南京林业大学

汇编语言上机实验

任务书

实验一　查看 CPU 和内存，用机器指令和汇编指令编程

一．实验目的

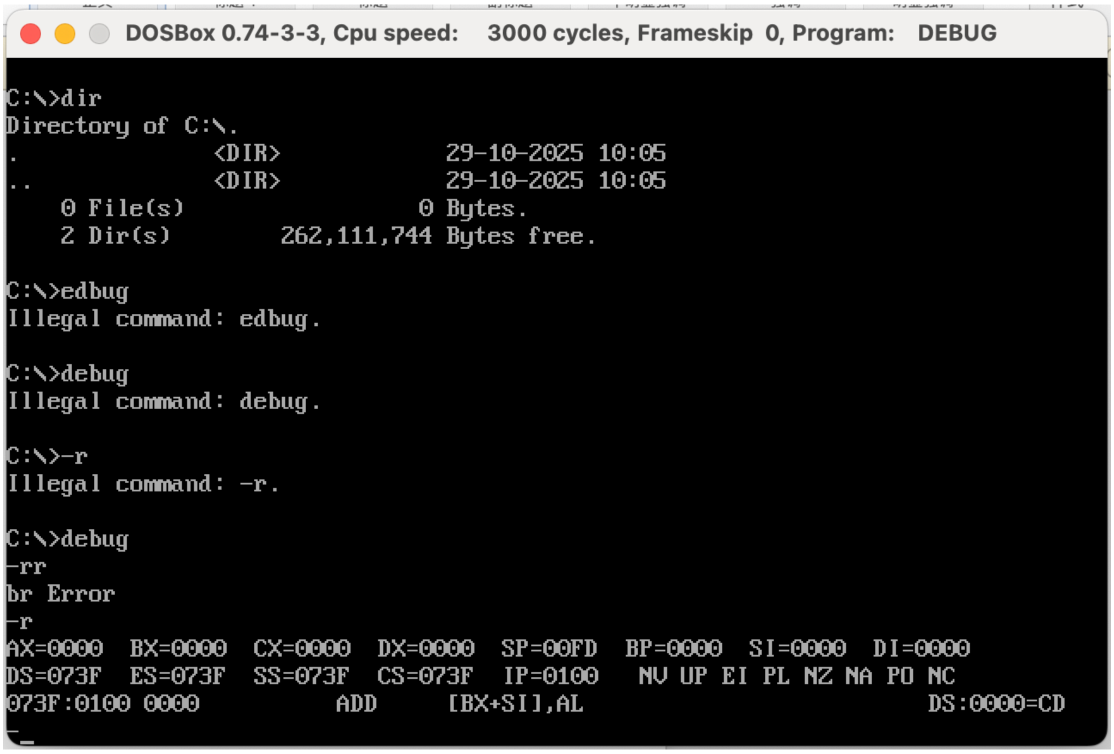
加深对进程调度的理解，熟悉进程调度的不同算法，比较其优劣性。

二．实验内容

(1) 什么是 debug

(2) 我们用到的 debug 功能

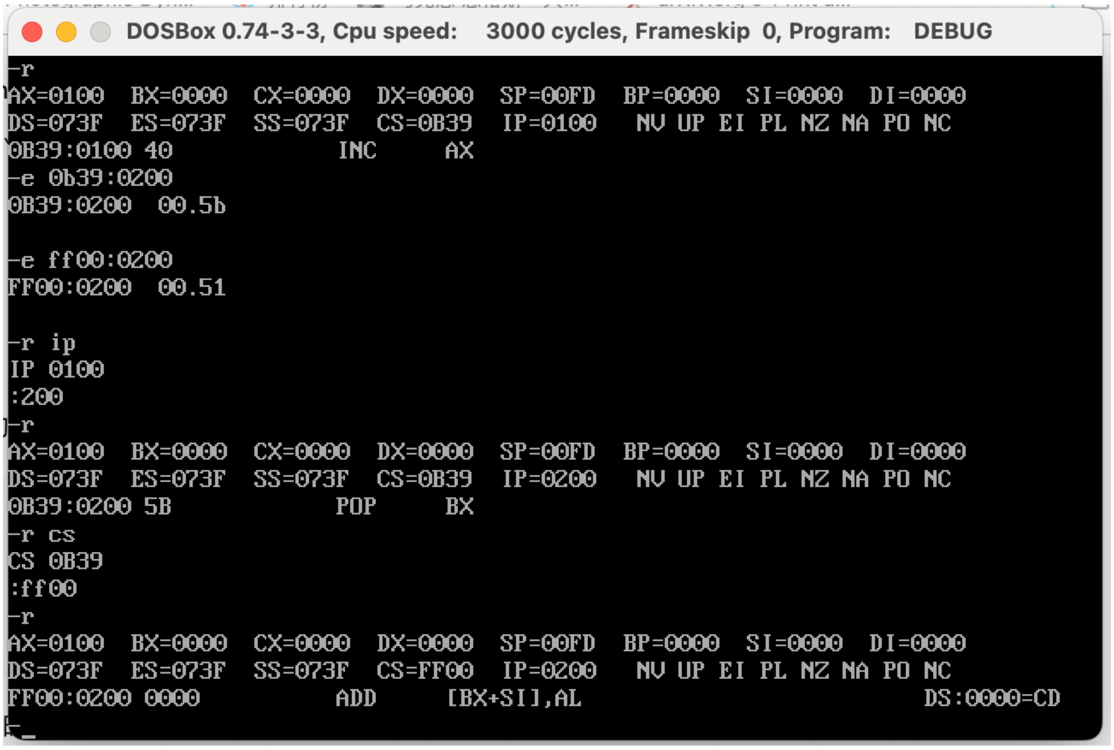
(3) 进入 debug



DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

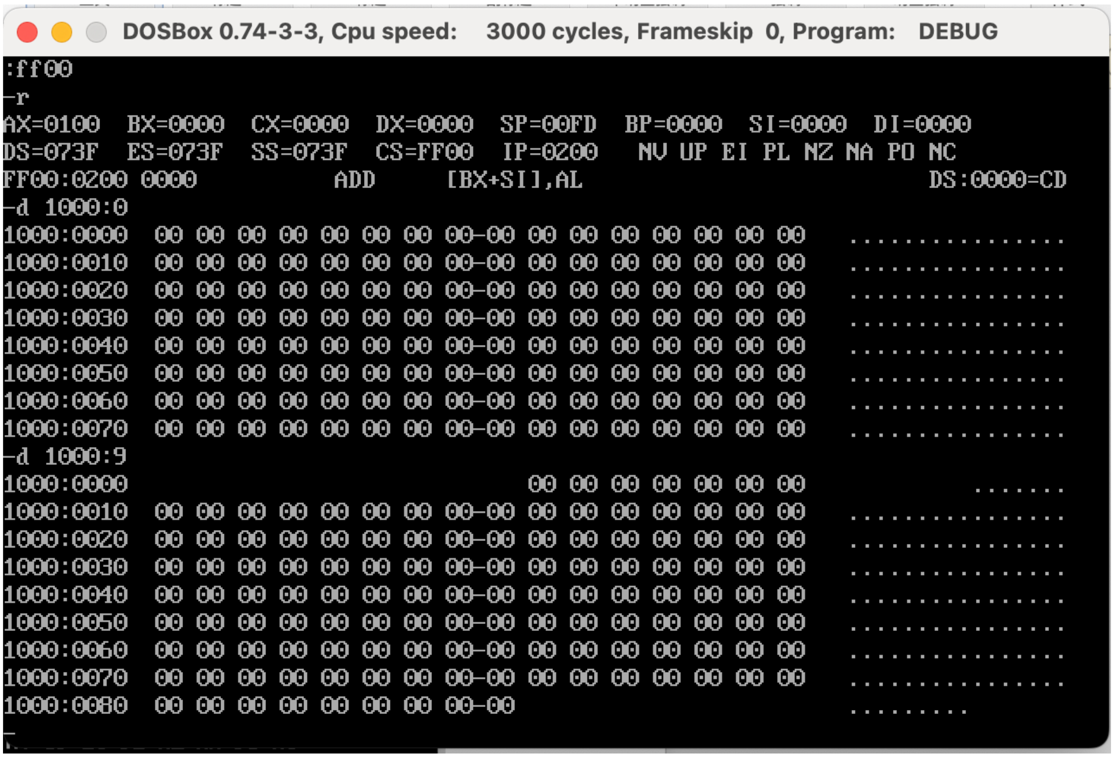
```
C:\>dir
Directory of C:\.
.               <DIR>            29-10-2025 10:05
..              <DIR>            29-10-2025 10:05
    0 File(s)                  0 Bytes.
    2 Dir(s)        262,111,744 Bytes free.

C:\>edbug
Illegal command: edbug.

C:\>debug
Illegal command: debug.

C:\>-r
Illegal command: -r.

C:\>debug
-rr
br Error
-r
AX=0000  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0100   NV UP EI PL NZ NA PO NC
073F:0100 0000          ADD     [BX+SI],AL                         DS:0000=CD
-_
```

(4) 用 R 命令查看、改变寄存器的内容

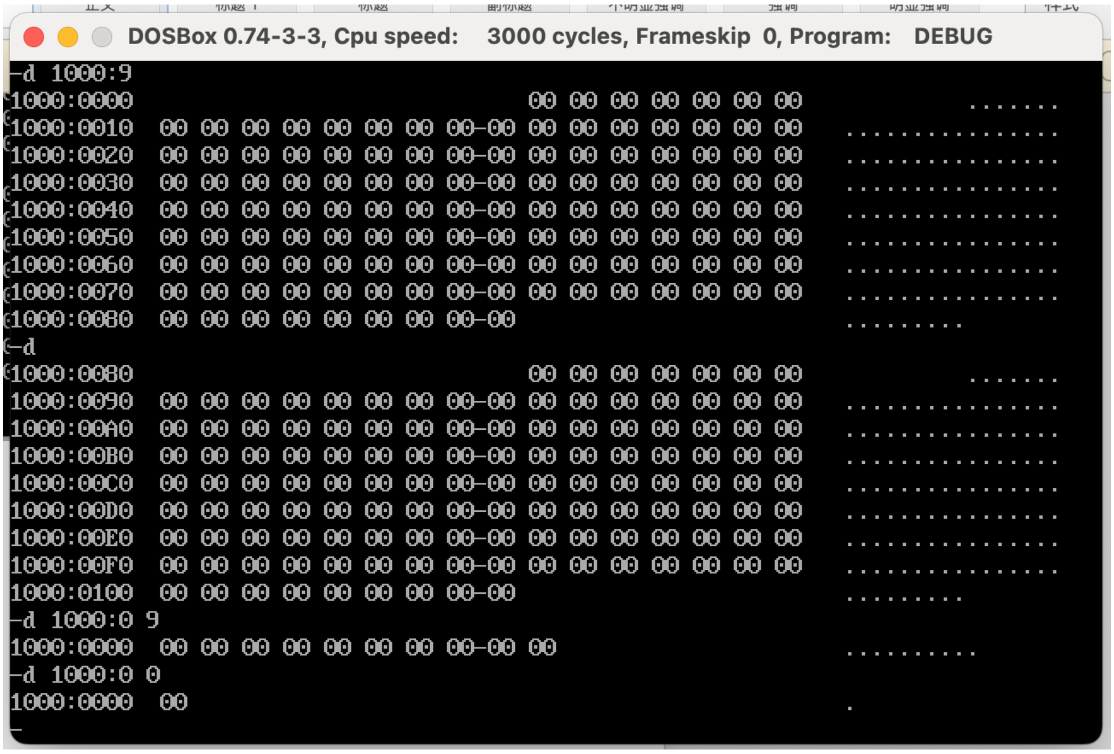

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

```
-r
AX=0100  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=0B39  IP=0100   NV UP EI PL NZ NA PO NC
0B39:0100 40            INC     AX
-e 0b39:0200
0B39:0200  00.5b

-e ff00:0200
FF00:0200  00.51

-r ip
IP 0100
:200
-r
AX=0100  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=0B39  IP=0200   NV UP EI PL NZ NA PO NC
0B39:0200 5B            POP     BX
-r cs
CS 0B39
:ff00
-r
AX=0100  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=FF00  IP=0200   NV UP EI PL NZ NA PO NC
FF00:0200 0000          ADD     [BX+SI],AL                         DS:0000=CD
-
```

(5) 用 debug 的 D 命令查看内存中的内容

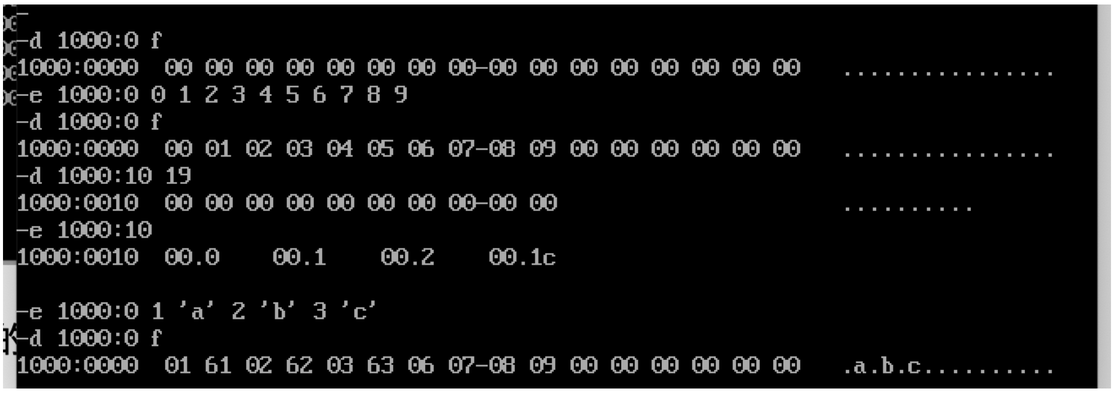

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

```
:ff00
-r
AX=0100  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=FF00  IP=0200   NV UP EI PL NZ NA PO NC
FF00:0200 0000          ADD     [BX+SI],AL                         DS:0000=CD
-d 1000:0
1000:0000  00 00 00 00 00 00 00 00-00 00 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   ................
-d 1000:9
1000:0000                             00 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   ................
1000:0080  00 00 00 00 00 00 00 00-00                        .........
-
```


DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

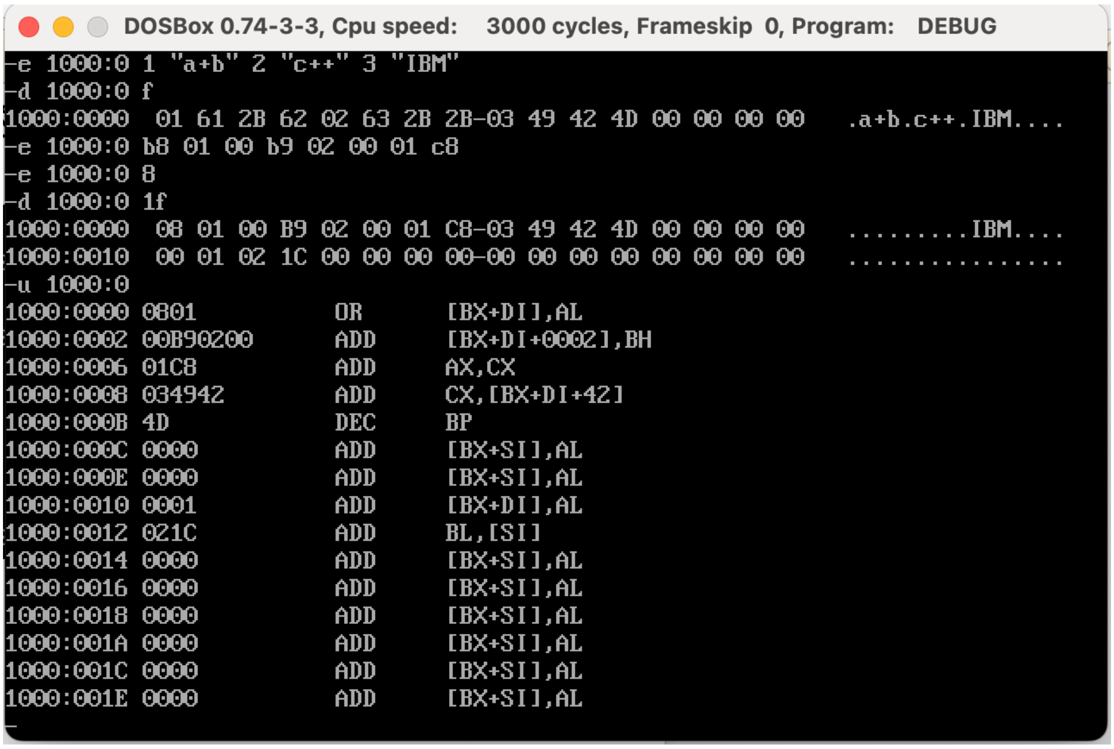
```
-d 1000:9
1000:0000                              00 00 00 00 00 00 00          .......
1000:0010  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0020  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0030  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 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   ................
1000:0080  00 00 00 00 00 00 00 00-00                        .........
-d
1000:0080                              00 00 00 00 00 00 00          .......
1000:0090  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:00A0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:00B0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:00C0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:00D0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:00E0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:00F0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
1000:0100  00 00 00 00 00 00 00 00-00                        .........
-d 1000:0 9
1000:0000  00 00 00 00 00 00 00 00-00 00                     ..........
-d 1000:0 0
1000:0000  00                                                .
-
```

(6) 用 debug 的 E 命令来改写内存中的内容

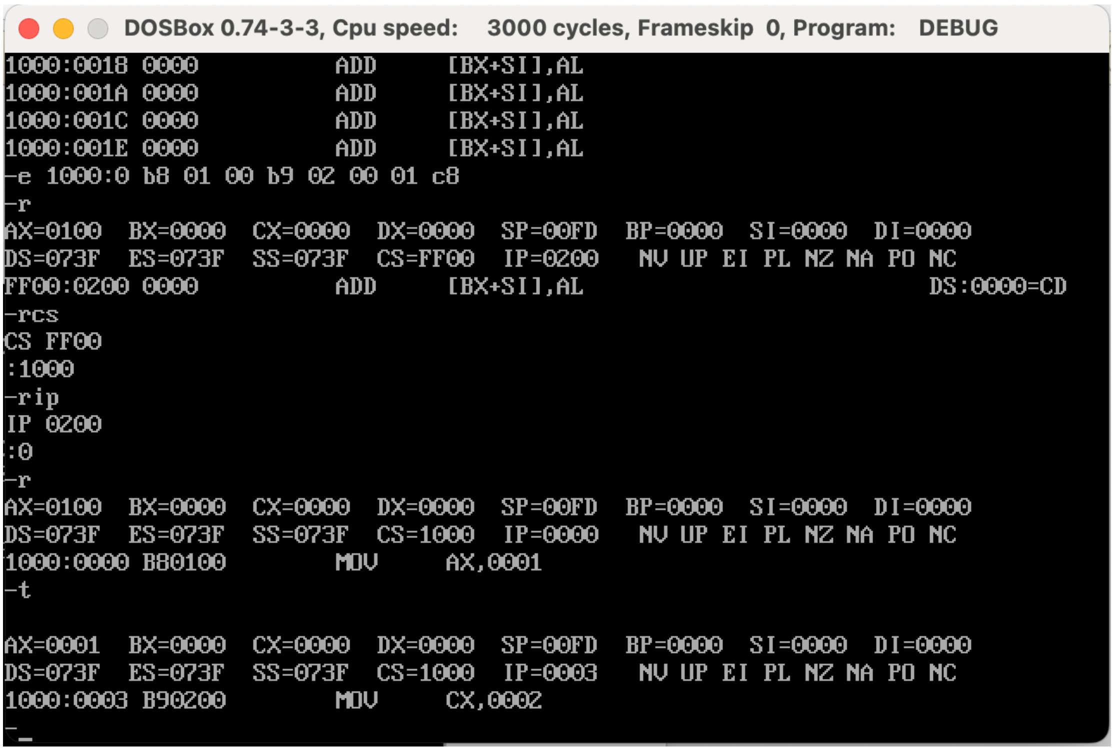


```
-
-d 1000:0 f
1000:0000  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
-e 1000:0 0 1 2 3 4 5 6 7 8 9
-d 1000:0 f
1000:0000  00 01 02 03 04 05 06 07-08 09 00 00 00 00 00 00   ................
-d 1000:10 19
1000:0010  00 00 00 00 00 00 00 00-00 00                     ..........
-e 1000:10
1000:0010  00.0    00.1    00.2    00.1c

-e 1000:0 1 'a' 2 'b' 3 'c'
-d 1000:0 f
1000:0000  01 61 02 62 03 63 06 07-08 09 00 00 00 00 00 00   .a.b.c..........
```

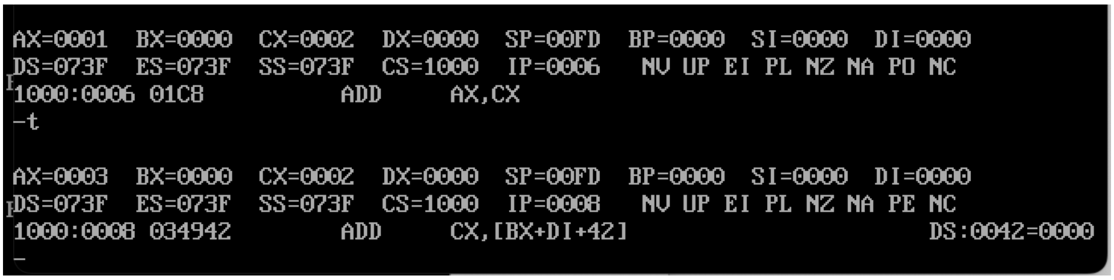
(7) 用 E 命令向内存中写入机器码


DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

```
-e 1000:0 1 "a+b" 2 "c++" 3 "IBM"
-d 1000:0 f
1000:0000  01 61 2B 62 02 63 2B 2B-03 49 42 4D 00 00 00 00   .a+b.c++.IBM....
-e 1000:0 b8 01 00 b9 02 00 01 c8
-e 1000:0 8
-d 1000:0 1f
1000:0000  08 01 00 B9 02 00 01 C8-03 49 42 4D 00 00 00 00   .........IBM....
1000:0010  00 01 02 1C 00 00 00 00-00 00 00 00 00 00 00 00   ................
-u 1000:0
1000:0000 0801          OR      [BX+DI],AL
1000:0002 00B90200      ADD     [BX+DI+0002],BH
1000:0006 01C8          ADD     AX,CX
1000:0008 034942        ADD     CX,[BX+DI+42]
1000:000B 4D            DEC     BP
1000:000C 0000          ADD     [BX+SI],AL
1000:000E 0000          ADD     [BX+SI],AL
1000:0010 0001          ADD     [BX+DI],AL
1000:0012 021C          ADD     BL,[SI]
1000:0014 0000          ADD     [BX+SI],AL
1000:0016 0000          ADD     [BX+SI],AL
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
-
```

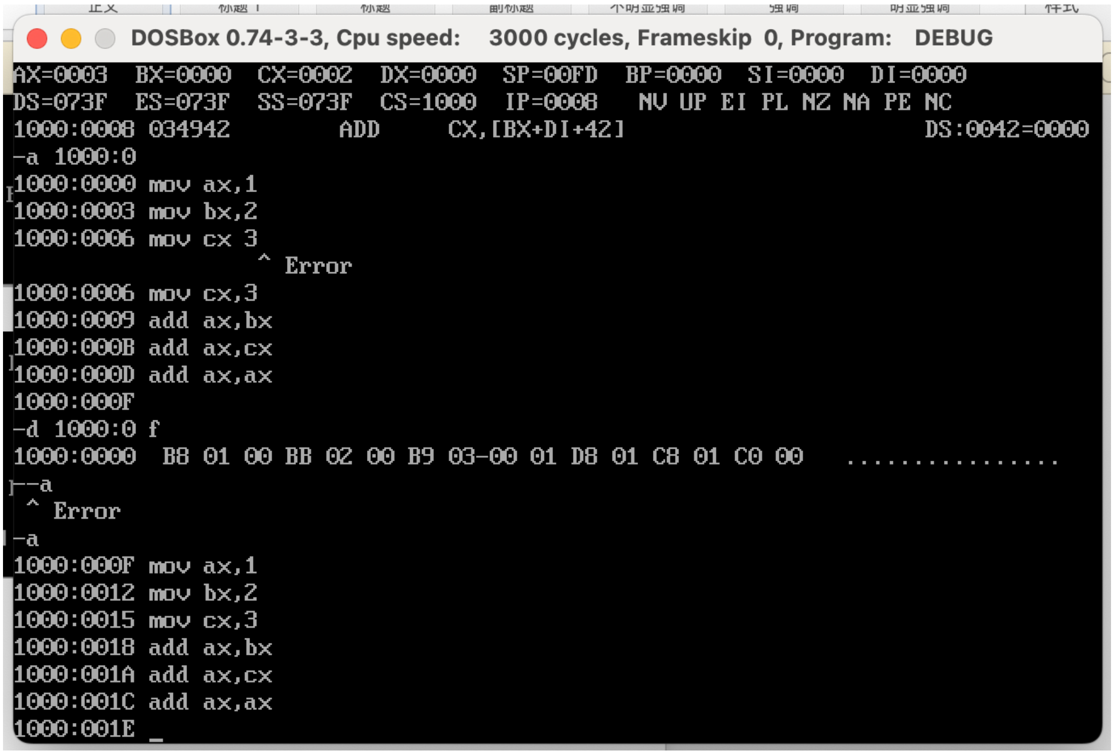

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

```
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
-e 1000:0 b8 01 00 b9 02 00 01 c8
-r
AX=0100  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=FF00  IP=0200   NV UP EI PL NZ NA PO NC
FF00:0200 0000          ADD     [BX+SI],AL                         DS:0000=CD
-rcs
CS FF00
:1000
-rip
IP 0200
:0
-r
AX=0100  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0000   NV UP EI PL NZ NA PO NC
1000:0000 B80100        MOV     AX,0001
-t

AX=0001  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0003   NV UP EI PL NZ NA PO NC
1000:0003 B90200        MOV     CX,0002
-_
```



```
AX=0001  BX=0000  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0006   NV UP EI PL NZ NA PO NC
1000:0006 01C8          ADD     AX,CX
-t

AX=0003  BX=0000  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0008   NV UP EI PL NZ NA PE NC
1000:0008 034942        ADD     CX,[BX+DI+42]                      DS:0042=0000
-
```

(8) 用 debug 的 A 命令以汇编形式在内存中写入机器指令

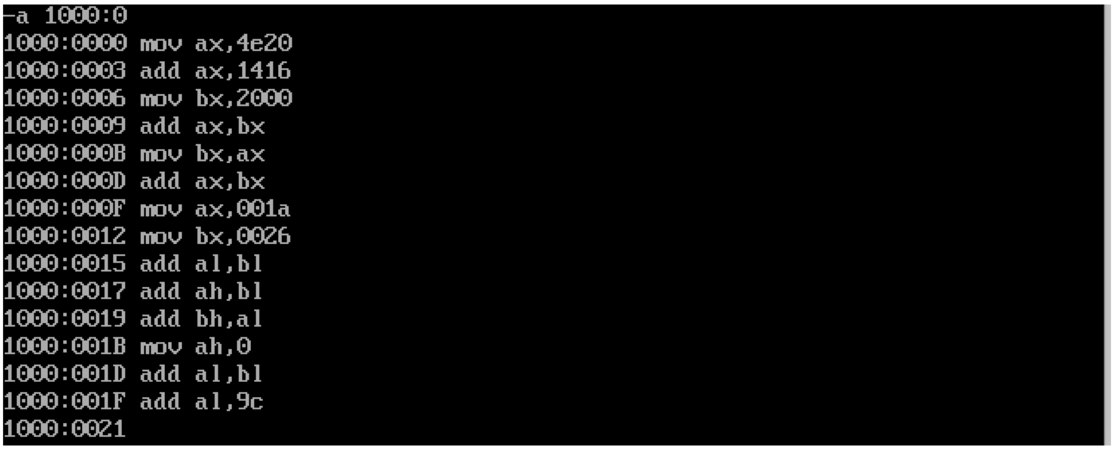

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

```
AX=0003  BX=0000  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0008   NV UP EI PL NZ NA PE NC
1000:0008 034942        ADD     CX,[BX+DI+42]                      DS:0042=0000
-a 1000:0
1000:0000 mov ax,1
1000:0003 mov bx,2
1000:0006 mov cx 3
                  ^ Error
1000:0006 mov cx,3
1000:0009 add ax,bx
1000:000B add ax,cx
1000:000D add ax,ax
1000:000F
-d 1000:0 f
1000:0000  B8 01 00 BB 02 00 B9 03-00 01 D8 01 C8 01 C0 00   ................
-a
 ^ Error
-a
1000:000F mov ax,1
1000:0012 mov bx,2
1000:0015 mov cx,3
1000:0018 add ax,bx
1000:001A add ax,cx
1000:001C add ax,ax
1000:001E _
```

三．实验任务

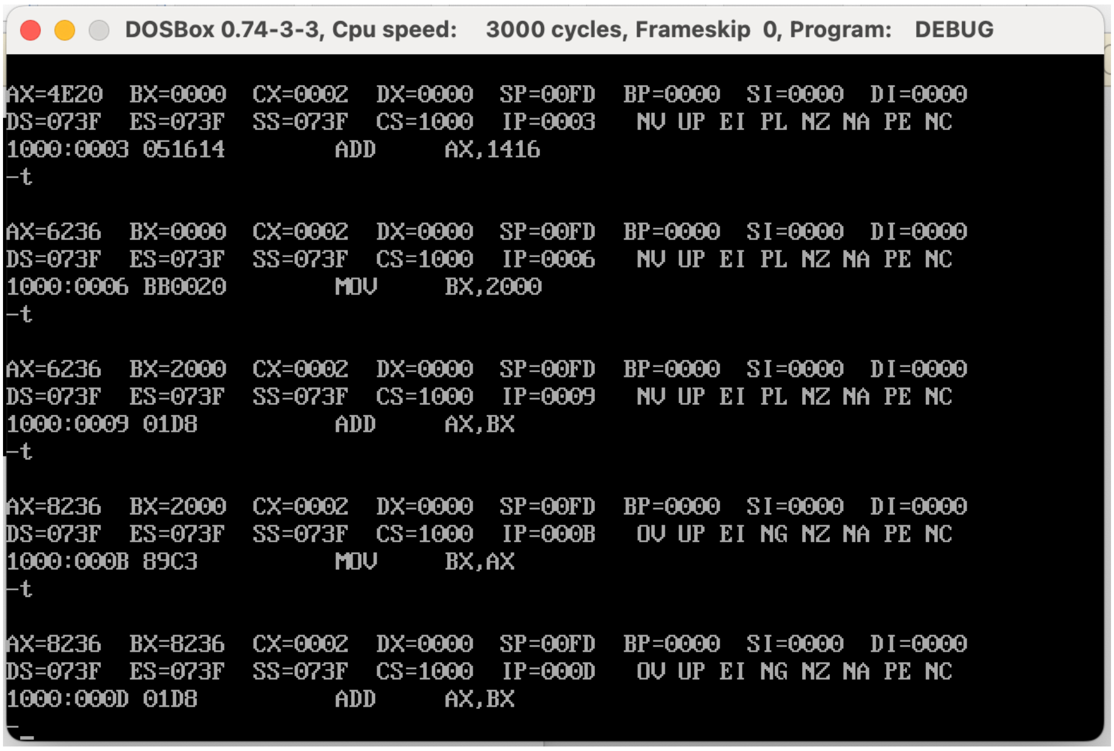
1.使用 Debug 将下面程序写入内存，逐条执行，观察每条指令执行后 cpu 相关寄存器中内容的变化。

代码的输入过程：



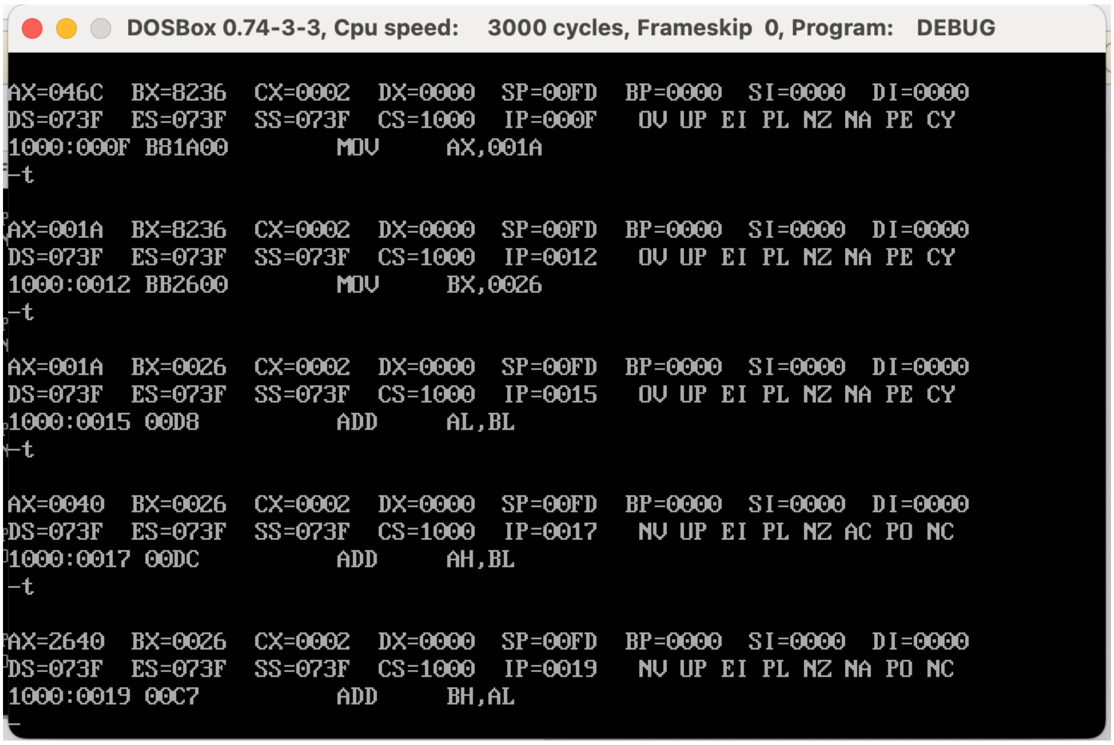
```
-a 1000:0
1000:0000 mov ax,4e20
1000:0003 add ax,1416
1000:0006 mov bx,2000
1000:0009 add ax,bx
1000:000B mov bx,ax
1000:000D add ax,bx
1000:000F mov ax,001a
1000:0012 mov bx,0026
1000:0015 add al,bl
1000:0017 add ah,bl
1000:0019 add bh,al
1000:001B mov ah,0
1000:001D add al,bl
1000:001F add al,9c
1000:0021
```

执行过程：



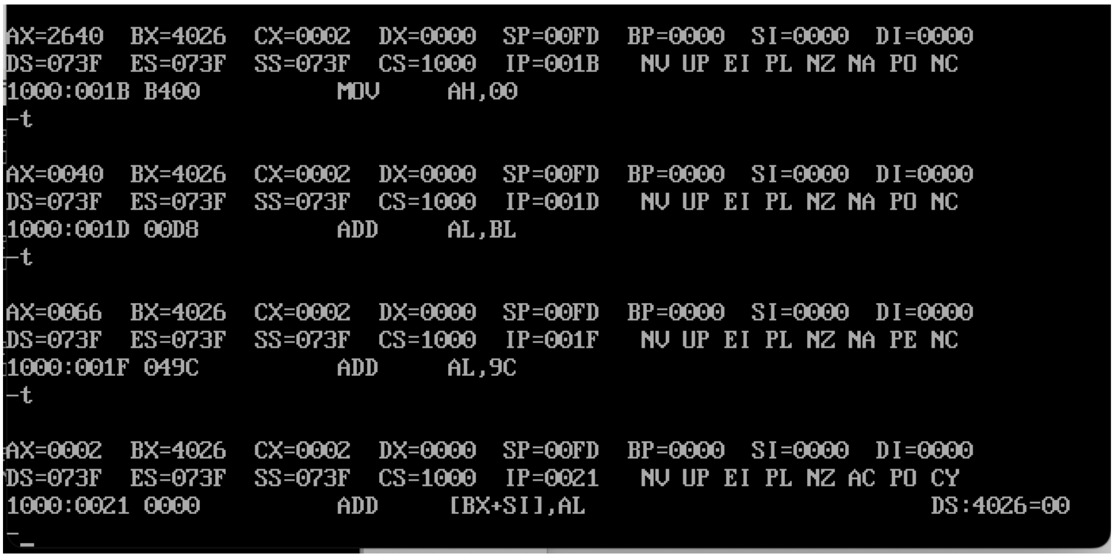
DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

```
AX=4E20  BX=0000  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0003   NV UP EI PL NZ NA PE NC
1000:0003 051614        ADD     AX,1416
-t

AX=6236  BX=0000  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0006   NV UP EI PL NZ NA PE NC
1000:0006 BB0020        MOV     BX,2000
-t

AX=6236  BX=2000  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0009   NV UP EI PL NZ NA PE NC
1000:0009 01D8          ADD     AX,BX
-t

AX=8236  BX=2000  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=000B   OV UP EI NG NZ NA PE NC
1000:000B 89C3          MOV     BX,AX
-t

AX=8236  BX=8236  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=000D   OV UP EI NG NZ NA PE NC
1000:000D 01D8          ADD     AX,BX
-_
```



DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

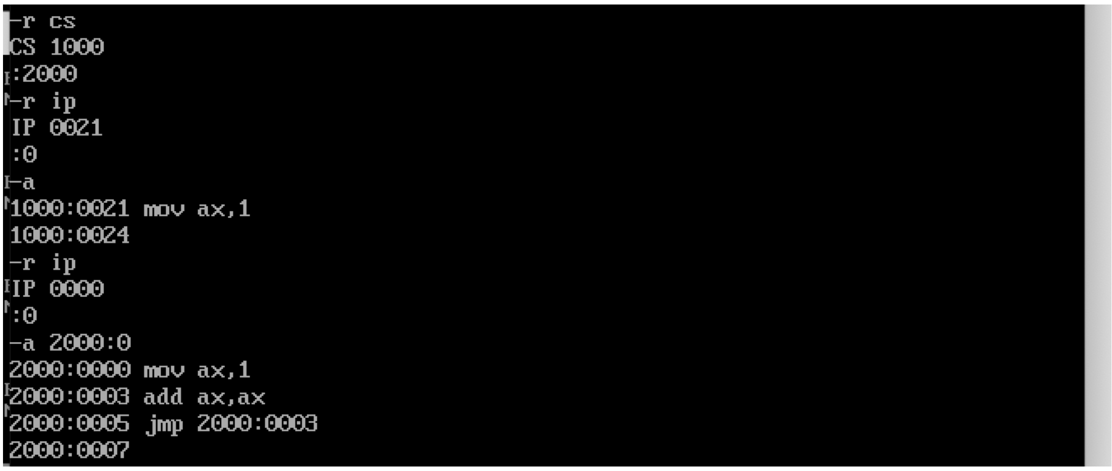
```
AX=046C  BX=8236  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=000F   OV UP EI PL NZ NA PE CY
1000:000F B81A00        MOV     AX,001A
-t

AX=001A  BX=8236  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0012   OV UP EI PL NZ NA PE CY
1000:0012 BB2600        MOV     BX,0026
-t

AX=001A  BX=0026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0015   OV UP EI PL NZ NA PE CY
1000:0015 00D8          ADD     AL,BL
-t

AX=0040  BX=0026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0017   NV UP EI PL NZ AC PO NC
1000:0017 00DC          ADD     AH,BL
-t

AX=2640  BX=0026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0019   NV UP EI PL NZ NA PO NC
1000:0019 00C7          ADD     BH,AL
-
```



```
AX=2640  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=001B   NV UP EI PL NZ NA PO NC
1000:001B B400          MOV     AH,00
-t

AX=0040  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=001D   NV UP EI PL NZ NA PO NC
1000:001D 00D8          ADD     AL,BL
-t

AX=0066  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=001F   NV UP EI PL NZ NA PE NC
1000:001F 049C          ADD     AL,9C
-t

AX=0002  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=1000  IP=0021   NV UP EI PL NZ AC PO CY
1000:0021 0000          ADD     [BX+SI],AL                         DS:4026=00
-_
```

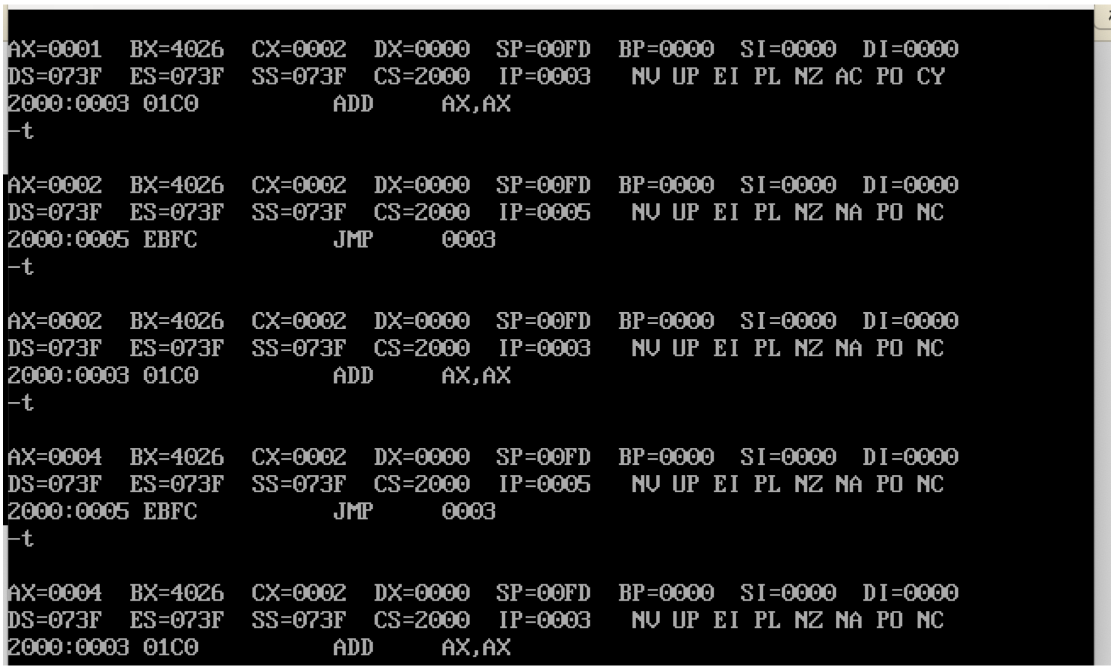
2.将下面 3 条指令写入从 2000:0 开始的内存单元中，利用这三条指令计算 2 的 8 次方

指令输入过程：

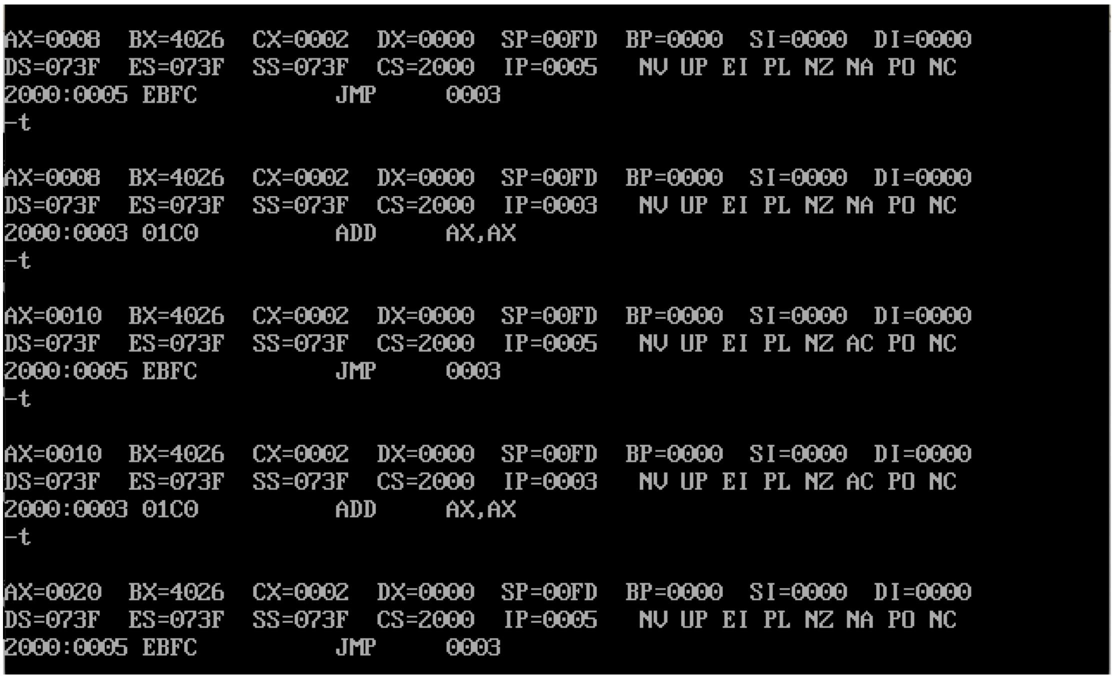


```
-r cs
CS 1000
:2000
-r ip
IP 0021
:0
-a
1000:0021 mov ax,1
1000:0024
-r ip
IP 0000
:0
-a 2000:0
2000:0000 mov ax,1
2000:0003 add ax,ax
2000:0005 jmp 2000:0003
2000:0007
```

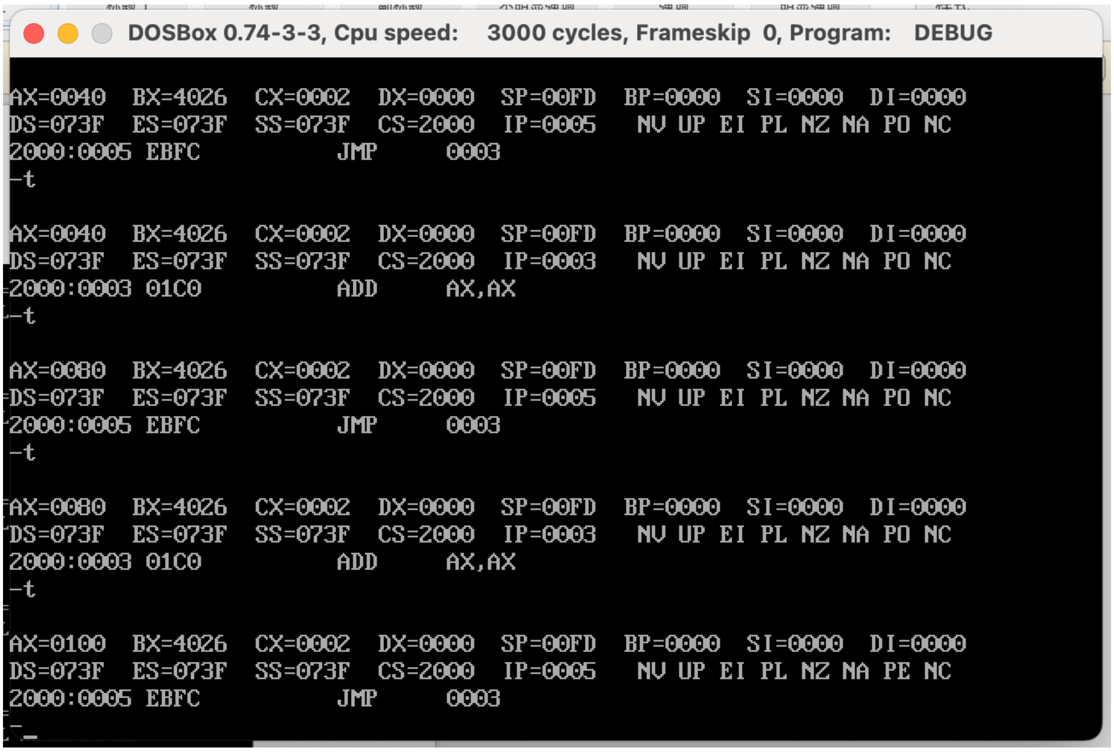
运行过程：



```
AX=0001  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0003   NV UP EI PL NZ AC PO CY
2000:0003 01C0          ADD     AX,AX
-t

AX=0002  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0005   NV UP EI PL NZ NA PO NC
2000:0005 EBFC          JMP     0003
-t

AX=0002  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0003   NV UP EI PL NZ NA PO NC
2000:0003 01C0          ADD     AX,AX
-t

AX=0004  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0005   NV UP EI PL NZ NA PO NC
2000:0005 EBFC          JMP     0003
-t

AX=0004  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0003   NV UP EI PL NZ NA PO NC
2000:0003 01C0          ADD     AX,AX
```



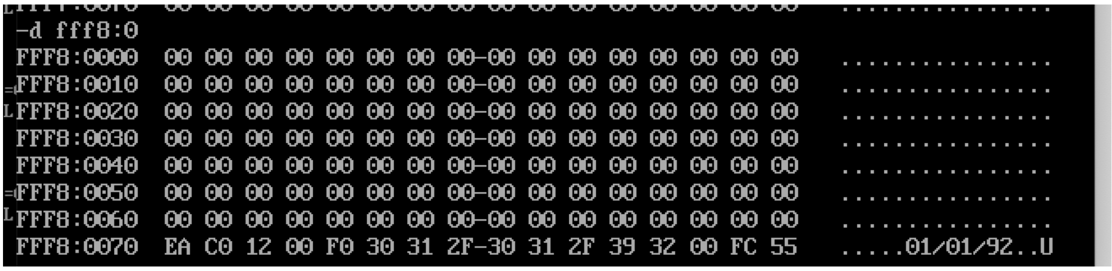
```
AX=0008  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0005   NV UP EI PL NZ NA PO NC
2000:0005 EBFC          JMP     0003
-t

AX=0008  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0003   NV UP EI PL NZ NA PO NC
2000:0003 01C0          ADD     AX,AX
-t

AX=0010  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0005   NV UP EI PL NZ AC PO NC
2000:0005 EBFC          JMP     0003
-t

AX=0010  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0003   NV UP EI PL NZ AC PO NC
2000:0003 01C0          ADD     AX,AX
-t

AX=0020  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0005   NV UP EI PL NZ NA PO NC
2000:0005 EBFC          JMP     0003
```


DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

```
AX=0040  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0005   NV UP EI PL NZ NA PO NC
2000:0005 EBFC          JMP     0003
-t

AX=0040  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0003   NV UP EI PL NZ NA PO NC
2000:0003 01C0          ADD     AX,AX
-t

AX=0080  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0005   NV UP EI PL NZ NA PO NC
2000:0005 EBFC          JMP     0003
-t

AX=0080  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0003   NV UP EI PL NZ NA PO NC
2000:0003 01C0          ADD     AX,AX
-t

AX=0100  BX=4026  CX=0002  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=2000  IP=0005   NV UP EI PL NZ NA PE NC
2000:0005 EBFC          JMP     0003
-
```

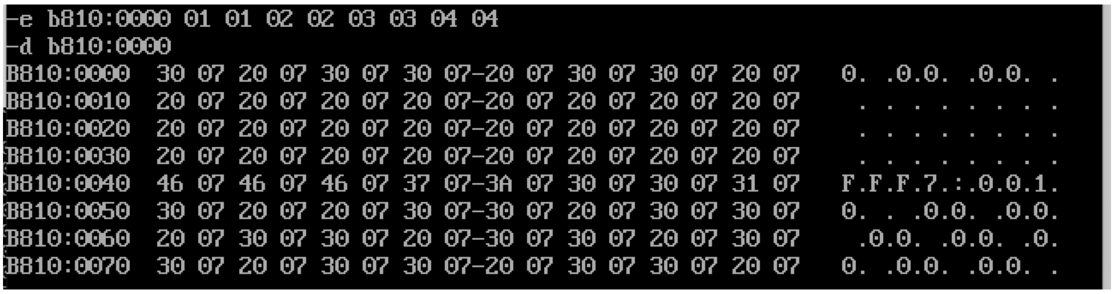
3.查看内存中的内容

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，请找到这个生成日期并试图改变它。



```
 -d fff8:0
 FFF8:0000  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
 FFF8:0010  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
 FFF8:0020  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
 FFF8:0030  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
 FFF8:0040  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
 FFF8:0050  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
 FFF8:0060  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
 FFF8:0070  EA C0 12 00 F0 30 31 2F-30 31 2F 39 32 00 FC 55   .....01/01/92..U
```

4.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
-d b810:0000
B810:0000  30 07 20 07 30 07 30 07-20 07 30 07 30 07 20 07   0. .0.0. .0.0. .
B810:0010  20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07    . . . . . . . .
B810:0020  20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07    . . . . . . . .
B810:0030  20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07    . . . . . . . .
B810:0040  46 07 46 07 46 07 37 07-3A 07 30 07 30 07 31 07   F.F.F.7.:.0.0.1.
B810:0050  30 07 20 07 20 07 30 07-30 07 20 07 30 07 30 07   0. . .0.0. .0.0.
B810:0060  20 07 30 07 30 07 20 07-30 07 30 07 20 07 30 07    .0.0. .0.0. .0.
B810:0070  30 07 20 07 30 07 30 07-20 07 30 07 30 07 20 07   0. .0.0. .0.0. .
```

B810:0 附近的内存区域是不可写入的，因为这是一个显存内存区域