CENTRE ESPECÍFIC
D´EDUCACIÓ A DISTÀNCIA DE
LA COMUNITAT VALENCIANA

UNIT 2.
FUNCTIONAL ELEMENTS OF A COMPUTER
Activities-2

Computer Systems
CFGS DAW

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

Nomenclatura

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


Importante


Atención


Interesante

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	Description
ENT M(m)	000mmmmm	Read data from keyboard to memory.
SAL M(m)	001mmmmm	Show data on screen from memory.
CAR R0, M(m)	010mmmmm	Store content a memory address in register R0.
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)

01001011 10000100 01011100 10001100 01010001 10001000 10111110 10101101 01001100 10001000 10011110 01010001 10001000 11001110 10000011 01101101 00101101

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.