

# UNIT 2.FUNCTIONAL ELEMENTS OF A COMPUTER

Activity 2. Solution

Computer Systems
CFGS DAW

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

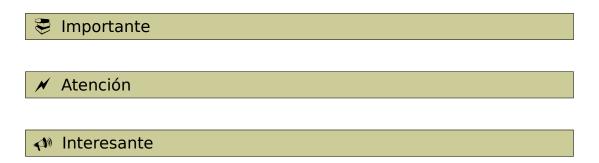
Versión:191022.1125

### Licencia

**Reconocimiento - NoComercial - Compartirlgual (by-nc-sa)**: No se permite un uso comercial de la obra original ni de las posibles obras derivadas, la distribución de las cuales se debe hacer con una licencia igual a la que regula la obra original.

### Nomenclatura

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



## UD01. FUNCTIONAL ELEMENTS OF A COMPUTER Activity 2. Solution

### 1. ACTIVITY 2

								ſ	1emo	ry								
0										16								
1										17	0	0	0	0	0	0	1	1
2										18								
3										19								
4										20								
5										21								
6										22								
7										23								
8										24								
9										25								
10										26								
11	0	0	0	0	0	0	0	1		27								
12	0	0	0	0	0	0	1	0		28	0	0	0	0	0	1	0	0
13	0	0	0	0	0	1	0	0		29								
14										30								
15										31								

Registers										
0	0	0	0	0	0	1	0	0		
1	0	0	0	0	0	0	0	1		
2	0	0	0	0	0	0	1	1		
3	0	0	0	0	0	1	0	0		

**00001011** Write in memory position 11

(A) [01010101] Write 1

**00001100** Write in memory position 12

(B) [00100001] Write 2

**00010001** Write in memory position 17

(C) [00000010] Write 3

00011100 Write in memory position 28

(D) [00101101] Write 4

**01001011** Copy the data from memory position 11 to register 0

**10000100** Copy the data from Register 0 to Register 1:  $1 \rightarrow \text{in R1}$ 

**01011100** Copy the data from memory position 28 to register 0

**10001100** Copy the data from Register 0 to Register 3:  $4 \rightarrow \text{in R3}$ 

**01010001** Copy the data from memory position 17 to register 0

**10001000** Copy the data from Register 0 to Register\_2:  $3 \rightarrow \text{in R2}$ 

**10111110** Multiply the content of R3 and R2 and write the result in R3 [3\*4]  $\rightarrow$  12 in R3

**10101101** Subtract the content of R3 and R1 and write the result in R3 [12-1]  $\rightarrow$  11 in R3

**01001100** Copy the data from memory position 12 to Register 0

**10001000** Copy the data from Register 0 to Register\_2:  $2 \rightarrow \text{in R2}$ 

**10011110** Add the content of R3 and R2 and write the result in R3 [2 + 11]  $\rightarrow$  13 ;n R3

**01010001** Copy the data from memory position 17 to Register 0

**10001000** Copy the data from register 0 to register  $2 \rightarrow 3$  in R2

**11001110** Divide the content of R3 by R2 and write in R3 [13/3] 4 in R3

**10000011** Copy the date from R3 to R0  $\rightarrow$  4 in R0

**01101101** Write in memory position 13 the content of Register 0

**00101101** Show in the screen the content of memory position 13

#### 1.1 Solution

- a) Formula: ((D\*C)-A+B)/C
- **b)** 4 (Content of memory position 13)
- c) The state shown in the solution
- **d)** If the PC was initially at 258 and we have executed 21 instructions, the PC will contain the value 279
- **e)** we have two bits, i. e. 4 registers.