UNIVERSIDADE FEDERAL DE UBERLÂNDIA
Faculdade de Computação - Prof. Anilton
Disciplinas: IB, IC1 e OPL

AULA – Representação da informática a nível de máquina (RAM)

Bit, Byte e Palavra

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

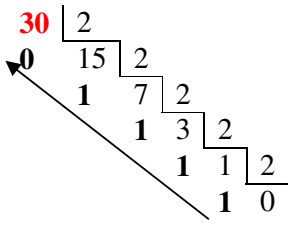
1bit = 0 ou 1 => menor componente físico

8bits = 1Byte => armazena um caracter

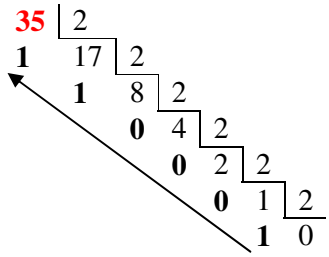
1 KiloByte	1024 Bytes	1x10^3 Bytes
1 MegaByte	1024 KBytes	1x10^6 Bytes
1 GigaByte	1024 MBytes	1x10^9 Bytes
1 TeraByte	1024 GBytes	1x10^{12} Bytes

Código ASCII – American Standard Code for Information Interchange

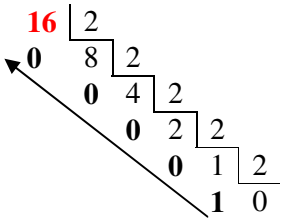
A = 65	01000001 41
B = 66	01000010 42
a = 97	01100001 61
b = 98	01100010 62
+ = 43	00101011 2B
espaço = 32	00100000 20



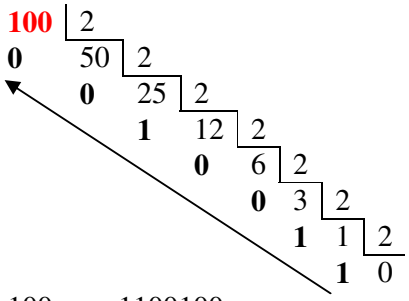
$30_{(10)} = 11110_{(2)}$
1*2^4+**1***2^3+**1***2^2+**1***2^1+**0***2^0
16 + 8 + 4 + 2 + 0 = 30



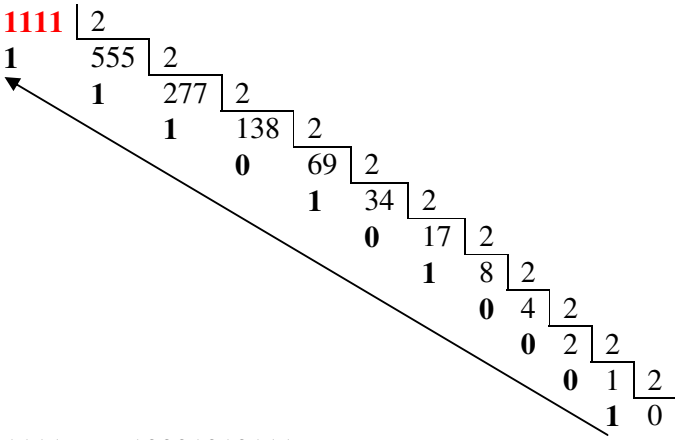
$35_{(10)} = 100011_{(2)}$
1*2^5+**0***2^4+**0***2^3+**0***2^2+**1***2^1+**1***2^0
32 + 0 + 0 + 0 + 2 + 1 = 35



$16_{(10)} = 10000_{(2)}$
1*2^4+**0***2^3+**0***2^2+**0***2^1+**0***2^0
16 + 0 + 0 + 0 + 0 = 16

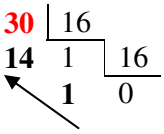


$100_{(10)} = 1100100_{(2)}$
1*2^6+**1***2^5+**0***2^4+**0***2^3+**1***2^2+**0***2^1+**0***2^0
64 + 32 + 0 + 0 + 4 + 0 + 0 = 100



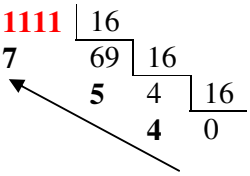
$1111_{(10)} = 10001010111_{(2)}$
1*2^{10}+**0***2^9+**0***2^8+**0***2^7+**1***2^6+**0***2^5+**1***2^4+**0***2^3+**1***2^2+**1***2^1+**1***2^0
1024 + 0 + 0 + 0 + 64 + 0 + 16 + 0 + 4 + 2 + 1 = 1111

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

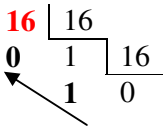


$30_{(10)} = 1E_{(16)}$
$11110_{(2)} = \{0001\}\{1110\}$*
1 **E**
$11110_{(2)} = 1E_{(16)}$

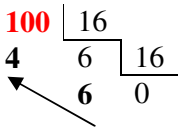
* Divide em grupos de 4;
Completa os grupos com zeros a esquerda se precisar;
Substitui os restos maiores que 9 por letras (tabela).



$1111_{(10)} = 457_{(16)}$
$10001010111_{(2)} = \{0100\}\{0101\}\{0111\}$
$10001010111_{(2)} =$ 4 5 $7_{(16)}$



$16_{(10)} = 10_{(16)}$
$11110_{(2)} = \{0001\}\{0000\}$
1 **0**
$10000_{(2)} = 10_{(16)}$



$100_{(10)} = 64_{(16)}$
$1100100_{(2)} = \{0110\}\{0100\}$
6 **4**
$1100100_{(2)} = 64_{(16)}$

$64_{(16)} = \mathbf{6}*16^1+\mathbf{4}*16^0$
$96 + 4 = 100_{(10)}$

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