Tutorial (TD): Series of Exercises n°3

Exercise 1

1. Find the hexadecimal representation in ASCII of the word: **Ms 1**
2. Find the word represented in ASCII hexadecimal: **42 69 74**
3. Find the word represented in binary ASCII: **100001011000011100011**

Reminders: The Code of Character '0' is $(48)_{10}$, The Code of the 'Space' character is $(32)_{10}$
The Code of Character 'A' is $(65)_{10}$, The Code of Character 'a' is $(97)_{10}$

Exercise 2

1. Code on 4 bits the integers **+7, +2, 0, −2, −7 and −8, +8** with the following representations:
- ✓ Signed-Magnitude (Sign + Absolute value).
- ✓ One's Complement (1's C).
- ✓ Tow's Complement (2's C).

2. Indicate the value coded by **1101100101110101** which represents an integer signed in Tow's Complement (2's C) on 16 bits.
- ✓ Same question with **0001000011101101**.

3. Give the decimal value corresponding to the Octal content on 8 bits, this content is represented in **1'sC** : $(273)_8$; same question with the hexadecimal content in **2's C** on 8 bits : $(D3)_{16}$

3. Perform (**on 6 bits**) in **1's C** then in **2's C** the following operations:
+19+5 ; +20+15 ; -13-12 ; -21-17 ; +19-3 ; +2-11 ; -18-14.

Exercise 3

A 32 -bit machine whose octal content is equal to $37724000000_{(8)}$
What is the decimal equivalent of this content if we consider that it represents:

1. An integer value in **2's C**.
2. A real value in notation of the **simple precision floating point** (standard IEEE 754).

Exercise 4

Give in hexadecimal, the representation in **SP floating point** (IEEE 754) following numbers:

$+64.5_{(10)}$ $+8.375_{(10)}$
$-2.625_{(10)} \times 2^{-129}$ $+5 \times 2^{-128}$

Exercise 5

Taking the notation of the simple precision **floating point (32 bits)** of the IEEE 754 standard

1- Give the largest and smallest positive number in normalized form (Np_{min}, Np_{max}) representable in the form $\pm a \times 2^b$ (a and b are decimal)

2- Put in the form $\pm a \times 2^b$ The two following hexadecimal contents:
$X = AE800000, Y = AF600000$ (a is binary and b decimal)
3- Calculate $Z = X - Y$
4- Deduce the representation of Z