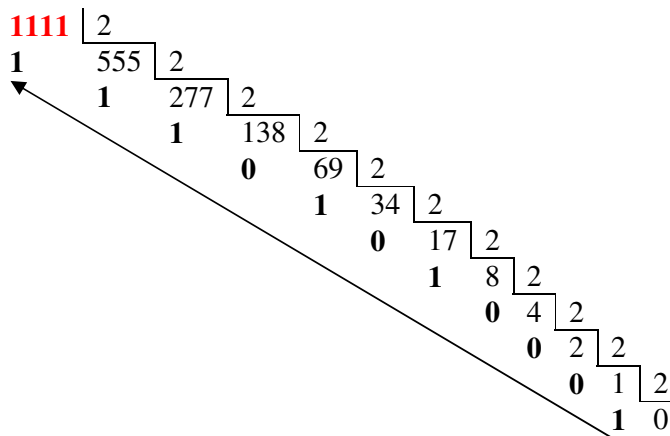
$$16 + 0 + 0 + 0 + 0 = 16$$



$$100_{(10)} = 1100100_{(2)}$$

$$1 \cdot 2^6 + 1 \cdot 2^5 + 0 \cdot 2^4 + 0 \cdot 2^3 + 1 \cdot 2^2 + 0 \cdot 2^1 + 0 \cdot 2^0$$

$$64 + 32 + 0 + 0 + 4 + 0 + 0 = 100$$

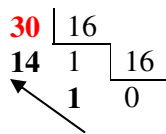


$$1111_{(10)} = 10001010111_{(2)}$$

$$1 \cdot 2^{10} + 0 \cdot 2^9 + 0 \cdot 2^8 + 0 \cdot 2^7 + 1 \cdot 2^6 + 0 \cdot 2^5 + 1 \cdot 2^4 + 0 \cdot 2^3 + 1 \cdot 2^2 + 1 \cdot 2^1 + 1 \cdot 2^0$$

$$1024 + 0 + 0 + 0 + 64 + 0 + 16 + 0 + 4 + 2 + 1 = 1111$$

DECIMAL	BINÁRIO	HEXA-DECIMAL
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

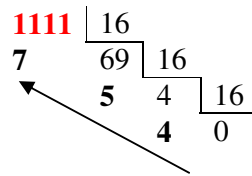


$$30_{(10)} = 1E_{(16)}$$

$$11110_{(2)} = \{0001\}\{1110\}^*$$

$$11110_{(2)} = 1E_{(16)}$$

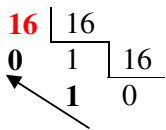
* Divide em grupos de 4;
 Completa os grupos com zeros a esquerda se precisar;
 Substitui os restos maiores que 9 por letras (tabela).



$$1111_{(10)} = 457_{(16)}$$

$$10001010111_{(2)} = \{0100\}\{0101\}\{0111\}$$

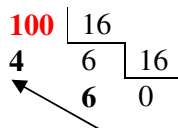
$$10001010111_{(2)} = 4 \quad 5 \quad 7_{(16)}$$



$$16_{(10)} = 10_{(16)}$$

$$11110_{(2)} = \{0001\}\{0000\}$$

$$10000_{(2)} = 10_{(16)}$$



$$100_{(10)} = 64_{(16)}$$

$$1100100_{(2)} = \{0110\}\{0100\}$$

$$1100100_{(2)} = 64_{(16)}$$

$$64_{(16)} = 6 \cdot 16^1 + 4 \cdot 16^0$$

$$96 + 4 = 100_{(10)}$$

Soma de binários

0 + 0 = 0
 1 + 0 = 1
 0 + 1 = 1
 1 + 1 = 0, com o transporte de 1 (vai 1)