Microprocessor and Interfacing: LAB 4

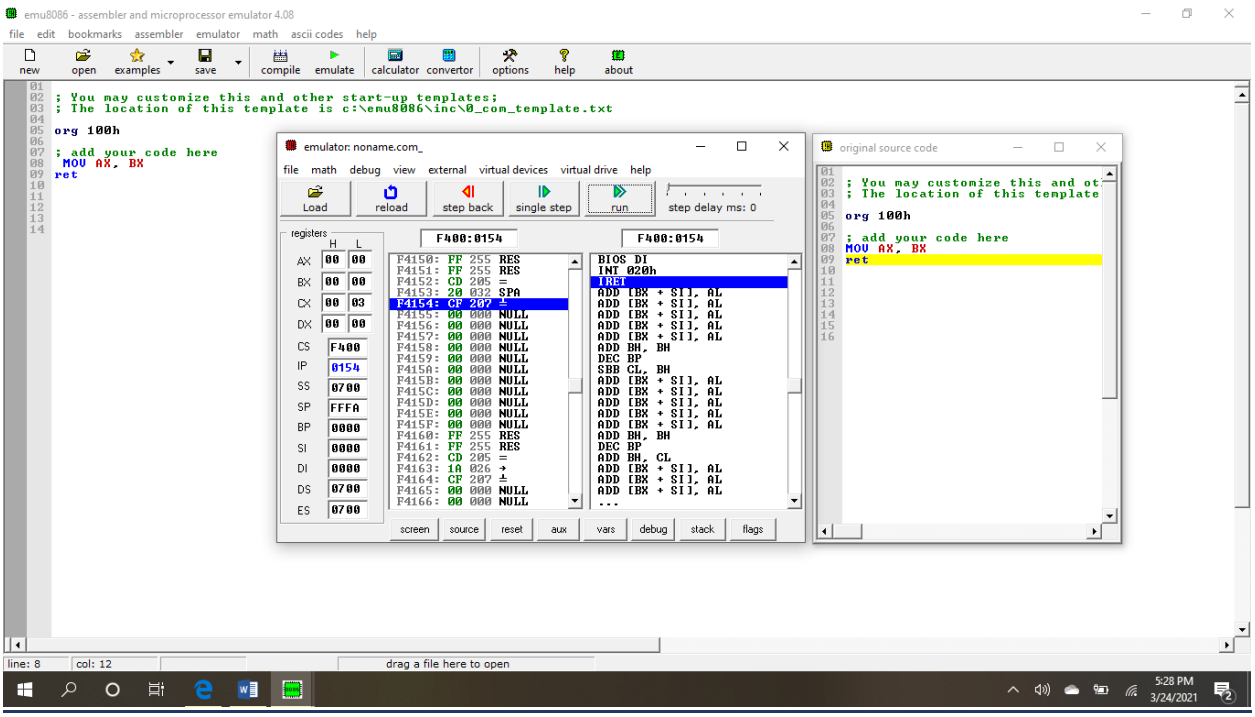
TASK: 1

Write a program to swap the contents of Ax and Bx registers using register addressing.

SOURCE CODE:

```
MOV AX, BX
```

Output:



TASK: 2

Declare two byte sized integer arrays num1 and num2 having 5 elements each, add them and store the result in a third array num3.

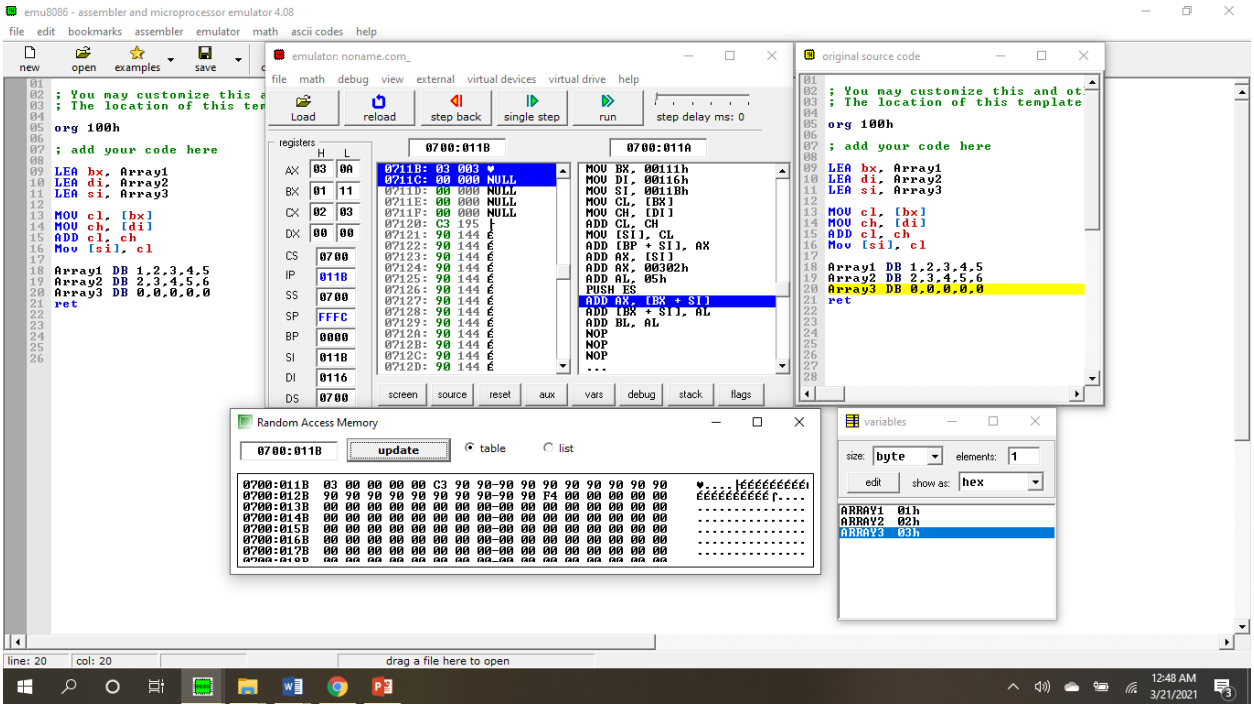
SOURCE CODE:

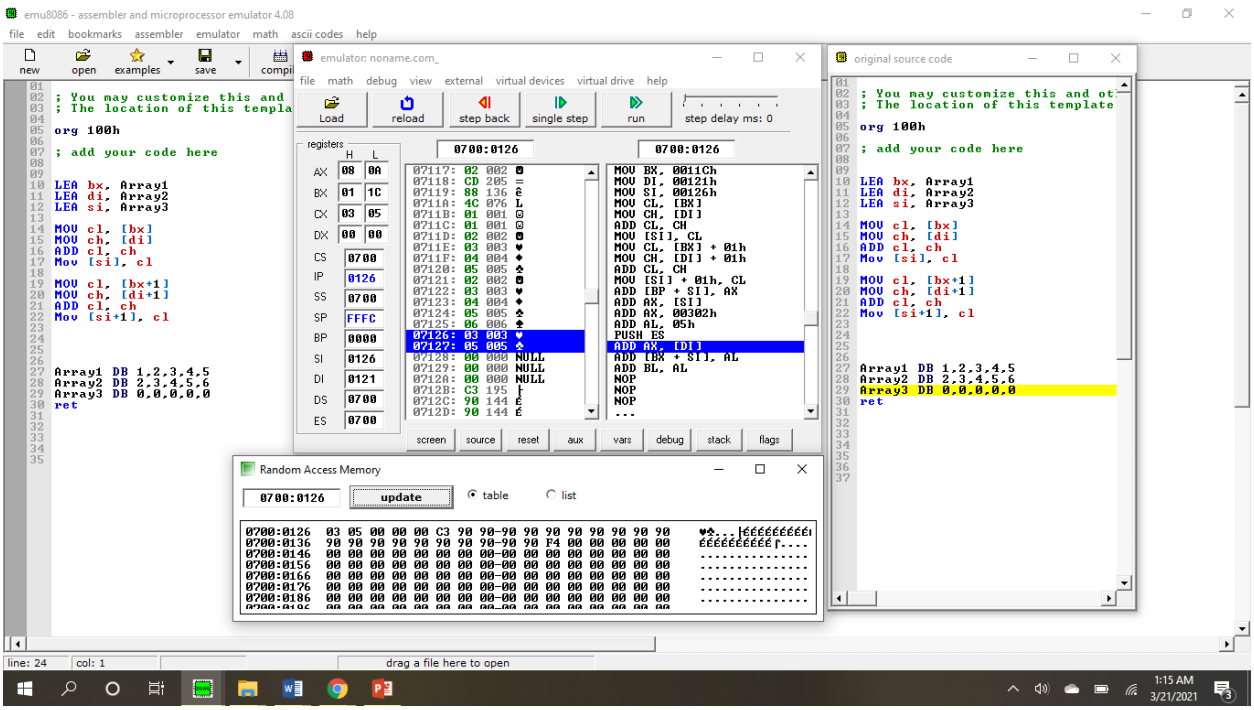
```
LEA bx, Array1
LEA di, Array2
LEA si, Array3

MOV cl, [bx]
MOV ch, [di]
ADD cl, ch
Mov [si], cl

MOV cl, [bx+1]
MOV ch, [di+1]
ADD cl, ch
Mov [si+1], cl

MOV cl, [bx+2]
MOV ch, [di+2]
ADD cl, ch
Mov [si+2], cl

MOV cl, [bx+3]
MOV ch, [di+3]
ADD cl, ch
Mov [si+3], cl
Array1 DB 1,2,3,4,5
```

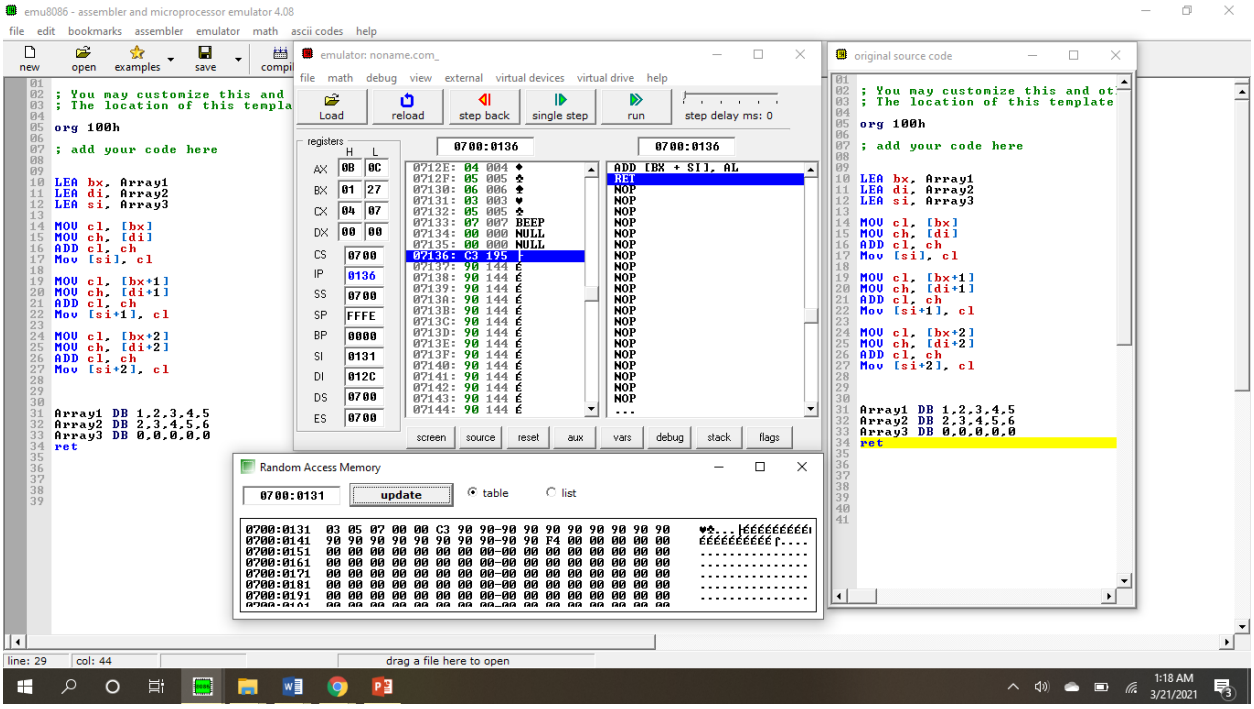
Array2 DB 2,3,4,5,6

Array3 DB 0,0,0,0,0

Output:



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emulator: noname.com_
Load reload step back single step run step delay ms: 0
registers
original source code
Random Access Memory
0700:0131
update
table list
line: 29 col: 44
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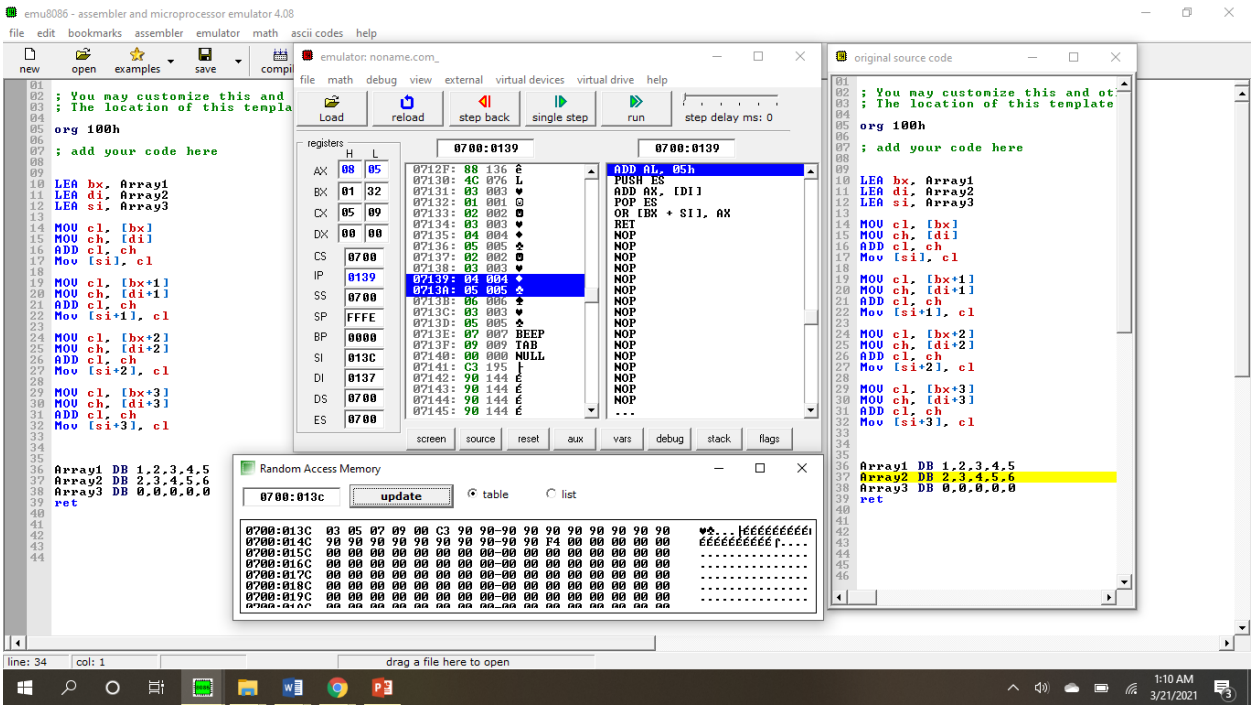
3/21/2021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Load reload step back single step run step delay ms: 0
registers
original source code
Random Access Memory
0700:013c
update
table list
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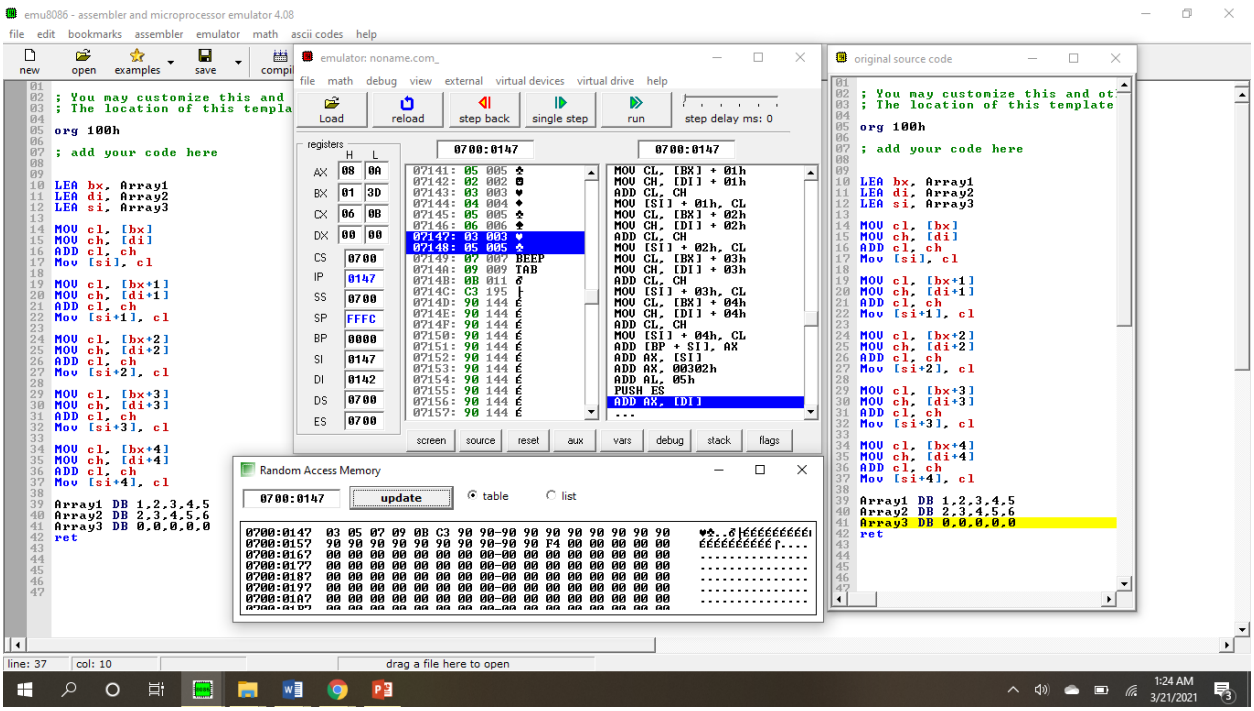


TASK: 3

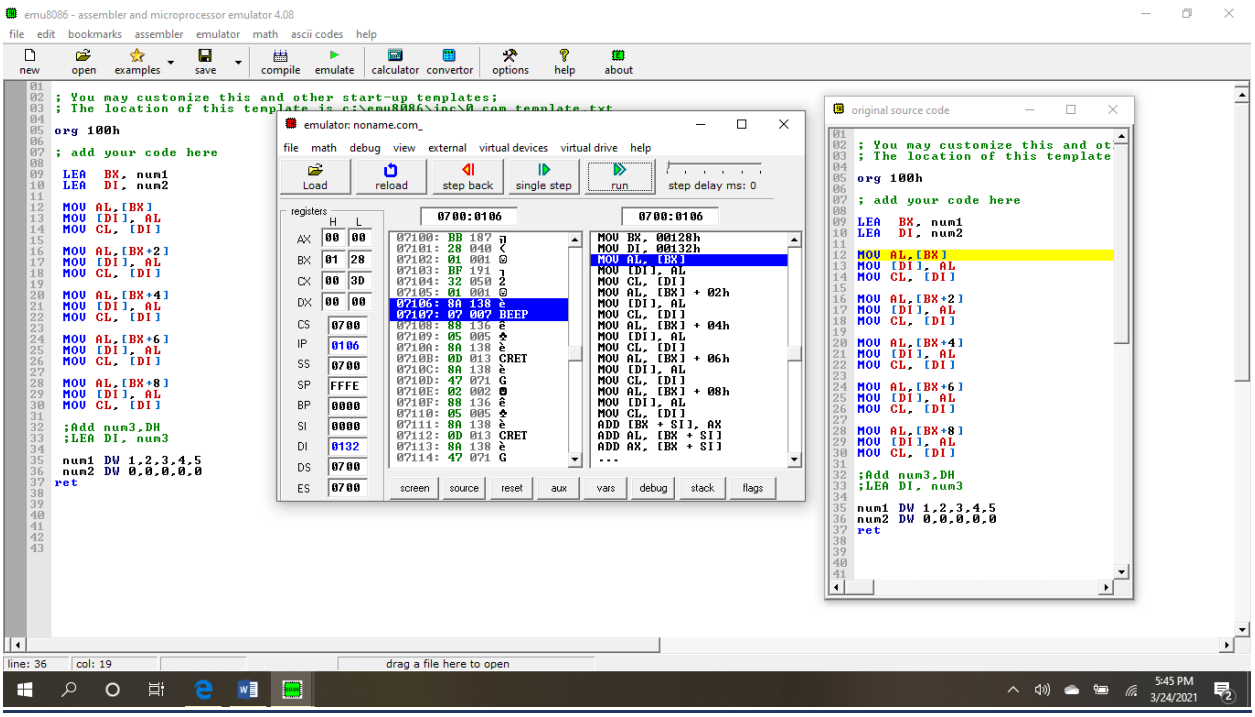
Write a program to swap the contents of two word sized arrays num1 and num2.

SOURCE CODE:

```
LEA  BX, num1
LEA  DI, num2

 MOV AL,[BX]
 MOV [DI], AL
 MOV CL, [DI]

 MOV AL,[BX+2]
 MOV [DI], AL
 MOV CL, [DI]
```

```
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]

MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]

MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]

;Add num3,DH
;LEA DI, num3

num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
```

Output: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; You may customize this and other start-up templates;
; The location of this template is c:\emu8086\inc\0_com_template.txt
org 100h
; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
emulator: noname.com_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
AX 0000
BX 0128
CX 0000
DX 0000
CS 0700
IP 0106
SS 0700
SP FFFE
BP 0000
SI 0000
DI 0132
DS 0700
ES 0700
0700:0106
0700:0106
screen source reset aux vars debug stack flags
original source code
line: 36 col: 19
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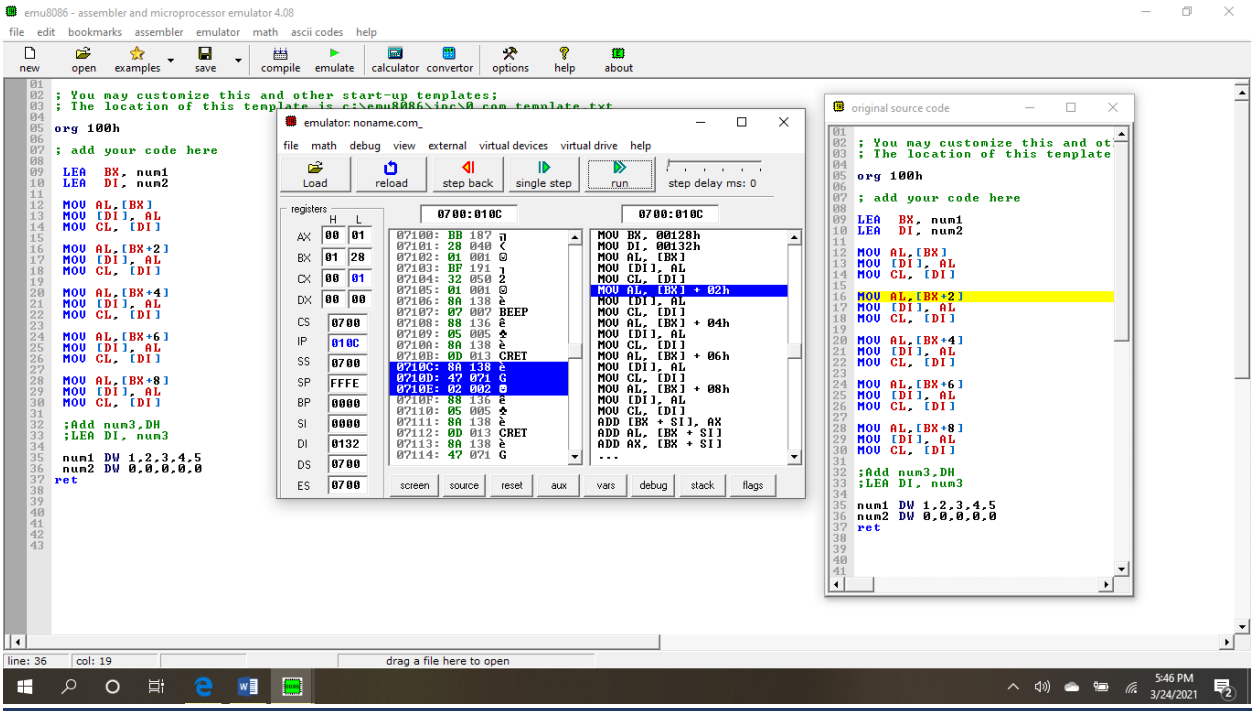
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; You may customize this and other start-up templates;
; The location of this template is c:\emu8086\inc\0_com_template.txt
org 100h
; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
emulator: noname.com_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
AX 0001
BX 0128
CX 0001
DX 0000
CS 0700
IP 010C
SS 0700
SP FFFE
BP 0000
SI 0000
DI 0132
DS 0700
ES 0700
0700:010C
0700:010C
screen source reset aux vars debug stack flags
original source code
line: 36 col: 19
drag a file here to open
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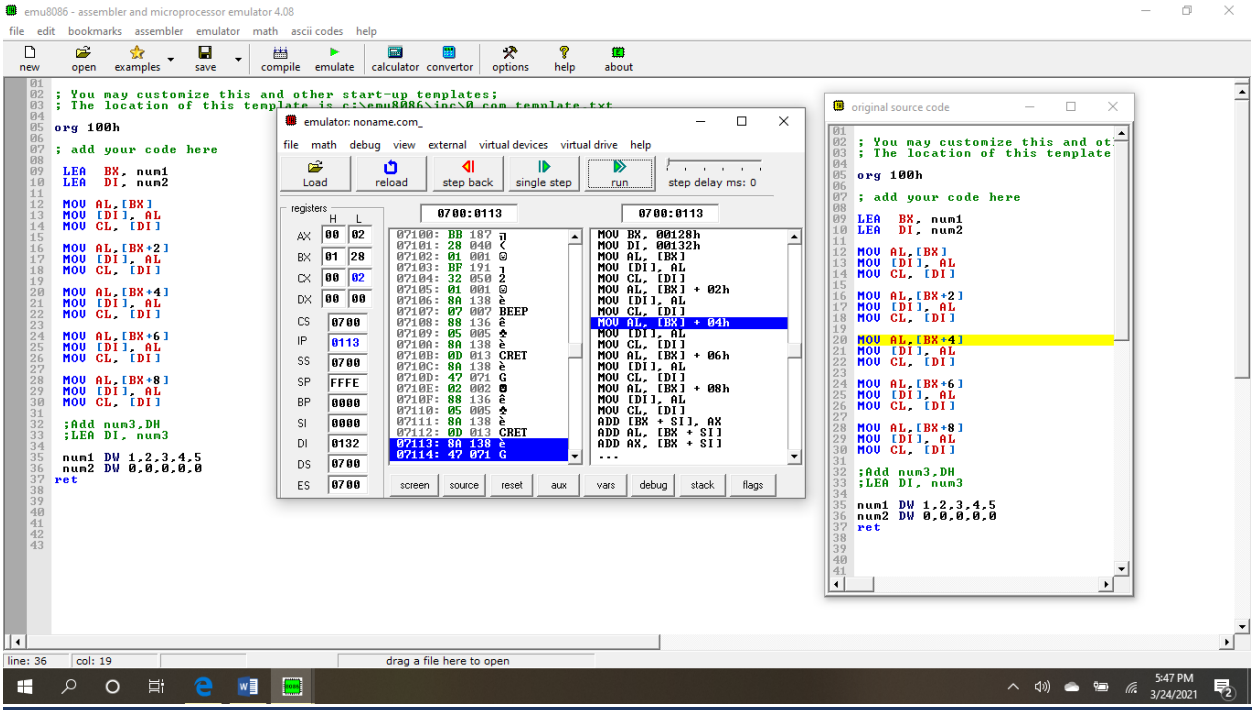
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; You may customize this and other start-up templates;
; The location of this template is c:\emu8086\inc\0_com_template.txt
org 100h
; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
emulator: noname.com_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
AX 00 02
BX 01 28
CX 00 02
DX 00 00
CS 0700
IP 0113
SS 0700
SP FFFE
BP 0000
SI 0000
DI 0132
DS 0700
ES 0700
0700:0113
0700:0113
07100: BB 187
07101: 28 040 (
07102: 01 001
07103: BF 191
07104: 32 050 2
07105: 01 001
07106: 8A 138 è
07107: 07 007 BEEP
07108: 88 136 ê
07109: 05 005 ♣
0710A: 8A 138 è
0710B: 0D 013 CRET
0710C: 8A 138 è
0710D: 47 071 G
0710E: 02 002
0710F: 88 136 ê
07110: 05 005 ♣
07111: 8A 138 è
07112: 0D 013 CRET
07113: 8A 138 è
07114: 47 071 G
MOV BX, 00128h
MOV DI, 00132h
MOV AL, [BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 02h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 04h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 06h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 08h
MOV [DI], AL
MOV CL, [DI]
ADD [BX + SI], AX
ADD AL, [BX + SI]
ADD AX, [BX + SI]
...
screen source reset aux vars debug stack flags
original source code
; You may customize this and ot
; The location of this template
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; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
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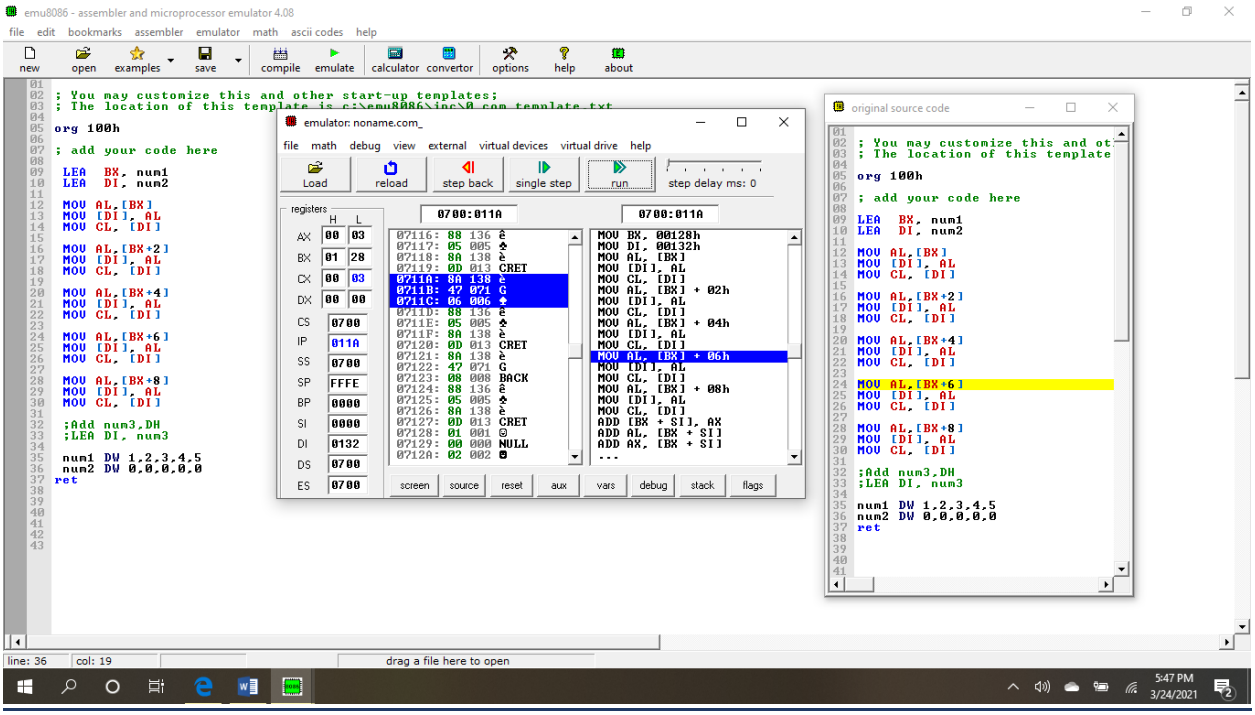
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; You may customize this and other start-up templates;
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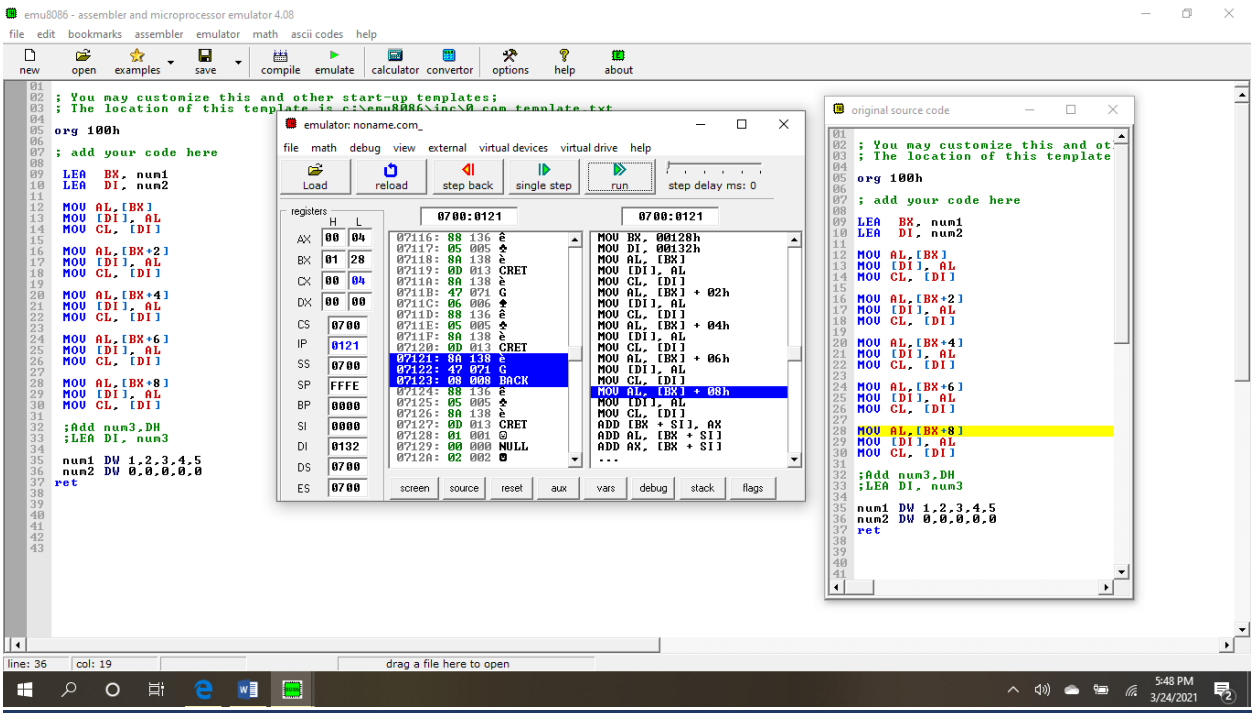
; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
emulator: noname.com_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
AX 00 03
BX 01 28
CX 00 03
DX 00 00
CS 0700
IP 011A
SS 0700
SP FFFE
BP 0000
SI 0000
DI 0132
DS 0700
ES 0700
0700:011A
0700:011A
07116: 88 136 ê
07117: 05 005 ♣
07118: 8A 138 è
07119: 0D 013 CRET
0711A: 8A 138 è
0711B: 47 071 G
0711C: 06 006
0711D: 88 136 ê
0711E: 05 005 ♣
0711F: 8A 138 è
07120: 0D 013 CRET
07121: 8A 138 è
07122: 47 071 G
07123: 08 008 BACK
07124: 88 136 ê
07125: 05 005 ♣
07126: 8A 138 è
07127: 0D 013 CRET
07128: 01 001
07129: 00 000 NULL
0712A: 02 002
MOV BX, 00128h
MOV DI, 00132h
MOV AL, [BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 02h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 04h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 06h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 08h
MOV [DI], AL
MOV CL, [DI]
ADD [BX + SI], AX
ADD AL, [BX + SI]
ADD AX, [BX + SI]
...
screen source reset aux vars debug stack flags
original source code
; You may customize this and ot
; The location of this template
org 100h
; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
line: 36 col: 19
drag a file here to open
5:47 PM
3/24/2021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; You may customize this and other start-up templates;
; The location of this template is c:\emu8086\inc\0_com_template.txt
org 100h
; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
emulator: noname.com_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
AX 00 04
BX 01 28
CX 00 04
DX 00 00
CS 0700
IP 0121
SS 0700
SP FFFE
BP 0000
SI 0000
DI 0132
DS 0700
ES 0700
0700:0121
0700:0121
07116: 88 136 ê
07117: 05 005 ♣
07118: 8A 138 è
07119: 0D 013 CRET
0711A: 8A 138 è
0711B: 47 071 G
0711C: 06 006 ♠
0711D: 88 136 ê
0711E: 05 005 ♣
0711F: 8A 138 è
07120: 0D 013 CRET
07121: 8A 138 è
07122: 47 071 G
07123: 08 008 BACK
07124: 88 136 ê
07125: 05 005 ♣
07126: 8A 138 è
07127: 0D 013 CRET
07128: 01 001 ☺
07129: 00 000 NULL
0712A: 02 002 ☻
MOV BX, 00128h
MOV DI, 00132h
MOV AL, [BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 02h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 04h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 06h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 08h
MOV [DI], AL
MOV CL, [DI]
ADD [BX + SI], AX
ADD AL, [BX + SI]
ADD AX, [BX + SI]
...
screen source reset aux vars debug stack flags
original source code
; You may customize this and ot
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; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
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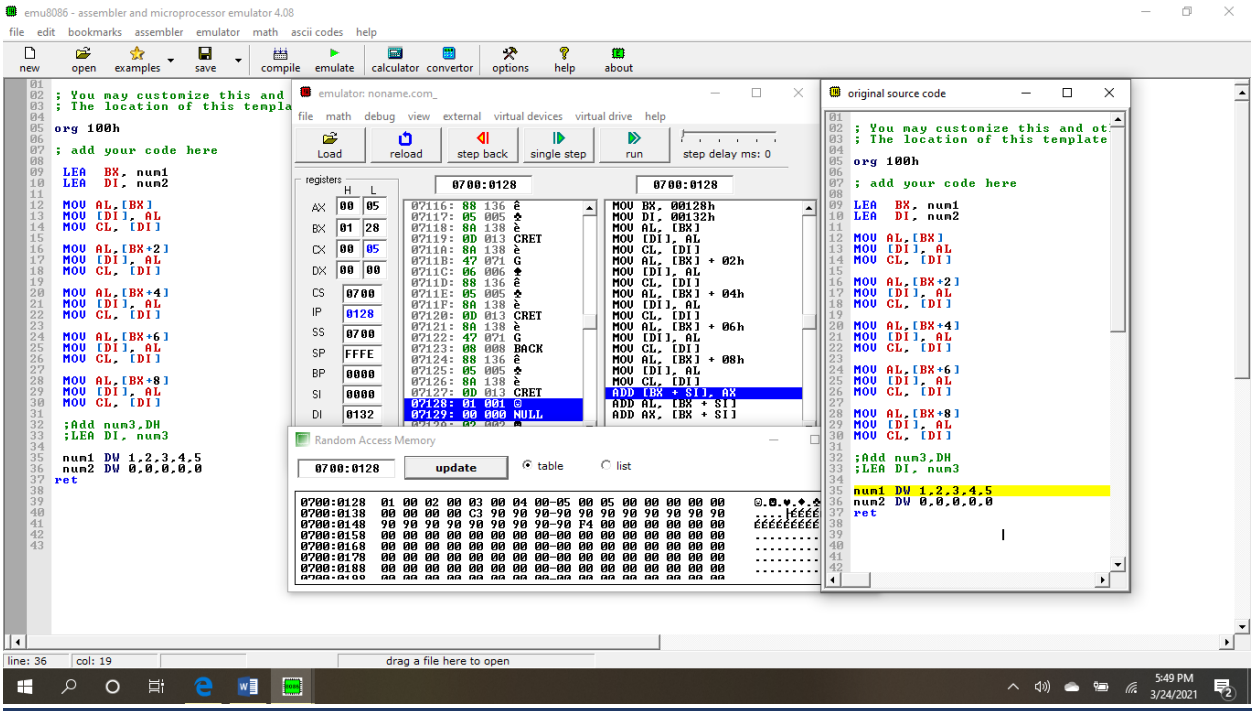
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new open examples save compile emulate calculator convertor options help about
; You may customize this and
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; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
emulator: noname.com_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
AX 00 05
BX 01 28
CX 00 05
DX 00 00
CS 0700
IP 0128
SS 0700
SP FFFE
BP 0000
SI 0000
DI 0132
0700:0128
0700:0128
07116: 88 136 ê
07117: 05 005 ♣
07118: 8A 138 è
07119: 0D 013 CRET
0711A: 8A 138 è
0711B: 47 071 G
0711C: 06 006 ♠
0711D: 88 136 ê
0711E: 05 005 ♣
0711F: 8A 138 è
07120: 0D 013 CRET
07121: 8A 138 è
07122: 47 071 G
07123: 08 008 BACK
07124: 88 136 ê
07125: 05 005 ♣
07126: 8A 138 è
07127: 0D 013 CRET
07128: 01 001 ☺
07129: 00 000 NULL
MOV BX, 00128h
MOV DI, 00132h
MOV AL, [BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 02h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 04h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 06h
MOV [DI], AL
MOV CL, [DI]
MOV AL, [BX] + 08h
MOV [DI], AL
MOV CL, [DI]
ADD [BX + SI], AX
ADD AL, [BX + SI]
ADD AX, [BX + SI]
Random Access Memory
0700:0128
update
table
list
0700:0128 01 00 02 00 03 00 04 00-05 00 05 00 00 00 00 00
0700:0138 00 00 00 00 C3 90 90 90-90 90 90 90 90 90 90 90
0700:0148 90 90 90 90 90 90 90 90-90 F4 00 00 00 00 00 00
0700:0158 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0700:0168 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0700:0178 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0700:0188 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
original source code
; You may customize this and ot
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org 100h
; add your code here
LEA BX, num1
LEA DI, num2
MOV AL,[BX]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+2]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+4]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+6]
MOV [DI], AL
MOV CL, [DI]
MOV AL,[BX+8]
MOV [DI], AL
MOV CL, [DI]
;Add num3,DH
;LEA DI, num3
num1 DW 1,2,3,4,5
num2 DW 0,0,0,0,0
ret
line: 36 col: 19
drag a file here to open
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