南京林业大学

汇编语言上机实验

任务书

实验四 [bx]和 loop 的使用

一． 实验目的

学会[bx]和 loop 的使用

二． 实验内容

编程，向内存 0:200~0:23F 中依次传送数据 0～63(3FH)。
代码如下：

```
Assume cs:code
Code segment
      mov ax,0
      mov ds,ax
      mov al,0
      mov bx,200h
      mov cx,64
s:    mov [bx],al
      inc al
      inc bx
      loop s
      mov ax,4c00h
      int 21h
code ends
end
```
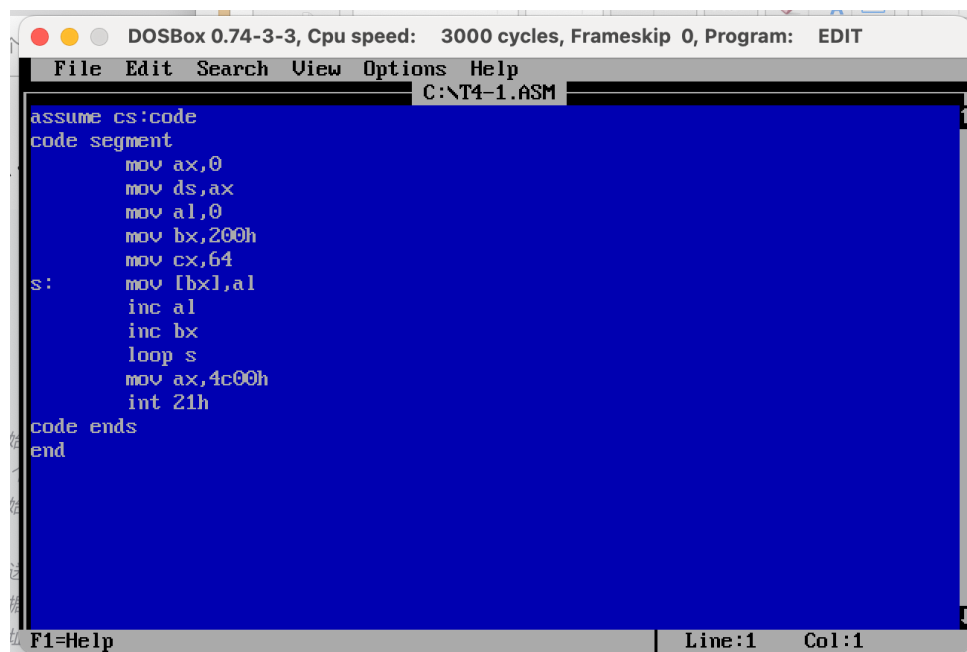
输入代码：

编译代码

```
C:\>masm t4-1.asm
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987.  All rights reserved.

Object filename [t4-1.OBJ]:
Source listing  [NUL.LST]:
Cross-reference [NUL.CRF]:

  51760 + 464784 Bytes symbol space free

      0 Warning Errors
      0 Severe  Errors
```

链接代码

```
C:\>link t4-1.obj

Microsoft (R) Overlay Linker  Version 3.60
Copyright (C) Microsoft Corp 1983-1987.  All rights reserved.

Run File [T4-1.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment
```

执行代码

```
C:\>t4-1
```

进入 debug 查看执行结果：

```
C:\>debug
-d 0:200
0000:0200   00 01 02 03 04 05 06 07-08 09 0A 0B 0C 0D 0E 0F    ................
0000:0210   10 11 12 13 14 15 16 17-18 19 1A 1B 1C 1D 1E 1F    ................
0000:0220   20 21 22 23 24 25 26 27-28 29 2A 2B 2C 2D 2E 2F     !"#$%&'()*+,-./
0000:0230   30 31 32 33 34 35 36 37-38 39 3A 3B 3C 3D 3E 3F    0123456789:;<=>?
0000:0240   00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00    ................
0000:0250   00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00    ................
0000:0260   00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00    ................
0000:0270   00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00    ................
```

编程，向内存 0:200~0:23F 依次传送数据 0~63(3FH)，程序中只能使用 9 条指令，其中 9 条指令中包含"mov ax,4c00h"和"int 21h"

代码如下：

Assume cs:code

Code segment

  mov ax,20h

  mov ds,ax

  mov bx,0

  mov cx,64
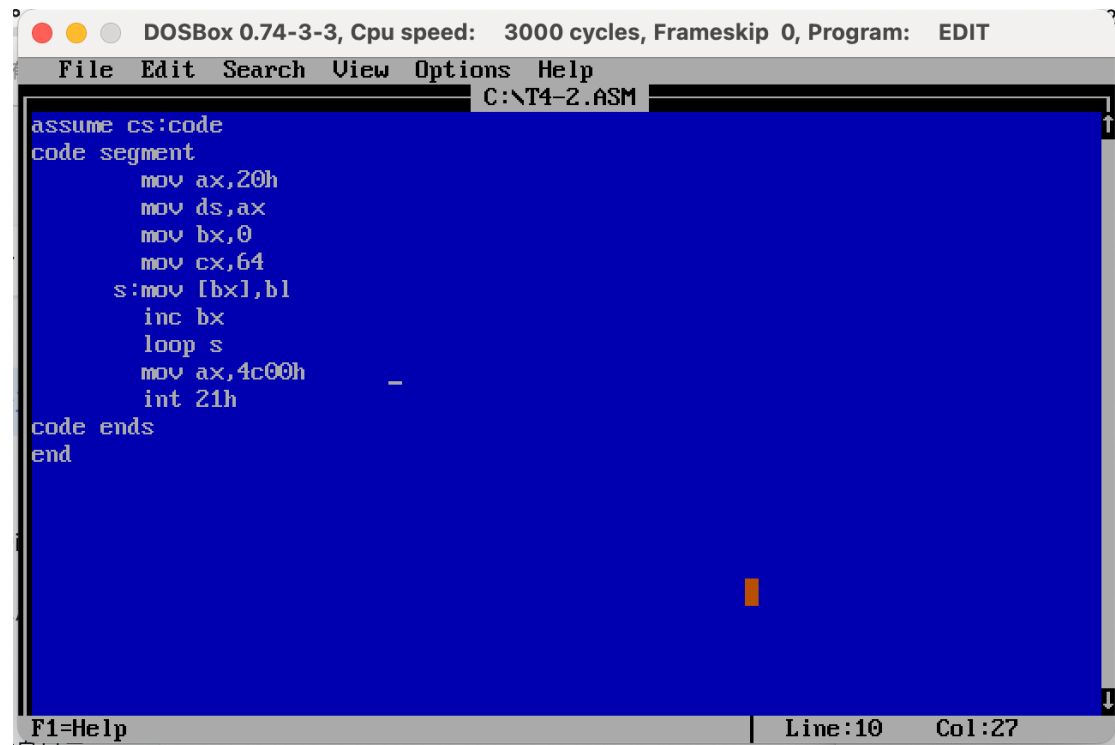
s: mov [bx],bl

  inc bx

  loop s
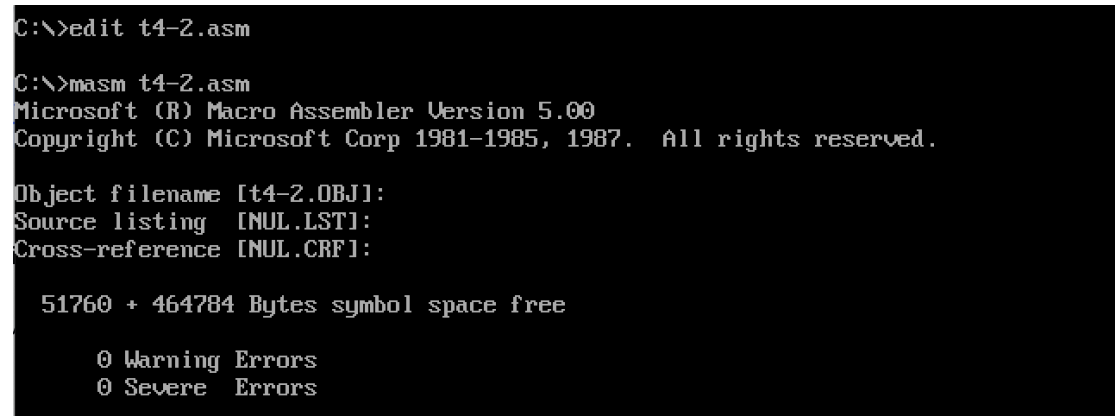
  mov ax,4c00h

  int 21h

code ends

end

end

首先写入代码：

编译：

链接

运行

首先写入代码：

在 debug 中查看结果

```
C:\>debug
-d 0:200
0000:0200   00 01 02 03 04 05 06 07-08 09 0A 0B 0C 0D 0E 0F   ................
0000:0210   10 11 12 13 14 15 16 17-18 19 1A 1B 1C 1D 1E 1F   ................
0000:0220   20 21 22 23 24 25 26 27-28 29 2A 2B 2C 2D 2E 2F    !"#$%&'()*+,-./
0000:0230   30 31 32 33 34 35 36 37-38 39 3A 3B 3C 3D 3E 3F   0123456789:;<=>?
0000:0240   00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:0250   00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:0260   00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:0270   00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
```

下面的程序都功能是将"mov ax，4c00h"之前的指令复制到内存 0:200 处，补全程序，上机调试，跟踪运行结果。

补全的代码：

```
assume cs:code
code segment
    mov ax,cs
    mov ds,ax
    mov ax,0020h
    mov es,ax
    mov bx,0
    mov cx,12
s:  mov al,[bx]
    mov es:[bx],al
    inc bx
    loop s
    mov ax,4c00h
    int 21h
code ends
end
```

输入代码：

5

```
File  Edit  Search  View  Options  Help
                        C:\T4-3.ASM
assume cs:code
code segment
        mov ax,cs
        mov ds,ax
        mov ax,0020h
        mov es,ax
        mov bx,0
        mov cx,12
     s:mov al,[bx]
        mov es:[bx],al
        inc bx
        loop s
        mov ax,4c00h
        int 21h
code ends
end

F1=Help                                Line:1      Col:1
```
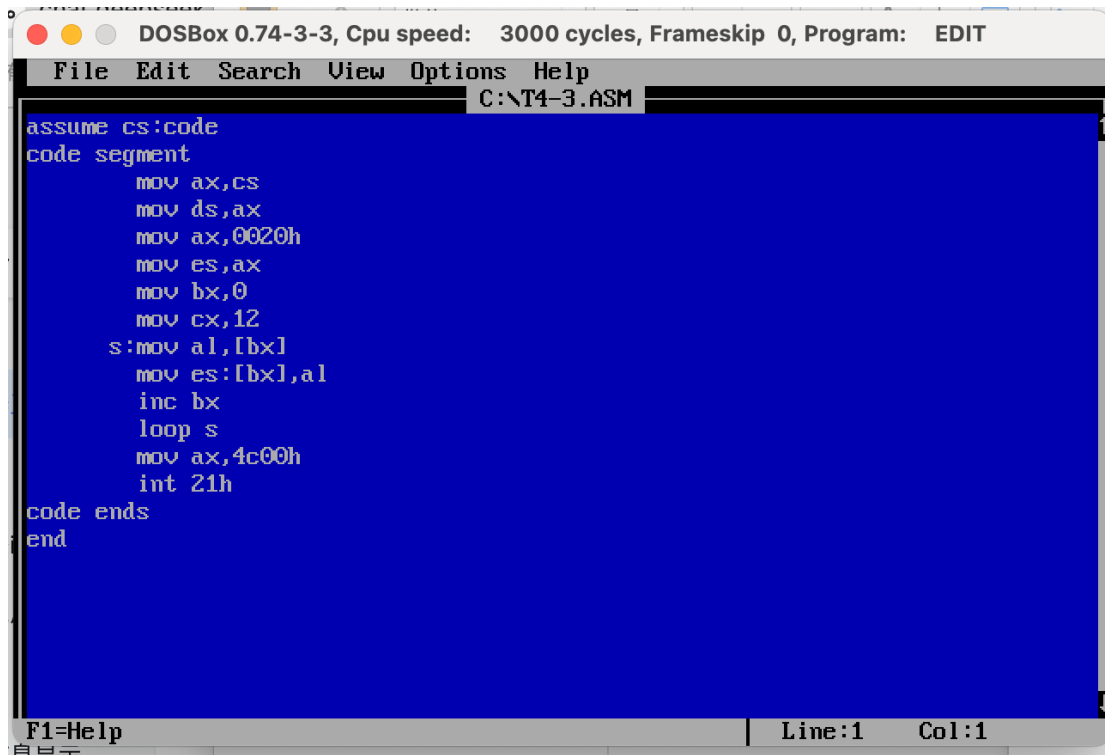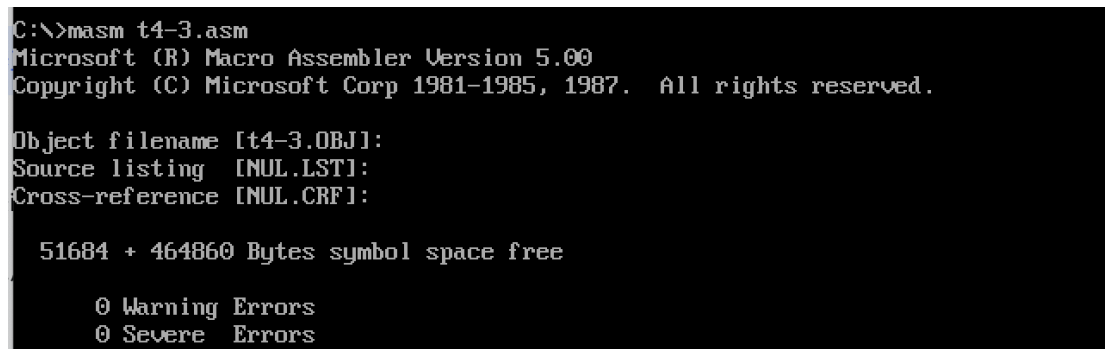
编译：
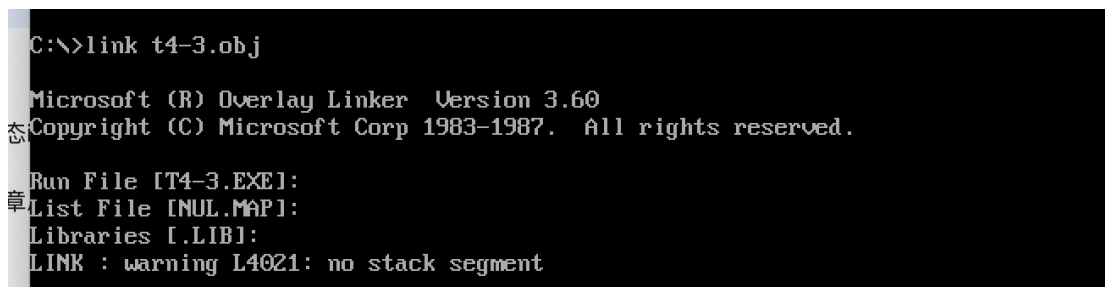
```
C:\>masm t4-3.asm
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987.  All rights reserved.

Object filename [t4-3.OBJ]:
Source listing  [NUL.LST]:
Cross-reference [NUL.CRF]:

  51684 + 464860 Bytes symbol space free

     0 Warning Errors
     0 Severe  Errors
```

链接：

```
C:\>link t4-3.obj

Microsoft (R) Overlay Linker  Version 3.60
Copyright (C) Microsoft Corp 1983-1987.  All rights reserved.

Run File [T4-3.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment
```

运行：

```
C:\>t4-3
```

查看运行结果：

```
C:\>debug
-d 0:200
0000:0200  8C C8 8E D8 B8 20 00 8E-C0 BB 00 00 0C 0D 0E 0F   .... .........
0000:0210  10 11 12 13 14 15 16 17-18 19 1A 1B 1C 1D 1E 1F   ................
0000:0220  20 21 22 23 24 25 26 27-28 29 2A 2B 2C 2D 2E 2F    !"#$%&'()*+,-./
0000:0230  30 31 32 33 34 35 36 37-38 39 3A 3B 3C 3D 3E 3F   0123456789:;<=>?
0000:0240  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:0250  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:0260  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:0270  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
```

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

```
0000:02B0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:02C0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:02D0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:02E0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
0000:02F0  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00   ................
-r
AX=0000  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=0000  IP=0200   NV UP EI PL NZ NA PO NC
0000:0200 8CC8          MOV     AX,CS
-t

AX=0000  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=0000  IP=0202   NV UP EI PL NZ NA PO NC
0000:0202 8ED8          MOV     DS,AX
-t

AX=0000  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=0000  ES=073F  SS=073F  CS=0000  IP=0204   NV UP EI PL NZ NA PO NC
0000:0204 B82000        MOV     AX,0020
-t

AX=0020  BX=0000  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=0000  ES=073F  SS=073F  CS=0000  IP=0207   NV UP EI PL NZ NA PO NC
0000:0207 8EC0          MOV     ES,AX
```

问题 1:复制的是什么？从哪里复制到哪里？

答：复制的是代码机器码，从代码段所指向的位置复制到 0:200h 处

问题 2:复制的是什么？有多少个字节？你如何知道要复制的字节的数量？

答：复制的是代码的机器码，有 12 个字节，看代码的行数。