Lab: 03

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Course: Computer Organization and Assembly Language

Question: 01 Effective address calculation.

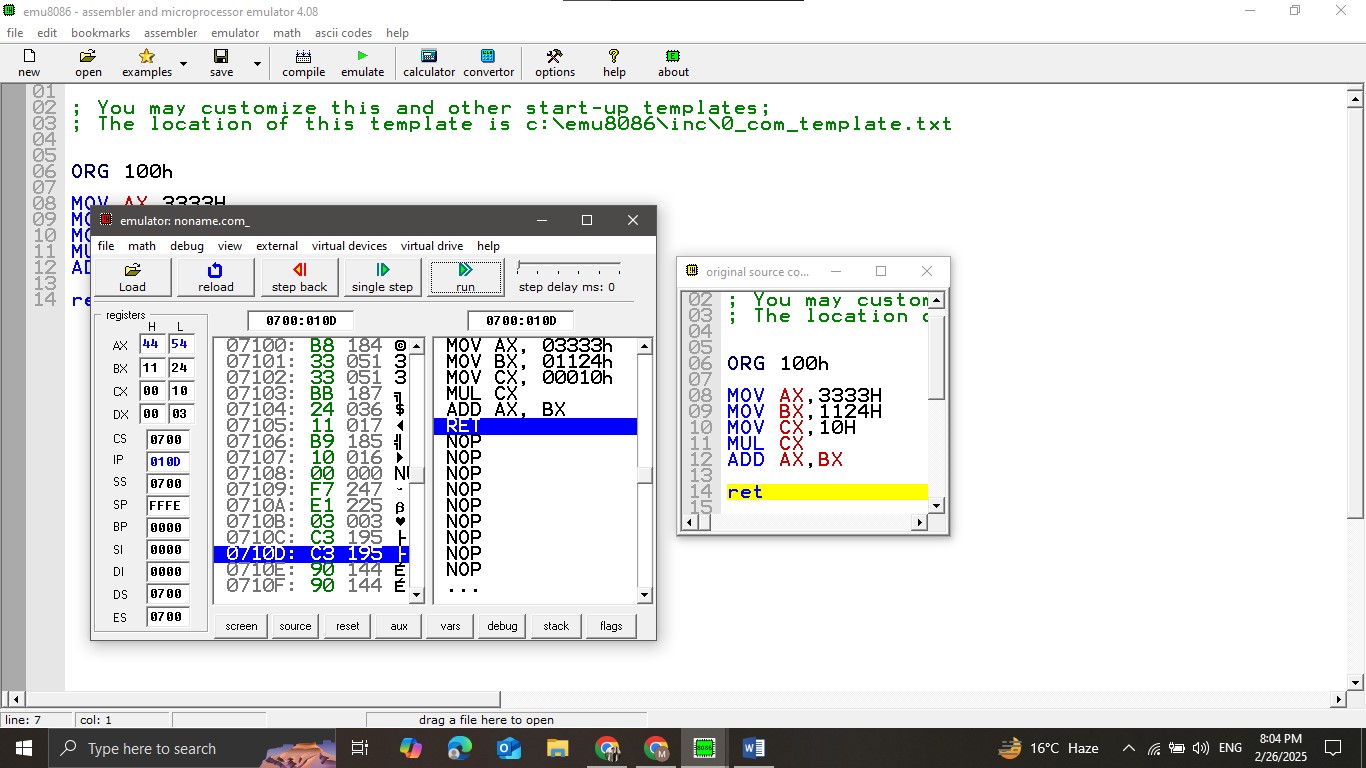
* Where is data located in memory for 8086?
* Why is the stack segment used?
* What is meant by saying that 8086 is a 16-bit processor?
* How will it be helpful for a processor if it has large number of registers?

DS= 3333H

BI= 1124H

Physical Address= 3333H\*10H+1124H

Physical Address = 34454H



* Data is located in memory segments (CS, DS, SS, ES) addressed via segment:offset pairs.
* The stack segment is used to manage subroutine calls, interrupts, and temporary data storage.
* 8086 is a 16-bit processor because it processes 16 bits of data at a time and has a 16-bit data bus.
* A large number of registers improves performance by reducing memory access and enabling faster data manipulation.

Question: 02

To Understand the Addressing. To explain and identify different addressing modes in 8086.

Show the location of data in memory, after the execution of these instructions, if the

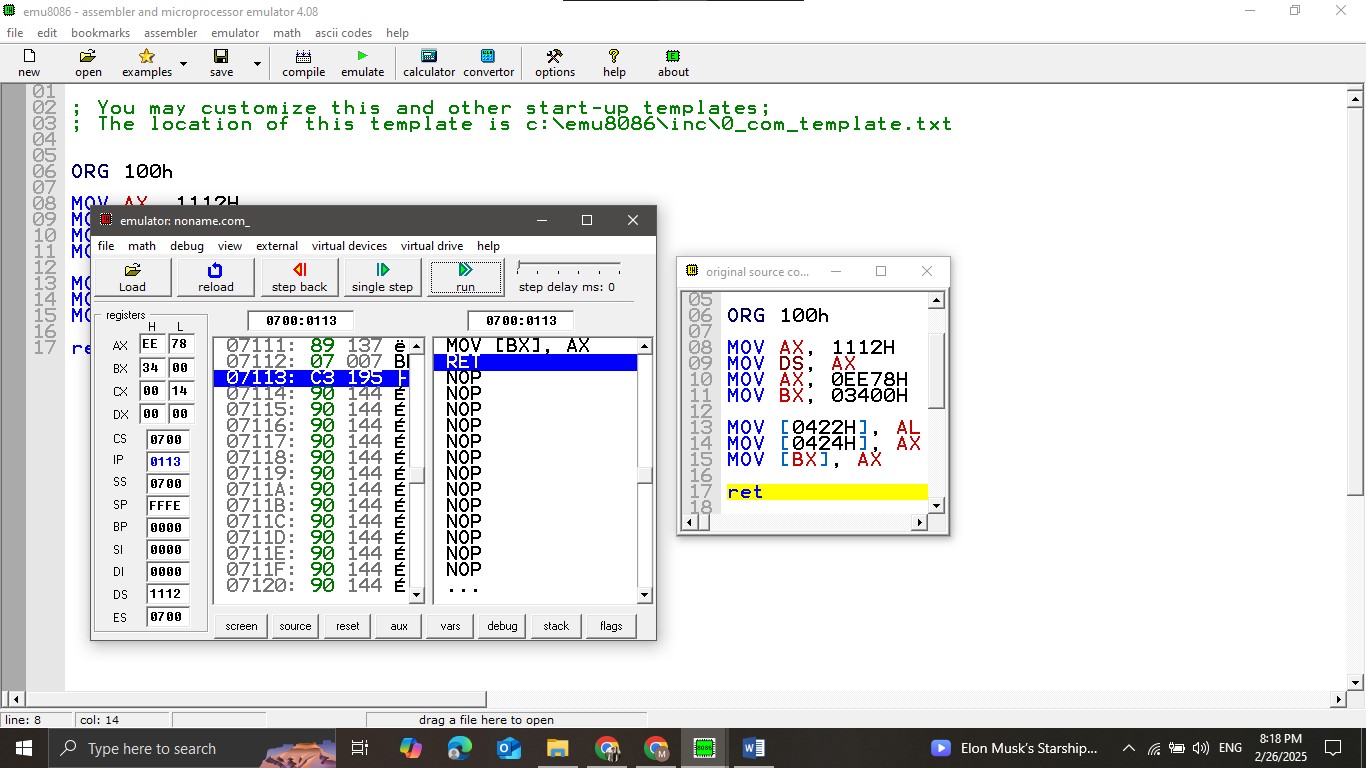
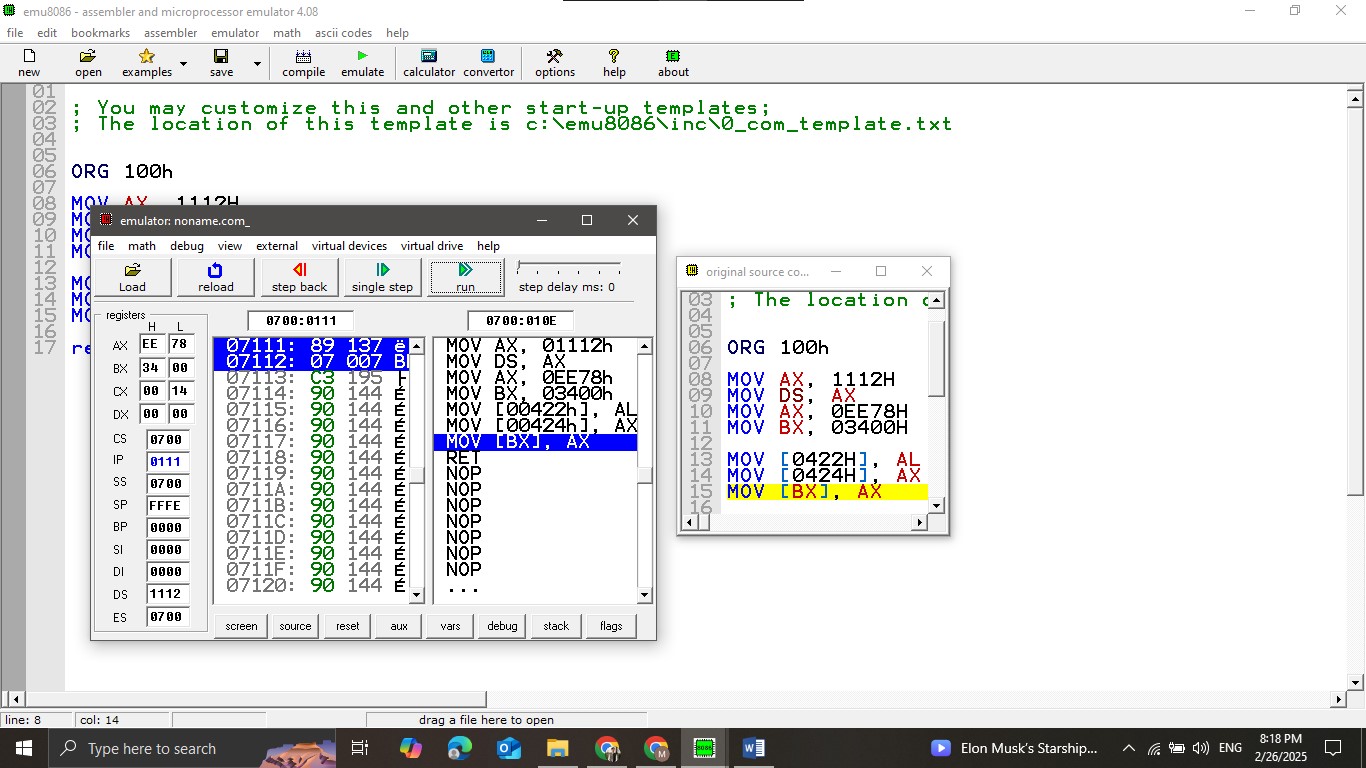
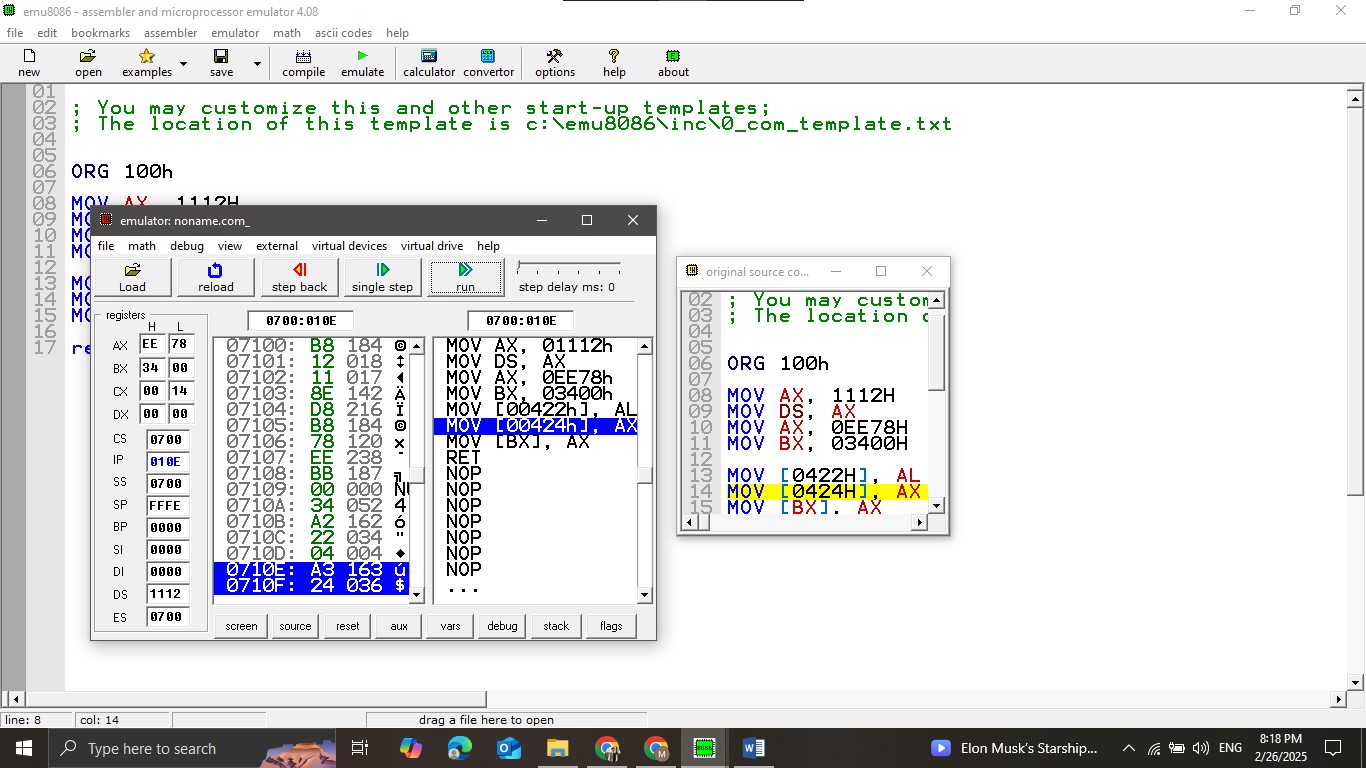
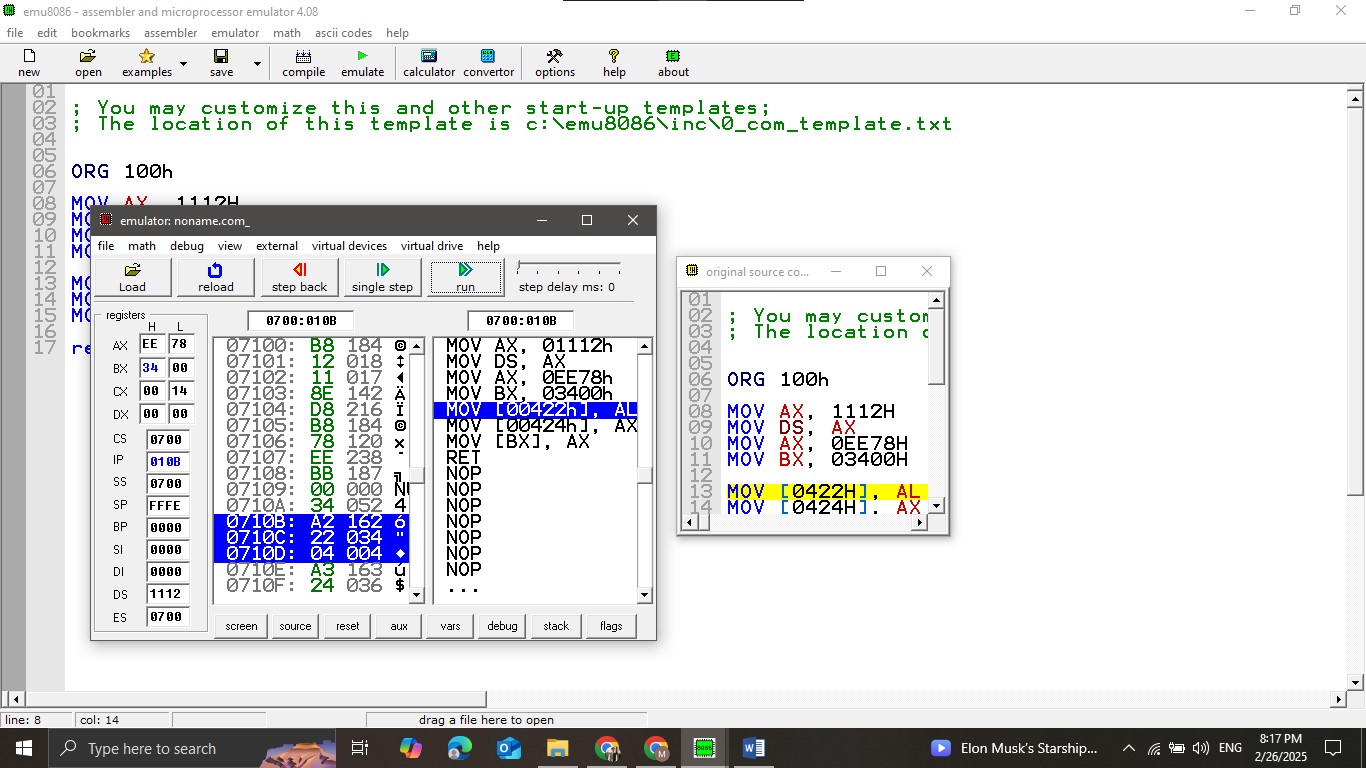
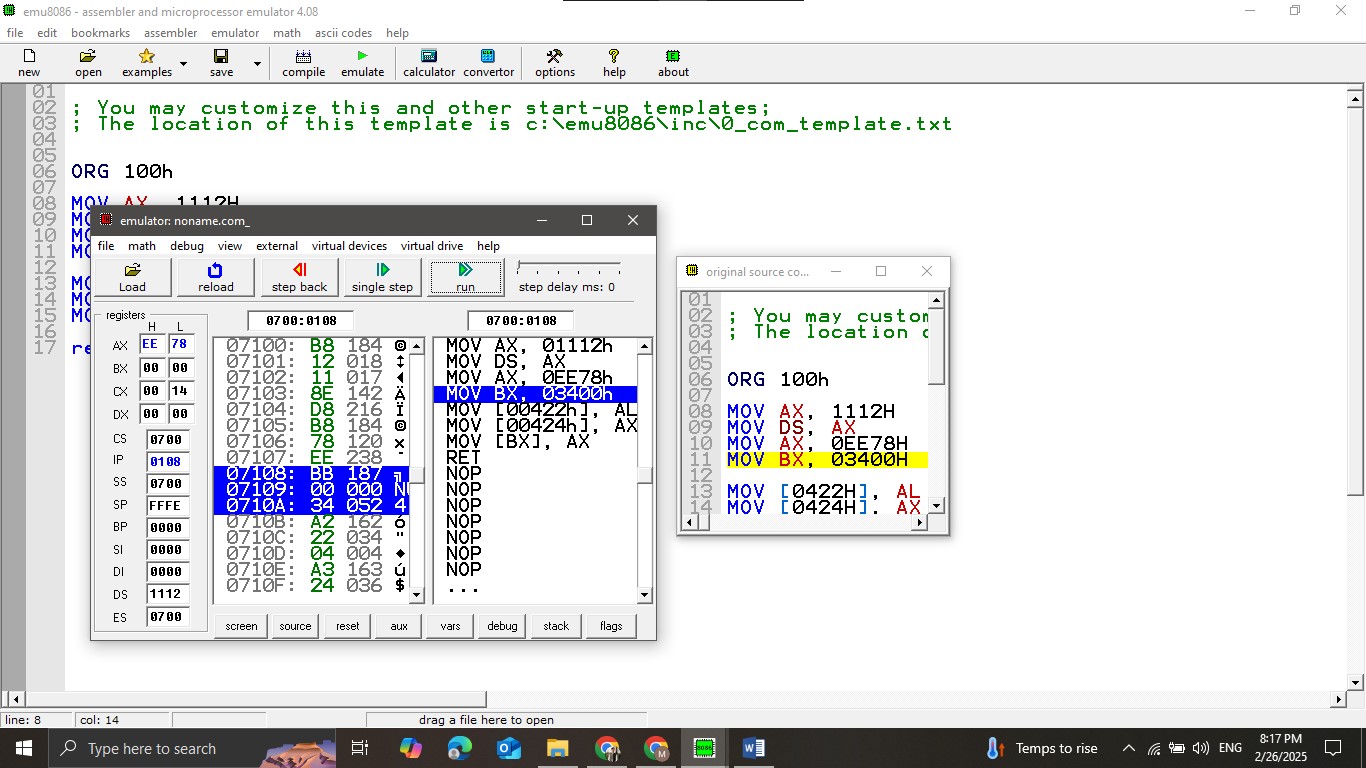
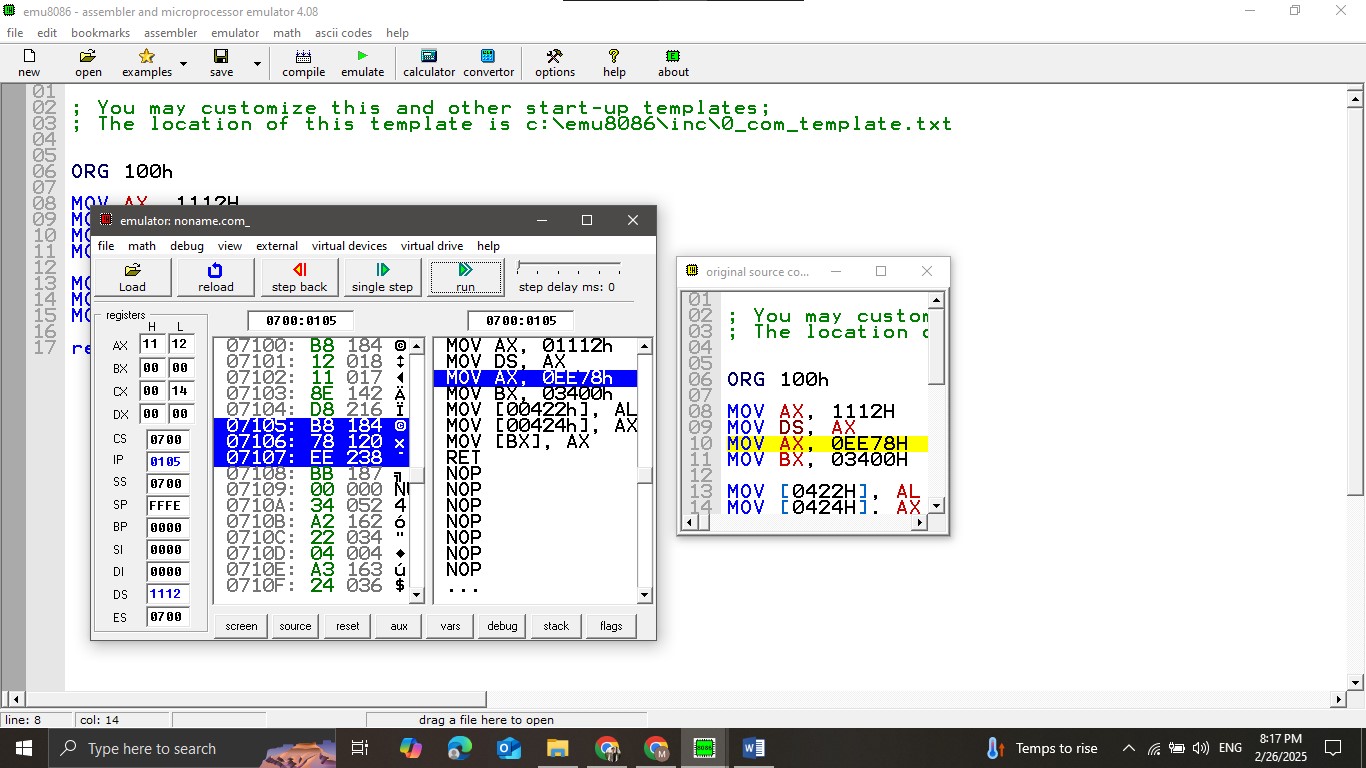
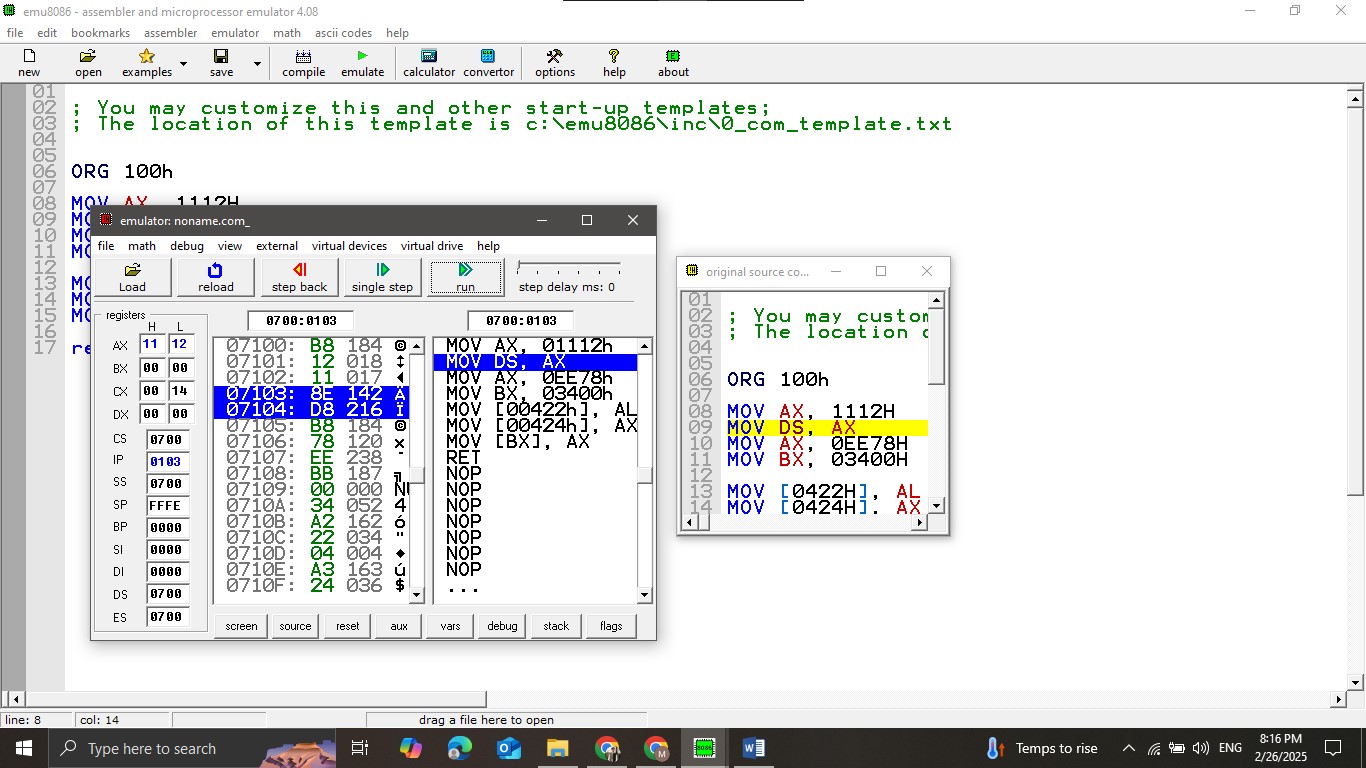
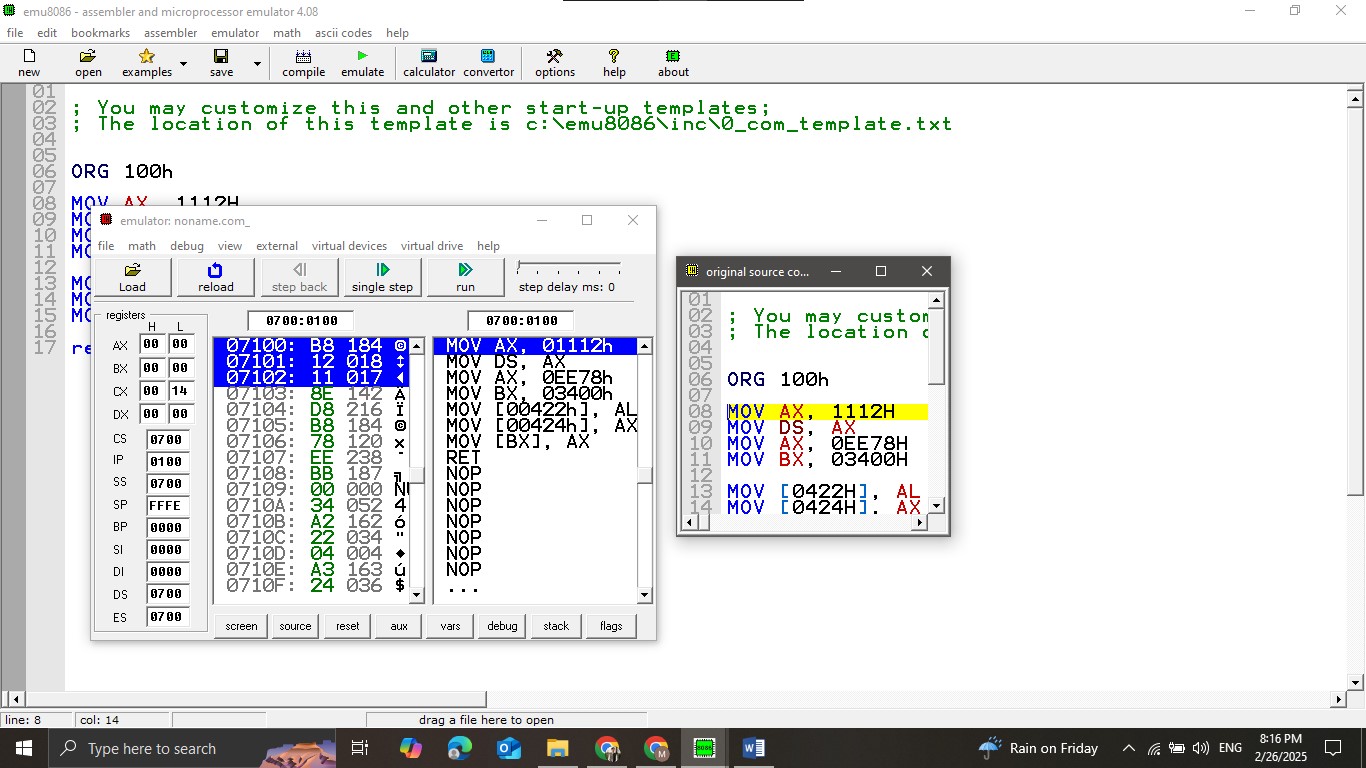
content of registers are as given;

DS= 1112H, AX=EE78H and BX=3400H

i. MOV[0422H],AL

ii. Mov[0424H],AX

iii. MOV[BX], AX



**2-** **SS=2344H, DS=4022H, BX=0200H, BP=1402H, SI=4442H  
Code:**org 100h

MOV AX, 2344H

MOV SS, AX

MOV AX, 4022H

MOV DS, AX

MOV BX, 0200H

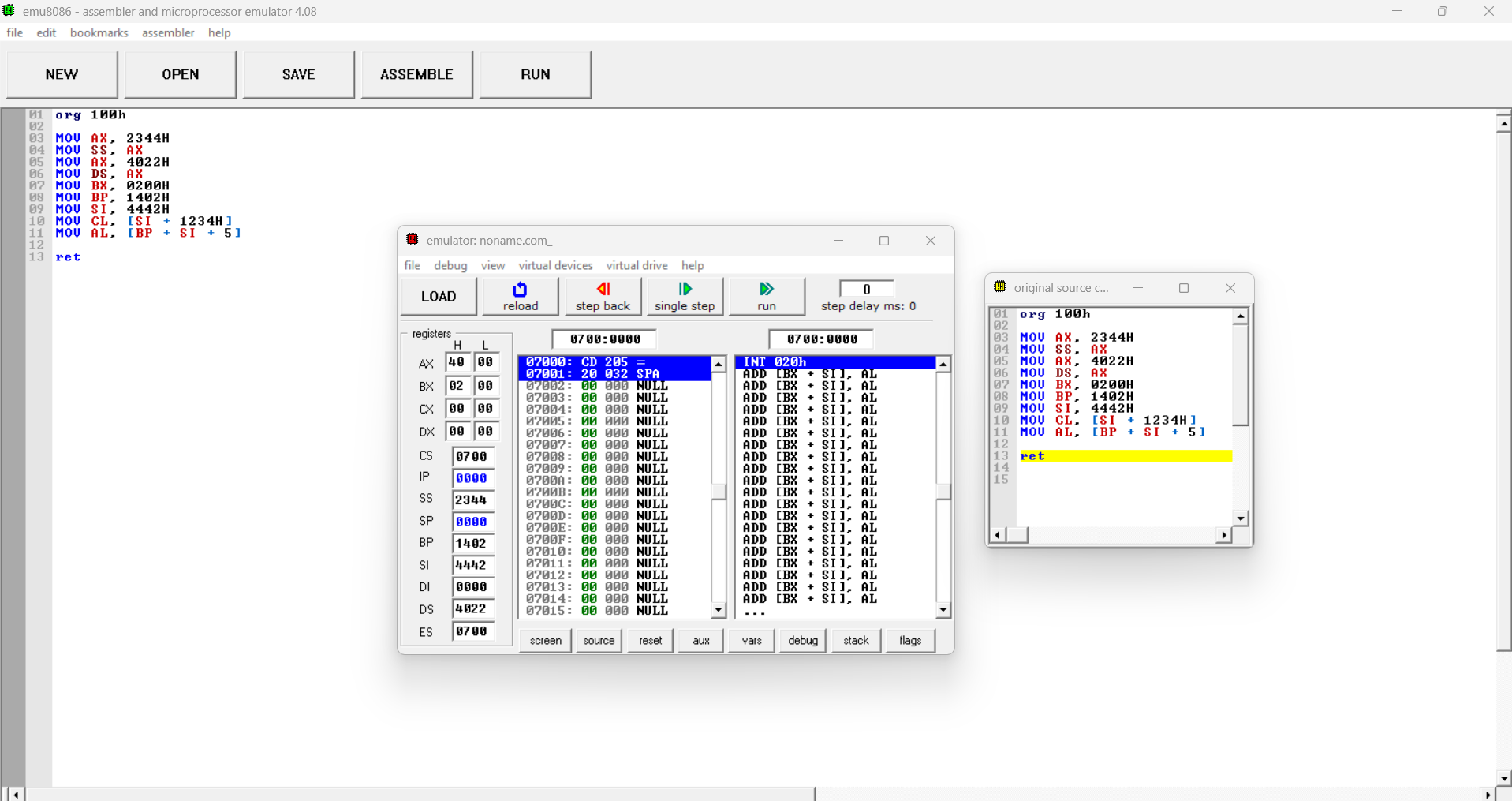
MOV BP, 1402H

MOV SI, 4442H

MOV CL, [SI + 1234H]

MOV AL, [BP + SI + 5]

Ret

**Output:  
**

**3-** **Specify the type of addressing mode and write the description of these instructions:**

**Code:**

org 100h

START DW 1234h

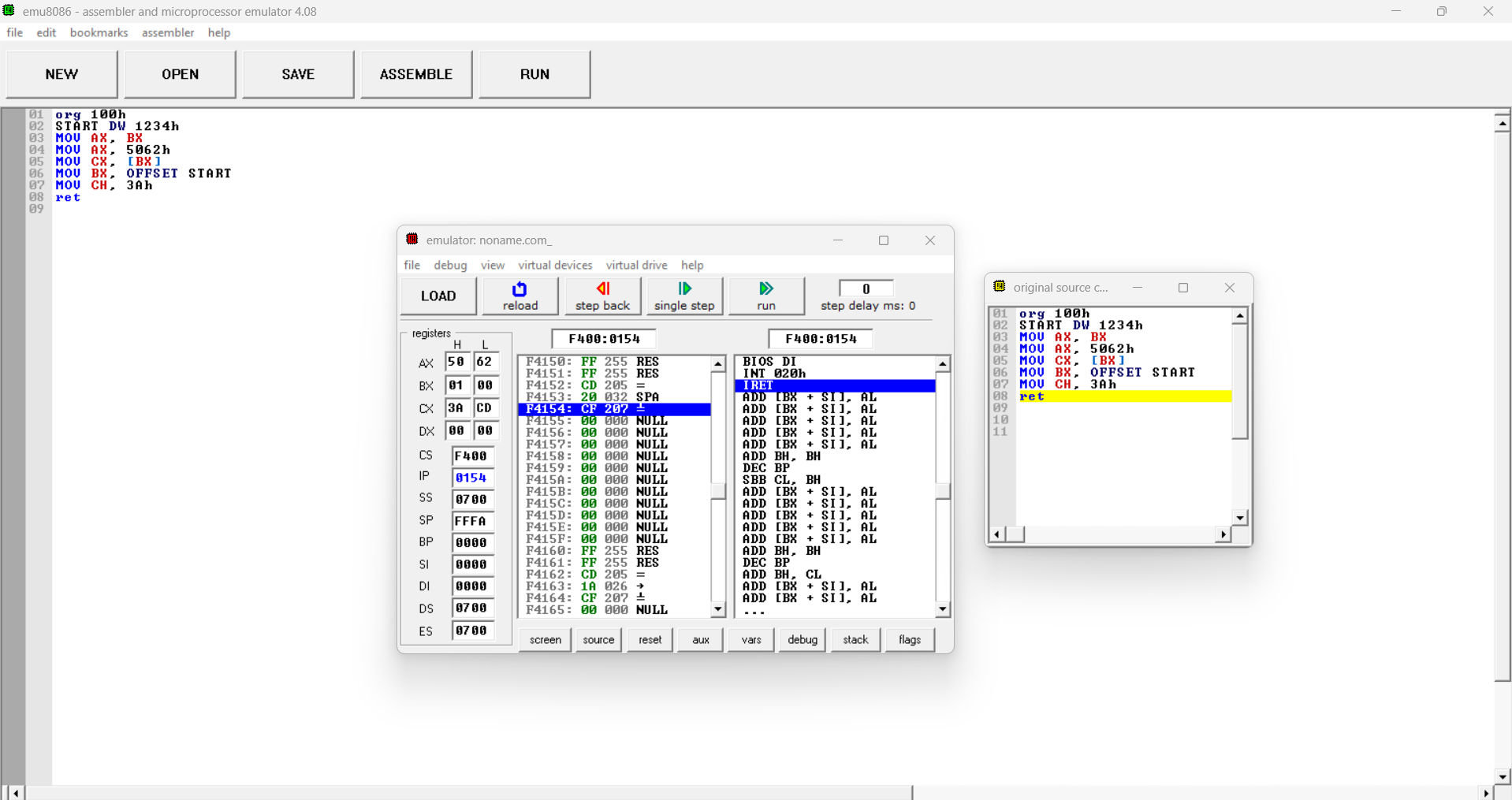
MOV AX, BX

MOV AX, 5062h

MOV CX, [BX]

MOV BX, OFFSET START

MOV CH, 3Ah

ret **Output:  
**

**Solution:**

1. **MOV AX, BX**
   * **Addressing Mode:** **Register Addressing Mode**
   * **Description:** The contents of register **BX** are copied into register **AX**. Both **AX** and **BX** are general-purpose registers.
2. **MOV AX, 5062h**
   * **Addressing Mode:** **Immediate Addressing Mode**
   * **Description:** The immediate value **5062h** (a constant) is directly loaded into the **AX** register.
3. **MOV CX, [BX]**
   * **Addressing Mode:** **Register Indirect Addressing Mode**
   * **Description:** The contents of the memory location whose address is stored in the **BX** register are copied into the **CX** register.
4. **MOV BX, START**
   * **Addressing Mode:** **Direct Addressing Mode**
   * **Description:** The contents of the memory location labelled **START** are copied into the **BX** register.
5. **MOV CH, 3Ah**
   * **Addressing Mode:** **Immediate Addressing Mode**
   * **Description:** The immediate value **3Ah** is directly loaded into the upper byte of the **CX** register (**CH**).