

Machine Structure 1 : Work Sheet N°02 bis

Exercise 1

1. Find the hexadecimal representation in ASCII of the word: **Ms1**
2. Find the word represented in ASCII hexadecimal: **42 69 74**
3. Find the word represented in binary ASCII: **01000010 01100001 01100011**

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 6 bits the integers **+17, 0, -12, and -32, +32** 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:

$$+64.5_{(10)} \qquad +8.375_{(10)}$$

Exercise 5

Assume that numbers are represented using fixed size of 8 bits. Consider the following bits sequences:

a) 01101101 b) 10011010

For each sequence, calculate the decimal number value being represented assuming these are floating point numbers where there are **4-bits assigned for the fraction part bits**, **3-bits assigned for the exponent part**, and a **bias of 3**

