Sistemas Informáticos (Computer Systems)

Unit 01. Activities 02

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1. Exercise 01

We have a computer with this instruction set:

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

Following the instruction sequence (simulating machine code):

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 that is provided using the keyboard and their values are:
A=1; B=2; C=3; D=4

A. What is the formula associated to A, B, C, D?
B. What is the result shown on screen?
C. What is the state of memory?
D. If Program Counter (PC) initial value was 258… Which is it actual value?
E. 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 :)