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BCC - 1º Período

Lista de Exercícios B

01. Realize a conversão entre os sistemas de numeração abaixo.

1. Ob 100011010000 \rightarrow dec $= 1 \cdot 2^4 + 1 \cdot 2^6 + 1 \cdot 2^7 + 1 \cdot 2^{11}$
110876543210

$= 16 + 64 + 128 + 2048$

$= 80 + 128 + 2048$

$= 208 + 2048$

$= 2256$

2. Ob 100011010000 \rightarrow hex
8d0

3. Ob 100011010000 \rightarrow octal
4320

4. 4357 \rightarrow bin 1.0001.0000.0101

4357 / 2

1 2178 / 2

0 1089 / 2

1 544 / 2

0 272 / 2

0 136 / 2

0 68 / 2

0 34 / 2

0 17 / 2

1 8

5. 4357 → hex

0b 1.0001.0000.0101

0x 1105

6. 4357 → octal

0b 1.000.100.00.0101

0x 40405

7. 0x56B → bin

0b 0101.0110.1011

8. 0x56B → dec

0b 0101.0110.1011

11 0 9 6 7 6 5 4 3 2 1 0

$$\sum_{i=0}^n 2^i = 2^{10} + 2^8 + 2^6 + 2^5 + 2^3 + 2^1 + 2^0$$

$$\sum_{i=0}^n 1024 + 256 + 64 + 32 + 2 + 1 + 0$$

$$\sum_{i=0}^n 1337$$

9. 0x56B → octal

0b 010.101.10.1011

0x 2553

10. 0x354 → bin

0b 110.011.101.100

11. 0x354 → hex

0b 1100.1110.1100

0x ccc

$$\sum_{i=0}^n 2^i = 2^{11} + 2^{10} + 2^7 + 2^6 + 2^5 + 2^3 + 2^2$$

$$\sum_{i=0}^n 2048 + 1024 + 128 + 64$$

$$+ 32 + 8 + 4$$

$$\sum_{i=0}^n 3308$$

12. 0x354 → dec

0b 1100.1110.1100

0x 9b (1031) 3210



Exercício 2

1. 502 → SM

502 L2

0 251 L2

1 125 L2

1 62 L2

0 31 L2

1 15 L2

1 7 L2

1 3 L2

Ob. 1111.0110 ou

0x16

em SM 10bits.

01.1111 0110

2. 502 → CD1

0x011111.0110 $\xrightarrow{CD1}$ 011111.0110

0x1F6

3. 502 → CD2

0x011111.0110 $\xrightarrow{CD2}$ 01.1111.0110

4. -502 → ~~CD1~~ SM

0x011111.0110 \xrightarrow{SM} 111111.0110

0x3F6

5. -502 → CD1

0x011111.0110 $\xrightarrow{CD1}$ 10.0000.1001

0x209

6. -502 → CD2

0x011111.0110 $\xrightarrow{CD2}$ 0x10.0000.1010

0x20a

7. 643 → SM

643 / 2

1 321 / 2

1 160 / 2

0 80 / 2

0 40 / 2

0 20 / 2

0 10 / 2

0b1010000011 SM ou 105 / 2

0x283

11 2 / 2

01

A palavra já ocupa 10 bits, não pode ser convertida em SM, CD1 ou CD2.

8. 643 → ED1

1010000011 ou 0x283

9. 643 → CD2

1010000011 ou 0x283

10. 643 → SM

11. -643 → CD1

12. -643 → CD2

A palavra já ocupa 10 bits; logo, a conversão é impossível. Seria necessário pelo menos 11 bits.

Exercício 3

1. 0b11101100 (SM) → 01101100

76543210

$$Z = 2^6 + 2^5 + 3^2 + 2^2$$

$$Z = 64 + 32 + 9 + 4$$

$$Z = 96 + 12$$

$$Z = 108$$

2. 0657 (D11)

Ob 11010111
(8)(36)(54)(3)(2)(10)

$$\Sigma, 2^8 + 2^7 + 2^5 + 2^3 + 2^2 + 2^1 + 2^0$$

$$\Sigma, 256 + 128 + 32 + 8 + 4 + 2 + 1$$

$$\Sigma, 384 + 40 + 8 + 1$$

$$\Sigma, 424 + 9$$

$$\Sigma, 434$$

3. 0x835 (SM)

Ob 1000.0011 0101 \rightarrow Ob 0000 0011 0101
(54) 32 10

$$\Sigma, 2^5 + 2^4 + 2^2 + 2^0$$

$$\Sigma, 32 + 16 + 4 + 1$$

$$\Sigma, 48 + 5$$

$$\Sigma, 53$$

4. 0x835 (D11)

Ob 1000.0011 0101 \rightarrow 01111100.1010
11 1096 1034 32 10

$$\Sigma, 2^{10} + 2^9 + 2^8 + 2^7 + 2^6 + 2^3 + 2^1$$

$$\Sigma, 1024 + 512 + 256 + 128 + 64 + 8 + 2$$

$$\Sigma, 1536 + 384 + 74$$

$$\Sigma, 1536 + 458$$

$$\Sigma, 1994$$

5. 0x835 (1021)

Ob 1000.0011 0101 → Ob 0111.1100.1011

11 1098 2654 3210

Z, $2^{10} + 2^9 + 2^8 + 2^7 + 2^6 + 2^3 + 2^1 + 2^0$

Z, $1024 + 512 + 256 + 128 + 64 + 8 + 2 + 1$

Z, $1536 + 384 + 72 + 3$

Z, $1920 + 72 + 3$

Z, $1992 + 3$

Z, 1995

6. 0x735 (1021)

Ob 0111.0011 0101 → Ob 1.000.1100.1010

11 1098 2654 3210

Z, $2^{11} + 2^7 + 2^6 + 2^3 + 2^1$

Z, $2048 + 128 + 64 + 8 + 2$

Z, $2176 + 72 + 10$

Z, 2258

4.

50. P 66 h 65 e 6e m

72 r 69 i 20 □ 6f o

cd r 6c k 6l a 73 s

6e n 69 i 6f o

63 c 70 p 73 s

69 i 20 □ 20 □

70 p 6d m 39 g

65 c 6f o 39 g

20 □ 72 r 20 □

50 P 72 r 6l a



5.

(3840 x 2160) x

24 bytes p/ pixel

60 fps

35 min \rightarrow 2100 $T = 3840 \times 2160 \times 24 \times 60 \times 2100$ $T = 25\,082\,965\,600\,000\text{ mb}$
8 $T = 3135\,283\,200\,000\text{ mb}$

6.

 $t = 1s$ $r = 5$ $t_a = 0,2s$ ou 5 Hertz $0 \rightarrow 0,00 \rightarrow 10000$ $0,2 \rightarrow 0,95 \quad 11110$ $0,4 \rightarrow 0,60 \quad 11001$ $0,65 \rightarrow 0,60 \quad 00110$ $0,85 \rightarrow 0,95 \quad 00001$ $1 \rightarrow 1 \quad 10000$

10000 11110 11001 00110 00001 10000