安徽大学人工智能学院
实验报告

课程名称： 《计算机组成原理与汇编语言》

专　　业： 人工智能

学　　号： WA2214014
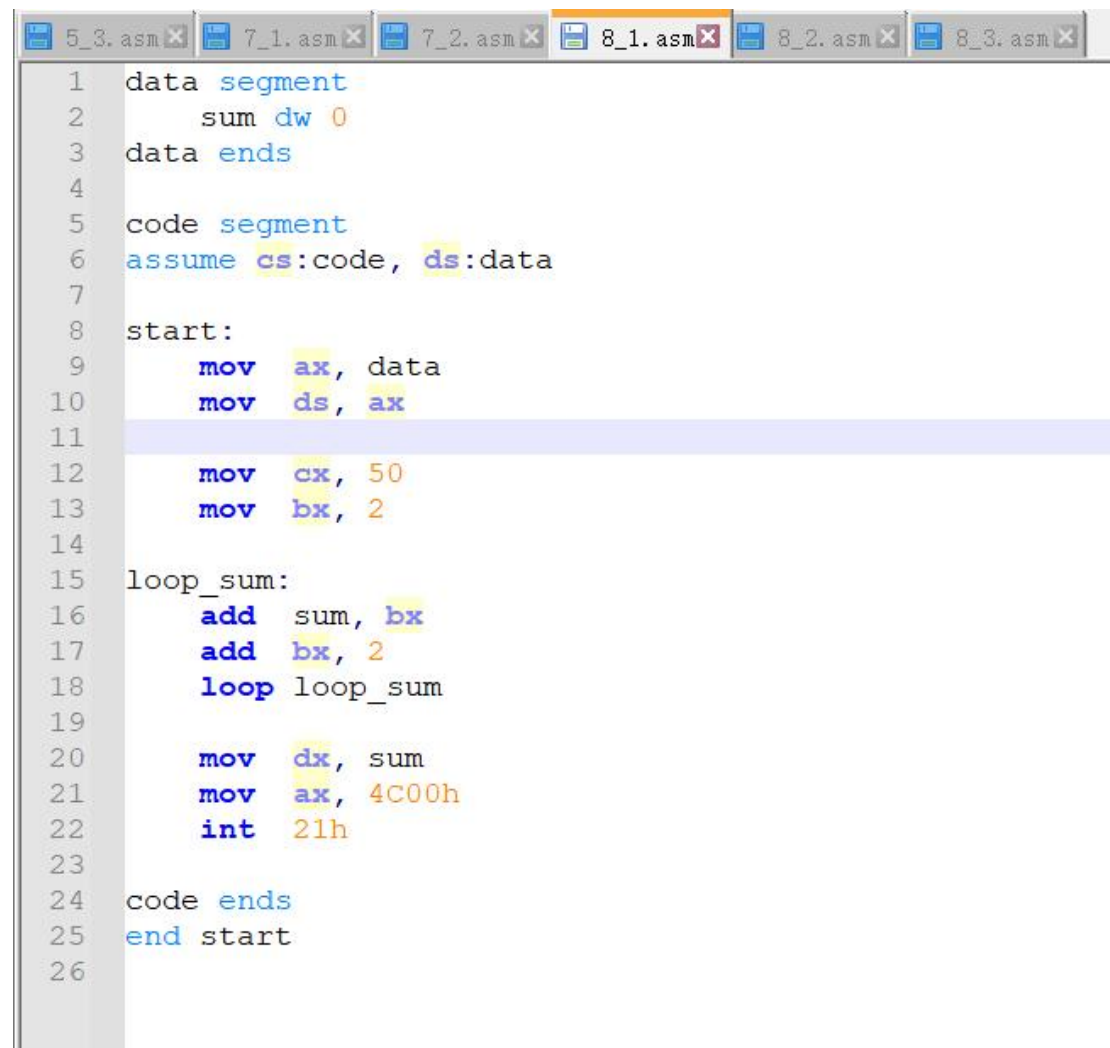
姓　　名： 杨跃浙

指导老师： 杜库

实验项目	实验 8-第八次上机实验		实验次序	08
实验地点	笃行南楼 A104	参与人员 杨跃浙	实验日期	05.29

一、实验目的

编程练习

二、实验环境

Windows 2011，DOSBox

三、实验内容

1.要求用循环累加的方式计算 2+4+6+..+100 的和，结果存放在 DX 中，不要求输出结果。
   （注：累加结果为 2550，所以(DX)=09F6H）

```asm
data segment
    sum dw 0
data ends

code segment
assume cs:code, ds:data

start:
    mov   ax, data
    mov   ds, ax

    mov   cx, 50
    mov   bx, 2

loop_sum:
    add   sum, bx
    add   bx, 2
    loop loop_sum

    mov   dx, sum
    mov   ax, 4C00h
    int   21h

code ends
end start
```

```
AX=076A  BX=0064  CX=0001  DX=0000  SP=0000  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=076B  IP=000B    NV UP EI PL NZ NA PO NC
076B:000B 011E0000     ADD     [0000],BX                          DS:0000=0992
-t

AX=076A  BX=0064  CX=0001  DX=0000  SP=0000  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=076B  IP=000F    NV UP EI PL NZ NA PE NC
076B:000F 83C302       ADD     BX,+02
-t

AX=076A  BX=0066  CX=0001  DX=0000  SP=0000  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=076B  IP=0012    NV UP EI PL NZ NA PE NC
076B:0012 E2F7         LOOP    000B
-t

AX=076A  BX=0066  CX=0000  DX=0000  SP=0000  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=076B  IP=0014    NV UP EI PL NZ NA PE NC
076B:0014 8B160000     MOV     DX,[0000]                          DS:0000=09F6
-t

AX=076A  BX=0066  CX=0000  DX=09F6  SP=0000  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=076B  IP=0018    NV UP EI PL NZ NA PE NC
076B:0018 B8004C       MOV     AX,4C00
```

2、从键盘输入 0-9 中的任意数，如果输入的字符在这个范围内，计算它的立方值，结果存于 DX 中。反之显示输入错误的信息。（提示：输入单个字符用 1 号子功能）

```asm
1   data segment
2       error_input db 'Input error$'
3   data ends
4
5   code segment
6   assume cs:code, ds:data
7
8   start:
9       mov  ax, data
10      mov  ds, ax
11
12      mov  ah, 01h
13      int  21h
14
15      cmp  al, '0'
16      jb   Error_output
17      cmp  al, '9'
18      ja   Error_output
19
20      sub  al, '0'
21      mov  dl, al
22      mov  bl, dl
23      mul  dl        ;al=al*dl
24      mov  cl, al
25      mov  al, bl
26      mul  cl        ;al=al*cl
27      mov  dl, al
28
29
30      mov  ax, 4C00h
31      int  21h
32
33  Error_output:
34
35      mov  ah, 09h
36      lea  dx, error_input
37      int  21h
38
39      mov  ax, 4C00h
40      int  21h
41
42  code ends
43  end start
44
```

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

Object filename [8_2.OBJ]:
Source listing  [NUL.LST]:
Cross-reference [NUL.CRF]:

   51766 + 464778 Bytes symbol space free

      0 Warning Errors
      0 Severe  Errors

C:\>link 8_2.obj

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Run File [8_2.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>8_2.exe
aInput error
C:\>8_2.exe
4
C:\>_
```

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

AX=076A  BX=0000  CX=0043  DX=0000  SP=0000  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=076B  IP=0005   NV UP EI PL NZ NA PO NC
076B:0005 B401          MOV     AH,01
-t

AX=016A  BX=0000  CX=0043  DX=0000  SP=0000  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=076B  IP=0007   NV UP EI PL NZ NA PO NC
076B:0007 CD21          INT     21
-t

AX=016A  BX=0000  CX=0043  DX=0000  SP=FFFA  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=F000  IP=14A0   NV UP DI PL NZ NA PO NC
F000:14A0 FB            STI
-t

AX=016A  BX=0000  CX=0043  DX=0000  SP=FFFA  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=F000  IP=14A1   NV UP EI PL NZ NA PO NC
F000:14A1 FE38          ???     [BX+SI]                      DS:0000=49
-t
6
AX=0136  BX=0000  CX=0043  DX=0000  SP=FFFA  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=0769  CS=F000  IP=14A5   NV UP EI PL NZ NA PO NC
F000:14A5 CF            IRET
-
```

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

AX=0024   BX=0006   CX=0043   DX=0006   SP=0000   BP=0000   SI=0000   DI=0000
DS=076A   ES=075A   SS=0769   CS=076B   IP=0019    NV UP EI PL NZ NA PE NC
076B:0019 8AC8           MOV     CL,AL
-t

AX=0024   BX=0006   CX=0024   DX=0006   SP=0000   BP=0000   SI=0000   DI=0000
DS=076A   ES=075A   SS=0769   CS=076B   IP=001B    NV UP EI PL NZ NA PE NC
076B:001B 8AC3           MOV     AL,BL
-t

AX=0006   BX=0006   CX=0024   DX=0006   SP=0000   BP=0000   SI=0000   DI=0000
DS=076A   ES=075A   SS=0769   CS=076B   IP=001D    NV UP EI PL NZ NA PE NC
076B:001D F6E1           MUL     CL
-t

AX=00D8   BX=0006   CX=0024   DX=0006   SP=0000   BP=0000   SI=0000   DI=0000
DS=076A   ES=075A   SS=0769   CS=076B   IP=001F    NV UP EI PL NZ NA PE NC
076B:001F 8AD0           MOV     DL,AL
-t

AX=00D8   BX=0006   CX=0024   DX=00D8   SP=0000   BP=0000   SI=0000   DI=0000
DS=076A   ES=075A   SS=0769   CS=076B   IP=0021    NV UP EI PL NZ NA PE NC
076B:0021 B8004C           MOV     AX,4C00
-
```

3.假定在数据段中存放着下列数据:

　　　　A   DB   'AAAAA'
　　　　B   DB   'BBBBB'
　　　　C   DB   'CCCCC'

　试编写一个汇编语言程序，使程序运行后数据存放如下（即实现字符串数据的交换）。

　　　　A   DB   'CCCCC'
　　　　B   DB   'AAAAA'
　　　　C   DB   'BBBBB'

```asm
1   data segment
2       A db 'AAAAA$'
3       B db 'BBBBB$'
4       C db 'CCCCC$'
5       temp db 5 dup(?)
6   data ends
7
8   code segment
9   assume cs:code, ds:data
10
11  start:
12      mov  ax, data
13      mov  ds, ax
14      mov  es, ax
15      cld
16
17      lea  si, A
18      lea  di, temp
19      mov  cx, 5
20      repe movsb
21
22      lea  si, C
23      lea  di, A
24      mov  cx, 5
25      repe movsb
26
27      lea  si, temp
28      lea  di, C
29      mov  cx, 5
30      repe movsb        ;C A change
31
32      lea  si, C
33      lea  di, temp
34      mov  cx, 5
35      repe movsb
36
37      lea  si, B
38      lea  di, C
39      mov  cx, 5
40      repe movsb
41
42      lea  si, temp
43      lea  di, B
44      mov  cx, 5
45      repe movsb        ;C B change
```

```
46
47        lea dx,A
48        mov ah,09
49        int 21h
50
51        lea dx,B
52        mov ah,09
53        int 21h
54
55        lea dx,C
56        mov ah,09
57        int 21h
58
59        mov  ax, 4c00h
60        int  21h
61
62    code ends
63    end start
64
```

```
Source listing  [NUL.LST]:
Cross-reference [NUL.CRF]:

  51766 + 464778 Bytes symbol space free

      0 Warning Errors
      0 Severe  Errors

C:\>

C:\>link 8_3.obj

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Run File [8_3.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:
LINK : warning L4021: no stack segment

C:\>

C:\>8_3.exe
CCCCCAAAAABBBBB
C:\>
```