# Unit 1. Exercises about representation of information

1. Convert from decimal to binary:
   1. 234 = 11101010
   2. 555 = 1000101011
   3. 12321 = 11000000100001
   4. 152 = 10011000
   5. 32768 = 1000000000000000
2. Convert from hexadecimal to binary:
   1. 45A0 = 100 0101 1010 0000
   2. CF = 1100 1111
   3. AAB2 = 1010 1010 1011 0010
   4. 3020 = 11 0000 0010 0000
3. Convert from binary to hexadecimal:
   1. 110001000 = 188
   2. 100010110 = 116
4. Complete the following conversions related to octal numeral system:
   1. Convert the numbers from exercise 3 to octal. 1100010002 = 610, 1000101102 = 426
   2. Convert the octal 3020 to binary: 11000010000
5. Fill the gaps, using all the conversions you need. You have to write the steps to transform each number.

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| **BINARY** | **DECIMAL** | **HEXADECIMAL** | **OCTAL** |
| 100001 | **33** | 21 | 41 |
| 1111 1111 | 255 | **FF** | 377 |
| 1111 1111 | 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 (7), 4AA (11), FF4FA (20), 345F (14)
3. decimal: 100 (7), 256 (9), 255 (8), 32 (6), 31 (5), 3 (2), 4350 (13), 1024 (11), 45 (6), 230 (31), 63 (6)
4. Solve the following parts using ASCII extended (8 bits).
   1. Write a random text, which contains letters, numbers and other alphanumeric characters.
   2. Encode to hexadecimal, according ASCII table.
   3. Convert to binary.