

## 8086 CODES - 16-17-2024

### 1.ALP FOR ADDITION OF 2 8-BIT NOS

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter options help about

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_template.txt
03 org 100h
04
05
06 MOU DI,1000H
07 MOU [DI],0X02
08 INC DI
09 MOU [DI],0X04
10
11 MOU DI,1000H
12 MOU AL,[DI]
13 INC DI
14 MOU BL,[DI]
15 ADD AL,BL
16 INC DI
17 MOU [DI],AL
18 HLT
19
20 ret
21
22
23
24
25

```

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

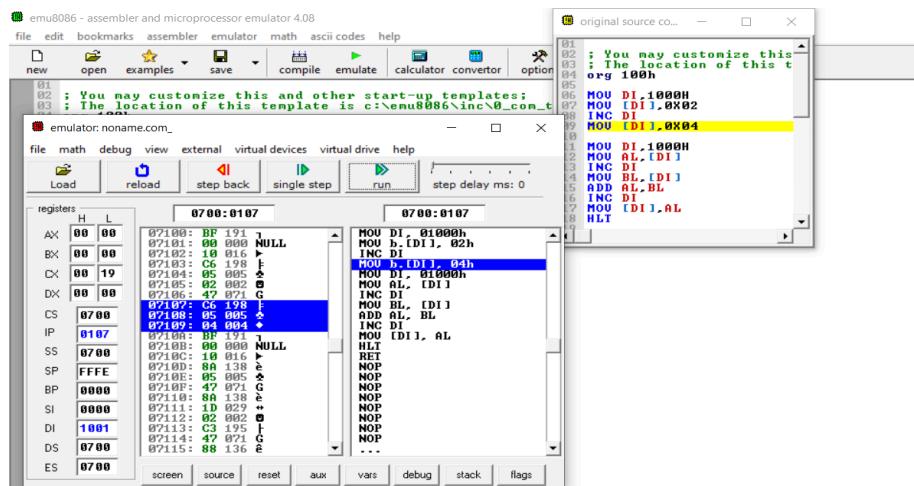
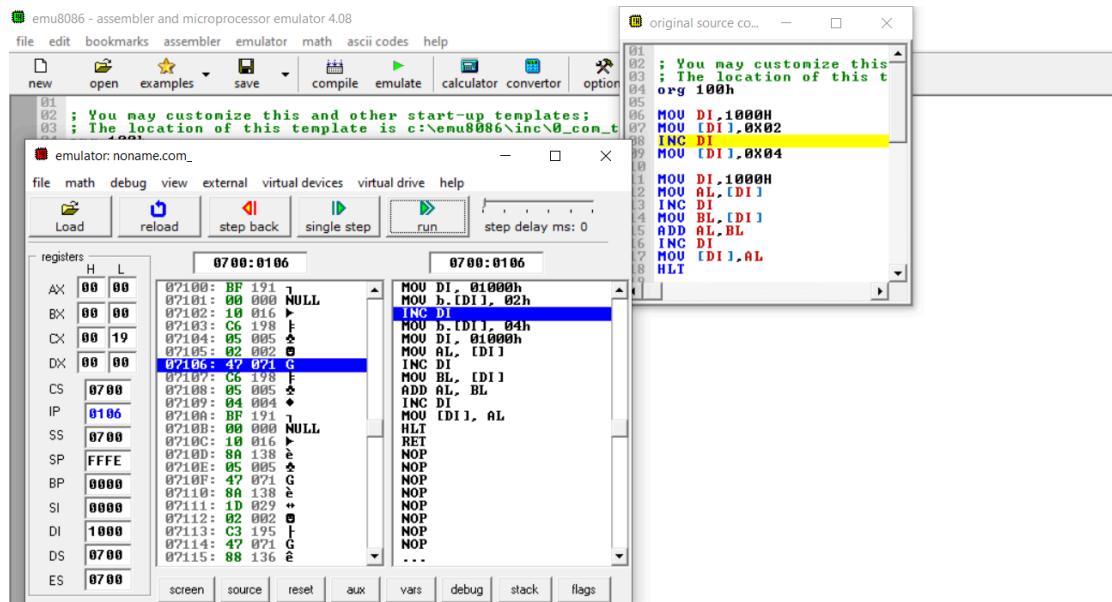
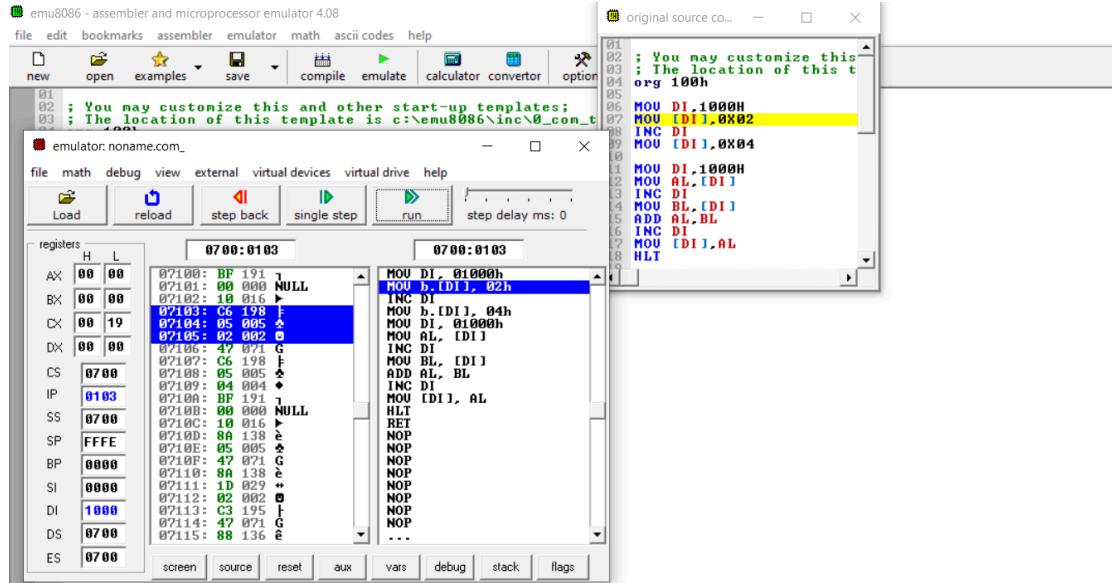
emulator: noname.com\_

file math debug view external virtual devices virtual drive help

Load reload step back single step run step delay ms: 0

registers		0700:0100	0700:0100
AX	<b>00 00</b>	07100: DF 191	MOU DI, 0100h
BX	<b>00 00</b>	07101: 00 000 NULL	MOU b,[DI], 02h
CX	<b>00 19</b>	07102: 10 016 >	INC DI
DX	<b>00 00</b>	07103: C6 198 F	MOU b,[DI], 04h
CS	<b>0700</b>	07104: 05 005 A	MOU DI, 01000h
IP	<b>0100</b>	07105: 02 002 C	MOU AL,[DI]
SS	<b>0700</b>	07106: 47 071 G	INC DI
SP	<b>FFFE</b>	07107: C6 198 F	MOU BL,[DI]
BP	<b>0000</b>	07108: 05 005 A	ADD AL,BL
SI	<b>0000</b>	07109: 04 004 D	INC DI
DI	<b>0000</b>	07110: BF 191 L	MOU [DI],AL
DS	<b>0700</b>	07111: 00 000 NULL	HLT
ES	<b>0700</b>	07112: 01 010 R	
		07113: 8A 138 E	RST
		07114: 05 005 A	NOP
		07115: 47 071 G	NOP
		07116: 8A 138 E	NOP
		07117: 02 002 C	NOP
		07118: C3 195 T	NOP
		07119: 47 071 G	NOP
		07120: 88 136 E	NOP
		...	

screen source reset aux vars debug stack flags



emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator convertor option

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 H L

AX	00 00
BX	00 00
CX	00 19
DX	00 00
CS	0700
IP	0100
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1001
DS	0700
ES	0700

0700:0100A

```

01: ; You may customize this and other start-up templates;
02: ; The location of this template is c:\emu8086\inc\0_com_t
03: ; org 100h
04:
05: MOU DI,1000H
06: MOU [DI],0X02
07: INC DI
08: MOU [DI],0X04
09:
10: MOU DI,1000H
11: MOU AL,[DI]
12: INC DI
13: MOU BL,[DI]
14: ADD AL,BL
15: INC DI
16: MOU [DI],AL
17: HLT
18:

```

0700:0100B

screen source reset aux vars debug stack flags

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator convertor option

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 H L

AX	00 00
BX	00 00
CX	00 19
DX	00 00
CS	0700
IP	0100
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1000
DS	0700
ES	0700

0700:0100D

```

01: ; You may customize this and other start-up templates;
02: ; The location of this template is c:\emu8086\inc\0_com_t
03: ; org 100h
04:
05: MOU DI,1000H
06: MOU [DI],0X02
07: INC DI
08: MOU [DI],0X04
09:
10: MOU DI,1000H
11: MOU AL,[DI]
12: INC DI
13: MOU BL,[DI]
14: ADD AL,BL
15: INC DI
16: MOU [DI],AL
17: HLT
18:

```

0700:0100E

screen source reset aux vars debug stack flags

The screenshot shows the emu8086 assembly editor interface. The top window displays the original source code:

```
01 ; You may customize this
02 ; The location of this template is c:\emu8086\inc\0_com_t
03
04 org 100h
05
06 MOU DI,1000h
07 MOU AL,[DI]
08 INC DI
09 MOU [DI],0X04
10
11 MOU DI,1000h
12 MOU AL,[DI]
13 INC DI
14 ADD AL,BL
15 INC DI
16 MOU [DI],AL
17 HLT
18
```

The bottom window shows the assembly output with memory dump and registers. The registers pane shows:

	H	L
AX	00	02
BX	00	00
CX	00	19
DX	00	00
CS	0700	
IP	010F	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	1000	
DS	0700	
ES	0700	

The memory dump pane shows two columns of memory starting at address 0700:010F. The left column contains the original source code, and the right column contains the assembled machine code. The instruction at IP 010F is highlighted in blue.

The screenshot shows the emu8086 assembly editor interface. The top menu bar includes file, edit, bookmarks, assembler, emulator, math, ascii codes, and help. Below the menu is a toolbar with icons for new, open, examples, save, compile, emulate, calculator, converter, and option. The main window has two panes: the left pane displays assembly code with labels like .org 100h and instructions like MOU DI, [DI], AL; the right pane shows the registers window with various CPU register values. The bottom navigation bar includes screen, source, reset, aux, vars, debug, stack, and flags.

The screenshot shows the emu8086 assembly editor interface. The top window displays the original source code:

```
01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com.t
03
04 ; You may customize this and other start-up templates;
05 ; The location of this template is c:\emu8086\inc\0_com.t
06
07 org 100h
08
09 MOU DI,1000h
10 MOU b,[DI],8x02
11 INC DI
12 MOU [DI],8x04
13
14 MOU DI,1000h
15 MOU AL,[DI]
16 INC DI
17 MOU BL,[DI]
18 ADD AL,BL
19 INC DI
20 MOU [DI],AL
21 HLT
```

The bottom window shows the assembly output with memory dump and registers. The assembly code is identical to the source code above. The registers pane shows:

	H	L
AX	00	02
BX	00	04
CX	00	19
DX	00	00
CS	0700	
IP	0112	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	1001	
DS	0700	
ES	0700	

The memory dump pane shows the memory starting at address 0100h:

Address	Value	Hex	Label
0100h	BF	191	
0101h	00	0000	NULL
0102h	10	016	
0103h	C6	198	
0104h	05	005	
0105h	00	0000	NULL
0106h	42	071	G
0107h	C6	198	
0108h	05	005	
0109h	04	0004	
010Ah	00	01	
010Bh	00	0000	NULL
010Ch	10	016	
010Dh	8A	138	
010Eh	05	005	
010Fh	00	0000	NULL
0110h	8A	138	
0111h	1D	029	
0112h	02	002	
0113h	C3	195	
0114h	42	071	G
0115h	88	136	

The status bar at the bottom shows: screen source reset aux vars debug stack flags.

The screenshot shows the emu8086 assembly editor interface. The assembly code window displays the following template:

```
01 ; You may customize this
02 ; The location of this template is c:\emu8086\inc\0_com.t
03 ; The data
04 org 100h
05 MOU DI,1000H
06 MOU [DI],0X02
07 INC DI
08 MOU [DI],0X04
09
10 MOU DI,1000H
11 MOU AL,[DI]
12 INC DI
13 MOU BL,[DI]
14 ADD BL,BL
15 INC DI
16 MOU [DI],AL
17 HLT
```

The code editor highlights the instruction `INC DI` at address `07114: 47 071 G`. The registers window shows the following values:

	H	L
AX	00 06	
BX	00 04	
CX	00 19	
DX	00 00	
CS	0700	
IP	0114	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	1001	
DS	0700	
ES	0700	

The CPU Registers window shows the following values:

	0700:0114	0700:0114
MOU DI, 01000h		
MOU b,[DI], 02h		
INC DI		
MOU b,[DI], 04h		
MOU DI, 01000h		
MOU AL, [DI]		
INC DI		
MOU BL, [DI]		
ADD AL, BL		
INC DI		
MOU [DI], AL		
INC DI		
MOU [DI], AL		
HLT		

The screenshot shows the emu8086 interface with the following components:

- Top Bar:** emu8086 - assembler and microprocessor emulator 4.08, file, edit, bookmarks, assembler, emulator, math, ascii codes, help.
- Toolbar:** new, open, examples, save, compile, emulate, calculator, converter, option.
- Code Editor (Left):** Shows assembly template code:

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com.t
03
04
05 org 100h
06
07 MOU DI,1000H
08 MOU [DI],0X02
09 INC DI
10 MOU [DI],0X04
11
12 MOU DI,1000H
13 MOU AI,[DI]
14 INC DI
15 MOU BL,[DI]
16 ADD AL,BL
17 INC DI
18 MOU [DI],AL
19 HLT

```
- Emulator Window (Bottom Left):** emulator: noname.com\_
  - File, math, debug, view, external, virtual devices, virtual drive, help.
  - Buttons: Load, reload, step back, single step, run, step delay ms: 0.
  - Registers pane (Registers, H, L):
 

	H	L
AX	00	00
BX	00	04
CX	00	19
DX	00	00
CS	07000	
IP	0115	
SS	07000	
SP	FFFE	
BP	00000	
SI	00000	
DI	1002	
DS	07000	
ES	07000	
  - Memory Dump pane (Registers, 07000:0115, 07000:0115):
 

071000: BF 191	071000: 00 0000 NULL
071002: 00 016	071002: b,[DI], 02h
071003: C6 198	071003: INC DI
071004: 05 005	071004: MOU b,[DI], 04h
071005: 02 002	071005: MOU DI, 01000h
071006: 00 000	071006: MOU AL,[DI]
071007: C6 198	071007: INC DI
071008: 05 005	071008: MOU BL,[DI]
071009: 04 004	071009: ADD AL,BL
07100A: BF 191	07100A: INC DI
07100B: 00 0000 NULL	07100B: MOU [DI], AL
07100C: 00 016	07100C: HLT
07100D: 88 138	07100D: RET
07100E: 00 000	07100E: NOP
07100F: 47 071	07100F: NOP
071010: 47 071	071010: NOP
071011: 88 138	071011: NOP
071012: 02 002	071012: NOP
071013: C3 195	071013: NOP
071014: 47 071	071014: G
071015: 88 136	071015: e
- Assembly Output Window (Right):** original source code... (01 to 19)

The screenshot shows the emu8086 assembly editor interface. The top menu bar includes file, edit, bookmarks, assembler, emulator, math, ascii codes, help, and option. Below the menu is a toolbar with new, open, examples, save, compile, emulate, calculator, converter, and option buttons. The main window has tabs for original source code and assembly. The assembly tab displays the following code:

```
01 ; You may customize this
02 ; The location of this template is c:\emu8086\inc\0_com.t
03
04 org 100h
05 MOU DI, 0000H
06 MOU [DI], 0002
07 INC DI
08 MOU [DI], 0004
09
10 MOU DI, 1000H
11 MOU AL, [DI]
12 INC DI
13 MOU BL, [DI]
14 ADD AL, BL
15 INC DI
16 MOU [DI], AL
17 HLT
```

The registers window shows the following values:

	H	L
AX	00	06
BX	00	04
CX	00	19
DX	00	00
CS	0700	
IP	0117	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	1002	
DS	0700	
ES	0700	

The memory dump window shows the memory starting at address 0700:0117. The assembly code is also displayed in the memory dump window.

## 2.ALP PROGRAM FOR SUBTRACTION OF 2 8-BIT NUMBERS

SIMILAR TO 1.

CHANGE ADD TO SUB

## 3.ALP PROGRAM FOR ADDITION OF 2 16- BIT NUMBERS

emu8086 - assembler and microprocessor emulator 4.08  
file edit bookmarks assembler emulator math ascii codes help

```
01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_template.txt
03
04
05 org 100h
06
07 MOU DI,1000H
08 MOU [DI],0xFFFF
09 INC DI
10 INC DI
11 MOU [DI],0xFFFF
12
13 MOU DI,1000H
14 MOU AX,[DI]
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 ADD AX,BX
19 INC DI
20 INC DI
21 MOU [DI],AX
22 HLT
23
24 ret
25
26
27
```

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help  
new open examples save compile emulate calculator convertor options

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0\_com\_t

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		0700:0100	0700:0100
AX	00 00	07100: BF 191 1	MOU DI,01000H
BX	00 00	07101: 00 000 NULL	MOU w,[DI1], 0FFFFh
CX	00 1E	07102: C0 005 1	INC DI
DX	00 00	07103: FF 255 RES	MOU DI, 01000h
CS	0700	07104: FF 255 RES	MOU AX, [DI1]
IP	0100	07105: 47 071 G	INC DI
SS	0700	07106: 47 071 G	MOU BX, [DI1]
SP	FFFE	07107: C0 005 1	ADD AX, BX
BP	0000	07108: FF 255 RES	INC DI
SI	0000	07109: FF 255 RES	INC DI
DI	0000	07110: BF 191 1	MOU [DI1], AX
DS	0700	07111: 00 000 NULL	HLT
ES	0700	07112: 10 016 ▶	RET
		07113: 8B 03 1	NOP
		07114: 8B 03 1	NOP
		07115: 8B 139 1	NOP
		07116: 1D 029 +	...

original source code

```
01 ; You may customize this
02 ; The location of this template is
03
04
05 org 100h
06
07 MOU DI,1000H
08 MOU [DI],0xFFFF
09 INC DI
10 INC DI
11 MOU [DI],0xFFFF
12
13 MOU DI,1000H
14 MOU AX,[DI]
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 ADD AX,BX
19 INC DI
20 INC DI
21 MOU [DI],AX
22 HLT
23
24 ret
25
26
27
```

The screenshot shows the emu8086 interface with two windows side-by-side. The left window displays the assembly code:

```
01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\N_com.t
03
04 org 100h
05 MOU DI,1000h
06 MOU [DI],0xFFFF
07 INC DI
08 INC DI
09 INC DI
10 INC DI
11 MOU [DI],0xFFFF
12
13 MOU DI,1000h
14 MOU AX,[DI]
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 ADD AX,BX
19 INC DI
```

The right window shows the original source code:

```
01 ; You may customize this
02 ; The location of this template is c:\emu8086\inc\N_com.t
03
04 org 100h
05 MOU DI,1000h
06 MOU [DI],0xFFFF
07 INC DI
08 INC DI
09 INC DI
10 INC DI
11 MOU [DI],0xFFFF
12
13 MOU DI,1000h
14 MOU AX,[DI]
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 ADD AX,BX
19 INC DI
```

The screenshot displays the emu8086 assembly editor interface. On the left, the original assembly code is shown:

```
01 ; You may customize this and other start-up templates:  
02 ; The location of this template is c:\emu8086\inc\8_com.t  
03  
04 ; You may customize this and other start-up templates:  
05 ; The location of this template is c:\emu8086\inc\8_com.t  
06  
07 org 100h  
08 MOU DI,1000h  
09 MOU [DI],0xFFFFF  
10 INC DI  
11 INC DI  
12 MOU DI,[DI]  
13 MOU DI,1000h  
14 MOU AX,[DI]  
15 INC DI  
16 INC DI  
17 MOU BX,[DI]  
18 ADD BX,BX
```

On the right, the modified assembly code is shown:

```
01 ; You may customize this and other start-up templates:  
02 ; The location of this template is c:\emu8086\inc\8_com.t  
03  
04 ; You may customize this and other start-up templates:  
05 ; The location of this template is c:\emu8086\inc\8_com.t  
06  
07 org 100h  
08 MOU DI,1000h  
09 MOU [DI],0xFFFFF  
10 INC DI  
11 INC DI  
12 MOU BX,[DI]  
13 MOU AX,[DI]  
14 INC DI  
15 INC DI  
16 MOU BX,[DI]  
17 ADD BX,BX
```

The registers pane at the bottom shows the following values for both windows:

	H	L
AX	00	00
BX	00	00
CX	00	1E
DX	00	00
CS	0700	
IP	0107	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	1000	
DS	0700	
ES	0700	

The screenshot shows the emu8086 interface with two windows open. The bottom window displays a memory dump of the CPU registers and stack. The registers window shows values for AX, BX, CX, DX, CS, IP, SS, SP, BP, SI, DI, DS, and ES. The stack window shows a series of assembly instructions starting with `ORG 100H`, including `MOU DI, 0100H`, `MOU [DI], 0xFFFF`, and `INC DI`. The assembly code window at the top shows the same instructions with some highlighted in yellow and blue.

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

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 H L

AX	00 00
BX	00 00
CX	00 1E
DX	00 00
CS	07 00
IP	01 09
SS	07 00
SP	FF FE
BP	00 00
SI	00 00
DI	10 02
DS	07 00
ES	07 00

07 00:0109 07 00:0109

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU BX,[DI]
17 ADD AX,BX
18 INC DI

```

screen source reset aux vars debug stack flags

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

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 H L

AX	00 00
BX	00 00
CX	00 1E
DX	00 00
CS	07 00
IP	01 00
SS	07 00
SP	FF FE
BP	00 00
SI	00 00
DI	10 02
DS	07 00
ES	07 00

07 00:0100 07 00:0100

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU BX,[DI]
17 ADD AX,BX
18 INC DI

```

screen source reset aux vars debug stack flags

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

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 H L

AX	00 00
BX	00 00
CX	00 1E
DX	00 00
CS	07 00
IP	01 10
SS	07 00
SP	FF FE
BP	00 00
SI	00 00
DI	10 00
DS	07 00
ES	07 00

07 00:0110 07 00:0110

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU BX,[DI]
17 ADD AX,BX
18 INC DI

```

screen source reset aux vars debug stack flags

The screenshot shows the emu8086 interface with two windows side-by-side. The left window displays assembly code with annotations: `; You may customize this and other start-up templates;` and `; The location of this template is c:\emu8086\inc\0_con_t`. The right window shows the assembly output for the code, with the instruction `INC DI` highlighted in yellow. The assembly code is as follows:

```
01 ; You may customize this
02 ; The location of this template is c:\emu8086\inc\0_con_t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU BX,[DI]
17 ADD AX,BX
18 TUR
```

The screenshot shows the emu8086 assembly editor interface. The assembly pane displays the following code:

```
01 ; You may customize this
02 ; The location of this template is c:\emu8086\inc\0_com.t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFFF
11
12
13 MOU DI,1000H
14 MOU AX,[DI]
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 ADD AX,BX
19 INC BX
```

The registers pane shows the following register values:

	H	L
AX	FF FF	
BX	00 00	
CX	00 1E	
DX	00 00	
CS	0700	
IP	0113	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	1001	
DS	0700	
ES	0700	

The memory dump pane shows the memory starting at address 07000:

	07000:0113	07000:0113
07000:0113	BE 191 I	MOU DI,1000h
07000:0114	00 000 NULL	MOU [DI],0xFFFFF
07000:0115	00 016 ►	INC DI
07000:0116	C7 199	MOU w,[DI],0FFFFh
07000:0117	05 005 *	MOU w,[DI],0000h
07000:0118	FF 255 RES	MOU AX,[DI]
07000:0119	FF 255 RES	INC DI
07000:011A	47 071 G	INC DI
07000:011B	47 071 G	MOU BX,[DI]
07000:011C	C7 199	ADD AX,BX
07000:011D	05 005 *	INC DI
07000:011E	FF 255 RES	INC DI
07000:011F	FF 255 RES	MOU EDI,AX
07000:0120	BB 191 HLT	HLT
07000:0121	00 000 NULL	RET
07000:0122	00 016 ►	NOP
07000:0123	8B 039 I	NOP
07000:0124	05 005 *	NOP
07000:0125	47 071 G	NOP
07000:0126	47 071 G	NOP
07000:0127	8B 139 I	...
07000:0128	0D 029 +	

The screenshot shows the emu8086 interface with two windows open. The left window displays a memory dump from address 07000 to 071B0. The right window shows assembly code starting at address 100H, which includes instructions like MOU DI,1000H, INC DI, and ADD AX,BX.

Address	Value	Content
07000:0116	FF FF	MOU DI,1000h
07000:0117	C0 95	MOU w,[DI],0FFFFh
070118:0701	47	INC DI
070119:0701	47	INC DI
07011A:0701	87	NOP
07011B:0705	45 45 45 45	MOU DI,[DI],0FFFFh
07011C:0704	F4 244	MOU AX,[DI]
07011D:0705	C3 195	INC DI
07011E:0705	90 144	INC DI
07011F:0705	90 144	INC DI
070120:0705	90 144	ADD AX,BX
070121:0705	90 144	INC DI
070122:0705	90 144	INC DI
070123:0705	90 144	MOU [DI],AX
070124:0705	90 144	HLT
070125:0705	90 144	REI
070126:0705	90 144	NOP
070127:0705	90 144	NOP
070128:0705	90 144	NOP
070129:0705	90 144	NOP
07012A:0705	90 144	NOP
07012B:0705	90 144	NOP

The screenshot shows the emu8086 interface with two windows open. The left window displays a memory dump from address 0700 to 071B. The right window shows assembly code starting at address 0000.

**Memory Dump (Left Window):**

Address	Value	Label
0700:0118	FF FE	
0701:0118	03 99	
0702:0118	C3 19	
0703:0118	47 01	G
0704:0118	01 1E	
0705:0118	83 E8	
0706:0118	05 B8	
0707:0118	00 04	
0708:0118	C3 19	
0709:0118	90 44	E
070A:0118	90 44	E
070B:0118	90 44	E
070C:0118	90 44	E
070D:0118	90 44	E
070E:0118	90 44	E
070F:0118	90 44	E
0710:0118	90 44	E
0711:0118	90 44	E
0712:0118	90 44	E
0713:0118	90 44	E
0714:0118	90 44	E
0715:0118	90 44	E
0716:0118	90 44	E
0717:0118	90 44	E
0718:0118	90 44	E
0719:0118	90 44	E
071A:0118	90 44	E
071B:0118	90 44	E

**Assembly Code (Right Window):**

```

02 ; You may customize this
03 ; The location of this template is c:\emu8086\inc\8_com_t
04
05 org 100h
06
07 MOU DI,1000H
08 MOU [DI],0FFFFF
09 INC DI
10 INC DI
11 MOU [DI],0xFFFFF
12
13 MOU DI,1000H
14 MOU AX,[DI]
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 HDB RX,BX
19 INC DI
20 INC DI

```

The screenshot shows the emu8086 interface. The assembly code window displays:

```

03 ; The location of this template is c:\emu8086\inc\0_com.t
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11
12 MOU DI,1000H
13 MOU [DI],0xFFFF
14 INC DI
15 INC DI
16 MOU BX,[DI]
17 ADD AX,BX
18 INC DI
19 INC DI
20 MOU [DI],0xFFFF

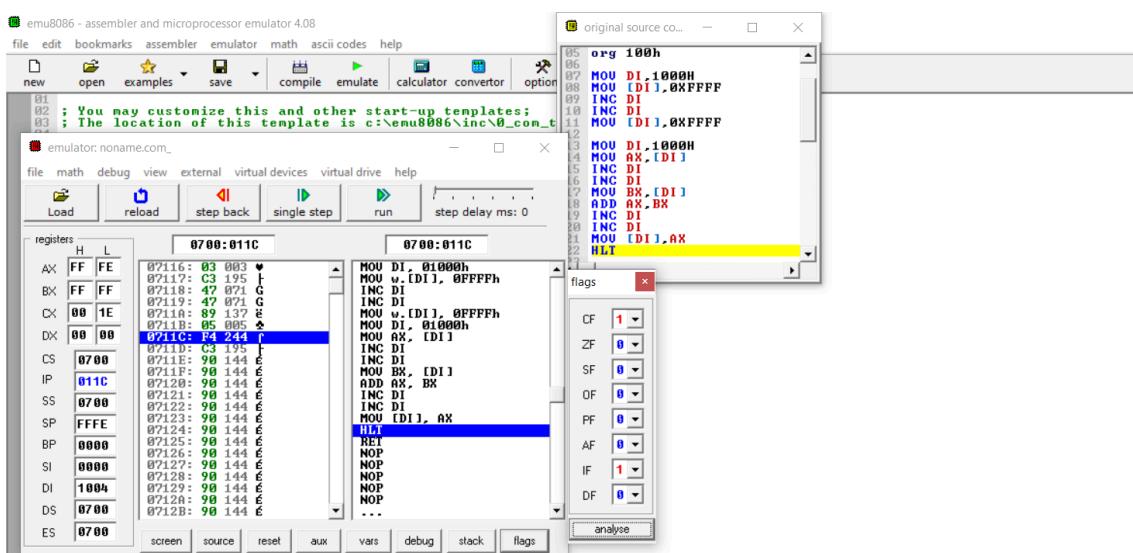
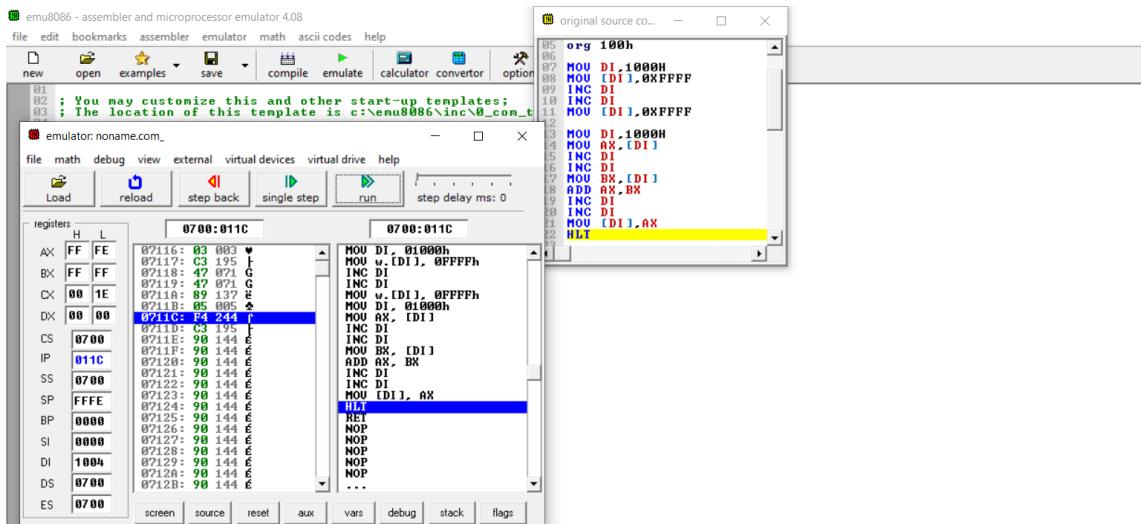
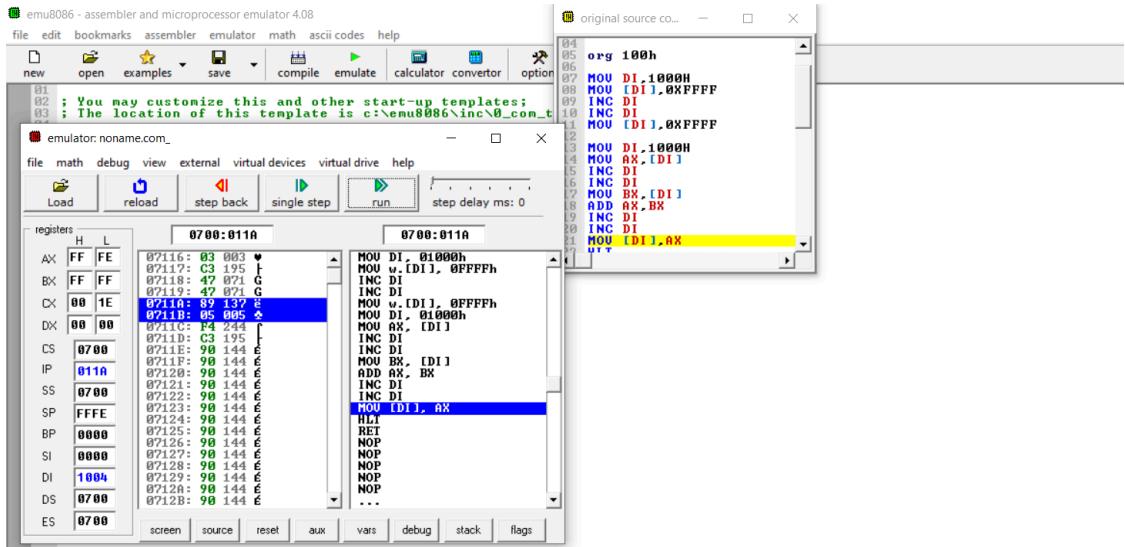
```

The registers window shows:

	H	L
AX	FF FF	
BX	FF FF	
CX	00 1E	
DX	00 05	
CS	0700	
IP	0119	
SS	0700	
SP	FFFF	
BP	0000	
SI	0000	
DI	1003	
DS	0700	
ES	0700	

The memory dump window shows the memory starting at address 0700:0119:

	0700:0119	0700:011A
07116:	03 003	
07117:	23 195	
07118:	47 071	G
07119:	47 071	G
0711A:	89 137	E
0711B:	05 005	
0711C:	F4 244	
0711D:	93 195	
0711E:	93 195	
0711F:	90 144	E
07120:	90 144	E
07121:	90 144	E
07122:	90 144	E
07123:	90 144	E
07124:	90 144	E
07125:	90 144	E
07126:	90 144	E
07127:	90 144	E
07128:	90 144	E
07129:	90 144	E
0712A:	90 144	E
0712B:	90 144	E



## 4.ALP PROGRAM FOR SUBTRACTION OF 2 16-BIT NUMBERS

SIMILAR TO 3.  
CHANGE ADD TO SUB

## 5.ALP PROGRAM FOR MULTIPLICATION OF 2 16-BIT NUMBERS

The screenshot shows the emu8086 assembler and emulator interface. The assembly code window displays the following program:

```
01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_template.txt
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU BX,[DI]
17 MUL BX
18 INC DI
19 INC DI
20 MOU [DI],AX
21 HLT
22
23 ret
24
25
26
27
28
```

The registers window shows the following initial values:

	H	L
AX	00	00
BX	00	00
CX	00	1E
DX	00	00
CS	0700	
IP	0100	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	0000	
DS	0700	
ES	0700	

The memory dump window shows the memory starting at address 0700:0100, which contains the assembly code.

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

emu: noname.com\_

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	1E
DX	00	00
CS	0700	
IP	0103	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	1000	
DS	0700	
ES	0700	

0700:0103

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\8_com_t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU BX,[DI]
17 MUL BX
18 TSC RT

```

0700:0103

MOU DI, 01000h  
INC DI  
MOU w,[DI], 0FFFFh  
MOU DI, 01000h  
MOU AX, [DI]  
INC DI  
INC DI  
MOU [DI], AX  
HLT  
RET  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
...

0700:0107

MOU DI, 01000h  
INC DI  
MOU w,[DI], 0FFFFh  
MOU DI, 01000h  
MOU AX, [DI]  
INC DI  
INC DI  
MOU [DI], AX  
HLT  
RET  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
...

0700:010B

MOU DI, 01000h  
INC DI  
MOU w,[DI], 0FFFFh  
MOU DI, 01000h  
MOU AX, [DI]  
INC DI  
INC DI  
MOU [DI], AX  
HLT  
RET  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
...

0700:010F

MOU DI, 01000h  
INC DI  
MOU w,[DI], 0FFFFh  
MOU DI, 01000h  
MOU AX, [DI]  
INC DI  
INC DI  
MOU [DI], AX  
HLT  
RET  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
...

0700:010B

MOU DI, 01000h  
INC DI  
MOU w,[DI], 0FFFFh  
MOU DI, 01000h  
MOU AX, [DI]  
INC DI  
INC DI  
MOU [DI], AX  
HLT  
RET  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
...

0700:010B

MOU DI, 01000h  
INC DI  
MOU w,[DI], 0FFFFh  
MOU DI, 01000h  
MOU AX, [DI]  
INC DI  
INC DI  
MOU [DI], AX  
HLT  
RET  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
NOP  
...

The screenshot shows the emu8086 assembly editor interface. The assembly code window displays the following code:

```
01; You may customize this and other start-up templates;
02; The location of this template is c:\emu8086\inc\0_com_t
03
04 org 100h
05
06 MOU DL,1000H
07 INC DI
08 INC DI
09 MOU (DI),0xFFFF
10
11 MOU DL,1000H
12 INC DI
13 INC DI
14 MOU AX,[DI]
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 INC DI
19 NUL BX
20 TMC RT
```

The registers window shows the following values:

	H	L
AX	00 00	07100: BF 191
BX	00 00	07101: 00 000 NULL
CX	00 1E	07102: 10 016 ►
DX	00 00	07103: C7 199
SI	00 00	07104: FF 255 RES
DI	1002	07105: FF 255 RES
DS	0700	07106: 47 071 G
CS	0700	07107: 47 071 G
IP	0109	07108: C7 199 I
SS	0700	07109: 05 005 ±
SP	FFFF	0710A: FF 255 RES
BP	0000	0710B: FF 255 RES
SI	0000	0710C: 47 071 G
DI	1002	0710D: 47 071 G
DS	0700	0710E: 8B 139 I
ES	0700	0710F: 47 071 G

The status bar at the bottom shows: screen source reset aux vars debug stack flags.

The screenshot shows the emu8086 assembly editor interface. The assembly code in the main window is as follows:

```
01 ; You may customize this
02 ; The location of this template is c:\emu8086\inc\0_com...
03
04 org 100h
05 MOU DI,1000h
06 MOU [DI],0FFFFF
07 INC DI
08 INC DI
09 MOU [DI],0FFFFF
10
11 MOU DI,1000h
12 MOU BX,[DI]
13 INC DI
14 INC BX
15 MOU BX,[DI]
16 MUL BX
17 INC BX
18
```

The registers window shows the following values:

	H	L
AX	00	00
BX	00	00
CX	00	1E
DX	00	00
CS	0700	
IP	0110	
SS	0700	
SP	FFFE	
BP	0000	
SI	0000	
DI	1000	
DS	0700	
ES	0700	

The stack window at the bottom shows the memory starting at address 0700:0110, with the current instruction being MOU AX, [DI].

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

01 ; You may customize this and other start-up templates;  
02 ; The location of this template is c:\emu8086\inc\0\_com\_t

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 H L

AX	FF FF
BX	00 00
CX	00 1E
DX	00 00
CS	0700
IP	0112
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1000
DS	0700
ES	0700

0700:0112 0700:0112

```

07100: BF 191 I
07101: 00 000 NULL
07102: 10 016 ▶
07103: C7 199 II
07104: 05 005 &
07105: FF 255 RES
07106: FF 255 RES
07107: 47 071 G
07108: 47 071 G
07109: C7 199 II
0710A: 05 005 &
0710B: FF 255 RES
0710C: FF 255 RES
0710D: BB 191
0710E: 00 000 NULL
0710F: 10 016 ▶
07110: 8B 139 I
07111: 05 005 &
07112: 47 071 G
07113: 47 071 G
07114: 8B 139 I
07115: 1D 029 +

```

screen source reset aux vars debug stack flags

original source code... org 100h

```

01 ; You may customize this
02 ; The location of this t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU AX,[DI]
17 MOU BX,[DI]
18 TMC NY

```

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

01 ; You may customize this and other start-up templates;  
02 ; The location of this template is c:\emu8086\inc\0\_com\_t

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 H L

AX	FF FF
BX	00 00
CX	00 1E
DX	00 00
CS	0700
IP	0113
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1001
DS	0700
ES	0700

0700:0113 0700:0113

```

07100: BF 191 I
07101: 00 000 NULL
07102: 10 016 ▶
07103: C7 199 II
07104: 05 005 &
07105: FF 255 RES
07106: FF 255 RES
07107: 47 071 RES
07108: 47 071 G
07109: C7 199 II
0710A: 05 005 &
0710B: FF 255 RES
0710C: FF 255 RES
0710D: BB 191
0710E: 00 000 NULL
0710F: 10 016 ▶
07110: 8B 139 I
07111: 05 005 &
07112: 47 071 G
07113: 47 071 G
07114: 8B 139 I
07115: 1D 029 +

```

screen source reset aux vars debug stack flags

original source code... org 100h

```

01 ; You may customize this
02 ; The location of this t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU AX,[DI]
17 MOU BX,[DI]
18 TMC NY

```

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

01 ; You may customize this and other start-up templates;  
02 ; The location of this template is c:\emu8086\inc\0\_com\_t

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 H L

AX	FF FF
BX	00 00
CX	00 1E
DX	00 00
CS	0700
IP	0114
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1002
DS	0700
ES	0700

0700:0114 0700:0114

```

07100: BF 191 I
07101: 00 000 NULL
07102: 10 016 ▶
07103: C7 199 II
07104: 05 005 &
07105: FF 255 RES
07106: FF 255 RES
07107: 47 071 RES
07108: 47 071 G
07109: C7 199 II
0710A: 05 005 &
0710B: FF 255 RES
0710C: FF 255 RES
0710D: BB 191
0710E: 00 000 NULL
0710F: 10 016 ▶
07110: 8B 139 I
07111: 05 005 &
07112: 47 071 G
07113: 47 071 G
07114: 8B 139 I
07115: 1D 029 +

```

screen source reset aux vars debug stack flags

original source code... org 100h

```

01 ; You may customize this
02 ; The location of this t
03
04 org 100h
05
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 MOU AX,[DI]
17 MOU BX,[DI]
18 TMC NY

```

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

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 H L

AX	FF FF
BX	FF FF
CX	00 1E
DX	00 00
CS	0700
IP	0116
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1002
DS	0700
ES	0700

0700:0116 0700:0114

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_t
03
04 org 100h
05 MOU DI,1000H
06 MOU [DI],0xFFFF
07 INC DI
08 INC DI
09 MOU [DI],0xFFFF
10 MOU DI,1000H
11 MOU AX,[DI]
12 INC DI
13 MOU DI,1000H
14 MOU BX,[DI]
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 MUL BX
19 INC DI
20

```

screen source reset aux vars debug stack flags

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

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 H L

AX	00 01
BX	FF FF
CX	00 1E
DX	FF FE
CS	0700
IP	0118
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1002
DS	0700
ES	0700

0700:0118 0700:0118

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_t
03
04 org 100h
05 MOU DI,01000H
06 MOU [DI],0xFFFF
07 INC DI
08 INC DI
09 MOU [DI],01000H
10 MOU AX,[DI]
11 INC DI
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 MUL BX
19 INC DI
20

```

screen source reset aux vars debug stack flags

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

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 H L

AX	00 01
BX	FF FF
CX	00 1E
DX	FF FE
CS	0700
IP	0119
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1003
DS	0700
ES	0700

0700:0119 0700:0119

```

01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_t
03
04 org 100h
05 MOU DI,01000H
06 MOU [DI],0xFFFF
07 INC DI
08 INC DI
09 MOU [DI],01000H
10 MOU AX,[DI]
11 INC DI
12 MOU DI,1000H
13 MOU AX,[DI]
14 INC DI
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 MUL BX
19 INC DI
20

```

screen source reset aux vars debug stack flags

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

01 ; You may customize this and other start-up templates;  
 02 ; The location of this template is c:\emu8086\inc\0\_com\_t

emu: noname.com\_

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 01
BX	FF FF
CX	00 1E
DX	FF FE
CS	0700
IP	011A
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1004
DS	0700
ES	0700

0700:011A 0700:011A

```

07116: F7 247 Z
07117: E3 227 H
07118: 47 071 G
07119: 47 071 G
0711A: 87 137 E
0711B: C0 005 S
0711C: MUL BX, DI
0711D: CS 195 I
0711E: 99 144 E
0711F: 99 144 E
07120: 99 144 E
07121: 99 144 E
07122: 99 144 E
07123: 99 144 E
07124: 99 144 E
07125: 99 144 E
07126: 99 144 E
07127: 99 144 E
07128: 99 144 E
07129: 99 144 E
0712A: 99 144 E
0712B: 99 144 E
0712C: ...

```

screen source reset aux vars debug stack flags

original source code

```

04 org 100h
05 MOU DI,1000H
06 MOU [DI],0xFFFF
07 INC DI
08 INC DI
09 MOU [DI],0xFFFF
10 MOU DI,1000H
11 MOU AX,[DI]
12 INC DI
13 MOU BX,[DI]
14 MUL BX
15 INC DI
16 INC DI
17 MOU BX,[DI]
18 MUL BX
19 INC DI
20 INC DI
21 MOU [DI],AX
22 HLT

```

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

01 ; You may customize this and other start-up templates;  
 02 ; The location of this template is c:\emu8086\inc\0\_com\_t

emu: noname.com\_

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 01
BX	FF FF
CX	00 1E
DX	FF FE
CS	0700
IP	011C
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1004
DS	0700
ES	0700

0700:011C 0700:011C

```

07116: F7 247 Z
07117: E3 227 H
07118: 47 071 G
07119: 47 071 G
0711A: 87 137 E
0711B: MUL BX, DI
0711C: CS 195 I
0711D: 99 144 E
0711E: 99 144 E
0711F: 99 144 E
07120: 99 144 E
07121: 99 144 E
07122: 99 144 E
07123: 99 144 E
07124: 99 144 E
07125: 99 144 E
07126: 99 144 E
07127: 99 144 E
07128: 99 144 E
07129: 99 144 E
0712A: 99 144 E
0712B: 99 144 E
0712C: ...

```

screen source reset aux vars debug stack flags

original source code

```

05 org 100h
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11 MOU DI,1000H
12 MOU AX,[DI]
13 INC DI
14 MOU BX,[DI]
15 MUL BX
16 INC DI
17 MOU BX,[DI]
18 MUL BX
19 INC DI
20 INC DI
21 MOU [DI],AX
22 HLT

```

emu8086 - assembler and microprocessor emulator 4.08

file edit bookmarks assembler emulator math ascii codes help

new open examples save compile emulate calculator converter option

01 ; You may customize this and other start-up templates;  
 02 ; The location of this template is c:\emu8086\inc\0\_com\_t

emu: noname.com\_

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 01
BX	FF FF
CX	00 1E
DX	FF FE
CS	0700
IP	011C
SS	0700
SP	FFFE
BP	0000
SI	0000
DI	1004
DS	0700
ES	0700

0700:011C 0700:011C

```

07116: F7 247 Z
07117: E3 227 H
07118: 47 071 G
07119: 47 071 G
0711A: 87 137 E
0711B: MUL BX, DI
0711C: CS 195 I
0711D: 99 144 E
0711E: 99 144 E
0711F: 99 144 E
07120: 99 144 E
07121: 99 144 E
07122: 99 144 E
07123: 99 144 E
07124: 99 144 E
07125: 99 144 E
07126: 99 144 E
07127: 99 144 E
07128: 99 144 E
07129: 99 144 E
0712A: 99 144 E
0712B: 99 144 E
0712C: ...

```

screen source reset aux vars debug stack flags

original source code

```

05 org 100h
06 MOU DI,1000H
07 MOU [DI],0xFFFF
08 INC DI
09 INC DI
10 MOU [DI],0xFFFF
11 MOU DI,1000H
12 MOU AX,[DI]
13 INC DI
14 MOU BX,[DI]
15 MUL BX
16 INC DI
17 MOU BX,[DI]
18 MUL BX
19 INC DI
20 INC DI
21 MOU [DI],AX
22 HLT

```

flags

CF	1
ZF	0
SF	0
OF	0
PF	0
AF	1
DF	0

analyse