

UNIT 2. FUNCTIONAL ELEMENTS OF A COMPUTER Activities-2



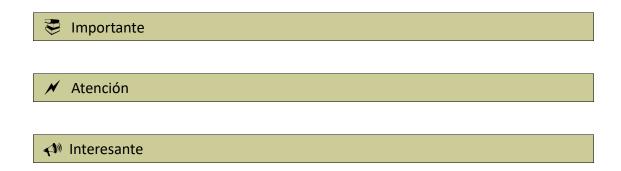
Alfredo Oltra / Sergio Garcia alfredo.oltra@ceedcv.es sergio.garcia@ceedcv.es 2019/2020 Versión:201018.0955

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Nomenclatura

A lo largo de este tema se utilizarán distintos símbolos para distinguir elementos importantes dentro del contenido. Estos símbolos son:



UD02. FUNCTIONAL ELEMENTS OF A COMPUTER Activities-2

(Exercise 1) We have a hypothetical computer with this instruction format:

OP_CODE	OPERAND 1	OPERAND 2
4 BITS	4 BITS	4 BITS

0000	0xC2
0001	0x19
0010	0x5A
0011	0x2

Figure 1. Memory (address and content)

SUM Rx, Ry

1001xxyy

Add RX+RY and it is stored in RX.

Following the instruction sequence:

100100010010

- a) What is the result after executing this instruction?
- b) Which will be the state of the memory after the execution of this instruction?
- c) Which is the addressing mode used in both operands?
- d) What would be the result if operand 2 uses immediate addressing mode?

(Exercise 2) We have a computer with this instruction set:

Code	Instrucction	<u>Description</u>
ENT M(m)	000mmmmm	Read data from keyboard to memory.
SAL M(m)	001mmmmm	Show data on screen from memory.
CAR RO, M(m)	010mmmmm	Store content a memory address in
		register RO.
ALM M(m), R0	011mmmmm	Store content of R0 in a memory
		address.
MOV Rx, Ry	1000xxyy	Copy content of RY to RX (X, Y are
		register numbers).
SUM Rx, Ry	1001xxyy	Add RX+RY and it is stored in RX.
RES Rx, Ry	1010xxyy	Subtract RX-RY and it is stored in RX.
MUL Rx, Ry	1011xxyy	Multiply RX * RY and it is stored in RX.
DIV Rx,Ry	1100xxyy	Divide RX / RY and it is stored in RX.

Following the instruction sequence:

00001011(A)

00001100(B)

00010001(C)

00011100(D)

Where A, B, C, D represents the input using the keyboard and their values are:

A=1

B=2

C=3

D=4

- e) What is the formula associated to A, B, C, D?
- f) What is the result shown on screen?
- g) What is the state of memory?
- h) If Program Counter (PC) initial value was 258... Which is it actual value?
- i) How many registers of general purpose (RX) has our architecture?

Share your solution and your doubts in the forum!!! If a classmate has problems with it, try to help him.