

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

1. 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

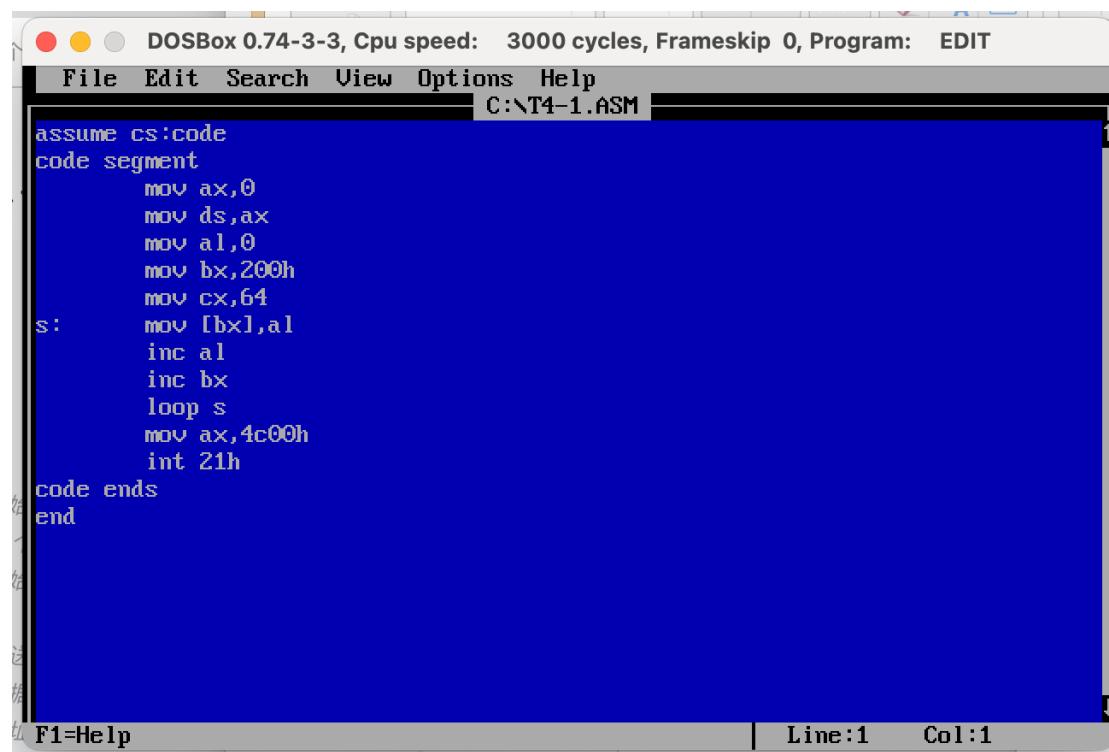
mov bx,200h

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：



The screenshot shows the DOSBox 0.74-3-3 window with the title bar "DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EDIT". The menu bar includes File, Edit, Search, View, Options, and Help. The current file is "C:\NT4-1.ASM". The code area contains the following assembly instructions:

```
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
```

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 00  ...
0000:0250  00 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 00  ...
0000:0270  00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00  ...
```

2. 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：



DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EDIT
File Edit Search View Options Help
C:\T4-2.ASM

```
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
```

F1=Help | Line:10 Col:27

编译：

```
C:\>edit t4-2.asm
C:\>masm t4-2.asm
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [t4-2.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

      51760 + 464784 Bytes symbol space free

          0 Warning Errors
          0 Severe Errors
```

链接

```
C:\>link t4-2.obj

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

Run File [T4-2.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment
```

运行

```
C:\>t4-2
```

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 00 00  .....
0000:0250  00 00 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 00 00  .....
0000:0270  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00  .....
```

3. 下面的程序的功能是将 “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：

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

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。