

## Tutorial exercises No 1

### Exercise 01 :

#### Reminder on Number Conversions in Decimal, Binary, and Hexadecimal Bases

1. How many bytes are in 24 bits, 32 bits, and 64 bits?
2. In the following byte: 1001 1010B, what is the Most Significant Bit (MSB) and the Least Significant Bit (LSB)?
3. We consider positive integers represented on 1 byte. What is the largest representable integer?
4. Let A and B be two numbers on one byte (8 bits). Calculate their values and determine if there is a carry.  
A = 1100 0110B + 0010 0110B  
B = 1110 1110B + 1110 1110B
5. Convert the numbers below to the requested base
  - a) 126D to binary and then to hexadecimal.
  - b) 1100 0110B to decimal.
  - c) 1A84H and E237H to binary and then to decimal.
  - d) 267D and 2147D to binary and then to hexadecimal.
6. Shift to the right and to the left

Let's consider the two numbers A = 65D and B = 150D

- a) Represent A and B in binary
- b) Shift the bits of A two positions to the left, inserting '0' from the LSB. Provide the new decimal value of A. What do you observe?
- c) Shift the bits of B three positions to the right, inserting '0's from the MSB. Provide the new decimal value of B. What do you observe?

### Exercise 02 :

1. What do the abbreviations **RISC**, **CISC**, and **MIPS** stand for?
2. The Intel microprocessor consists of two separate processing units, can you name them?
3. Name the elements that constitute a Von Neumann Computer Model.
4. List the main characteristics of a microprocessor.
5. Name the input devices one can find on a computer.
6. Name the output devices one can find on a computer.
7. Name the storage devices one can find on a computer.

### Exercise 03 :

Answer the following statements with (true) or (false), and correct the false statements:

1. The address bus is bidirectional and allows the selection of information to be processed in a memory space.
2. A hard drive is a storage medium and can be considered as main memory.
3. A microprocessor based on the RISC architecture can recognize more than 100 instructions.
4. A microprocessor based on the CISC architecture can execute complex tasks with a single instruction.
5. The BIU manages all data and address transfers on the buses.
6. Main memory is temporary storage.
7. The RISC architecture helps improve execution time.