Lista de Exercícios / Bases Numéricas

Ex1 - Para Decimal.

3) 60110_2

$1 \times 2^5 + 0 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$
$= 32 + 0 + 0 + 4 + 2 + 0 = 38_{10} //$

b) 011110_2

$0 \times 2^5 + 1 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$
$= 16 + 8 + 4 + 2 = 30_{10} //$

c) 111011_2

$1 \times 2^5 + 1 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$
$= 32 + 16 + 8 + 2 + 1 = 59_{10} //$

d) 1010000_2

$1 \times 2^6 + 0 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 0 \times 2^0$
$= 64 + 16 = 80_{10} //$

e) 11000101_2

$1 \times 2^7 + 1 \times 2^6 + 0 \times 2^5 + 0 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$
$= 128 + 64 + 4 + 1 = 197_{10} //$

tilibra

Ex2 $\underline{2}$ para binário

a) $66_{10} = 66 \underline{|2}$
$\qquad$ $0 \quad 33 \underline{|2}$
$\qquad$ $1 \quad 16 \underline{|2}$
$\qquad$ $0 \quad 8 \underline{|2}$
$\qquad$ $0 \quad 4 \underline{|2}$
$\qquad$ $0 \quad 2 \underline{|2}$
$\qquad$ $0 \quad 1 \quad = 1000010_{2} \uparrow$

b) $102_{10} = 102 \underline{|2}$
$\qquad$ $0 \quad 51 \underline{|2}$
$\qquad$ $1 \quad 25 \underline{|2}$
$\qquad$ $1 \quad 12 \underline{|2}$
$\qquad$ $0 \quad 6 \underline{|2}$
$\qquad$ $0 \quad 3 \underline{|2}$
$\qquad$ $1 \quad 1 = 1100110_{2} \uparrow$

c) $215_{10} = 215 \underline{|2}$
$\qquad$ $1 \quad 107 \underline{|2}$
$\qquad$ $1 \quad 53 \underline{|2}$
$\qquad$ $1 \quad 26 \underline{|2}$
$\qquad$ $0 \quad 13 \underline{|2}$
$\qquad$ $1 \quad 6 \underline{|2}$
$\qquad$ $0 \quad 3 \underline{|2}$
$\qquad$ $1 \quad 1 = 11010111_{2} \uparrow$

d) $404_{10} = 404 \underline{|2}$
$\qquad$ $0 \quad 202 \underline{|2}$
$\qquad$ $0 \quad 101 \underline{|2}$
$\qquad$ $1 \quad 50 \underline{|2}$
$\qquad$ $0 \quad 25 \underline{|2}$
$\qquad$ $1 \quad 12 \underline{|2}$
$\qquad$ $0 \quad 6 \underline{|2}$
$\qquad$ $0 \quad 3 \underline{|2}$
$\qquad$ $1 \quad 1 = 110010100_{2} \uparrow$

c) 808_{10}

$$
\begin{array}{ll}
808 & \lfloor 2 \\
0 \quad 404 & \lfloor 2 \\
\quad 0 \quad 202 & \lfloor 2 \\
\quad\quad 0 \quad 101 & \lfloor 2 \\
\quad\quad\quad 1 \quad 50 & \lfloor 2 \\
\quad\quad\quad\quad 0 \quad 25 & \lfloor 2 \\
\quad\quad\quad\quad\quad 1 \quad 12 & \lfloor 2 \\
\quad\quad\quad\quad\quad\quad 0 \quad 6 & \lfloor 2 \\
\quad\quad\quad\quad\quad\quad\quad 0 \quad 3 & \lfloor 2 \\
\quad\quad\quad\quad\quad\quad\quad\quad 1 \quad 1 &
\end{array}
$$

$= 1100101,000$

Ex3) Quantos bits para representar:

bits	max
1 -	1
2 -	3
3 -	7
4 -	15
5 -	31
6 -	63
7 -	127
8 -	255

a) $250_{10} \rightarrow$ 8 bits

b) $12_{10} \rightarrow$ 4 bits

c) $2_{10} \rightarrow$ 2 bits

d) $17_{10} \rightarrow$ 5 bits

Ex4) Para decimal.

a) $14_8 = 1 \times 8^1 + 4 \times 8^0 = 8 + 4 = 12_{10}$

b) $67_8 = 6 \times 8 + 7 \times 8^0 = 48 + 7 = 55_{10}$

c) $153_8 = 1 \times 8^2 + 5 \times 8^1 + 3 \times 8^0 = 64 + 40 + 3 = 107_{10}$

ex5) Por que 15874 não pode ser octal?

O algarismo 8 não existe na base octal. A base 8 trabalha com algarismos de 0 a 7.

Ex 6) Para octal

2) 107_{10} $\dfrac{107\ \lfloor 8}{\begin{array}{l}3\quad 13\ \lfloor 8\\ \quad\ 5\quad 1\end{array}}$ $= 153_{8/1}$

b) 185_{10} $\dfrac{185\ \lfloor 8}{\begin{array}{l}1\quad 23\ \lfloor 8\\ \quad\ 7\quad 2\end{array}}$ $= 271_{8/1}$

c) 2048_{10} $\dfrac{2048\ \lfloor 8}{\begin{array}{l}0\quad 256\ \lfloor 8\\ \quad\ 0\quad 32\ \lfloor 8\\ \qquad\ 0\quad 4\end{array}}$ $= 4000_{8/1}$

Ex 7) para binário

2) $477_8 \to b_{10}$ $4\times 8^2 + 7\times 8^1 + 7\times 8^0 = 256 + 56 + 7 = 319_{10}$

$\dfrac{319_{10}\ \lfloor 2}{\begin{array}{l}1\quad 159\ \lfloor 2\\ \quad\ 1\quad 79\ \lfloor 2\\ \qquad 1\quad 39\ \lfloor 2\\ \qquad\quad 1\quad 19\ \lfloor 2\\ \qquad\qquad 1\quad 9\ \lfloor 2\\ \qquad\qquad\quad 1\quad 4\ \lfloor 2\\ \qquad\qquad\qquad 0\quad 2\ \lfloor 2\\ \qquad\qquad\qquad\quad 0\quad 1\end{array}}$

$= 100111111_{2/1}$

b) $1523_8 \to b_{10}$ $1\times 8^3 + 5\times 8^2 + 2\times 8^1 + 3\times 8^0 = 512 + 320 + 16 + 3 = 851_{10}$

$\dfrac{851\ \lfloor 2}{\begin{array}{l}1\quad 425\ \lfloor 2\\ \quad\ 1\quad 212\ \lfloor 2\\ \qquad 0\quad 106\ \lfloor 2\\ \qquad\quad 0\quad 53\ \lfloor 2\\ \qquad\qquad 1\quad 26\ \lfloor 2\\ \qquad\qquad\quad 0\quad 13\ \lfloor 2\\ \qquad\qquad\qquad 1\quad 6\ \lfloor 2\\ \qquad\qquad\qquad\quad 0\quad 3\ \lfloor 2\\ \qquad\qquad\qquad\qquad 1\quad 1\end{array}}$

$= 1101010011_{2/1}$

c) 1001_8 $1 \times 8^3 + 0 \times 8^2 + 0 \times 8^1 + 1 \times 8^0 = 512 + 1 = 513_{10}$

```
513 |2
 1  256 |2
     0  128 |2
         0  64 |2
             0  32 |2
                 0  16 |2
                     0  8 |2
                         0  4 |2
                             0  2 |2
                                 0  1  = 1000000001_2 ||
```

6x8) Para octal

a) $1011_2 = 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 = 8 + 2 + 1 = 11_{10}$

```
11 |8
 3  1  = 13_8 ||
```

b) 10011100_2 $1 \times 2^7 + 0 \times 2^6 + 0 \times 2^5 + 1 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 0 \times 2^0$
$= 128 + 16 + 8 + 4 = 156_{10}$

```
156_{10} |8
    4   19 |8
        3   2  = 234_8 ||
```