

# 汇编第三章第一次作业

20182131055 侯佳耀

1.编程实现四则运算： $(5v+X*Y-6)/Z \rightarrow V$ ，X、Y、Z 均为 16 位有符号数。

代码：cau.asm

```
DATAS SEGMENT
```

```
x dw 2
```

```
y dw 3
```

```
z dw 4
```

```
v dw 1
```

```
rss dw ?
```

```
DATAS ENDS
```

```
Stack segment stack
```

```
Stack ends
```

```
CODES SEGMENT
```

```
ASSUME CS:CODES, DS:DATAS
```

```
START:
```

```
mov ax,DATAS
```

```
mov DS,ax
```

```
mov ax,x
```

```
imul y
```

```
sub ax,6
```

```
mov dx,ax
```

```
mov ax,v
```

```
mov bx,5
```

```
imul bx
```

add ax,dx

div z

mov rax,ax

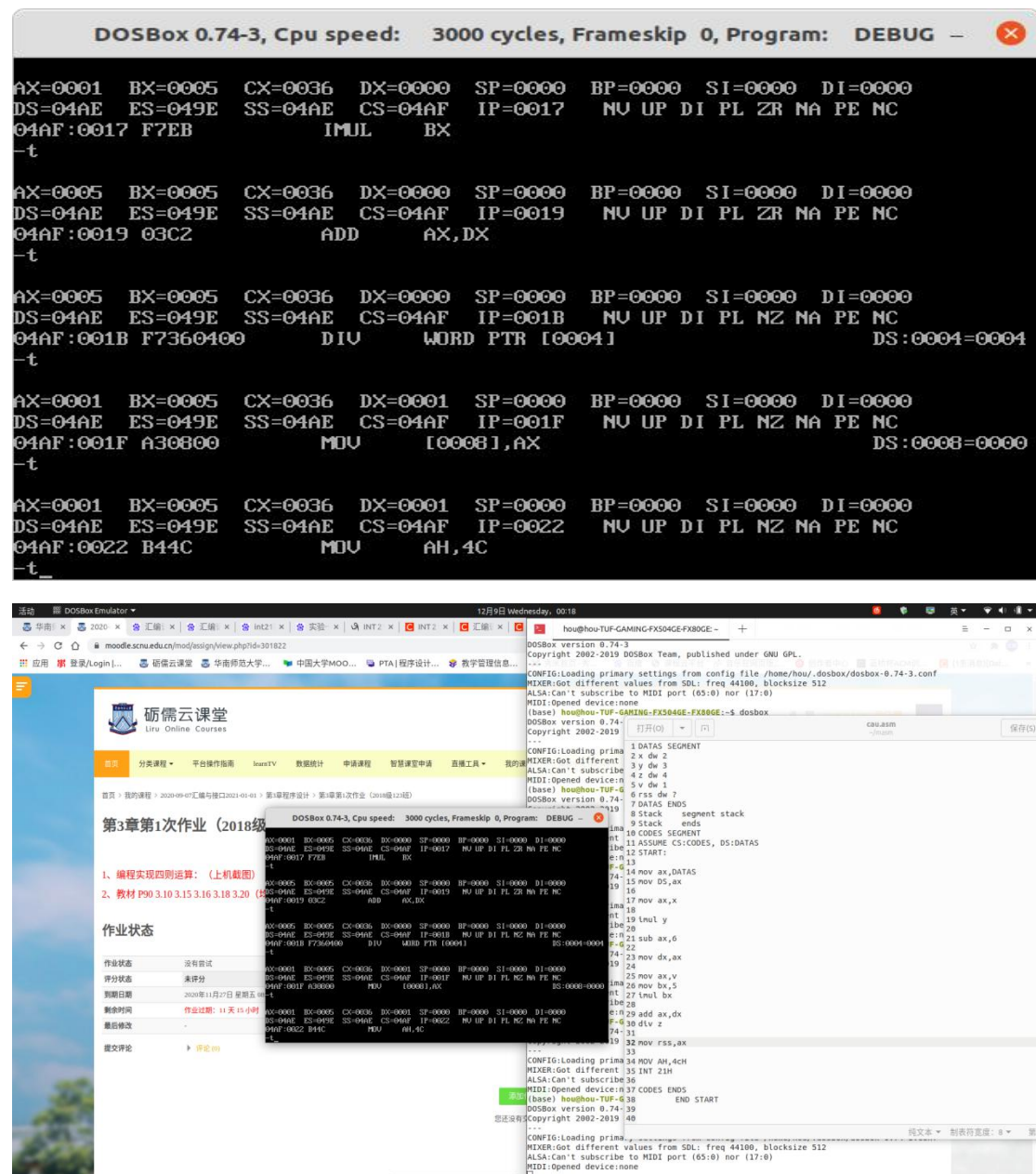
MOV AH,4ch

INT 21H

CODES ENDS

END START

上机结果：



可以发现执行完最后一步除法后 ax=0001,dx=0001.结果正确！

## 2、课本习题：

( 3.10 )

代码：

```
DATAS SEGMENT
byte_var db 'ABC',10,10h,'EF',3 dup(-1,?,3 dup (4))
DATAS ENDS

Stack    segment stack
Stack    ends

CODES SEGMENT
ASSUME CS:CODES, DS:DATAS
START:
mov AX,DATAS
mov DS,ax
MOV AH,4cH
INT 21H
CODES ENDS
        END START
```

运行结果：

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG -
04AE:0050 FF 00 80 BA 78 FE 2B 75-09 C6 86 F8 FE FF FE BE ...:x~+u.F.x~.~.
04AE:0060 78 FE B8 2B 00 50 B8 64-37 50 8D 86 78 FE 50 E8 x~8+.P8d7P..x~Ph
04AE:0070 32 3A B3 C4 06 80 BE F8-FE 00 75 B3 80 3E 48 07 Z:.D...>x~.u3.>H.
-D 04AE:0000
04AE:0000 41 42 43 0A 10 45 46 FF-00 04 04 04 FF 00 04 04 ABC..EF.....
04AE:0010 04 FF 00 04 04 04 00 00-00 00 00 00 00 00 00 .....
04AE:0020 B8 AE 04 8E D8 B4 4C CD-21 0D C6 06 4B 07 FF C6 8...X4LM!.F.K..F
04AE:0030 86 F8 FE 00 B8 0C 03 50-8D 86 78 FE 50 E8 3E DC .x~.8..P..x~Ph>\
04AE:0040 83 C4 04 80 BE 78 FE 00-74 32 8B B6 78 FE 81 E6 .D...>x~.t2.6x~.f
04AE:0050 FF 00 80 BA 78 FE 2B 75-09 C6 86 F8 FE FF FE BE ...:x~+u.F.x~.~.
04AE:0060 78 FE B8 2B 00 50 B8 64-37 50 8D 86 78 FE 50 E8 x~8+.P8d7P..x~Ph
04AE:0070 32 3A B3 C4 06 80 BE F8-FE 00 75 B3 80 3E 48 07 Z:.D...>x~.u3.>H.
-Q
C:\>DEBUG CH3Q10.EXE
-D 04AE:0000
04AE:0000 41 42 43 0A 10 45 46 FF-00 04 04 04 FF 00 04 04 ABC..EF.....
04AE:0010 04 FF 00 04 04 04 00 00-00 00 00 00 00 00 00 .....
04AE:0020 B8 AE 04 8E D8 B4 4C CD-21 0D C6 06 4B 07 FF C6 8...X4LM!.F.K..F
04AE:0030 86 F8 FE 00 B8 0C 03 50-8D 86 78 FE 50 E8 3E DC .x~.8..P..x~Ph>\
04AE:0040 83 C4 04 80 BE 78 FE 00-74 32 8B B6 78 FE 81 E6 .D...>x~.t2.6x~.f
04AE:0050 FF 00 80 BA 78 FE 2B 75-09 C6 86 F8 FE FF FE BE ...:x~+u.F.x~.~.
04AE:0060 78 FE B8 2B 00 50 B8 64-37 50 8D 86 78 FE 50 E8 x~8+.P8d7P..x~Ph
04AE:0070 32 3A B3 C4 06 80 BE F8-FE 00 75 B3 80 3E 48 07 Z:.D...>x~.u3.>H.

```

DATAS SEGMENT

word\_var dw 10h,-5,3 dup(?)

DATAS ENDS

Stack segment stack

Stack ends

CODES SEGMENT

ASSUME CS:CODES, DS:DATAS

START:

mov AX,DATAS

mov DS,ax

MOV AH,4cH

INT 21H

CODES ENDS

END START

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG
04AF:0009 E84CD9 CALL D958
04AF:000C 83C404 ADD SP,+04
04AF:000F C6066E082B MOV BYTE PTR [086E],2B
04AF:0014 C7062421020D MOV WORD PTR [2124],0D02
04AF:001A C6064B07FF MOV BYTE PTR [074B],FF
04AF:001F C686F8FE00 MOV BYTE PTR [BP+FEF8],00
-d 04ae:0
04AE:0000 10 00 FB FF 00 00 00 00-00 00 00 00 00 00 00 00 ...f.....
04AE:0010 B8 AE 04 8E D8 B4 4C CD-21 E8 4C D9 83 C4 04 C6 8...X4LM!hLY.D.F
04AE:0020 06 6E 08 2B C7 06 24 21-02 0D C6 06 4B 07 FF C6 .n.+G.$!..F.K..F
04AE:0030 86 F8 FE 00 B8 0C 03 50-8D 86 78 FE 50 E8 3E DC .x~.B..P..x~Ph>\
04AE:0040 83 C4 04 80 BE 78 FE 00-74 32 8B B6 78 FE 81 E6 .D..>x~.t2.6x~.f
04AE:0050 FF 00 80 BA 78 FE 2B 75-09 C6 86 F8 FE FF FE 8E ...:x~+u.F.x~.~.
04AE:0060 78 FE B8 2B 00 50 B8 64-37 50 8D 86 78 FE 50 E8 x~B+.P8d7P..x~Ph
04AE:0070 32 3A 83 C4 06 80 BE F8-FE 00 75 B3 80 3E 48 07 Z:.D...>x~.u3.>H.
-d 04af:0
04AF:0000 B8 AE 04 8E D8 B4 4C CD-21 E8 4C D9 83 C4 04 C6 8...X4LM!hLY.D.F
04AF:0010 06 6E 08 2B C7 06 24 21-02 0D C6 06 4B 07 FF C6 .n.+G.$!..F.K..F
04AF:0020 86 F8 FE 00 B8 0C 03 50-8D 86 78 FE 50 E8 3E DC .x~.B..P..x~Ph>\
04AF:0030 83 C4 04 80 BE 78 FE 00-74 32 8B B6 78 FE 81 E6 .D..>x~.t2.6x~.f
04AF:0040 FF 00 80 BA 78 FE 2B 75-09 C6 86 F8 FE FF FE 8E ...:x~+u.F.x~.~.
04AF:0050 78 FE B8 2B 00 50 B8 64-37 50 8D 86 78 FE 50 E8 x~B+.P8d7P..x~Ph
04AF:0060 32 3A 83 C4 06 80 BE F8-FE 00 75 B3 80 3E 48 07 Z:.D...>x~.u3.>H.
04AF:0070 00 74 0A B8 03 04 50 E8-F8 72 83 C4 02 C6 06 6E .t.B..Phzr.D.F.n

```

### ( 3.15 )

- (1)byte ptr 的操作数为字节类型，而 1000 大于 FFH，故不正确
- (2)offset 返回偏移地址需要程序执行确定，故参数无法确定
- (3)cmp 不允许直接比较两个储存单元
- (4)同(2)，变量不确定
- (5)AL 一个字节与字类型不匹配
- (6)jnz 只支持相对寻址，不支持间接寻址

### ( 3.16 )

code:

data segment

```
        mess db 'input error!',0ah,0dh,'$'
data ends

code segment
        assume ds:data,cs:code

start:
        mov ax,data
        mov ds,ax
        mov ah,01h
        int 21h
        cmp al,'A'
        jb err
        cmp al,'z'
        ja err
        add al,20h
        mov dl,al
        mov ah,02h
        int 21h
        jmp exit

err:

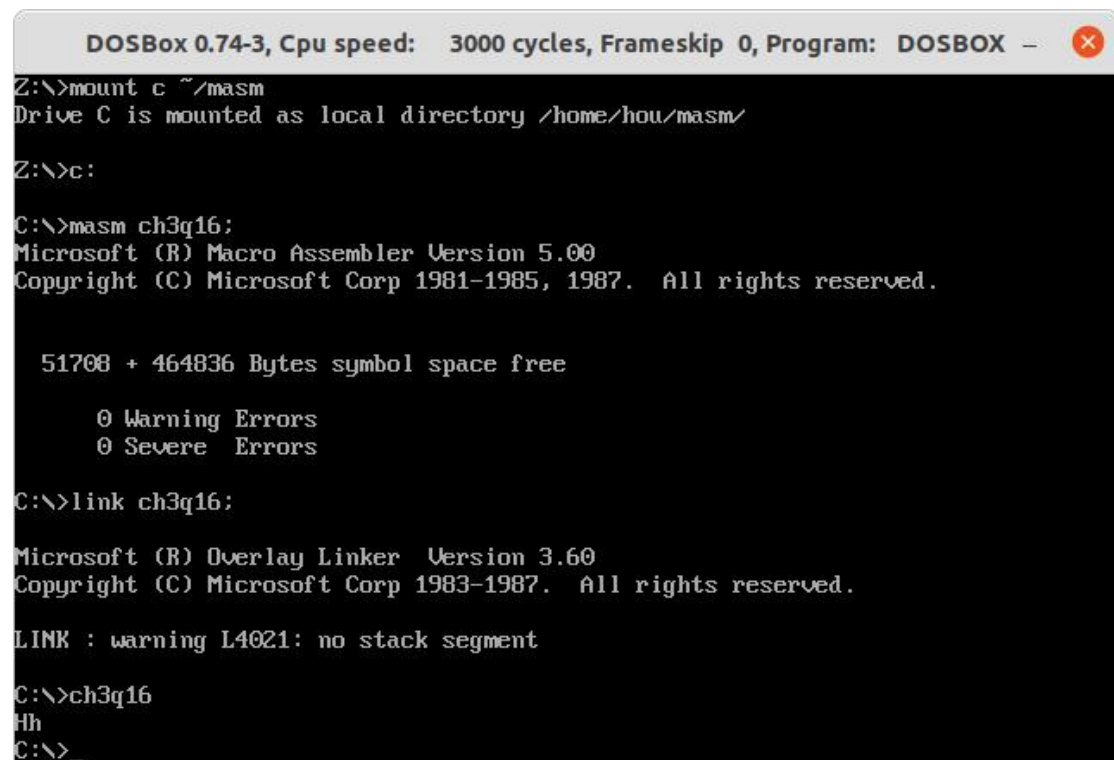
        mov dx,offset mess
        mov ah,09h
        int 21h

exit:
        mov ah,4ch
        int 21h

code ends
```

end start

result:



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX -
Z:\>mount c ~/masm
Drive C is mounted as local directory /home/hou/masm/
Z:\>c:
C:\>masm ch3q16;
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

51708 + 464836 Bytes symbol space free

0 Warning Errors
0 Severe Errors
C:\>link ch3q16;
Microsoft (R) Overlay Linker Version 3.60
Copyright (C) Microsoft Corp 1983-1987. All rights reserved.

LINK : warning L4021: no stack segment
C:\>ch3q16
Hh
C:\>_
```

( 3.18 )

code:

data segment

bufX dw 3

bufY dw 2

bufZ dw ?

data ends

code segment

assume ds:data,cs:code

start:

mov ax,data

mov ds,ax

```

    mov ax,bufX
    sub ax,bufY
    cmp ax,0
    jl  gotomov2
    jmp gotomov1
gotomov1:
    mov ax,bufX
    mov bufZ,AX
    mov ah,4ch
    int 21h
gotomov2:
    mov ax,bufY
    mov bufZ,AX
    mov ah,4ch
    int 21h
code ends
end start

```

result:

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

Address	Instruction	AX	BX	CX	DX	SP	BP	SI	DI
04AF:000C	CMP AX,0000	0001	0000	003B	0000	0000	0000	0000	0000
04AF:000F	JL 001E	0001	0000	003B	0000	0000	0000	0000	0000
04AF:0011	JMP 0014	0001	0000	003B	0000	0000	0000	0000	0000
04AF:0014	MOV AX,[0000]	0003	0000	003B	0000	0000	0000	0000	0000
04AF:0017	MOV [0004],AX	0003	0000	003B	0000	0000	0000	0000	0000



通过 debug 可以发现 , 最后程序跳转至 gotomov1

结果正确 !

( 3.20 )

code:

data segment

    bufX dw 3

    bufY dw 2

    bufZ dw 2

data ends

code segment

    assume ds:data,cs:code

start:

    mov ax,data

    mov ds,ax

    mov ax,bufX

    sub ax,bufY

    cmp ax,0

    jne st2

    je st1

st1:

    mov dx,1

    mov ax,bufY

```
sub ax,bufZ
cmp ax,0
je st3
jne st4
```

st2:

```
mov dx,0
mov ax,bufY
sub ax,bufZ
cmp ax,0
je st3
jne st4
```

st3:

```
add dx,1
cmp dx,2
je two
jne one
```

st4:

```
cmp dx,1
je one
jne zero
```

two:

```
mov dl,32h
mov ah,2
int 21h
mov ah,4ch
int 21h
```

one:

```
mov dl,31h
mov ah,2
int 21h
mov ah,4ch
int 21h
```

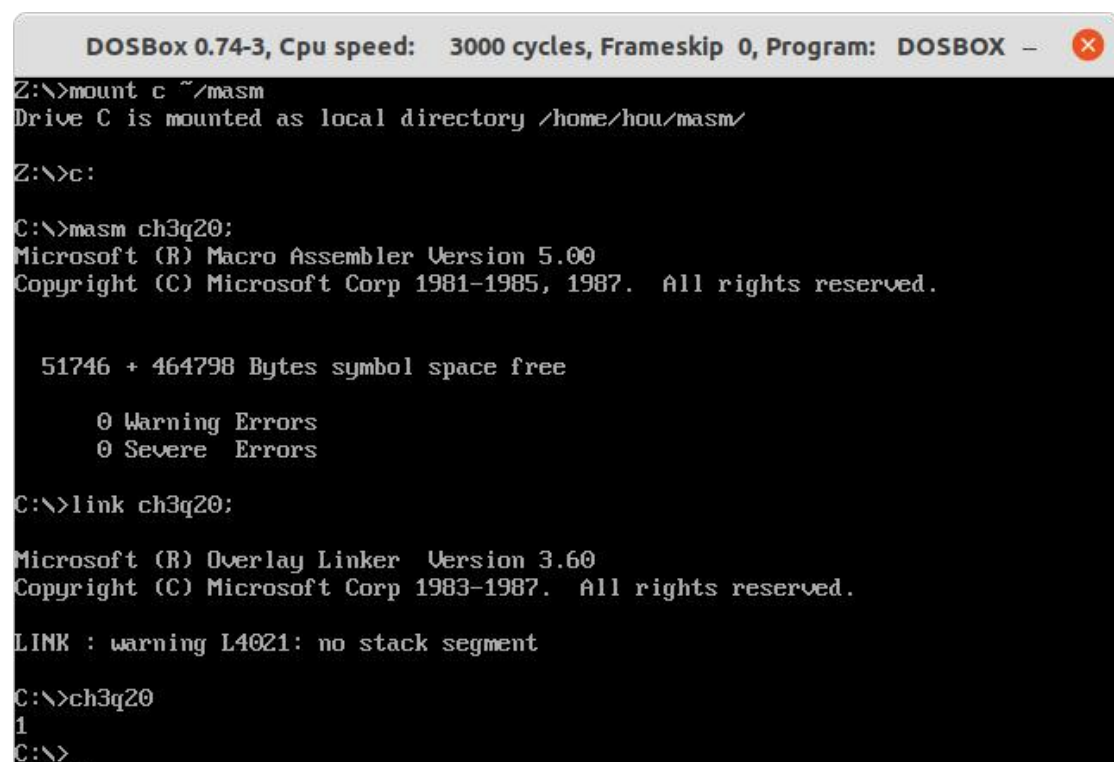
zero:

```
mov dl,30h
mov ah,2
int 21h
mov ah,4ch
int 21h
```

code ends

end start

result:



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX
Z:\>mount c ~/masm
Drive C is mounted as local directory /home/hou/masm/
Z:\>c:
C:\>masm ch3q20:
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

51746 + 464798 Bytes symbol space free

0 Warning Errors
0 Severe Errors
C:\>link ch3q20:
Microsoft (R) Overlay Linker Version 3.60
Copyright (C) Microsoft Corp 1983-1987. All rights reserved.

LINK : warning L4021: no stack segment
C:\>ch3q20
1
C:\>_
```