14210301 2

Experiment - 1

Find manually operational code for following instructions using instruction template. Verify the correctness of the opcode using suitable tools for debugging. Explain the operation of forming each opcode in a handwritten report. Comment on Default segment assignment. Further repeat to carry out process of opcode formation by preceding the instruction byte by segment overide prefix by any segment register of your choice. Verify the correctness of code formed

i) Mov AX, BX

from Register to Register

1	0	0	0	1	0	d	w		mod	reg	r/m
						↓	↓		↓	↓	↓
						1	1		11	000	011

1000	1011	1100	0011
8	11	12	3

8BC3

The default segment assignment is Data segment

2) MOV AX, [1000H]

10 → H 00 → L

Memory to Accumulator -

1010000	W	addr - low	addr - high
	↓	↓	↓
10100000	1	00	10

→ 1010 (A) 0001 (1) 00 10

00 10

⇒ A1, 00, 10

3) MOV [BX], AX

Accumulator to memory

10	10	00	1	W	add - low	add - high
					↓	↓
					00	10

1010 (A) 0011 (3) 00 10

00 10

142103012

MOV [BP+DI+8BH], AL

Register to Memory

1 0 0 0 1 0	d w	mod	reg	r/m
	0 0	10	000	011

=> 1000 1000 1000 0011
8 8 8 3

=> 88, 83

5) MOV [DI], AX

Register to Memory

1 0 0 0 1 0	d w	mod	reg	r/m
	0 1	00	000	101

=>

1000 1001 000 0101
8 9 0 5

89, 05

6) MOV AX, [BX + DI + 1239 H]

Memory to Register

1	0	0	0	1	0	d	w	mod	reg	r/m
						↓	↓	↓	↓	↓
						1	1	10	000	001

1000	1011	1000	0001
8	B	8	1

⇒ 8B, 81

7) MOV AH, BL

Register to Register

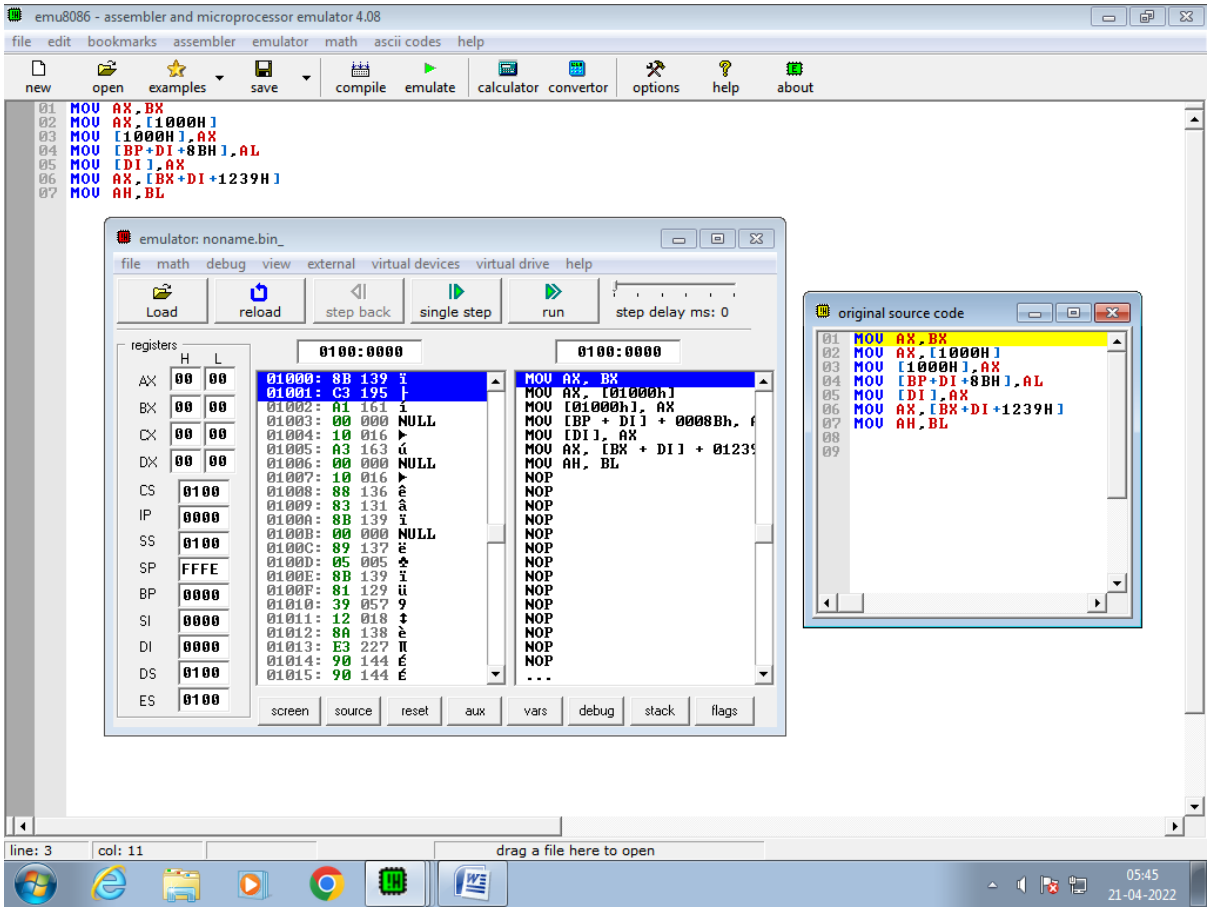
1	0	00	10	d	w	mod	reg	r/m
				↓	↓	↓	↓	↓
				1	0	11	100	011

1000	1010	1110	0011
8	A	E	3

⇒ 8A, E3

142103012 Experiment -1

1



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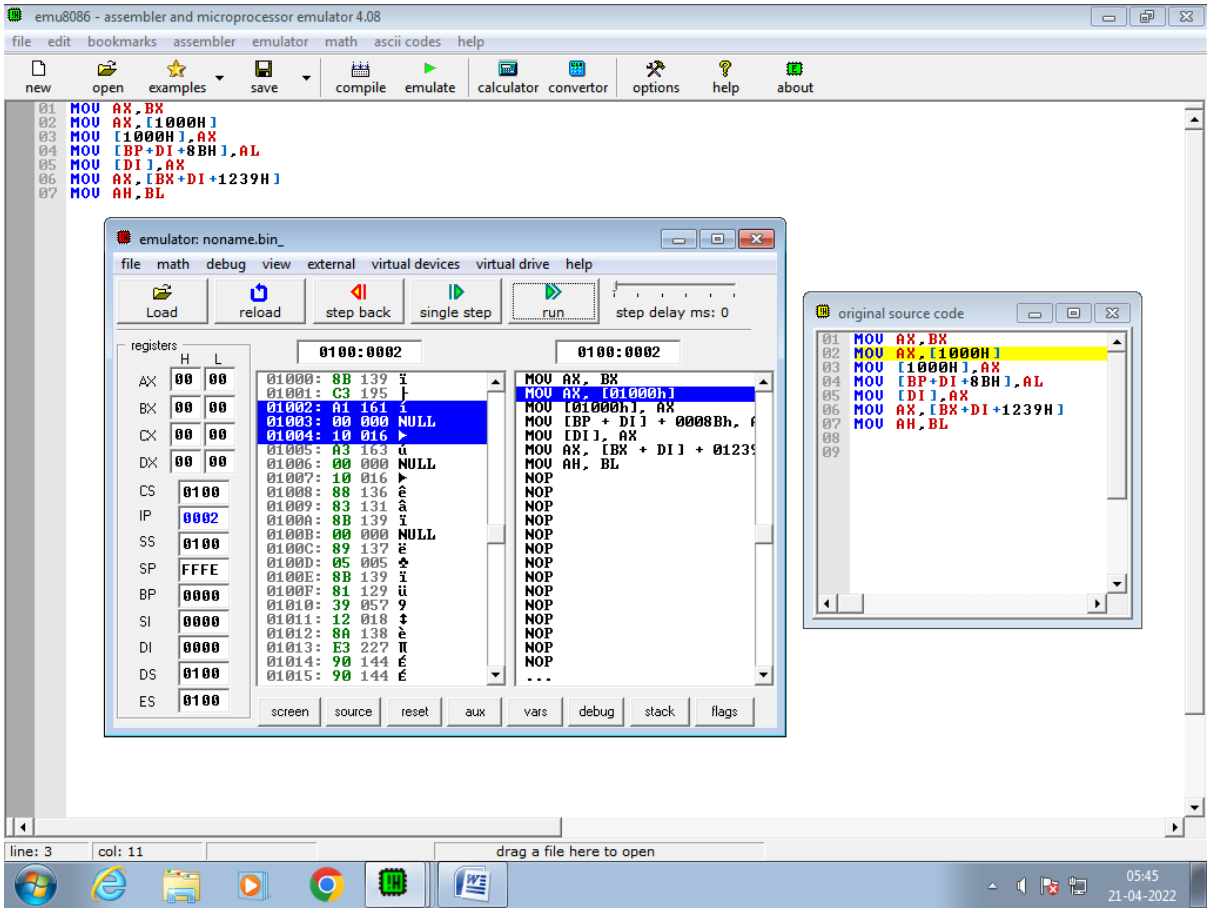
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02 MOV AX,[1000H]
03 MOV [1000H],AX
04 MOV [BP+DI+8BH],AL
05 MOV [DI],AX
06 MOV AX,[BX+DI+1239H]
07 MOV AH,BL
emulator: noname.bin_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
H L
AX 00 00
BX 00 00
CX 00 00
DX 00 00
CS 0100
IP 0002
SS 0100
SP FFFE
BP 0000
SI 0000
DI 0000
DS 0100
ES 0100
0100:0002
0100:0002
01000: 8B 139 ï
01001: C3 195 ├
01002: A1 161 í
01003: 00 000 NULL
01004: 10 016 ►
01005: A3 163 ú
01006: 00 000 NULL
01007: 10 016 ►
01008: 88 136 ê
01009: 83 131 â
0100A: 8B 139 ï
0100B: 00 000 NULL
0100C: 89 137 ë
0100D: 05 005 ♣
0100E: 8B 139 ï
0100F: 81 129 ü
01010: 39 057 9
01011: 12 018 ↕
01012: 8A 138 è
01013: E3 227 π
01014: 90 144 É
01015: 90 144 É
MOV AX, BX
MOV AX, [01000h]
MOV [01000h], AX
MOV [BP + DI] + 0008Bh, A
MOV [DI], AX
MOV AX, [BX + DI] + 0123
MOV AH, BL
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
...
screen source reset aux vars debug stack flags
original source code
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02 MOV AX,[1000H]
03 MOV [1000H],AX
04 MOV [BP+DI+8BH],AL
05 MOV [DI],AX
06 MOV AX,[BX+DI+1239H]
07 MOV AH,BL
08
09
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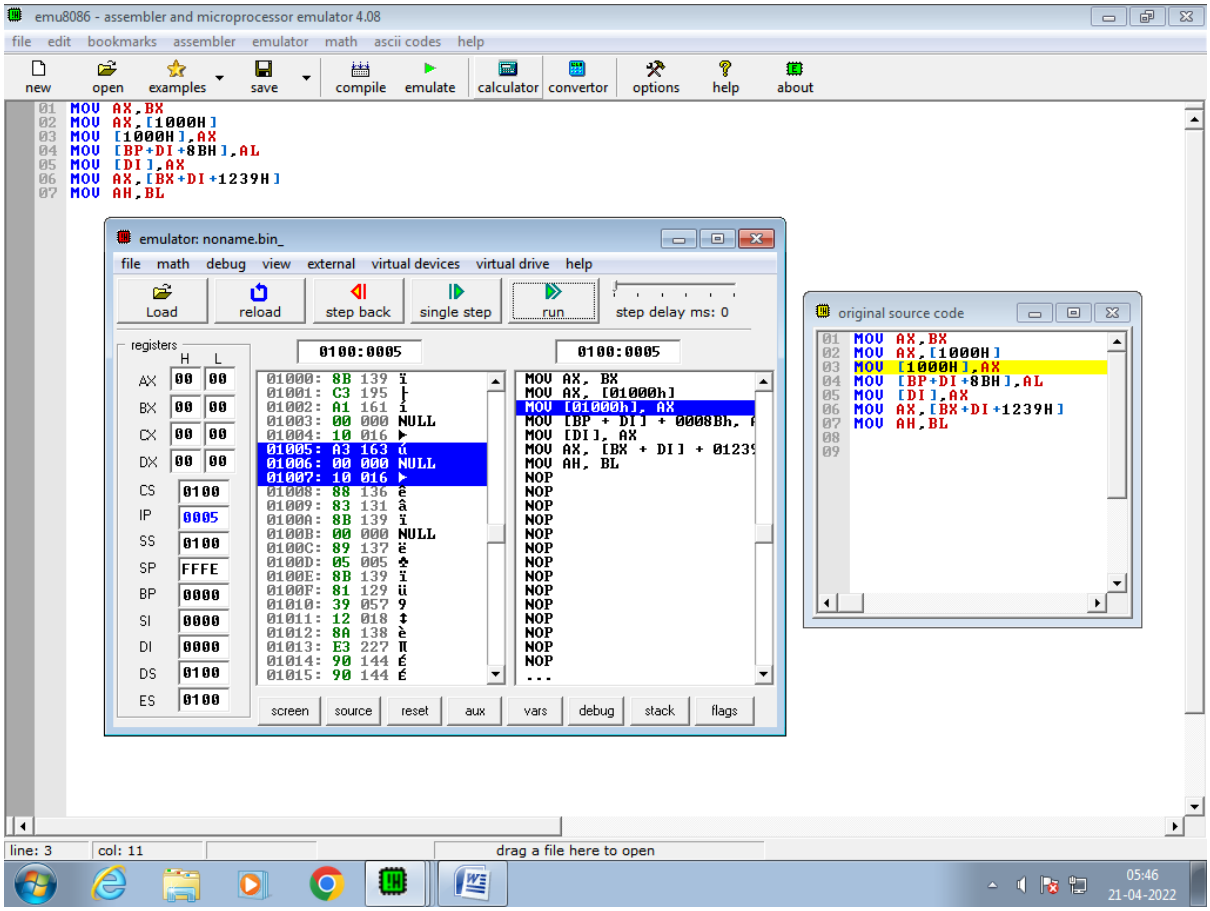
3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07 MOV AH,BL
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H L
AX 00 00
BX 00 00
CX 00 00
DX 00 00
CS 0100
IP 0005
SS 0100
SP FFFE
BP 0000
SI 0000
DI 0000
DS 0100
ES 0100
0100:0005
0100:0005
MOV AX, BX
MOV AX, [01000h]
MOV [01000h], AX
MOV [BP + DI] + 0008Bh, A
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MOV AH, BL
NOP
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07 MOV AH,BL
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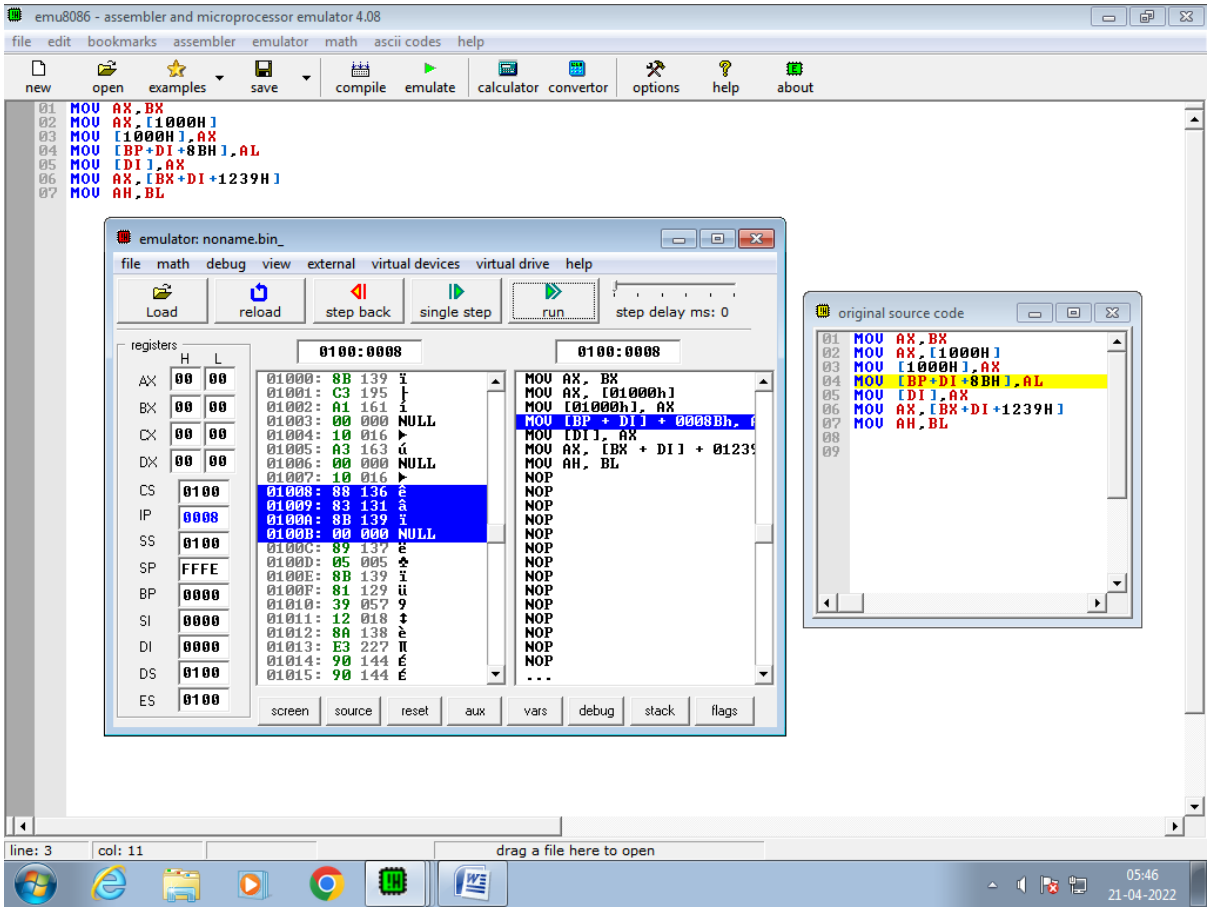
4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Load reload step back single step run step delay ms: 0
registers
H L
AX 00 00
BX 00 00
CX 00 00
DX 00 00
CS 0100
IP 0008
SS 0100
SP FFFE
BP 0000
SI 0000
DI 0000
DS 0100
ES 0100
0100:0008
0100:0008
01000: 8B 139 ï
01001: C3 195 ├
01002: A1 161 í
01003: 00 000 NULL
01004: 10 016 ►
01005: A3 163 ú
01006: 00 000 NULL
01007: 10 016 ►
01008: 88 136 ê
01009: 83 131 â
0100A: 8B 139 ï
0100B: 00 000 NULL
0100C: 89 137 ë
0100D: 05 005 ♣
0100E: 8B 139 ï
0100F: 81 129 ü
01010: 39 057 9
01011: 12 018 ↕
01012: 8A 138 è
01013: E3 227 π
01014: 90 144 É
01015: 90 144 É
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MOV [01000h], AX
MOV [BP + DI] + 0008Bh,
MOV [DI], AX
MOV AX, [BX + DI] + 0123
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NOP
NOP
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05 MOV [DI],AX
06 MOV AX,[BX+DI+1239H]
07 MOV AH,BL
08
09
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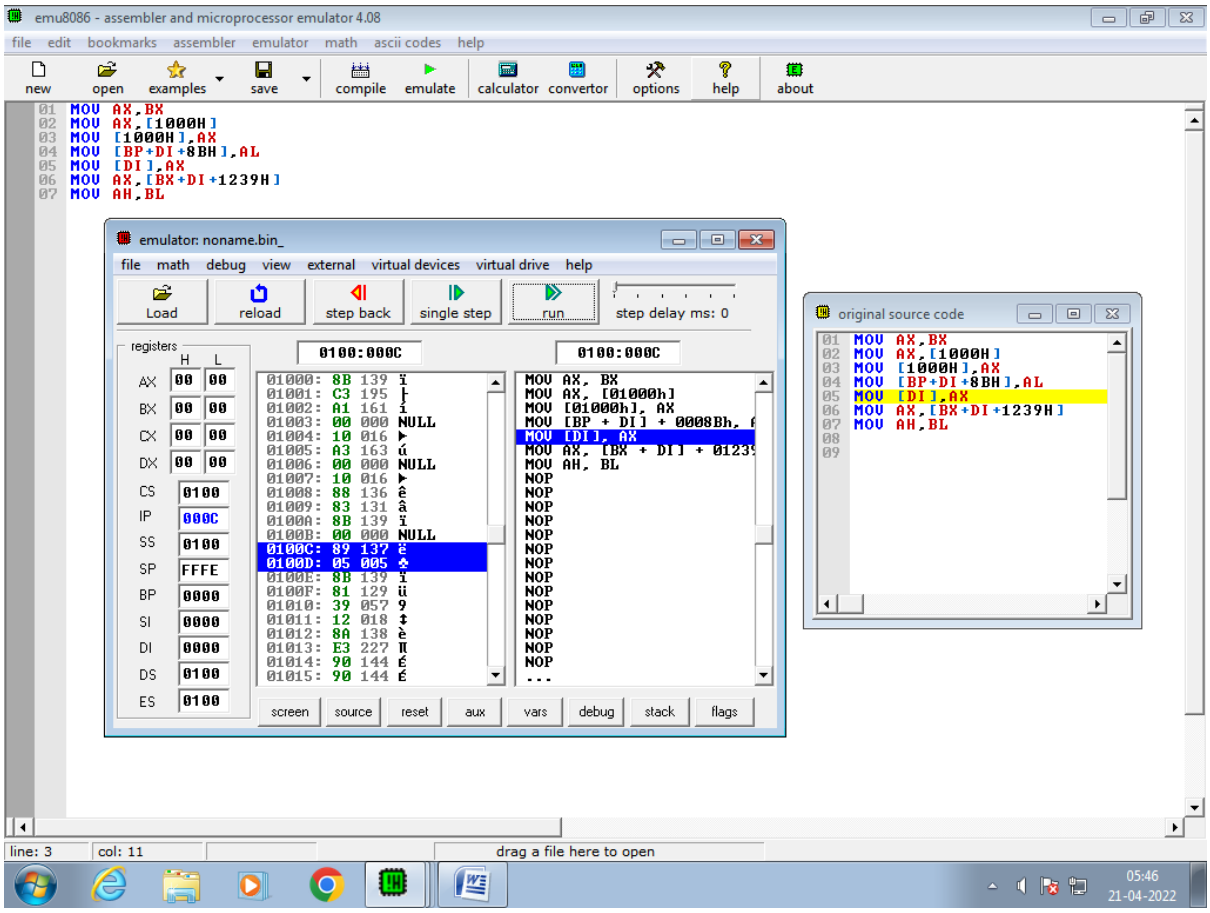
5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AX 00 00
BX 00 00
CX 00 00
DX 00 00
CS 0100
IP 000C
SS 0100
SP FFFE
BP 0000
SI 0000
DI 0000
DS 0100
ES 0100
0100:000C
0100:000C
01000: 8B 139 ï
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07 MOV AH,BL
08
09
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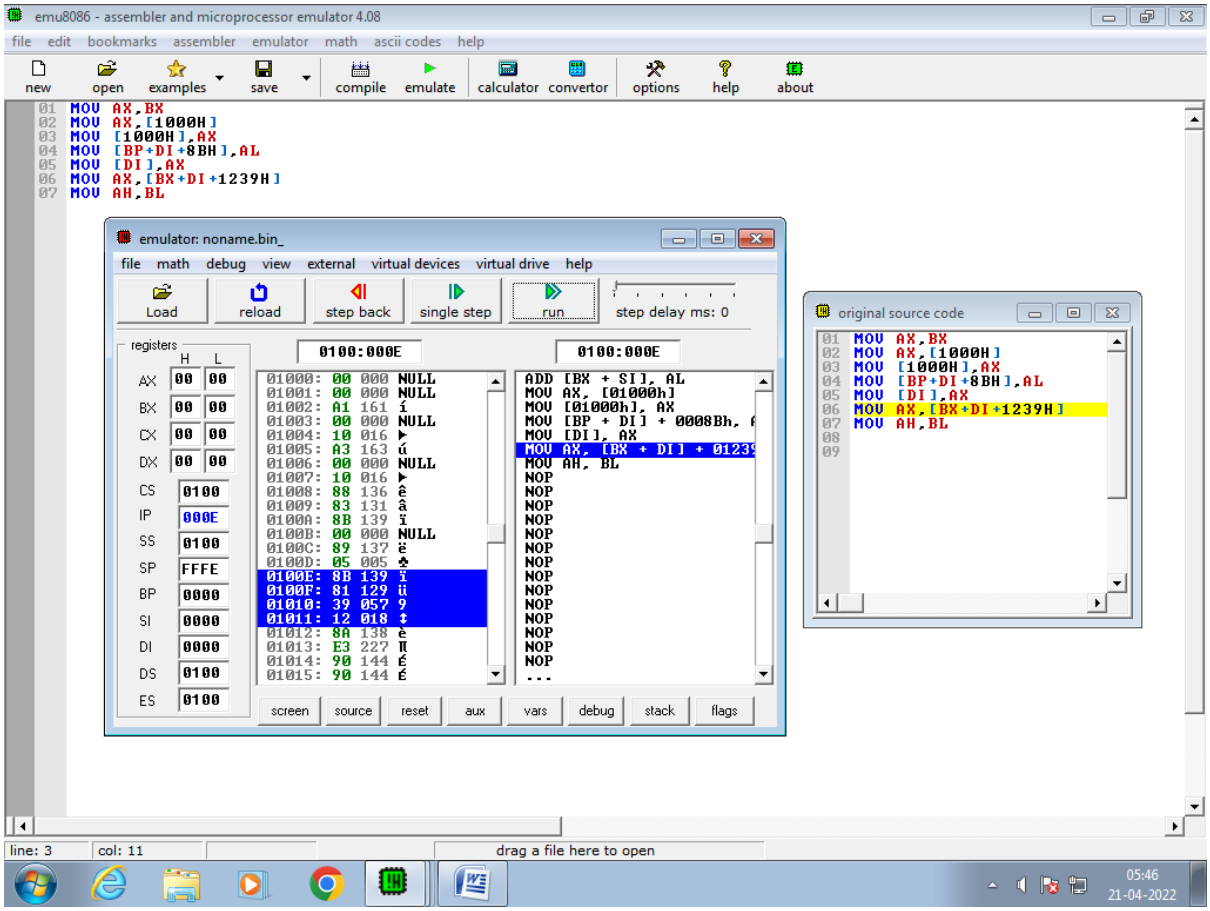
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BX 00 00
CX 00 00
DX 00 00
CS 0100
IP 000E
SS 0100
SP FFFE
BP 0000
SI 0000
DI 0000
DS 0100
ES 0100
0100:000E
0100:000E
01000: 00 000 NULL
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01003: 00 000 NULL
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01005: A3 163 ú
01006: 00 000 NULL
01007: 10 016 ►
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01010: 39 057 9
01011: 12 018 ↕
01012: 8A 138 è
01013: E3 227 π
01014: 90 144 É
01015: 90 144 É
ADD [BX + SI], AL
MOV AX, [01000h]
MOV [01000h], AX
MOV [BP + DI] + 0008Bh, A
MOV [DI], AX
MOV AX, [BX + DI] + 0123
MOV AH, BL
NOP
NOP
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NOP
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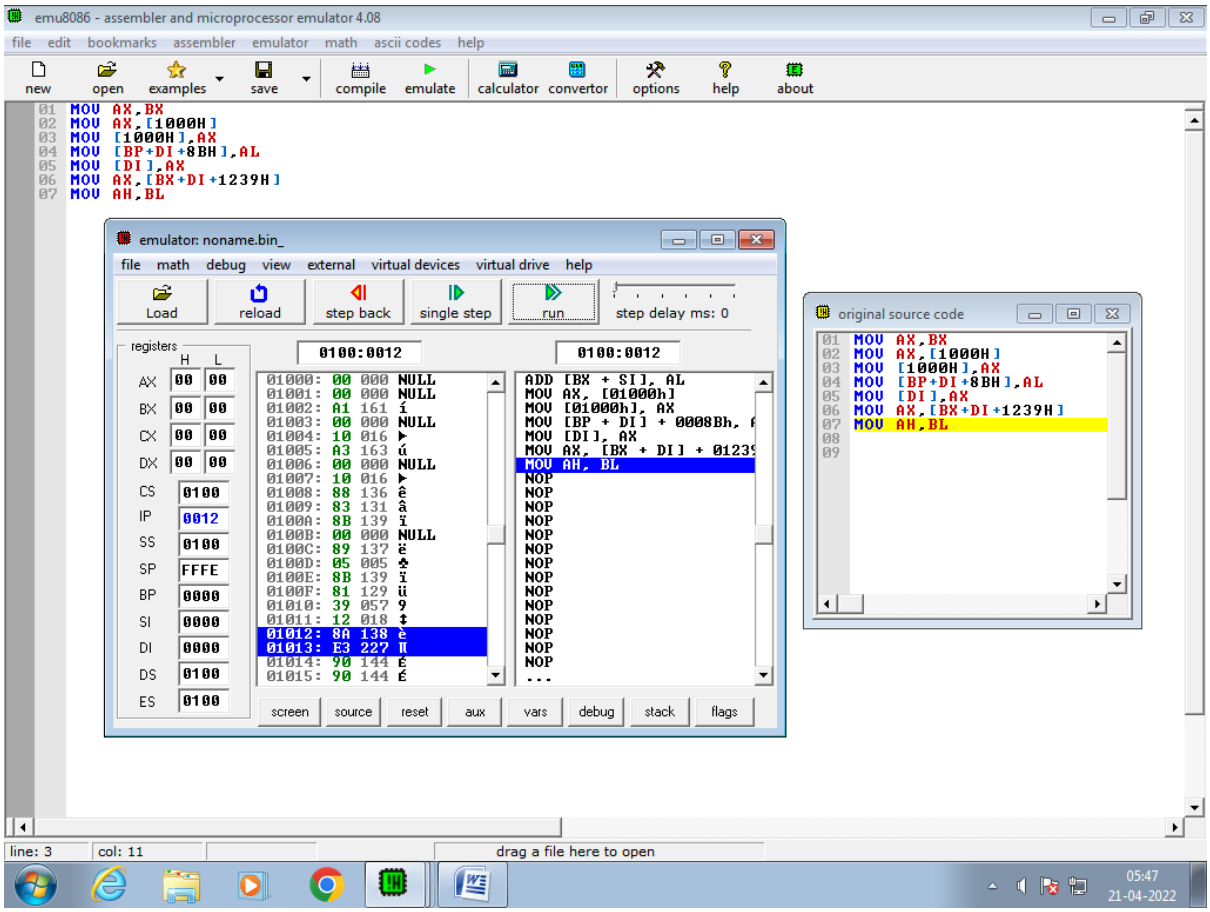
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emulator: noname.bin_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
H L
AX 00 00
BX 00 00
CX 00 00
DX 00 00
CS 0100
IP 0012
SS 0100
SP FFFE
BP 0000
SI 0000
DI 0000
DS 0100
ES 0100
0100:0012
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07 MOV AH,BL
line: 3
col: 11
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