

Section #03

(Writing assembly using Debug)

1) A → Assemble.

A Assemble Used to enter assembly language.

```
C:\>debug
-a100
073F:0100 mov ax,1
073F:0103 mov bx,2
073F:0106 mov cx,3
073F:0109 add ax,bx
073F:010B add ax,cx
073F:010D int 3
073F:010E
```

2) U → Unassemble.

- Can be written in two formats [U StartA EndA, U StartA L#bytes].
- You cannot assemble lower than 100 because the beginning 256 bytes are reserved by DOS.

```
-u 100 10d
073F:0100 B80100      MOV     AX,0001
073F:0103 BB0200      MOV     BX,0002
073F:0106 B90300      MOV     CX,0003
073F:0109 01D8        ADD     AX,BX
073F:010B 01C8        ADD     AX,CX
073F:010D CC          INT     3
```

3) G → Go

- Execute instructions between two addresses.
- If no address begins execute instruction at CS:IP until a breakpoint is reached.
- INT 3 terminate execution.

```
C:\>debug
-a100
073F:0100 mov ax,2
073F:0103 mov bx,3
073F:0106 add ax,bx
073F:0108 int 3
073F:0109
-g
AX=0005 BX=0003 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010B  NU UP EI PL NZ NA PE NC
073F:010B CC          INT     3
-g=100 103
AX=0002 BX=0003 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0103  NU UP EI PL NZ NA PE NC
073F:0103 BB0300      MOV     BX,0003
-g=100
AX=0005 BX=0003 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010B  NU UP EI PL NZ NA PE NC
073F:010B CC          INT     3
~
```

4) T→ Trace

- Trace the contents of one instruction.
- Can write in form [T begin address #of Instruction].

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG
C:\>debug
-a100
073F:0100 mov ax,0002
073F:0103 mov bx,0004
073F:0106 add ax,bx
073F:0108 nop ; No operation
073F:0109
-t
AX=0002 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0103  NU UP EI PL NZ NA PO NC
073F:0103 BB0400      MOV     BX,0004
-t
AX=0002 BX=0004 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0106  NU UP EI PL NZ NA PO NC
073F:0106 01D8      ADD     AX,BX
-t
AX=0006 BX=0004 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0108  NU UP EI PL NZ NA PE NC
073F:0108 90        NOP
-
```

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG
-a100
073F:0100 mov ax,0002
073F:0103 mov bx,0004
073F:0106 add ax,bx
073F:0108 mov cx,ax
073F:010A
-t=100 4
AX=0002 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0103  NU UP EI PL NZ NA PO NC
073F:0103 BB0400      MOV     BX,0004
AX=0002 BX=0004 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0106  NU UP EI PL NZ NA PO NC
073F:0106 01D8      ADD     AX,BX
AX=0006 BX=0004 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0108  NU UP EI PL NZ NA PE NC
073F:0108 89C1      MOV     CX,AX
AX=0006 BX=0004 CX=0006 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010A  NU UP EI PL NZ NA PE NC
073F:010A D801      FADD    DWORD PTR [BX+DI]  DS:0004=00
-
```

True or False:

```
DOS
BOX DOSBox 0.74, Cpu speed: 3000 cycles, Framesk
C:\>debug
-a100
073F:0100 mov bh,2
073F:0102 mov ax,bh
                ^ Error
073F:0102 mov ah,123
                ^ Error
073F:0102 mov ax,12345
                ^ Error
073F:0102 mov bx,0003
073F:0105 mov al,bx
                ^ Error
073F:0105 mov dh,02
073F:0107 mov sl,dh
                ^ Error
073F:0107
```

5) W → Write

6) N → Name

- Steps used to save an assembly program:
- Obtain length using "h"
- Name your program using "n"
- Put length on "CX"
- Write your program on disk using "w"

```
C:\8086>debug
-a100
073F:0100 mov ah,02
073F:0102 mov dl,01
073F:0104 int 21
073F:0106 int 20
073F:0108
-h108 100
0208 0008
-n smile.com
-r cx
CX 0000
:0008
-w
Writing 00008 bytes
-
```

7) L Load

- First give the name of the file you want to load.
- Load file using " L "

```
C:\8086>debug
-n smile.com
-l
-u 100 108
075A:0100 B402      MOV     AH,02
075A:0102 B201      MOV     DL,01
075A:0104 CD21      INT     21
075A:0106 CD20      INT     20
075A:0108 0000      ADD     [BX+SI],AL
-
```

Q→ Quit.

- Exit from debug program.