Computer Systems – Activity 2 solution

UNIT 01. FUNCTIONAL ELEMENTS OF A COMPUTER

Computer Systems
CFGS DAW

Sergio García / Alfredo Oltra 2022/2023

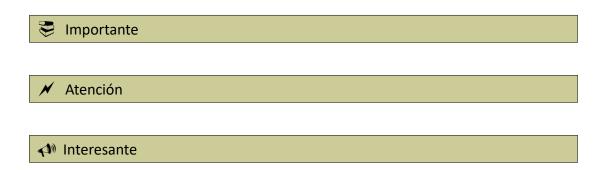
Versión:220910.1541

Licencia

Reconocimiento - NoComercial - Compartirigual (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:



UNIT 01. FUNCTIONAL ELEMENTS OF A COMPUTER Activity 2. Solution

1. ACTIVITY 2

Memory																		
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			

CFGS. DAM/DAW 1.3

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: $4 \rightarrow$ 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 $[2 + 11] \rightarrow 13$ in 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.

CFGS. DAM/DAW 1.4