# Exercises about representation of information

**Add a few explanations to demonstrate how to perform each conversion. For example, from decimal to binary we use powers and then explain the corresponding operations.**

1. Convert from decimal to binary:
   1. 234

1110 1010

* 1. 555

0010 0010 1011

* 1. 12321

0011 0000 0010 0001

* 1. 152

1001 1000

* 1. 32768

1000 0000 0000 0000

1. Convert from binary to decimal:
   1. 1.000.000.00

256

* 1. 1011110100

756

* 1. 10011101

157

* 1. 11111111111

2047

1. Convert from hexadecimal to binary:
   1. 45A0

0100010110100000

* 1. CF

11001111

* 1. AAB2

1010 1010 1011 0010

* 1. 3020

0011 0000 0010 0000

1. Convert from binary to hexadecimal:
   1. 110001000

188

* 1. 100010110

116

1. Complete the following conversions related to octal numeral system:
   1. Convert the numbers from exercise 4 to octal.

610, 426

* 1. Convert the octal 3020 to binary.

0110 0001 0000

1. Fill in the gaps, using all the conversions you need. You have to write the steps to transform each number.

|  |  |  |  |
| --- | --- | --- | --- |
| **BINARY** | **DECIMAL** | **HEXADECIMAL** | **OCTAL** |
| 0010 0001 | **33** | 21 | 41 |
| 11111111 | 255 | **FF** | 377 |
| 11111111 | 255 | FF | **377** |
| **10 0001** | 33 | 21 | 41 |

1. How many bits do you need to represent the following numbers in binary?
2. hexadecimal: 4B, 4AA, FF4FA, 345F
3. decimal: 100, 256, 255, 32, 31, 3, 4350, 1024, 45, 2, 63
4. Solve the following parts using ASCII extended (8 bits).
   1. Write a random text, which contains letters, numbers and other alphanumeric characters.

AWO7/

* 1. Encode to hexadecimal, according ASCII table

A=41

W=57

O=4F

7=37

/=2F

* 1. Convert to binary.

41=0100 0001

57=0101 0111

4F=0100 1111

37=0011 0111

2F=0010 1111

Total number: 0100 0001 0101 0111 0100 1111 0011 0111 0010 1111