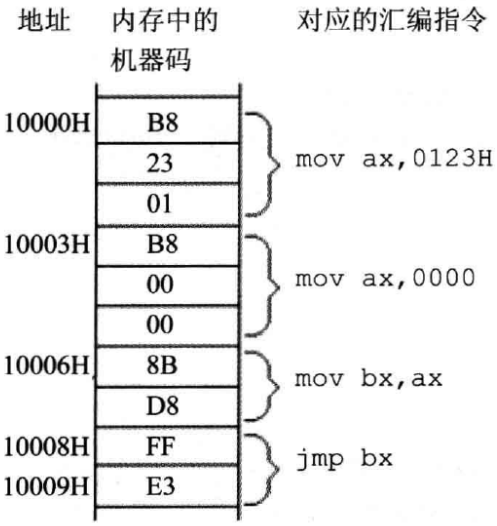
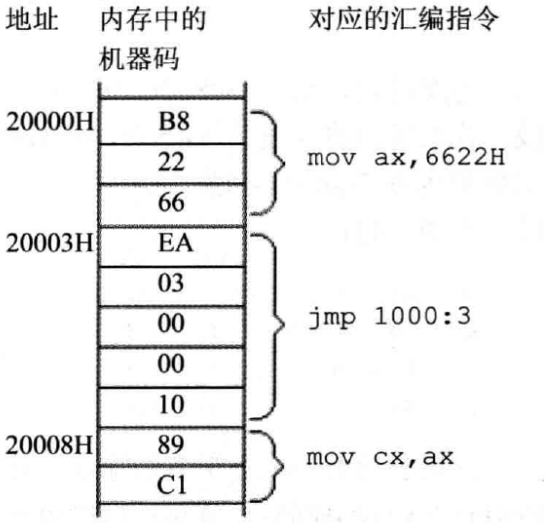
修改CS和IP

- 同时修改cs和ip：`jmp 段地址:偏移地址`
- 只修改ip：`jmp 寄存器`

如图所示：CPU初始状态CS=2000H，IP=0000H



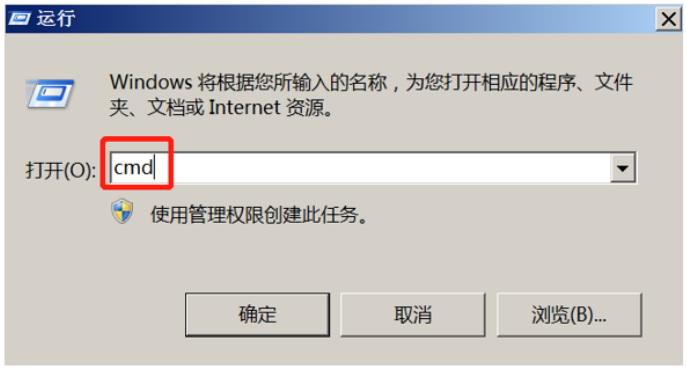


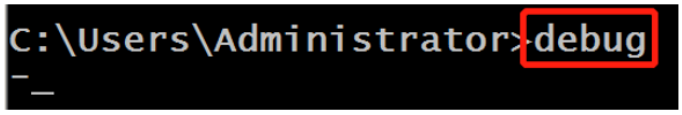
Debug调试

常用指令

- R命令查看、改变CPU寄存器的内容
- D命令查看内存中的内容
- E命令改写内存中的内容
- U命令将内存中的机器指令翻译成汇编指令
- T命令执行一条机器指令
- A命令以汇编指令格式在内存中写入一条机器指令

进入Debug





R命令查看寄存器内容

```
C:\Users\Administrator>debug
-r
AX=0000  BX=0000  CX=0000  DX=0000  SP=FFEE  BP=0000  SI=0000  DI=0000
DS=0B09  ES=0B09  SS=0B09  CS=0B09  IP=0100   NV UP EI PL NZ NA PO NC
0B09:0100 F6C780        TEST    BH,80
-r ax
AX 0000
:1111
-r
AX=1111  BX=0000  CX=0000  DX=0000  SP=FFEE  BP=0000  SI=0000  DI=0000
DS=0B09  ES=0B09  SS=0B09  CS=0B09  IP=0100   NV UP EI PL NZ NA PO NC
0B09:0100 F6C780        TEST    BH,80
```

- CS:IP所指向的内存单元处存放着机器码F6C780
- 对应汇编指令 TEST BH,80

D命令查看内存中内容

```
C:\Users\Administrator>debug
-d
0B09:0100  F6 C7 80 74 05 C6 06 7D-97 01 E9 2D 01 3A C3 75   ...t...}...-.:.u
0B09:0110  05 80 CF 80 EB D4 3C 0D-75 03 E9 18 34 00 F8 0A   ......<.u...4...
0B09:0120  96 75 03 E9 17 01 B2 3A-38 14 75 1D 80 3E 0C 98   .u.....:8.u..>..
0B09:0130  01 75 03 E8 23 E1 E8 5C-01 AC E8 58 01 89 3E 4E   .u..#..\...X..>N
0B09:0140  99 C6 06 50 99 00 E9 B3-00 89 3E 4E 99 C6 06 50   ...P......>N...P
0B09:0150  99 00 80 3E 0C 98 01 75-1D E8 8F E3 75 18 50 A0   ...>...u....u.P.
0B09:0160  2E 96 04 41 E8 2E 01 B0-3A E8 29 01 58 89 3E 4E   ...A....:.).X.>N
0B09:0170  99 C6 06 50 99 00 E8 B6-E0 74 06 E8 17 01 AC EB   ...P.....t......
-d 1000:0
1000:0000  20 20 20 20 20 20 20 20-20 20 00 00 00 00 00 00                ......
1000:0010  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0020  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0030  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0040  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0050  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0060  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0070  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
-e 1000:0 1 2 3 4 5 6 7 8 9 A B C
-d 1000:0 f
1000:0000  01 02 03 04 05 06 07 08-09 0A 0B 0C 00 00 00 00   ................
```

E命令将机器码写入内存

```
-e 1000:0 b8 01 00 b9 02 00 01 c8
-d 1000:0 2f
1000:0000  B8 01 00 B9 02 00 01 C8-09 0A 0B 0C 00 00 00 00
1000:0010  01 61 6D 2B 6E 63 2B 2B-00 00 00 00 00 00 00 00
1000:0020  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
-u 1000:0
1000:0000 B80100        MOV     AX,0001
1000:0003 B90200        MOV     CX,0002
1000:0006 01C8          ADD     AX,CX
1000:0008 090A          OR      [BP+SI],CX
1000:000A 0B0C          OR      CX,[SI]
1000:000C 0000          ADD     [BX+SI],AL
1000:000E 0000          ADD     [BX+SI],AL
1000:0010 01616D        ADD     [BX+DI+6D],SP
1000:0013 2B6E63        SUB     BP,[BP+63]
1000:0016 2B2B          SUB     BP,[BP+DI]
1000:0018 0000          ADD     [BX+SI],AL
1000:001A 0000          ADD     [BX+SI],AL
1000:001C 0000          ADD     [BX+SI],AL
1000:001E 0000          ADD     [BX+SI],AL
```

机器码	对应的汇编指令
b80100	mov ax, 0001
b90200	mov cx, 0002
01c8	add ax, cx

实验任务1

- 将下面三条命令写入从2000:0开始的内存单元中，利用这三条指令计算2的8次方

- mov ax, 1
- add ax, ax
- jmp 2000:0003

```
-a 2000:0
2000:0000 mov ax, 1
2000:0003 add ax, ax
2000:0005 jmp 2000:0003
2000:0007
-r cs
CS 0B09
:2000
-r ip
IP 0100
:0
-t

AX=0001  BX=0000  CX=0000  DX=0000  SP=FFEE  BP=0000  SI=0000  DI=0000
DS=0B09  ES=0B09  SS=0B09  CS=2000  IP=0003   NV UP EI PL NZ NA PO NC
2000:0003 01C0          ADD     AX,AX
```

实验任务2

- 在PC机主板的ROM中写有一个生产日期，在内存FFF00H~FFFFFH的某几个单元中，请找到这个生产日期并试图改变它。

```
-d fff0:0 ff
FFF0:0000  EF 00 F5 65 F0 4D F8 41-F8 59 EC 39 E7 59 F8 2E   ...e.M.A.Y.9.Y..
FFF0:0010  E8 D2 EF 59 FF F2 E6 6E-FE 53 FF 53 FF A4 F0 C7   ...Y...n.S.S....
FFF0:0020  EF 00 00 32 F2 E2 F5 66-0D 66 0D 66 0D 73 84 66   ...2...f.f.f.s.f
FFF0:0030  0D 09 F5 E9 DC F5 E8 F0-EE CB 50 B0 00 E6 43 90   ..........P...C.
FFF0:0040  90 E4 40 90 90 8A E0 E4-40 86 C4 8B F8 58 C3 00   ..@.....@....X..
FFF0:0050  00 00 00 CF E9 AD ED FF-E7 E9 71 9E E9 69 9E 50   ..........q..i.P
FFF0:0060  56 2E 03 36 A8 FE 2E 8B-34 2E 03 36 A8 FE B4 0E   V..6....4..6....
FFF0:0070  2E AC 0A C0 74 04 CD 10-EB F6 5E 58 C3 FA B4 0B   ....t.....^X....
FFF0:0080  E8 96 45 24 57 E8 A8 45-CB 00 00 00 00 00 00 00   ..E$W..E........
FFF0:0090  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
FFF0:00A0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
FFF0:00B0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
FFF0:00C0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
FFF0:00D0  00 00 00 00 00 00 00 00-00 00 00 00 00 E8 93 FE   ................
FFF0:00E0  CB 00 00 00 E9 09 8C 00-00 00 00 00 00 00 00 00   ................
FFF0:00F0  EA 5B E0 00 F0 30 34 2F-31 33 2F 31 38 00 FC 57   .[...04/13/18..W
-e ffff:5
FFFF:0005  30.31
-e ffff:6
FFFF:0006  34.25
-d ffff:0 f
FFFF:0000  EA 5B E0 00 F0 31 25 2F-31 33 2F 31 38 00 FC 57   .[...1%/13/18..W
```

实验任务3

- 向内存从B8100H开始的单元中填写数据，如：
  -e B810:0000 01 01 02 02 03 03 04 04