

南京林业大学



汇编语言上机实验 任务书

实验六 实践课程中的程序

一. 实验目的

实践课程中的程序

二. 实验内容

1. 将课程中所有讲解过的程序上机调试, 用 Debug 跟踪其执行过程, 并在过程中进一步理解所讲内容。

1) 问题 7.1: 用 debug 查看内存, 结果如下:

2000:1000 BE 00 06 00 00 00.....

写出下面程序执行后, ax bx cx 中的内容。

```
assume cs:codesg
```

```
codesg segment
```

```
start:
```

```
    mov ax,2000h
```

```
    mov ds,ax
```

```
    mov bx,1000h
```

```
    mov ax,[bx]
```

```
    mov cx,[bx+1]
```

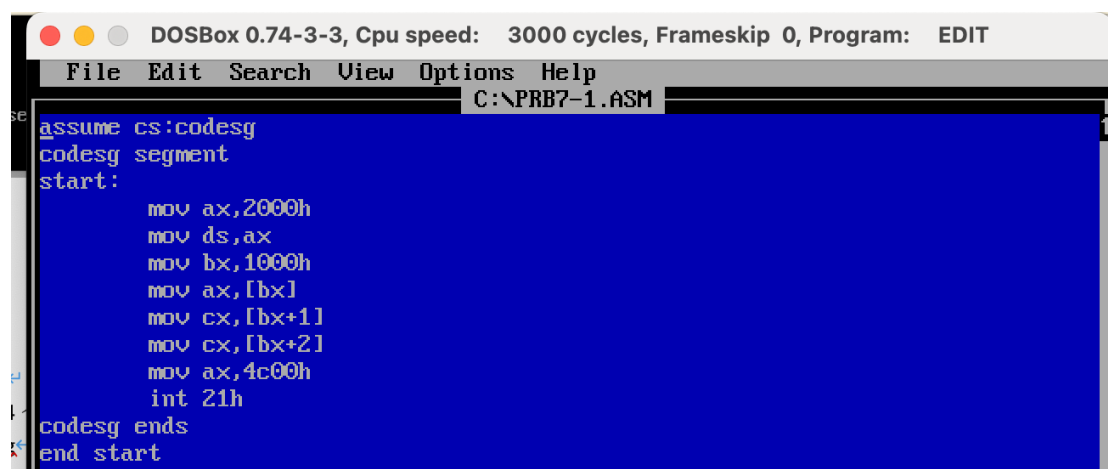
```
    mov cx,[bx+2]
```

```
    mov ax,4c00h
```

```
    int 21h
```

```
codesg ends
```

```
end start
```



```
DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EDIT
File Edit Search View Options Help
C:\PRB7-1.ASM
assume cs:codesg
codesg segment
start:
    mov ax,2000h
    mov ds,ax
    mov bx,1000h
    mov ax,[bx]
    mov cx,[bx+1]
    mov cx,[bx+2]
    mov ax,4c00h
    int 21h
codesg ends
end start
```

编译、链接:

```

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

0 Warning Errors
0 Severe Errors

C:\>link prb7.1

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

Run File [PRB7.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : fatal error L1093: PRB7.1 : object not found

C:\>link prb7-1

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

Run File [PRB7-1.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>_

```

用 debug 运行:

```

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

076A:0013 CD21      INT     21
076A:0015 AB        STOSW
076A:0016 015EC9    ADD     [BP-37],BX
076A:0019 C20600    RET     0006
076A:001C C8        DB      C8
076A:001D 06        PUSH    ES
076A:001E 0000      ADD     [BX+SI],AL
-g

Program terminated normally
-d
076A:0000 B8 00 20 8E D8 BB 00 10-8B 07 8B 4F 01 8B 4F 02  ..  ....0...0.
076A:0010 B8 00 4C CD 21 AB 01 5E-C9 C2 06 00 C8 06 00 00  ..L.!...^.....
076A:0020 57 56 33 F6 39 36 CE 49-75 05 33 C0 E9 D3 00 8B  WJ3.96.lu.3.....
076A:0030 7E 06 39 75 0E 74 13 FF-76 08 57 6A 08 56 E8 1F  ~.9u.t...o.Wj.U..
076A:0040 D3 8B F0 0B F0 74 03 E9-B8 00 83 3E CE 49 01 75  ....t.....>.I.u
076A:0050 50 A1 2C 4B 33 D2 E8 01-07 8B F0 89 56 FE 0B D0  P.,K3.....U...
076A:0060 75 06 B8 1F 00 E9 9A 00-8B 1D 2A E4 8A 47 04 50  u.....*...G.P
076A:0070 8A 45 10 03 45 02 50 8A-45 11 2A E4 03 45 04 50  .E..E.P.E.*...E.P
-t

AX=2000 BX=0000 CX=0015 DX=0000 SP=0000 BP=0000 SI=0000 DI=0000
DS=075A ES=075A SS=0769 CS=076A IP=0003  NU UP EI PL NZ NA PO NC
076A:0003 8ED8          MOV     DS,AX
_

```

Ax=2000H, bx=0000H, cx=0015H

2) 问题 7.2

assume cs:codesg,ds:datasg

datasg segment

db 'welcome to masm'

```

        db '.....'
datasg ends
codesg segment
start:  mov ax,datasg
        mov ds,ax
        mov si,0
        mov di,16
        mov cx,8
s:      mov ax,[si]
        mov [di],ax
        add si,2
        add di,2
        loop s
        mov ax,4c00h
        int 21h
codesg ends
end start
输入代码:

```

```

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EDIT
File Edit Search View Options Help
C:\PRB7-2.ASM
assume cs:codesg,ds:datasg
datasg segment
        db 'welcome to masm'
        db '.....'
datasg ends
codesg segment
start:  mov ax,datasg
        mov ds,ax
        mov si,0
        mov di,16
        mov cx,8
s:      mov ax,[si]
        mov [di],ax
        add si,2
        add di,2
        loop s
        mov ax,4c00h
        int 21h
codesg ends
end start_
F1=Help Line:20 Col:10

```

编译、链接:

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

C:\>masm prb7-2
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [prb7-2.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51672 + 464872 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link prb7-2

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

Run File [PRB7-2.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>_
```

用 debug 运行程序:

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

Run File [PRB7-2.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>debug prb7-2.exe
-u
076C:0000 B86A07      MOV     AX,076A
076C:0003 8ED8          MOV     DS,AX
076C:0005 BE0000      MOV     SI,0000
076C:0008 BF1000      MOV     DI,0010
076C:000B B90800      MOV     CX,0008
076C:000E 8B04          MOV     AX,[SI]
076C:0010 8905          MOV     [DI],AX
076C:0012 83C602      ADD     SI,+02
076C:0015 83C702      ADD     DI,+02
076C:0018 E2F4          LOOP   000E
076C:001A B8004C      MOV     AX,4C00
076C:001D CD21      INT     21
076C:001F 0C00      OR      AL,00
-g
Program terminated normally
```

查看运行结果:

```

0-d 076a:0000
,076A:0000 77 65 6C 63 6F 6D 65 20-74 6F 20 6D 61 73 6D 2E welcome to masm.
076A:0010 77 65 6C 63 6F 6D 65 20-74 6F 20 6D 61 73 6D 2E welcome to masm.
076A:0020 B8 6A 07 8E D8 BE 00 00-BF 10 00 B9 08 00 8B 04 .j.....
076A:0030 89 05 83 C6 02 83 C7 02-E2 F4 B8 00 4C CD 21 0C .....L.!.
076A:0040 00 52 50 E8 EA 48 83 C4-04 50 E8 7B 0E 83 C4 04 .RP..H...P.{....
076A:0050 3D FF FF 74 03 E9 ED 00-C4 5E FC 26 8A 47 0C 2A =..t.....^.&.G.*
076A:0060 E4 40 50 8B C3 8C C2 05-0C 00 52 50 E8 C1 48 83 .@P.....RP..H.
076A:0070 C4 04 50 8D 86 FA FE 50-E8 17 73 83 C4 06 8B B6 ..P....P..s.....

```

3) 我们可以利用[bx(si/di)+idata]的方式, 让代码变得简洁, 程序如下:

codesg segment

start: mov ax,datasg

mov ds,ax

mov si,0

mov cx,8

s: mov ax,0[si]

mov 16[si],ax

add si,2

loop s

mov ax,4c00h

int 21h

codesg ends

end start

输入代码:

```

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EDIT
File Edit Search View Options Help
C:\PRB7-3.ASM
assume ds:datasg,cs:codesg
datasg segment
    db 'welcome to masm'
    db '.....'
datasg ends
codesg segment
start: mov ax,datasg
      mov ds,ax
      mov si,0
      mov cx,8
s:     mov ax,0[si]
      mov 16[si],ax
      add si,2
      loop s
      mov ax,4c00h
      int 21h
codesg ends
end start
F1=Help | Line:9 Col:11

```

编译、链接:

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

C:\>masm prb7-3
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [prb7-3.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51596 + 464948 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link prb7-3

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

Run File [PRB7-3.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>
```

执行:

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

Run File [PRB7-3.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>debug prb7-3.exe
-u
076C:0000 B86A07      MOV     AX,076A
076C:0003 8ED8          MOV     DS,AX
076C:0005 BE0000      MOV     SI,0000
076C:0008 B90800      MOV     CX,0008
076C:000B 8B04          MOV     AX,[SI]
076C:000D 894410      MOV     [SI+10],AX
076C:0010 83C602      ADD     SI,+02
076C:0013 E2F6          LOOP   000B
076C:0015 B8004C      MOV     AX,4C00
076C:0018 CD21          INT     21
076C:001A FC          CLD
076C:001B 8B56FE      MOV     DX,[BP-02]
076C:001E 050C00      ADD     AX,000C
-g

Program terminated normally
_
```

查看结果:

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

```

076C:0003 8ED8      MOV     DS,AX
076C:0005 BE0000    MOV     SI,0000
076C:0008 B90800    MOV     CX,0008
076C:000B 8B04      MOV     AX,[SI]
076C:000D 894410    MOV     [SI+10],AX
076C:0010 83C602    ADD     SI,+02
076C:0013 E2F6      LOOP    000B
076C:0015 B8004C    MOV     AX,4C00
076C:0018 CD21      INT     21
076C:001A FC        CLD
076C:001B 8B56FE    MOV     DX,[BP-02]
076C:001E 050C00    ADD     AX,000C
-g

Program terminated normally
-d 076a:0000
076A:0000 77 65 6C 63 6F 6D 65 20-74 6F 20 6D 61 73 6D 2E  welcome to masm.
076A:0010 77 65 6C 63 6F 6D 65 20-74 6F 20 6D 61 73 6D 2E  welcome to masm.
076A:0020 B8 6A 07 8E D8 BE 00 00-B9 08 00 8B 04 89 44 10  .j.....D.
076A:0030 83 C6 02 E2 F6 B8 00 4C-CD 21 FC 8B 56 FE 05 0C  ....L!..U...
076A:0040 00 52 50 E8 EA 48 83 C4-04 50 E8 7B 0E 83 C4 04  .RP..H...P.{....
076A:0050 3D FF FF 74 03 E9 ED 00-C4 5E FC 26 8A 47 0C 2A  =..t.....^.&.G.*
076A:0060 E4 40 50 8B C3 8C C2 05-0C 00 52 50 E8 C1 48 83  .@P.....RP..H.
076A:0070 C4 04 50 8D 86 FA FE 50-E8 17 73 83 C4 06 8B B6  ..P....P..s.....

```

4) 问题 7.4

assume cs:codesg

codesg segment

start: mov ax,2000h

mov ds,ax

mov bx,1000h

mov si,0

mov ax,[bx+si]

inc si

mov cx,[bx+si]

inc si

mov di,si

add cx,[bx+di]

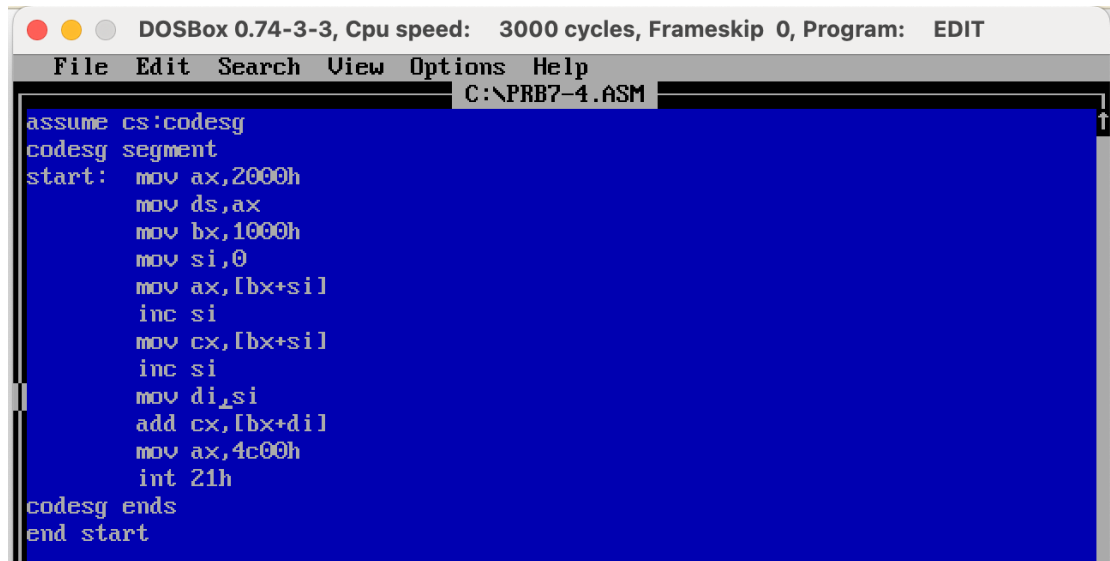
mov ax,4c00h

int 21h

codesg ends

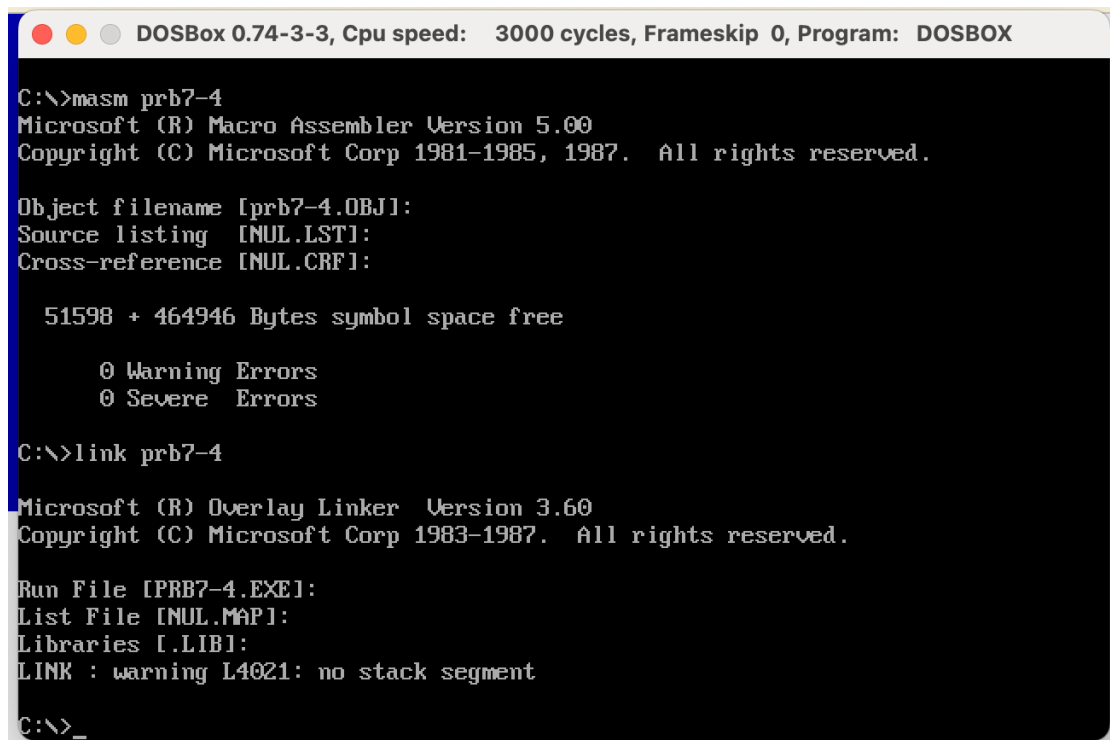
end start

输入程序:



```
assume cs:codesg
codesg segment
start:  mov ax,2000h
        mov ds,ax
        mov bx,1000h
        mov si,0
        mov ax,[bx+si]
        inc si
        mov cx,[bx+si]
        inc si
        mov di,si
        add cx,[bx+di]
        mov ax,4c00h
        int 21h
codesg ends
end start
```

编译、链接:



```
C:\>masm prb7-4
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [prb7-4.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51598 + 464946 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link prb7-4

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

Run File [PRB7-4.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>_
```

执行:

```

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>debug prb7-4.exe
-u
076A:0000 B80020      MOV     AX,2000
076A:0003 8ED8        MOV     DS,AX
076A:0005 BB0010      MOV     BX,1000
076A:0008 BE0000      MOV     SI,0000
076A:000B 8B00        MOV     AX,[BX+SI]
076A:000D 46            INC     SI
076A:000E 8B08        MOV     CX,[BX+SI]
076A:0010 46            INC     SI
076A:0011 8BFE        MOV     DI,SI
076A:0013 0309        ADD     CX,[BX+DI]
076A:0015 B8004C      MOV     AX,4C00
076A:0018 CD21        INT     21
076A:001A 050C00      ADD     AX,000C
076A:001D 52            PUSH    DX
076A:001E 50            PUSH    AX
076A:001F EB0E49      CALL    4930
-g
Program terminated normally

```

查看运行结果:

```

Program terminated normally
-t
AX=2000 BX=0000 CX=001A DX=0000 SP=0000 BP=0000 SI=0000 DI=0000
DS=075A ES=075A SS=0769 CS=076A IP=0003  NU UP EI PL NZ NA PO NC
076A:0003 8ED8        MOV     DS,AX
3C_

```

5) 问题 7.5

assume cs:codesg

code segment

```

start:  mov ax,2000h
        mov ds,ax
        mov bx,1000h
        mov si,0
        mov ax,[bx+2+si]
        inc si
        mov cx,[bx+2+si]
        inc si
        mov di,si
        mov bx,[bx+2+di]
        mov ax,4c00h
        int 21h

```

codesg ends

end start

输入代码:

```
assume cs:codesg
code segment
start:  mov ax,2000h
        mov ds,ax
        mov bx,1000h
        mov si,0
        mov ax,[bx+2+si]
        inc si
        mov cx,[bx+2+si]
        inc si
        mov di,si
        mov bx,[bx+2+di]
        mov ax,4c00h
        int 21h
codesg ends
end start
```

编译链接:

```
C:\>masm prb7-5
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [prb7-5.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51598 + 464946 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link prb7-5

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

Run File [PRB7-5.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>_
```

用 debug 执行:

```

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>debug prb7-5.exe
-u
076A:0000 B80020      MOV     AX,2000
076A:0003 8ED8        MOV     DS,AX
076A:0005 BB0010      MOV     BX,1000
076A:0008 BE0000      MOV     SI,0000
076A:000B 8B4002      MOV     AX,[BX+SI+02]
076A:000E 46             INC     SI
076A:000F 8B4802      MOV     CX,[BX+SI+02]
076A:0012 46             INC     SI
076A:0013 8BFE      MOV     DI,SI
076A:0015 8B5902      MOV     BX,[BX+DI+02]
076A:0018 B8004C      MOV     AX,4C00
076A:001B CD21      INT     21
076A:001D 52             PUSH    DX
076A:001E 50             PUSH    AX
076A:001F E80E49      CALL    4930
-g
Program terminated normally

```

查看内存中的数据:

```

Program terminated normally
-d 2000:0000
2000:0000 5B 07 70 07 72 07 62 07-37 07 2D 07 35 07 2E 07  l.p.r.b.7-.5...
2000:0010 4F 07 42 07 4A 07 5D 07-3A 07 20 07 20 07 20 07  O.B.J.I.:. . . .
2000:0020 20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07  . . . . .
2000:0030 20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07  . . . . .
2000:0040 20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07  . . . . .
2000:0050 20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07  . . . . .
2000:0060 20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07  . . . . .
2000:0070 20 07 20 07 20 07 20 07-20 07 20 07 20 07 20 07  . . . . .
-

```

6) 问题 7.6: 编程, 加过 debug 段中每个单词的头一个字母改成大写字母

assume cs:codesg,ds:datasg

datasg segment

```

    db '1.file'
    db '2.edit'
    db '3.search'
    db '4.view'
    db '5.options'
    db '6.help'

```

datasg ends

codesg segment

start: mov ax,datasg

mov ds,ax

mov bx,0

mov cx,6

s: mov al,[bx+2]

```
and al,11011111B
mov [bx+2],al
add bx,16
loop s
mov ax,4c00h
int 21h
```

codesg ends

end start

输入代码:



The screenshot shows a DOSBox window titled "DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EDIT". The window contains an assembly program in the EDIT editor. The program defines a data segment named 'datasg' containing six strings: '1.file', '2.edit', '3.search', '4.view', '5.options', and '6.help'. It also defines a code segment named 'codesg' with a 'start' label. The code initializes the data segment register (ds) to 'datasg', sets bx to 0 and cx to 6, and enters a loop 's' that prints each string using the INT 21h function 9 (mov al, [bx+2], and al, 11011111B). After the loop, it calls the DOS exit function (mov ax, 4c00h, int 21h). The status bar at the bottom shows "F1=Help", "Line:1", and "Col:1".

```
assume cs:codesg,ds:datasg
datasg segment
    db '1.file'
    db '2.edit'
    db '3.search'
    db '4.view'
    db '5.options'
    db '6.help'
datasg ends
codesg segment
start:  mov ax,datasg
        mov ds,ax
        mov bx,0
        mov cx,6
s:      mov al,[bx+2]
        and al,11011111B
        mov [bx+2],al
        add bx,16
        loop s
        mov ax,4c00h
        int 21h
codesg ends
F1=Help
```

编译、链接:

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

C:\>masm prb7-6
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [prb7-6.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51596 + 464948 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link prb7-6
Microsoft (R) Overlay Linker Version 3.60
Copyright (C) Microsoft Corp 1983-1987. All rights reserved.

Run File [PRB7-6.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>
```

执行:

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

Run File [PRB7-6.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>debug prb7-6.exe
-u
0770:0000 B86A07      MOV     AX,076A
0770:0003 8ED8          MOV     DS,AX
0770:0005 BB0000      MOV     BX,0000
0770:0008 B90600      MOV     CX,0006
0770:000B 8A4702      MOV     AL,[BX+02]
0770:000E 24DF          AND     AL,DF
0770:0010 8B4702      MOV     [BX+02],AL
0770:0013 83C310      ADD     BX,+10
0770:0016 E2F3          LOOP   000B
0770:0018 B8004C      MOV     AX,4C00
0770:001B CD21          INT     21
0770:001D 06          PUSH    ES
0770:001E 8BB6FAFE    MOV     SI,[BP+FEFA]
-g

Program terminated normally
```

查看结果:

```

Program terminated normally
-d 076a:0000
076A:0000 31 2E 46 69 6C 65 20 20-20 20 20 20 20 20 20 20 1.File
076A:0010 32 2E 45 64 69 74 20 20-20 20 20 20 20 20 20 20 2.Edit
076A:0020 33 2E 53 65 61 72 63 68-20 20 20 20 20 20 20 20 3.Search
076A:0030 34 2E 56 69 65 77 20 20-20 20 20 20 20 20 20 20 4.View
076A:0040 35 2E 4F 70 74 69 6F 6E-73 20 20 20 20 20 20 20 20 5.Options
076A:0050 36 2E 48 65 6C 70 20 20-20 20 20 20 20 20 20 20 6.Help
076A:0060 B8 6A 07 8E D8 BB 00 00-B9 06 00 8A 47 02 24 DF .j.....G.$
076A:0070 B8 47 02 83 C3 10 E2 F3-B8 00 4C CD 21 06 8B B6 .G.....L.?!...

```

7) 问题 7.7

assume cs:codesg,ds:datasg

datasg segment

db 'ibm'

db 'dec'

db 'dos'

db 'vax'

datasg ends

codesg segment

start: mov ax,datasg

mov ds,ax

mov bx,0

mov cx,4

s1: mov si,0

mov dx,cx

mov cx,3

s2: mov al,[bx+si]

and al,11011111B

mov [bx+si],al

inc si

loop s2

mov cx,dx

add bx,16

loop s1

mov ax,4c00h

int 21h

codesg ends

end start

输入代码:

```
DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EDIT
File Edit Search View Options Help
C:\PRB7-7.ASM
assume cs:codesg,ds:datasg
datasg segment
    db 'ibm'
    db 'dec'
    db 'dos'
    db 'vax'
datasg ends
code segment
start: mov ax,datasg
      mov ds,ax
      mov bx,0
      mov cx,4
s1:    mov si,0
      mov dx,cx
      mov cx,3
s2:    mov al,[bx+si]
      and al,11011111B
      mov [bx+si],al
      inc si
      loop s2
      mov cx,dx
      and bx,16
F1=Help Line:1 Col:1
```

编译、链接:

```
DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX
C:\>masm prb7-7
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [prb7-7.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51596 + 464948 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link prb7-7

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

Run File [PRB7-7.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>
```

运行:


```

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG
Run File [PRB7-7.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>debug prb7-7.exe
-u
076E:0000 B86A07      MOV     AX,076A
076E:0003 8ED8        MOV     DS,AX
076E:0005 BB0000      MOV     BX,0000
076E:0008 B90400      MOV     CX,0004
076E:000B BE0000      MOV     SI,0000
076E:000E 8BD1        MOV     DX,CX
076E:0010 B90300      MOV     CX,0003
076E:0013 8A00        MOV     AL,IBX+SI1
076E:0015 24DF        AND     AL,DF
076E:0017 8B00        MOV     IBX+SI1,AL
076E:0019 46          INC     SI
076E:001A E2F7        LOOP   0013
076E:001C 8BCA        MOV     CX,DX
076E:001E 83C310      ADD     BX,+10
-g
Program terminated normally

```

查看结果:

```

-d 076a:0000
076A:0000 49 42 4D 20 20 20 20 20-20 20 20 20 20 20 20 20 20  IBM
076A:0010 44 45 43 20 20 20 20 20-20 20 20 20 20 20 20 20 20  DEC
076A:0020 44 4F 53 20 20 20 20 20-20 20 20 20 20 20 20 20 20  DOS
076A:0030 56 41 58 20 20 20 20 20-20 20 20 20 20 20 20 20 20  VAX
076A:0040 B8 6A 07 8E D8 BB 00 00-B9 04 00 BE 00 00 8B D1  .j.....
076A:0050 B9 03 00 8A 00 24 DF 88-00 46 E2 F7 8B CA 83 C3  ....$.F.....
076A:0060 10 E2 E8 B8 00 4C CD 21-0C 00 52 50 E8 C1 48 83  ....L.!.RP..H.
076A:0070 C4 04 50 8D 86 FA FE 50-E8 17 73 83 C4 06 8B B6  ..P....P..s....

```

8) 问题 7.8

assume cs:codesg,ds:datasg,ss:stacksg

datasg segment

```

    db 'ibm'
    db 'dec'
    db 'dos'
    db 'vax'

```

datasg ends

stacksg segment

```

    dw 0,0,0,0,0,0,0

```

stacksg ends

codesg segment

start: mov ax,stacksg

```

    mov ss,ax

```

```

    mov ax,datasg

```

```

    mov ds,ax

```

```

    mov bx,0

```

```

        mov cx,4
s0:`    push cx
        mov si,0
        mov cx,3
s:      mov al,[bx+si]
        and al,11011111b
        mov [bx+si],al
        inc si
        loop s
        add bx,16
        pop cx
        loop s0
        mov ax,4c000h
        int 21h

```

输入代码：

```

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EDIT
File Edit Search View Options Help
C:\PRB7-8.ASM
assume cs:codesg,ds:datasg,ss:stacksg
datasg segment
    db 'ibm'
    db 'dec'
    db 'dos'
    db 'vax'
datasg ends
stacksg segment
    dw 0,0,0,0,0,0,0,0
stacksg ends
codesg segment
start: mov ax,stacksg
        mov ss,ax
        mov ax,datasg
        mov ds,ax
        mov bx,0
        mov cx,4
s0:`    push cx
        mov si,0
        mov cx,3
s:      mov al,[bx+si]
        and al,11011111b
F1=Help Line:22 Col:16

```

编译、链接：

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

C:\>masm prb7-8
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [prb7-8.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51594 + 464950 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link prb7-8

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

Run File [PRB7-8.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>_
```

运行:

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

Run File [PRB7-8.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>debug prb7-8.exe
-u
076F:0000 B86E07      MOV     AX,076E
076F:0003 8ED0          MOV     SS,AX
076F:0005 B86A07      MOV     AX,076A
076F:0008 8ED8          MOV     DS,AX
076F:000A BB0000      MOV     BX,0000
076F:000D B90400      MOV     CX,0004
076F:0010 51             PUSH    CX
076F:0011 BE0000      MOV     SI,0000
076F:0014 B90300      MOV     CX,0003
076F:0017 8A00          MOV     AL,[BX+SI]
076F:0019 24DF          AND     AL,DF
076F:001B 8800          MOV     [BX+SI],AL
076F:001D 46             INC     SI
076F:001E E2F7      LOOP    0017
-g

Program terminated normally
_
```

查看结果:

```

-d 076a:0000
076A:0000 49 42 4D 20 20 20 20 20-20 20 20 20 20 20 20 20 IBM
076A:0010 44 45 43 20 20 20 20 20-20 20 20 20 20 20 20 DEC
076A:0020 44 4F 53 20 20 20 20 20-20 20 20 20 20 20 20 DOS
076A:0030 56 41 58 20 20 20 20 20-20 20 20 20 20 20 20 UAX
076A:0040 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
076A:0050 B8 6E 07 8E D0 B8 6A 07-8E D8 BB 00 00 B9 04 00 .n....j.....
076A:0060 51 BE 00 00 B9 03 00 8A-00 24 DF 88 00 46 E2 F7 Q.....$.F..
076A:0070 83 C3 10 59 E2 EA B8 00-4C CD 21 83 C4 06 8B B6 ...Y....L.!.

```

2. 编程，完成问题 7.9 中的程序。

编程，将 datasg 段中每个单词的前 4 个字母改成大写字母

assume cs:codesg, ss:stacksg, ds:datasg

stacksg segment

dw 0,0,0,0,0,0,0

stacksg ends

datasg segment

db '1. display'

db '2. brows'

db '3. replace'

db '4. modify'

datasg ends

codesg segment

start:

mov ax, stacksg

mov ss, ax

mov sp, 16

mov ax, datasg

mov ds, ax

mov bx, 0

mov cx, 4

s:

push cx

mov si, 3

mov cx, 4

s0:

mov al, [bx+si]

and al, 11011111b

mov [bx+si], al

inc si

loop s0

add bx, 10

pop cx

loop s

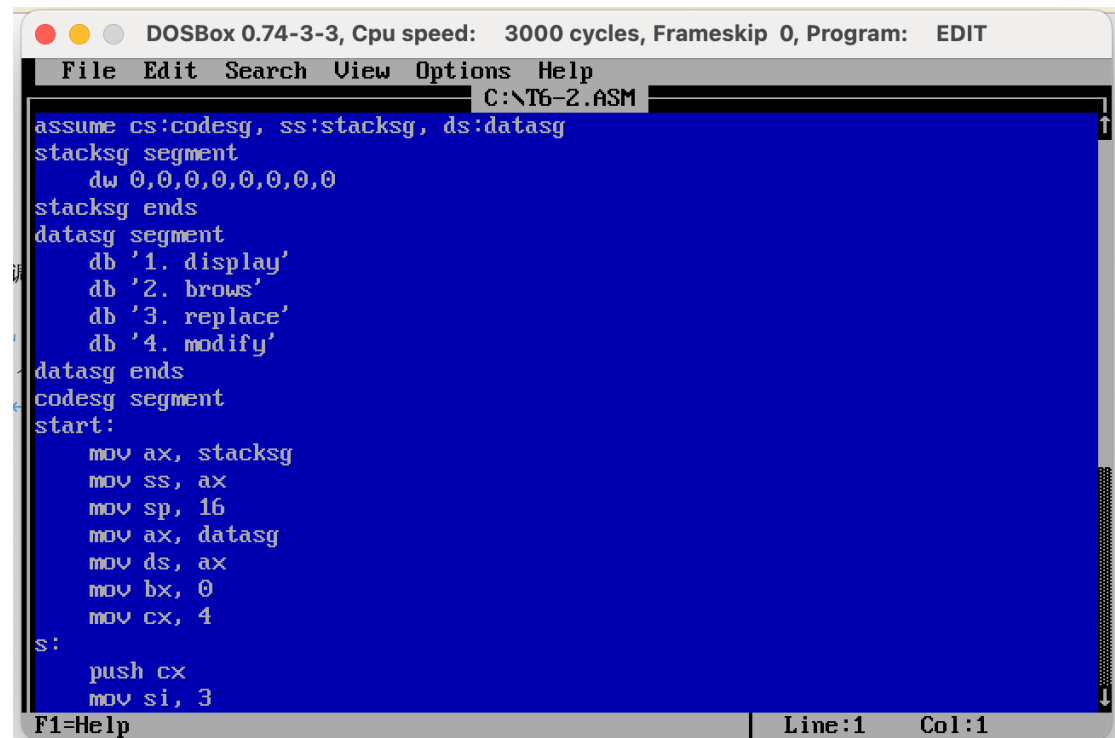
mov ax, 4c00h

int 21h

codesg ends

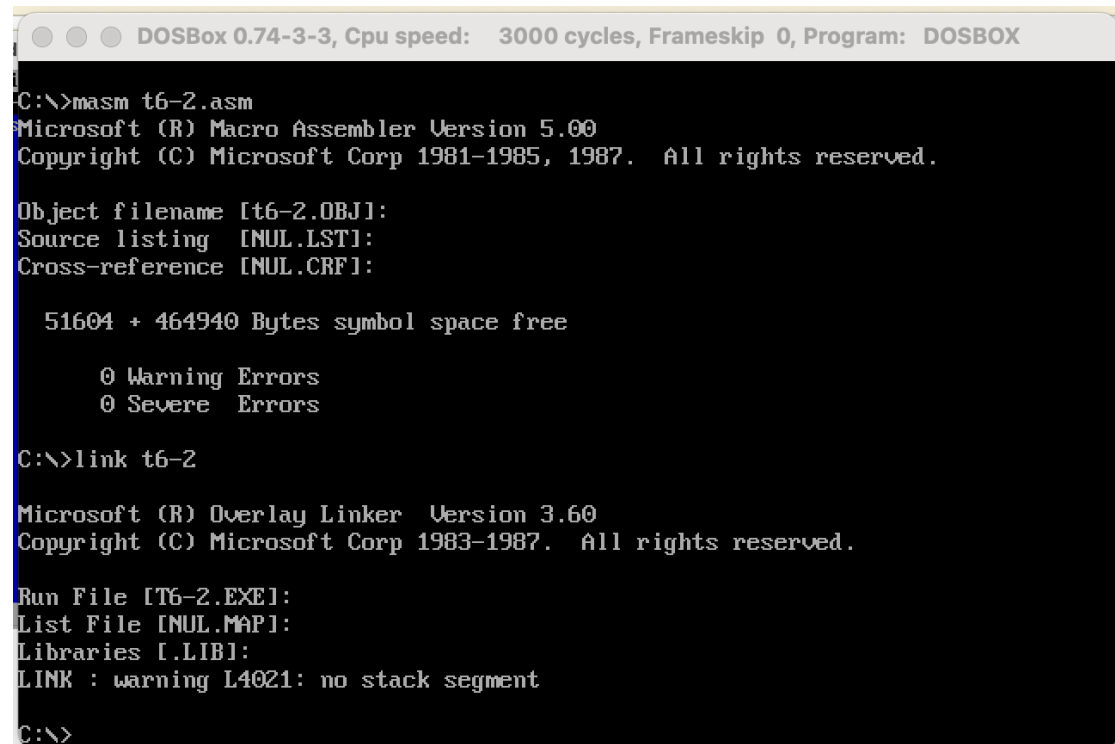
end start

代码输入到 dos 系统中



```
assume cs:codesg, ss:stacksg, ds:datasg
stacksg segment
    dw 0,0,0,0,0,0,0,0
stacksg ends
datasg segment
    db '1. display'
    db '2. brows'
    db '3. replace'
    db '4. modify'
datasg ends
codesg segment
start:
    mov ax, stacksg
    mov ss, ax
    mov sp, 16
    mov ax, datasg
    mov ds, ax
    mov bx, 0
    mov cx, 4
s:
    push cx
    mov si, 3
```

编译、链接程序:



```
C:\>masm t6-2.asm
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [t6-2.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51604 + 464940 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link t6-2

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

Run File [T6-2.EXE]:
List File [NUL.MAP]:
Libraries [LIB]:
LINK : warning L4021: no stack segment

C:\>_
```

用 debug 执行程序:

```

DOSBox 0.74-3-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG
076E:0003 BED0      MOV     SS,AX
076E:0005 BC1000    MOV     SP,0010
076E:0008 B86B07    MOV     AX,076B
076E:000B BED8      MOV     DS,AX
076E:000D BB0000    MOV     BX,0000
076E:0010 B90400    MOV     CX,0004
076E:0013 51        PUSH    CX
076E:0014 BE0300    MOV     SI,0003
076E:0017 B90400    MOV     CX,0004
076E:001A 8A00      MOV     AL,[BX+SI]
076E:001C 24DF      AND     AL,DF
076E:001E 8800      MOV     [BX+SI],AL
-g
Program terminated normally
-d 076a:0000
076A:0000  00 00 00 00 00 00 00 00 00-00 00 2E 00 6E 07 16 72  .....n..r
076A:0010  31 2E 20 44 49 53 50 6C-61 79 32 2E 20 42 52 4F  1. DISPlay2. BRO
076A:0020  57 73 33 2E 20 72 65 50-4C 41 43 65 34 2E 20 6D  ws3. rePLAcE4. m
076A:0030  6F 44 49 46 59 00 00 00-00 00 00 00 00 00 00 00  oDIFY.....
076A:0040  B8 6A 07 8E D0 BC 10 00-B8 6B 07 8E D8 BB 00 00  .j.....k.....
076A:0050  B9 04 00 51 BE 03 00 B9-04 00 8A 00 24 DF 88 00  ...Q.....$.
076A:0060  46 E2 F7 83 C3 0A 59 E2-EA B8 00 4C CD 21 48 83  F.....Y....L.!H.
076A:0070  C4 04 50 8D 86 FA FE 50-E8 17 73 83 C4 06 8B B6  ..P....P..s.....

```

运行结果：可以看到每 4 个单词的前 4 个字母均变为大写。