Experiment-8

AIM:To perform Multiplication and Division Operations in 8086.

Program :

(a) Write a program in 8086 microprocessor to multiply two 8-bit numbers, where numbers are stored from offset 500 and store the result into offset 600.

Examples – Inputs and output are given in Hexadecimal representation.

Algorithm –

1. Load data from offset 500 to register AL (first number)
2. Load data from offset 501 to register BL (second number)
3. Multiply them (AX=AL*BL)
4. Store the result (content of register AX) to offset 600
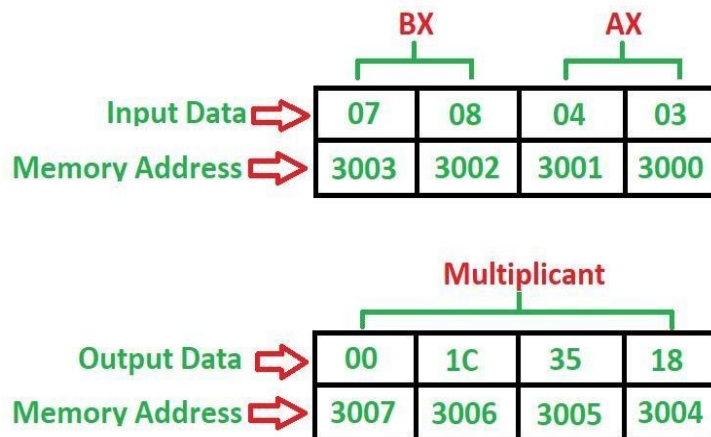5. Stop

Program –

Explanation –

(b) **Problem** – Write a program to multiply two 16-bit numbers where starting address is **2000** and the numbers are at **3000** and **3002** memory address and store result into **3004** and **3006** memory address.
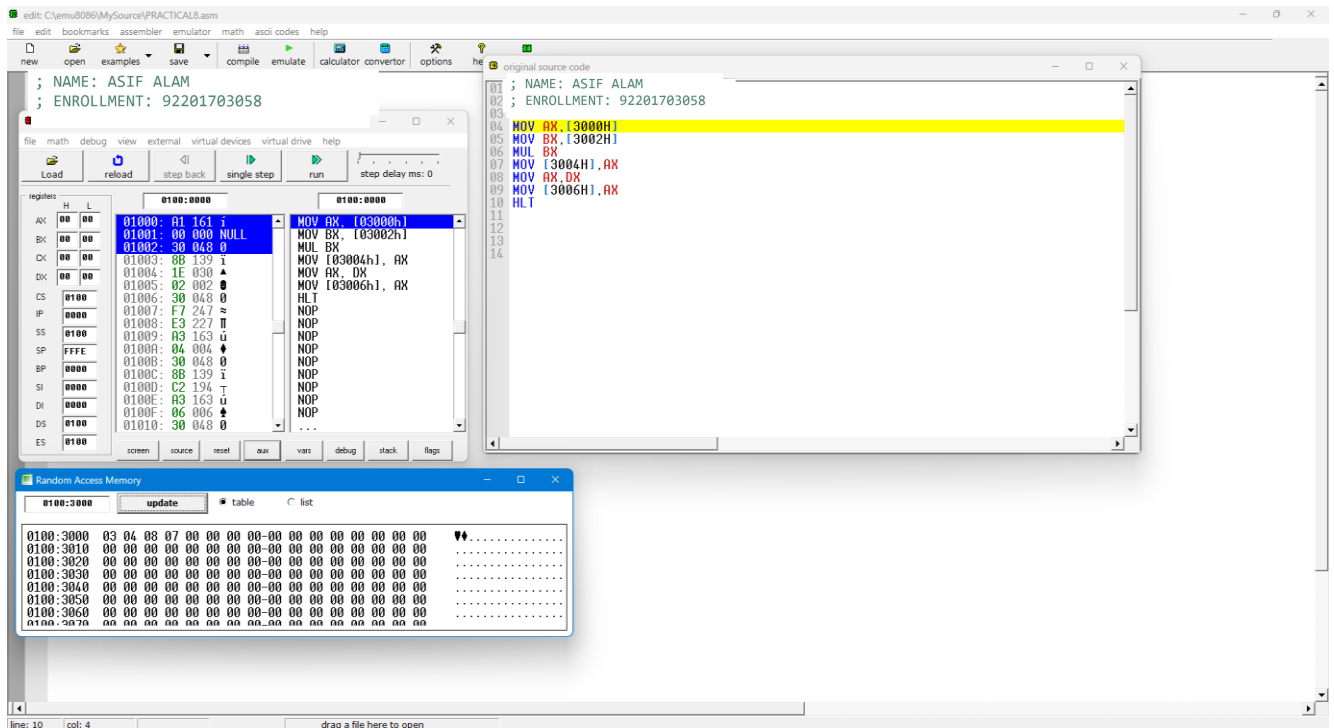
Example –

Algorithm –

1. First load the data into AX(accumulator) from memory 3000
2. Load the data into BX register from memory 3002
3. Multiply BX with Accumulator AX
4. Move data from AX(accumulator) to memory
5. Move data from DX to AX
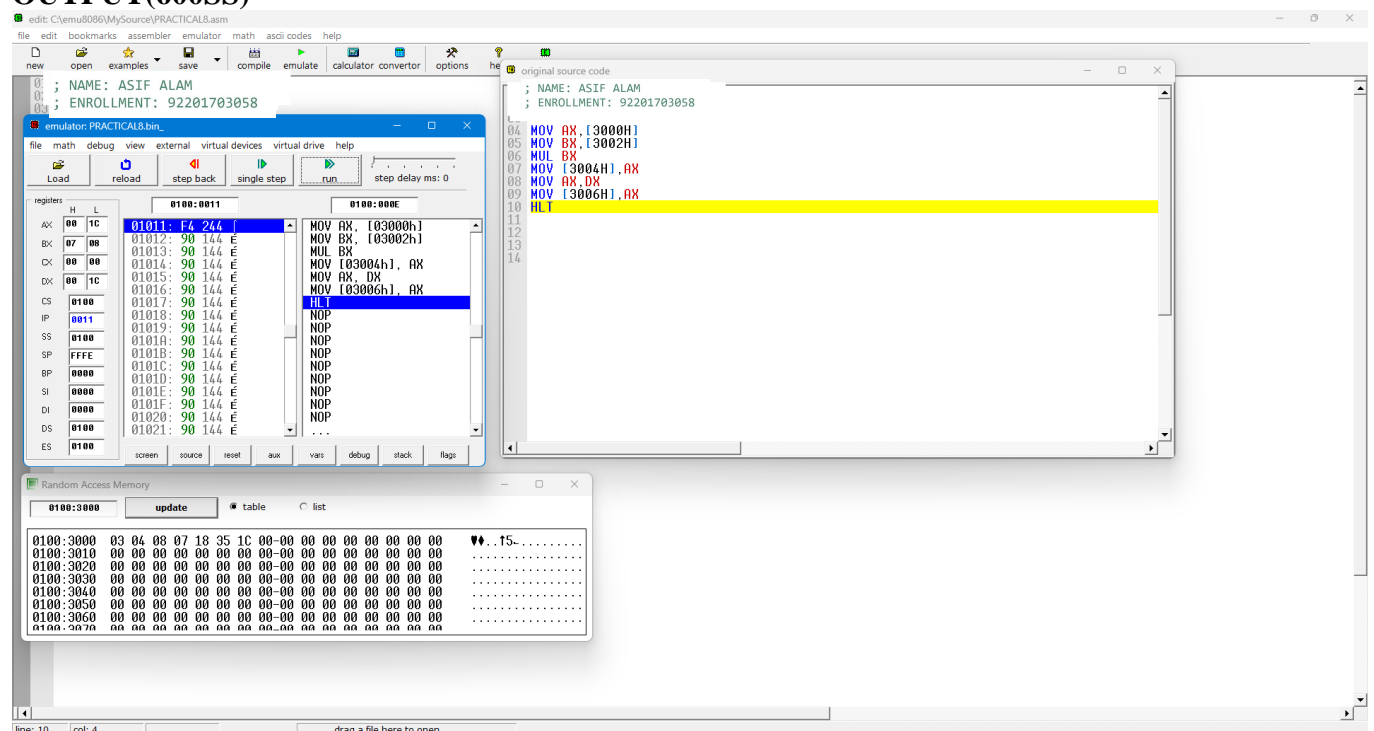6. Move data from AX(accumulator) to memory
7. Stop

Program –

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![Marwadi University NAAC A+ logo]	**Marwadi University** **Department of Computer Engineering**
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Experiment No: 08	**Date:** **Enrolment No:92201703058**

UPDATE MEMORY AND PROVIDE DATA-

OUTPUT(600SS)-

8086 Microprocessor Division Instructions

The following instructions are supported by 8086 microprocessor that are used to perform the division operation:

8086 DIV Instruction (Unsigned Operands)

The DIV instruction performs the division of two unsigned operands. The denominator resides in a source operand and it should not be immediate. However, it can be register or a memory location. There are four division cases depending on the number of bits. The division can be:

1. Byte with byte
2. Word with word
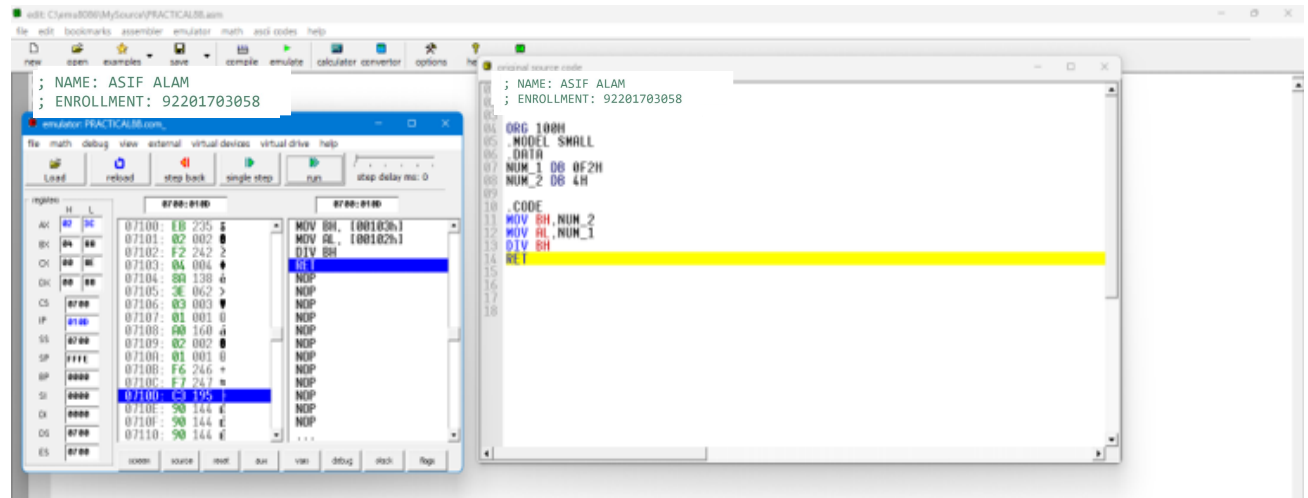3. Word with byte
4. Doubleword with word

Byte with Byte Divsion

In this case, the nominator and denominator operands are bytes. The nominator resides in the AL register and AH is set to zero. After division, the instruction stores quotient in AL and the remainder in AH register.

Assembly Example Code

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Output

The DIV instruction divides BH by AL. F2 divided by 04 gives quotient of 3C and give 02 as a remainder. AL stores the quotient and remainder is stored in AH register.
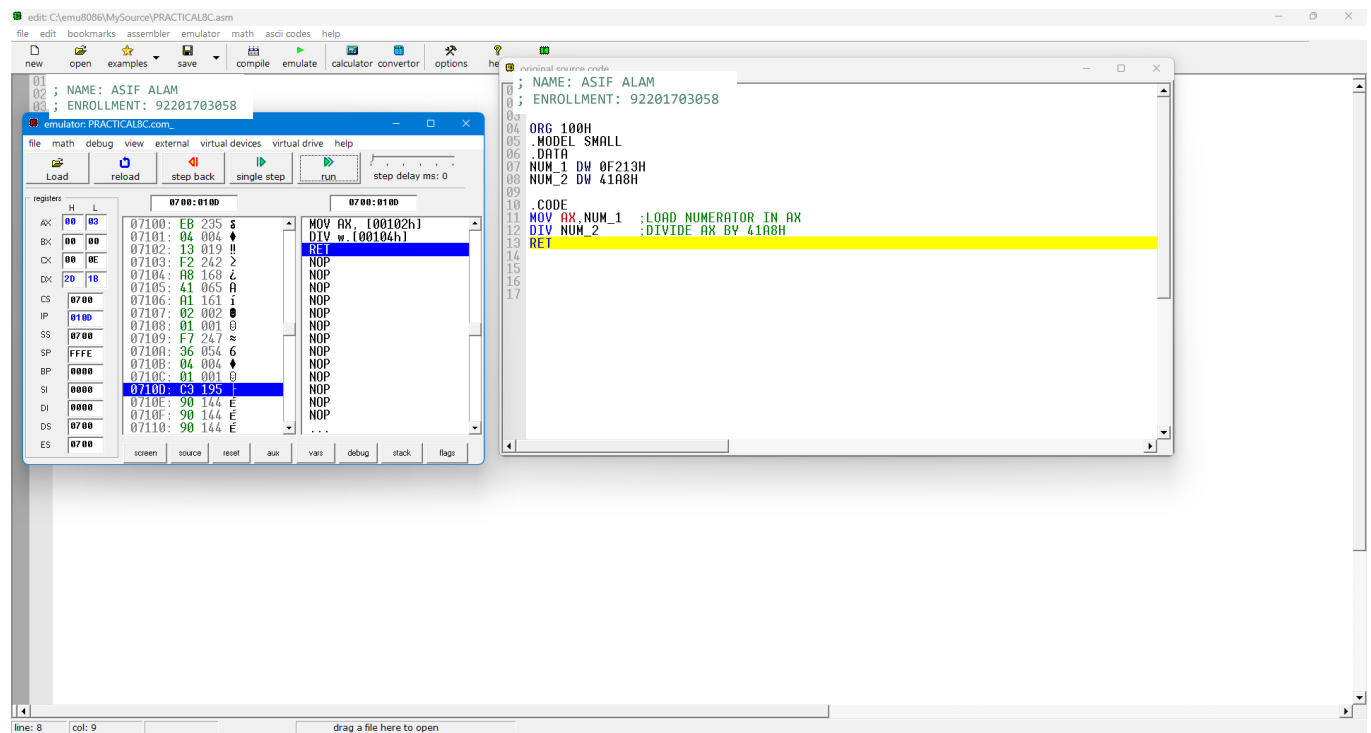
Word with word Division

In this case, the AX register holds the numerator. After division, the quotient is stored in the AX register and the remainder goes to the DX register.

Assembly Example Code

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Output

The output window shows that the division of F213H by 41A8 gives the remainder of 2D1B and 03 as a quotient.
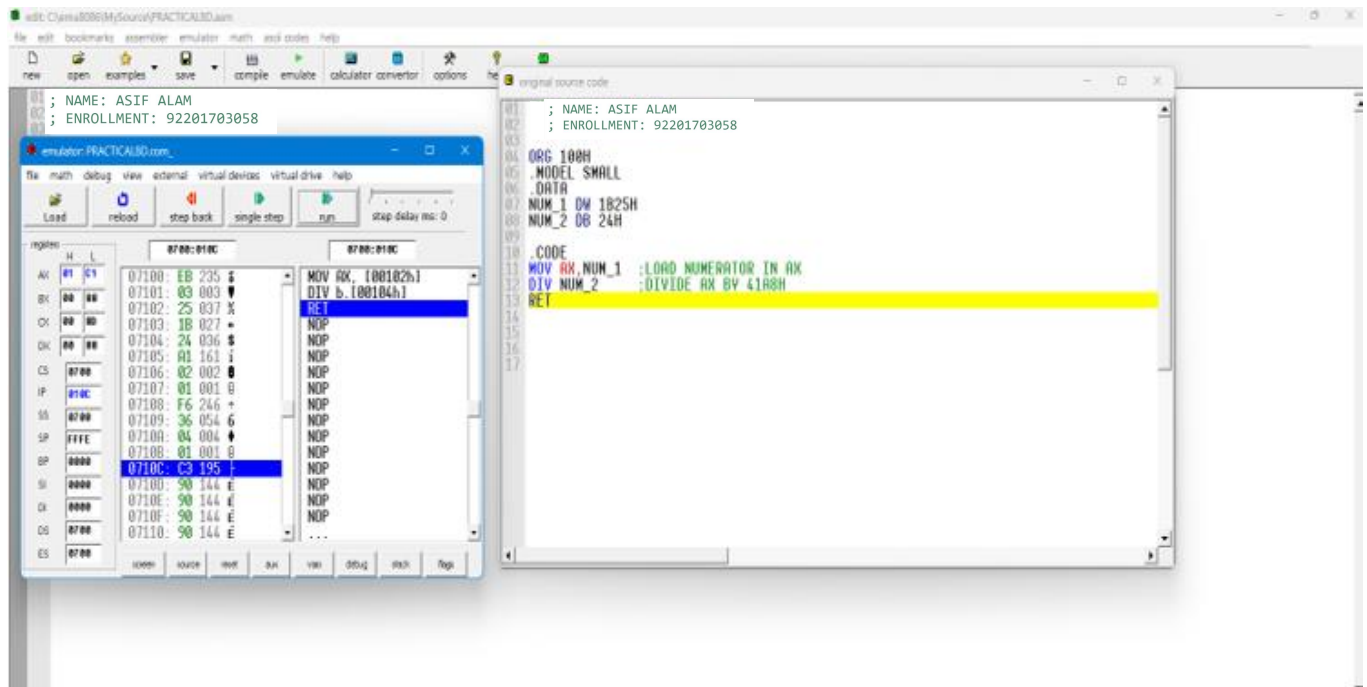
Word with Byte

The numerator is a 16-bit word stored in AX which is divided with an 8-bit denominator. After division, the AL contains the quotient and AH will contain the remainder.

Assembly Example Code

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Output

The NUM_1 is divided by NUM_2 which gives a quotient of C1 and remainder of 01. You can see from the contents of register AX that AH contains the remainder and AL stores the quotient.

Double word by word Divsion

It is the last case of division in which a numerator is a 32-bit number and a denominator is a 16-bit number. In this case, AX and DX stores the numerator. The most significant part resides in the DX register and the least significant bits of numerator are in the AX register.
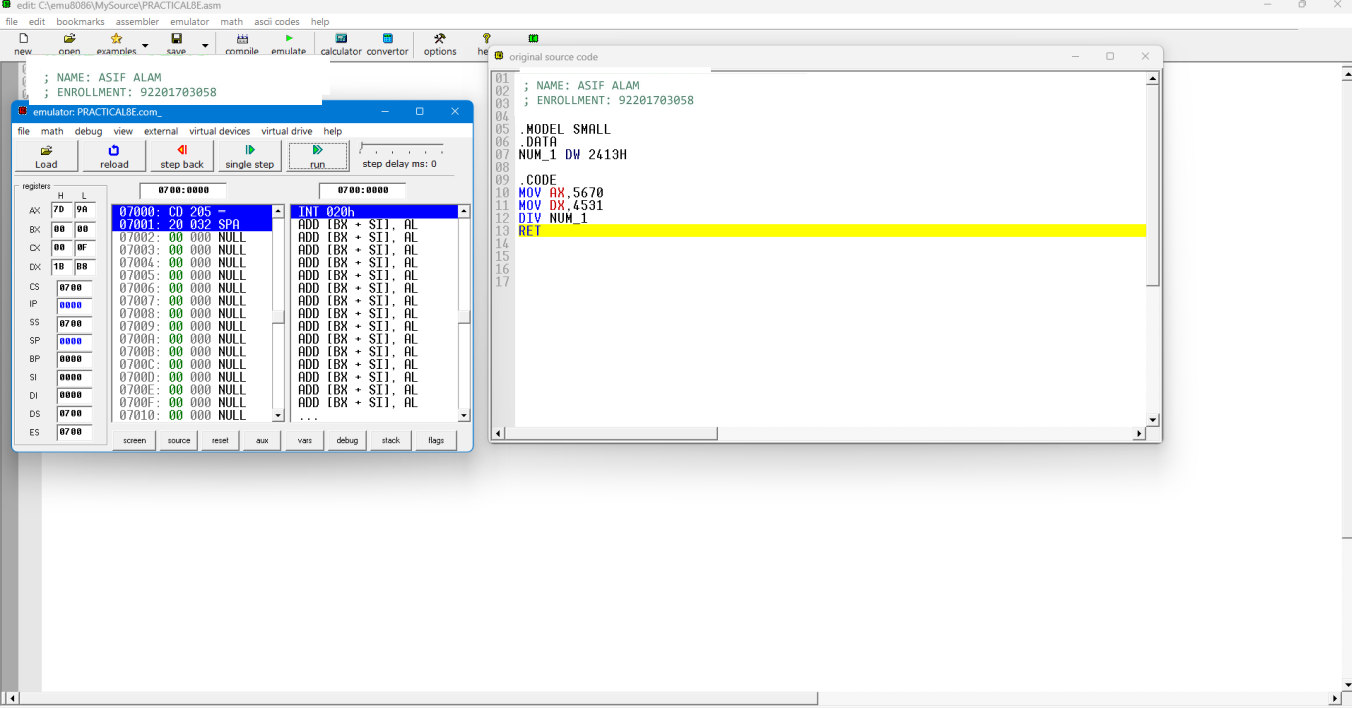
After the execution of DIV instruction, the remainder goes to DX register and the quotient lie in AX register.

Assembly Example Code

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Output

Here, the numerator in DX and AX which is 45315670. It is divided by 4531 to give quotient of 7D9A which is in AX register.

Conclusion: