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Experiment – 2

Problem Statement: Write an assembly language program to compute the average of two numbers.

Algorithm:

Step 1: Define the Base Register Address value during the program creation.
Step 2: Move the first operand in the General-Purpose Register R1.
Step 3: Move the second operand in the General-Purpose Register R2.
Step 4: Perform the addition operation with the values in the registers.
Step 5: Result will be stored in the destination register.
Step 6: Divide the destination register value by 2, and the result will be stored in the destination register.
Step 7: Store the resultant value in a data memory location.
Step 8: Terminate the program.

Assembly Language code:

MOV #6, R01 //Store value of 6 in register R01

MOV #4, R02 //Store value of 4 in register R02

ADD R01, R02 //Add the register R01 and R02 values and store the resultant value in register R02

DIV #2, RO2 //Divide register RO2 by value 2 and store the resultant value in register R02

STB R01, 00 //Store the resultant value of R01 in memory location 00

HLT //Stop the simulator

Result:

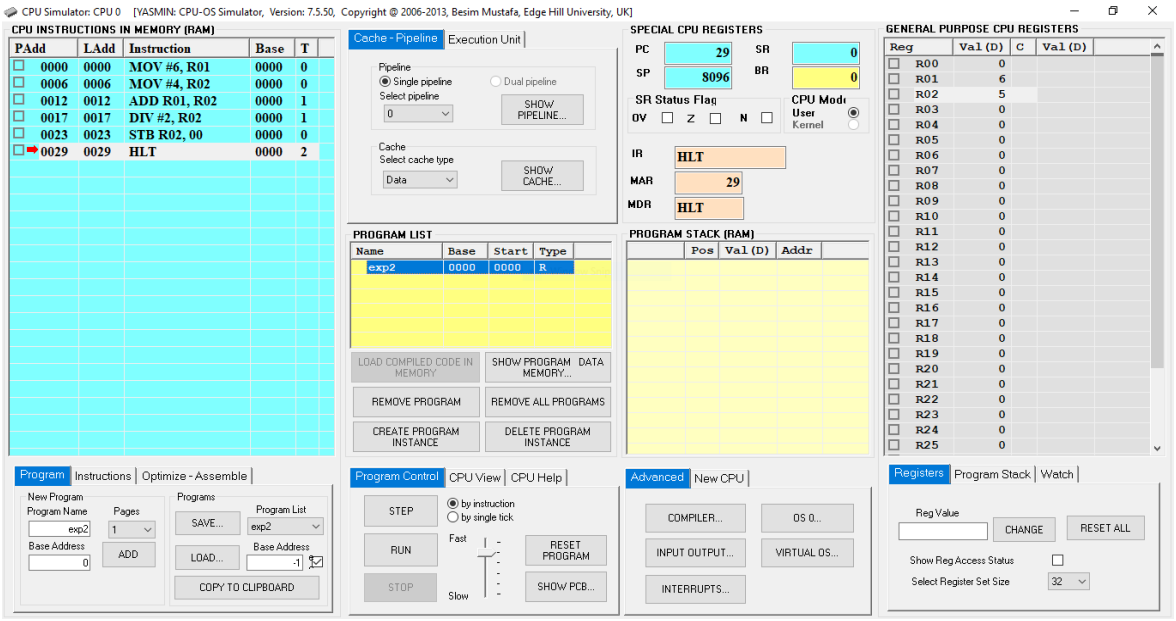

Fig. 1: CPU Simulator Window

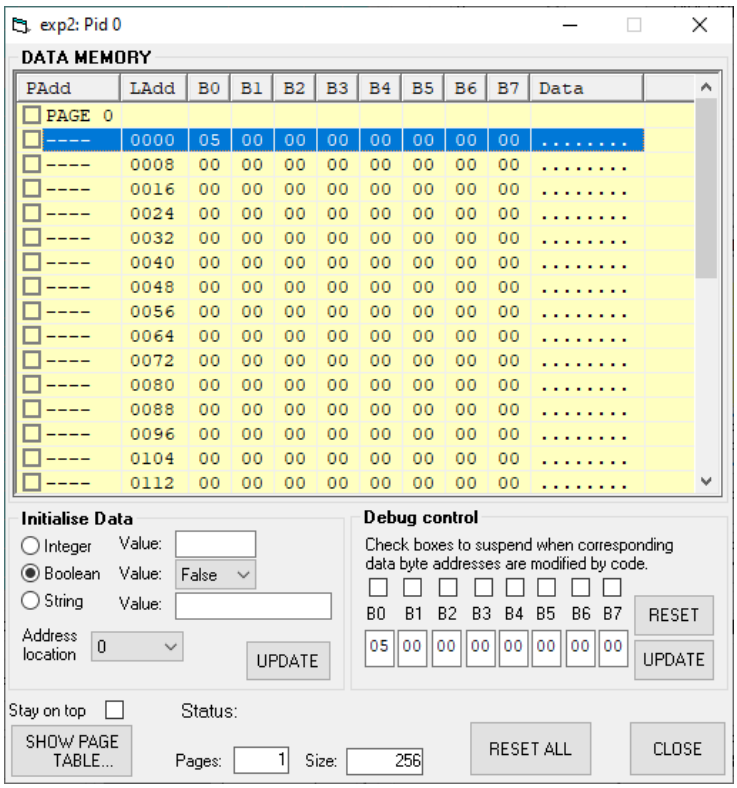

Fig. 2: Data Memory Window

Step 01	
PC	6
IR	MOV #6, R01
MAR	0
MDR	MOV #6, R01
R01	6
Step 02	

PC	12
IR	MOV #4, R02
MAR	6
MDR	MOV #4, R02
R01	6
R02	4
Step 03	
PC	17
IR	ADD R01, R02
MAR	12
MDR	ADD R01, R02
R01	6
R02	10
Step 04	
PC	23
IR	DIV #2, R02
MAR	17
MDR	DIV #2, R02
R01	6
R02	5
00	05
Step 05	
PC	29
IR	STB R02, 00
MAR	0
MDR	5
R01	6
R02	5
00	05
Step 06	
PC	30
IR	HLT
MAR	29
MDR	HLT
R01	6
R02	5
00	05