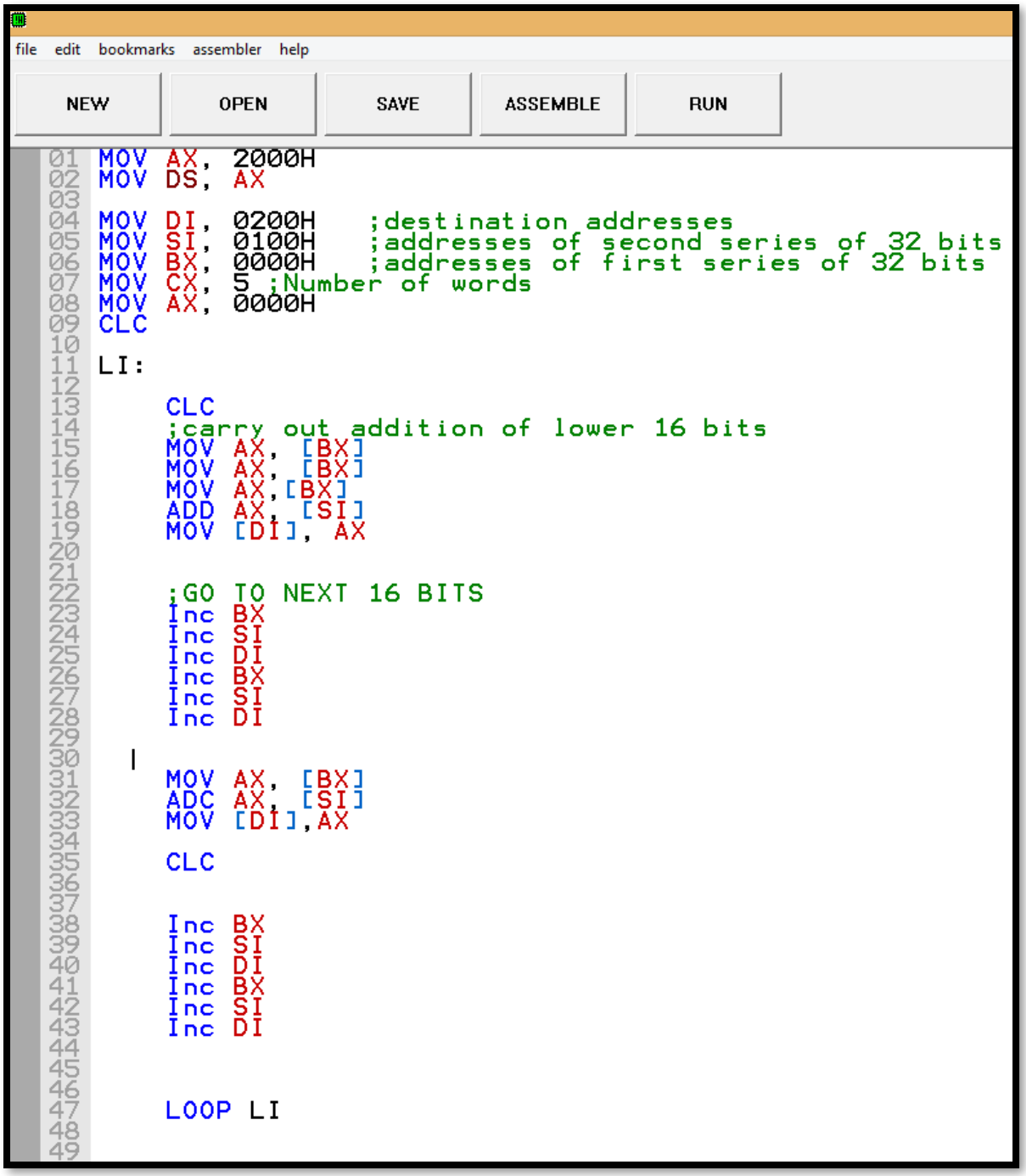
Experiment 3

Write an assembly language program in 8086 to add two 32 bit numbers stored from location 2000:0000H and 3000:0000H respectively. Store the result in 4000:0000H onwards

a) Modify the program to add a number series of 32 bit numbers stored from the same location as given above, for which Count of numbers in the series is stored in CX register. Store the result at 4000:0000H onwards.

b) Modify the program in (a) above to convert it to a subroutine to be called from a main program. Write subroutine and the main program after initializing the stack at 5000:0000H. Demonstrate the operation of stack through breakpoints/single stepping.

a)




```
01 MOV AX, 2000H
02 MOV DS, AX
03
04 MOV DI, 0200H    ;destination addresses
05 MOV SI, 0100H    ;addresses of second series of 32 bits
06 MOV BX, 0000H    ;addresses of first series of 32 bits
07 MOV CX, 5 ;Number of words
08 MOV AX, 0000H
09 CLC
10
11 LI:
12
13      CLC
14      ;carry out addition of lower 16 bits
15      MOV AX, [BX]
16      MOV AX, [BX]
17      MOV AX,[BX]
18      ADD AX, [SI]
19      MOV [DI], AX
20
21
22      ;GO TO NEXT 16 BITS
23      Inc BX
24      Inc SI
25      Inc DI
26      Inc BX
27      Inc SI
28      Inc DI
29
30
31      MOV AX, [BX]
32      ADC AX, [SI]
33      MOV [DI],AX
34
35      CLC
36
37
38      Inc BX
39      Inc SI
40      Inc DI
41      Inc BX
42      Inc SI
43      Inc DI
44
45
46
47      LOOP LI
48
49
```

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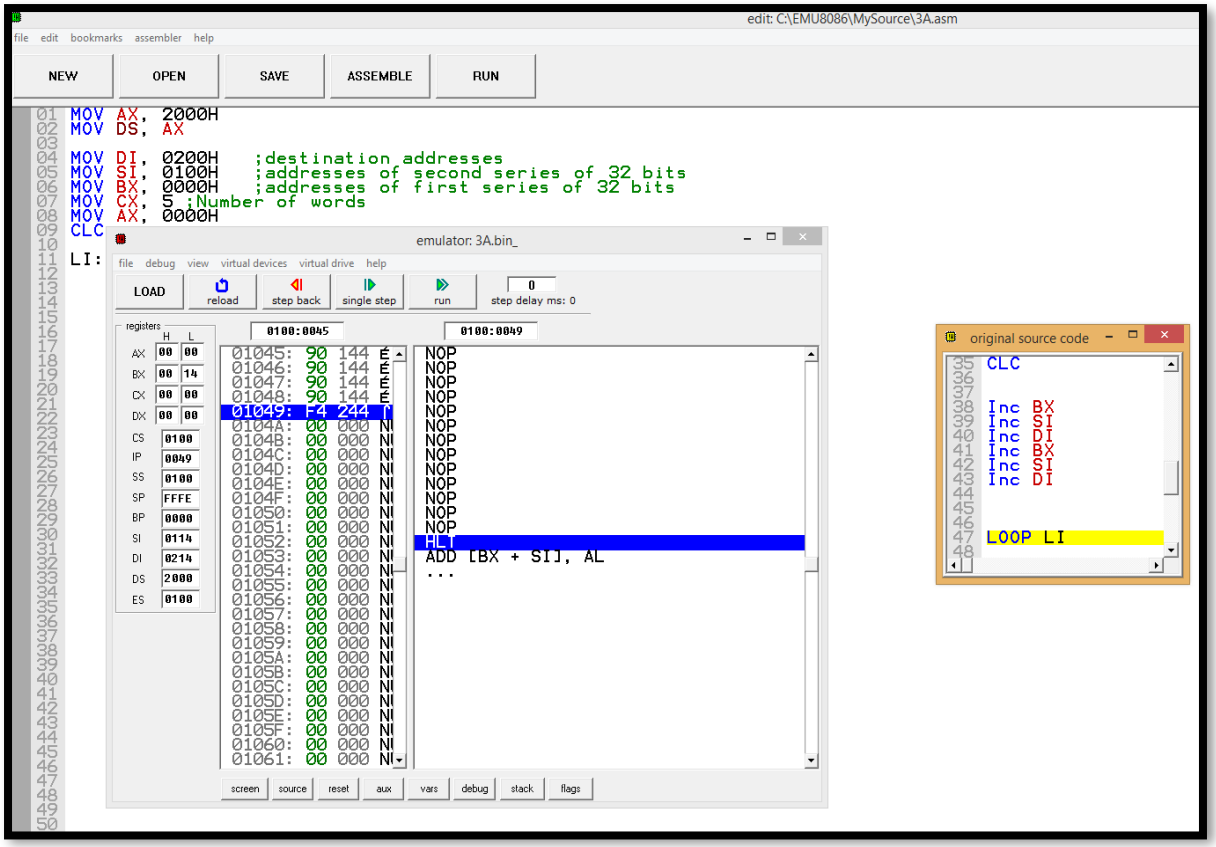
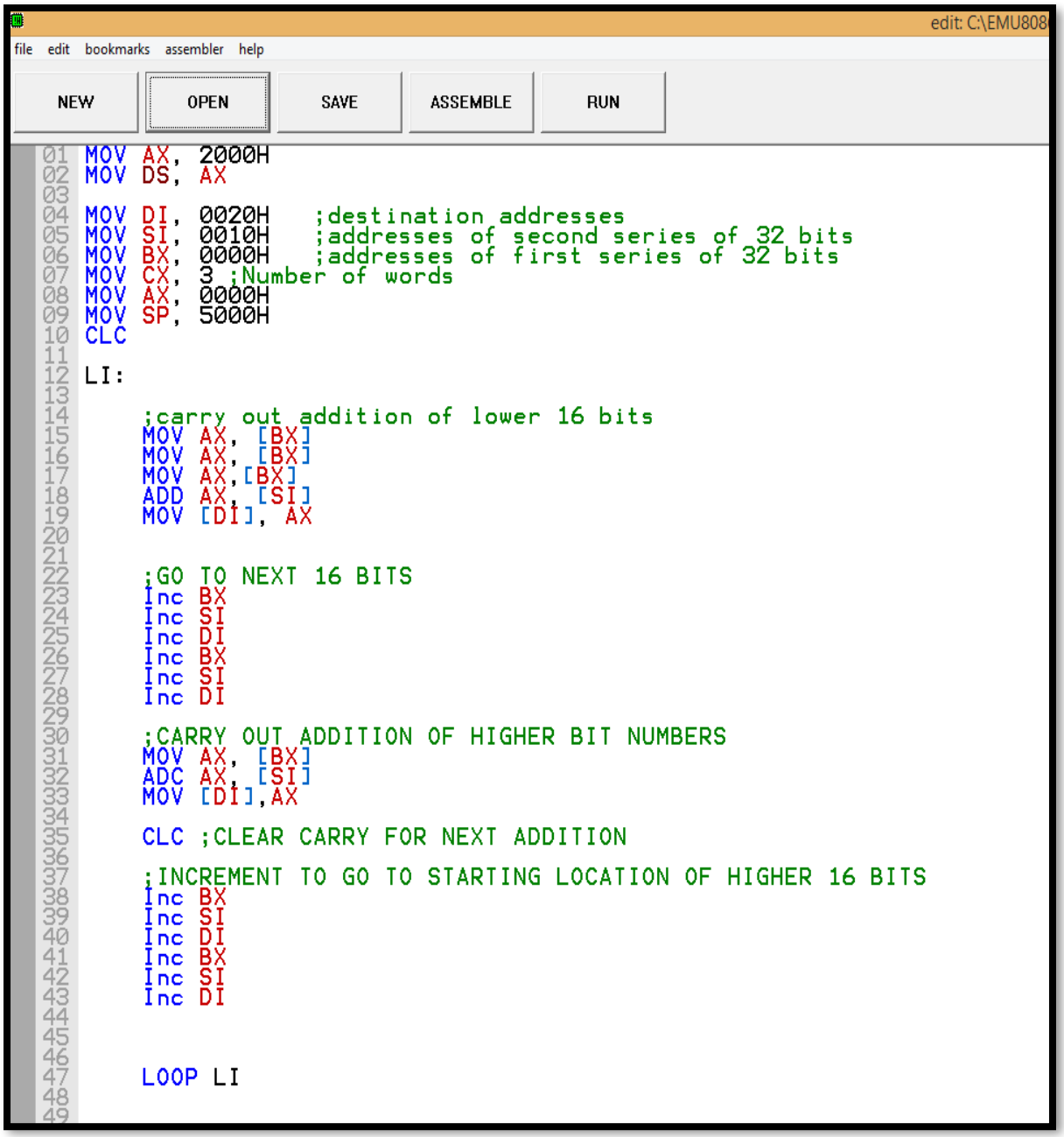


b)




```
01 MOV AX, 2000H
02 MOV DS, AX
03
04 MOV DI, 0020H    ;destination addresses
05 MOV SI, 0010H    ;addresses of second series of 32 bits
06 MOV BX, 0000H    ;addresses of first series of 32 bits
07 MOV CX, 3 ;Number of words
08 MOV AX, 0000H
09 MOV SP, 5000H
10 CLC
11
12 LI:
13
14      ;carry out addition of lower 16 bits
15      MOV AX, [BX]
16      MOV AX, [BX]
17      MOV AX,[BX]
18      ADD AX, [SI]
19      MOV [DI], AX
20
21
22      ;GO TO NEXT 16 BITS
23      Inc BX
24      Inc SI
25      Inc DI
26      Inc BX
27      Inc SI
28      Inc DI
29
30      ;CARRY OUT ADDITION OF HIGHER BIT NUMBERS
31      MOV AX, [BX]
32      ADC AX, [SI]
33      MOV [DI],AX
34
35      CLC ;CLEAR CARRY FOR NEXT ADDITION
36
37      ;INCREMENT TO GO TO STARTING LOCATION OF HIGHER 16 BITS
38      Inc BX
39      Inc SI
40      Inc DI
41      Inc BX
42      Inc SI
43      Inc DI
44
45
46
47      LOOP LI
48
49
```

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