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LAB SESSION 5

Objective

Assembling, editing, linking, and executing Assembly code examples using EMU8086

Theory

Practice 8086 Emulator

- Loading, verifying and saving machine code
- Executing instructions and tracing programs
- Writing a complete assembly program

Sample Code :

```
;;;;; This program does basic arithmetic operations for two variables
;A and B are the variables

Org
100h

;;;;; Data segment starts
.DATA
A     DW     11
B     DW
      SUM   DW
      ?
DIFFERENCE DW   ?
MULTIPLICATION DW     ?
DIVISION   DW ?

;;;;; Code segment starts
.CODE

MAIN PROC FAR
;initialize DS

MOV    AX,@DATA
MOV    DS,AX

;add the numbers
MOV    AX,A          ;AX has A
ADD    AX,B          ;AX has A+B
MOV    SUM,AX        ;SUM = A+B
```

```
;subtract the
numbers
MOV    AX,A          ;AX has A again
SUB    AX,B          ; AX has A-B
MOV    DIFFERENCE,AX  ; DIFFERENCE = A - B

;multiply the numbers
MOV    AX,A          ;AX has A again
MOV    BX,B
MUL    BX            ; AX has A*B
MOV    MULTIPLICATION,AX  ; MULTIPLICATION = A * B

;divide the numbers
MOV    AX,A          ;AX has A again
DIV    BX            ; AX has A/B and DX has modulus
MOV    DIVISION,AX   ; DIVISION = A / B

MAIN ENDP
END    MAIN

RET
```

Procedure:

1. Calculate manually the value of variables seen in the data segment of the code above.
2. Write and run the code in EMU8086 environment.
3. Open „Emulator“ window , run your code and click „vars“ button to watch your variables. You should see the screens in the Figure 1

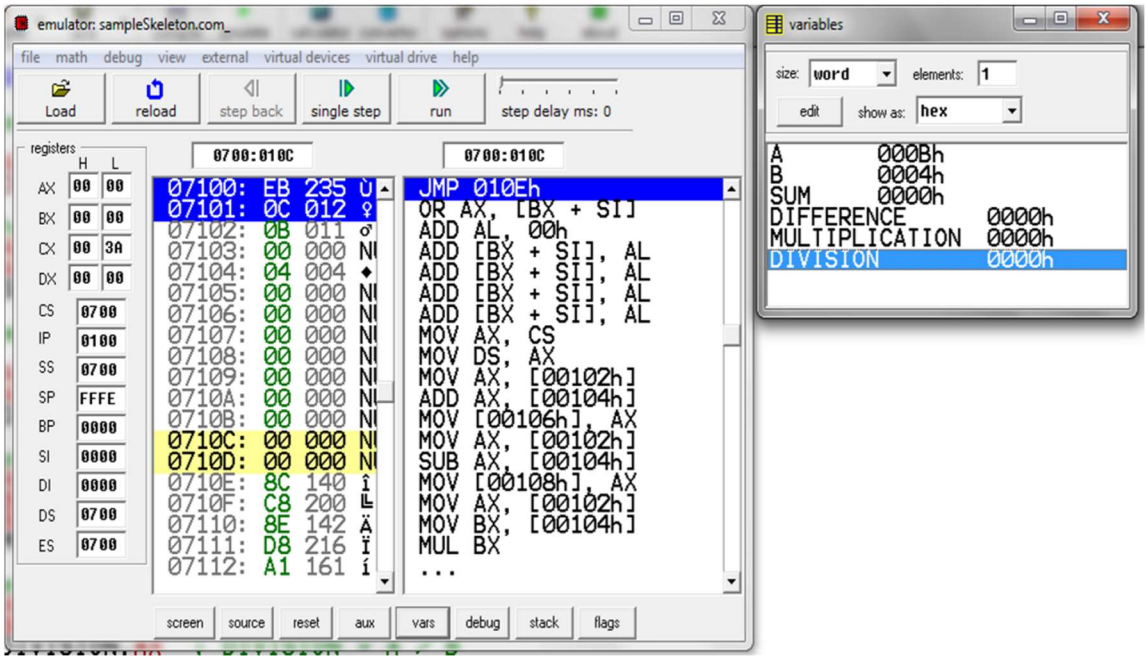

Figure 1: Emulator window and Variables window

ANSWER:

Program Run:

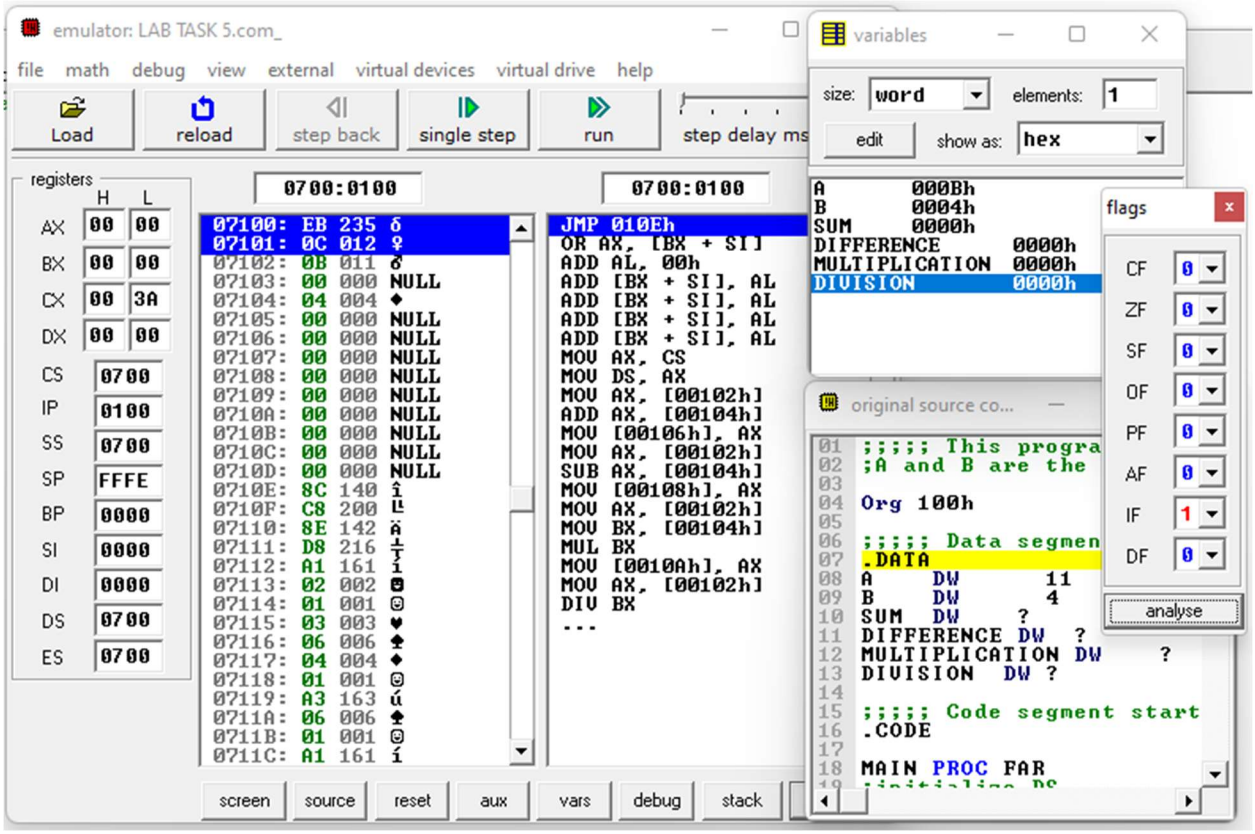

Figure 1

4. Fill the following table.

Variables	Calculated	Actual
A	**000Bh**	**11**
B	**0004h**	**4**
SUM	**000Fh**	**15**
DIFFERENCE	**0007h**	**7**
MULTIPLICATION	**002Ch**	**44**
DIVISION	**0002h**	**2**