



# VIT<sup>®</sup>

**Vellore Institute of Technology**

(Deemed to be University under section 3 of UGC Act, 1956)

# Microprocessors and Interfacing

(CSE – 3002)

## LAB EXPERIMENT- 1

Name: **Vibhu Kumar Singh**

Reg. No: **19BCE0215**

Teacher: **Mr. Konguvel E.**

## 1. Addition (16 bit) in emu8086:

**CODE:**

(19 BCE0215)		
1.	MOV	AX, [1000h]
2.	MOV	BX, [1002h]
3.	MOV	CL, 00h
4.	SUB	<del>AX</del> , BX
5.	JNC	jump
6.	INC	CL
7.	NOT	AX
8.	ADD	AX, 0001h
9.	MOV	[1004h], AX
10.	MOV	[1006h], CL
11.	HLT	

**OUTPUT:**

Initial Memory in RAM:

- [1000] = 16
- [1001] = 23
- [1002] = 43
- [1003] = 32

Random Access Memory																		
0100:1000		update		<input checked="" type="radio"/> table		<input type="radio"/> list												
0100:1000	16	23	43	32	00	00	00	00-00	00	00	00	00	00	00	00	00	-#C2.....	
0100:1010	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	00	.....	
0100:1020	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	00	.....	
0100:1030	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	00	.....	
0100:1040	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	00	.....	
0100:1050	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	00	.....	
0100:1060	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	00	.....	
0100:1070	00	00	00	00	00	00	00	00-00	00	00	00	00	00	00	00	00	.....	

Expected Output:

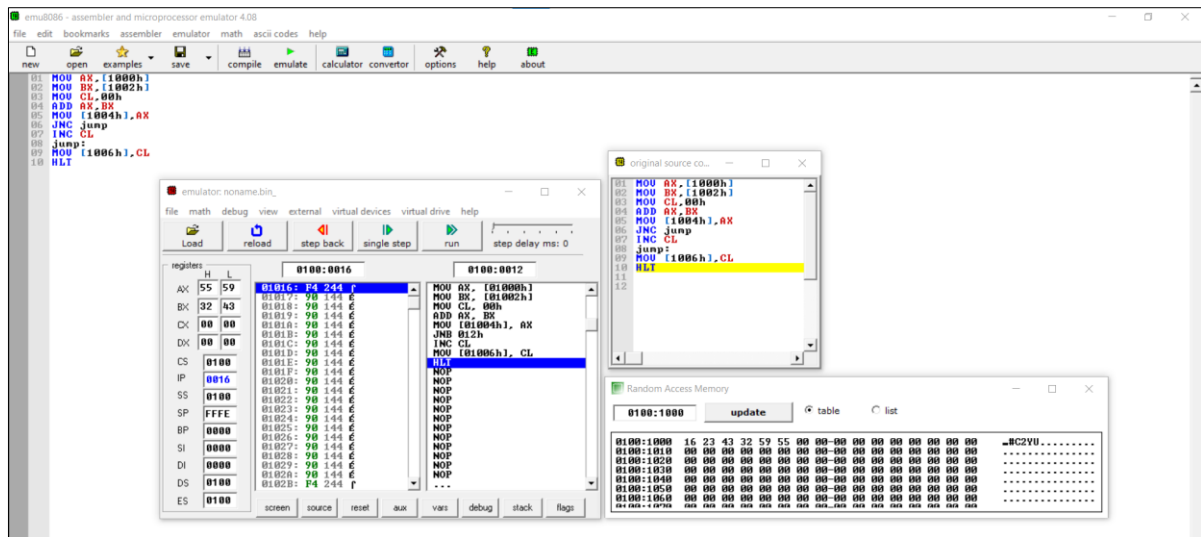
$$\begin{array}{r} 2316 \\ +3243 \\ \hline 5559 \end{array}$$

**After Program Execution:**

- AX = 5559
- BX = 3243

- CL = 00
- [1004] = 59
- [1005] = 55
- [1006] = 00 (no carry)

Result: 5559 (as expected)



## 2. Subtraction (16 bit) in emu8086:

CODE:

(19BCE0215)
1. MOV AX, [1000h]
2. MOV BX, [1002h]
3. MOV CL, 00h
4. ADD AX, BX
5. MOV [1004h], AX
6. JNC jump
7. INC CL
8. jump:
9. MOV [1006h], CL
10. HLT

OUTPUT:

Initial Memory in RAM:

- [1000] = 43
- [1001] = 32
- [1002] = 16
- [1003] = 23

Random Access Memory																			
0100:1000		update		table		list													
0100:1000	43	32	16	23	00	00	00	00	00	00	00	00	00	00	00	00	00	C2-#	.....
0100:1010	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....	.....
0100:1020	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....	.....
0100:1030	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....	.....
0100:1040	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....	.....
0100:1050	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....	.....
0100:1060	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....	.....
0100:1070	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....	.....

Expected Output:

3243  
- 2316  
0F2D

After Program Execution:

- AX = 0F2D
- BX = 2316
- CL = 00
- [1004] = 2D
- [1005] = 0F
- [1006] = 00 (no carry)

Result: 0F2D (as expected)

The screenshot displays the execution of the Subtraction16bit.asm program. The assembly code window shows the following instructions:

```

01 MOV AX, [1000h]
02 MOV BX, [1002h]
03 MOV CL, 00h
04 SUB AX, BX
05 JNC jump
06 INC CL
07 NOT AX
08 ADD AX, 0001h
09 jump:
10 MOV [1004h], AX
11 MOV [1006h], CL
12 HLT

```

The registers window shows the state of the registers after execution:

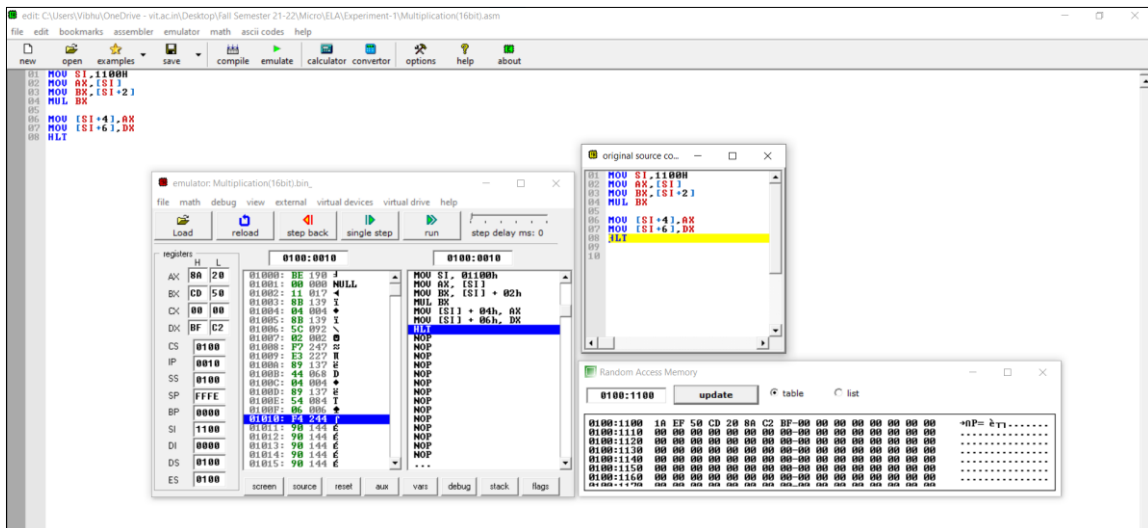
Register	Value
AX	0F2D
BX	2316
CL	00
DX	0000
SI	0000
DI	0000
ES	0100

The Random Access Memory window shows the memory layout with the expected output 0F2D at address 1004:

Address	Value
0100:1000	43 32 16 23 00 00 00 00 00 00 00 00 00 00 00 00
0100:1010	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:1020	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:1030	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:1040	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:1050	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:1060	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:1070	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00



Result: BFC28A20 (as expected)



#### 4. Division (32 bit by 16 bit) in emu8086:

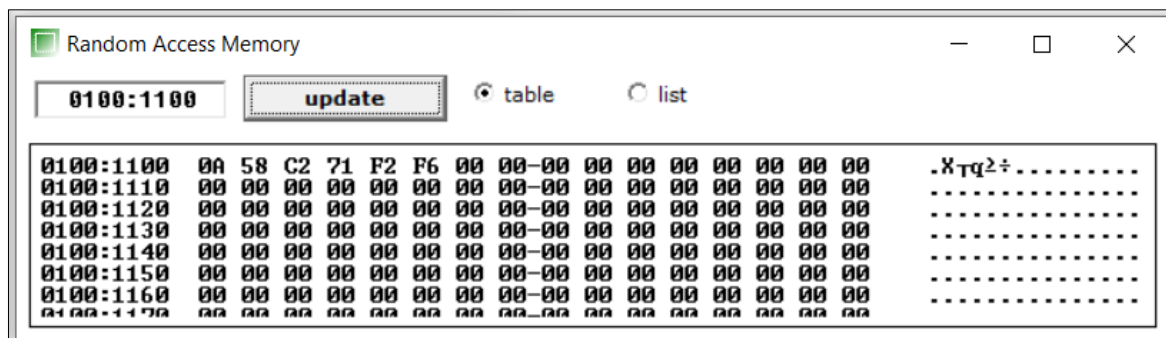
CODE:

V011 (19BCE0215)		
1.	MOV	SI, 1100H
2.	MOV	AX, [SI]
3.	MOV	DX, [SI+2]
4.	MOV	BX, [SI+4]
5.	DIV	BX
6.	MOV	[SI+6], AX
7.	MOV	[SI+8], DX
8.	HLT	

OUTPUT:

Initial Memory in RAM:

- [1100] = 1A
- [1101] = EF
- [1102] = 50
- [1103] = CD



## Expected Output:

71C2580A  
/     F6F2      
    75EE  
(remainder: 290E)

## After Program Execution:

- AX = 75EE (quotient)
- BX = F6F2 (divisor)
- DX = 290E (remainder)
- SI = 1100
- [1104] = F2
- [1005] = F6
- [1006] = EE
- [1007] = 75
- [1008] = 0E
- [1009] = 29

Result: 75EE (quotient), 290E (remainder) [as expected]

