

Antwoorden Blok1 HO1 Onderdeel 2

Opdracht 1 Van binair naar decimaal

- a $00100101 \text{ (bin)} = 2^5 + 2^2 + 2^0 = 32 + 4 + 1 = 37 \text{ (dec)}$
b $10011110 \text{ (bin)} = 2^7 + 2^4 + 2^3 + 2^2 + 2^1 = 128 + 16 + 8 + 4 + 2 = 158 \text{ (dec)}$
c $11111010011 \text{ (bin)} = 2^{10} + 2^9 + 2^8 + 2^7 + 2^6 + 2^4 + 2^1 + 2^0 = 2003 \text{ (dec)}$

Opdracht 2 Van decimaal naar binair

- a $63 \text{ (dec)} = 32 + 16 + 8 + 4 + 2 + 1 = 111111 \text{ (bin)}$
Je ziet overigens dat 63 precies één minder is dan 64.
 $64 \text{ (dec)} = 100\ 0000$; 63 is dus één minder, ofwel 0111111

Alternatief:

63/2 is 31 rest 1

31/2 is 15 rest 1

15/2 is 7 rest 1

7/2 is 3 rest 1

3/2 is 1 rest 1

1/2 is 0 rest 1

binair 111111

85/2 is 42 rest 1

42/2 is 21 rest 0

21/2 is 10 rest 1

10/2 is 5 rest 0

5/2 is 2 rest 1

2/2 is 1 rest 0

1/2 is 0 rest 1

binair 1010101

- b $1000 \text{ (dec)} = 512 + 256 + 128 + 64 + 32 + 8 = 2^9 + 2^8 + 2^7 + 2^6 + 2^5 + 2^3 =$
 1111101000 (bin)

Alternatief:

1000/2 is 500 rest 0

500/2 is 250 rest 0

250/2 is 125 rest 0

125/2 is 62 rest 1

62/2 is 31 rest 0

31/2 is 15 rest 1

15/2 is 7 rest 1

7/2 is 3 rest 1

3/2 is 1 rest 1

1/2 is 0 rest 1

binair 1111101000

Opdracht 3 Binair optellen

- a
$$\begin{array}{r} 00100101 \\ 10011110 + \\ \hline 11000011 \end{array} \quad \begin{array}{r} 37 \\ 158 + \\ 195 \end{array}$$
- b
$$\begin{array}{r} 01110011 \\ 11000111 + \\ 100111010 \end{array} \quad \begin{array}{r} 115 \\ 199 + \\ 314 \end{array}$$

Past niet in één byte.

Opdracht 4 Hexadecimale notatie

- a $87 \text{ (dec)} = 80 + 7 = 5 \times 16^1 + 7 \times 16^0 = 57 \text{ (hex)}$
- b $A2 \text{ (hex)} = A \times 16^1 + 2 \times 16^0 = 10 \times 16 + 2 \times 1 = 162 \text{ (dec)}$
- c $FF \text{ (hex)} = F \times 16^1 + F \times 16^0 = 15 \times 16 + 15 \times 1 = 240 + 15 = 255 \text{ (dec)}$
 $FF \text{ (Hex)} = 11111111 \text{ (bin)}$
- d $0101111100111011 \text{ (bin)}$
Verdeel in groepjes van vier bits. **Begin rechts.**
 $0101|1111|0011|1011$
Vertaal elk groepje afzonderlijk in de hexadecimale waarde.
 0101 is 5 (dec) wordt 5 (hex)
 1111 is 15 (dec) wordt F (hex)
 0011 is 3 (dec) wordt 3 (hex)
 1011 is 11 (dec) wordt B (hex)
 $0101111100111011 \text{ (bin)}$ wordt 5F3B (hex)

Opdracht 5 Gemengd

- a $0101\ 1010 \text{ (bin)} = 2^6 + 2^4 + 2^3 + 2^1 = 64 + 16 + 8 + 2 = 90 \text{ (dec)}$
 $0101|1010 \text{ (bin)} = 5 \text{ (dec)}\ 10 \text{ (dec)}$ is 5 (hex) A (hex) wordt 5A
- b $81A3CC \text{ (hex)}$
is 8×16^5 wordt $8 \times 1.048.576 = 8.388.608$
 $+ 1 \times 16^4$ wordt $1 \times 65.536 = 65.536$
 $+ A \times 16^3$ wordt $10 \times 16^3 = 10 \times 4096 = 40.960$
 $+ 3 \times 16^2$ wordt $3 \times 256 = 768$
 $+ C \times 16^1$ wordt $12 \times 16^1 = 12 \times 16 = 192 +$
 $+ C \times 16^0$ wordt $12 \times 16^0 = 12 \times 1 = 12$
8.496.076 (dec)
- c 81 (hex) wordt binair 1000001 dus 129 (dec)
 $A3 \text{ (hex)}$ wordt binair 10100011 dus 163 (dec)
 $CC \text{ (hex)}$ wordt binair 11001100 dus 204 (dec)