UNIVERSIDADE FEDERAL DE UBERLÂNDIA
Faculdade de Computação
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AULA – Representação da informática a nível de máquina

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

1bit = 0 ou 1

8bits = 1Byte

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 | 2
0 15 | 2
1 7 | 2
1 3 | 2
1 1 | 2
1 0

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

35 | 2
1 17 | 2
1 8 | 2
0 4 | 2
0 2 | 2
0 1 | 2
1 0

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

16 | 2
0 8 | 2
0 4 | 2
0 2 | 2
0 1 | 2
1 0

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

100 | 2
0 50 | 2
0 25 | 2
1 12 | 2
0 6 | 2
0 3 | 2
1 1 | 2
1 0

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

1111 | 2
1 555 | 2
1 277 | 2
1 138 | 2
0 69 | 2
1 34 | 2
0 17 | 2
1 8 | 2
0 4 | 2
0 2 | 2
0 1 | 2
1 0

$1111_{(10)} = 10001010111_{(2)}$
$\mathbf{1}*2^{10}+\mathbf{0}*2^9+\mathbf{0}*2^8+\mathbf{0}*2^7+\mathbf{1}*2^6+\mathbf{0}*2^5+\mathbf{1}*2^4+\mathbf{0}*2^3+\mathbf{1}*2^2+\mathbf{1}*2^1+\mathbf{1}*2^0$
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 | 16
14 1 | 16
1 0

$30_{(10)} = 1E_{(16)}$
$11110_{(2)}$ = {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 | 16
7 69 | 16
5 4 | 16
4 0

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

16 | 16
0 1 | 16
1 0

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

100 | 16
4 6 | 16
6 0

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

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