

**TA: Jade Cheng**  
**ICS 312**  
**Homework Solution #8**  
**Due Date: September 15, 2009**

**Program Code**

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```
;; program2 -- This program asks the user how many numbers are to be added, and input
;; the user's response, which we will call n. Now go into a loop which is iterated
;; n times, and in each iteration asks the user to enter a number. Your program
;; should add up all these numbers, using only a single ADD instruction, and finally
;; output: The sum of your numbers is: followed by the sum.
```

```
                .model      small
                .stack 100

                .data
prompt1        db      0ah,0dh,"Enter a number < 10: $"
prompt2        db      0ah, 0dh, "Your number: $"
result         db      0ah,0dh,"Sum of your numbers is: $"

                .code
prog          proc
                mov      ax, @data
                mov      ds, ax

                lea     dx, prompt1      ; display prompt1.
                mov     ah, 9h
                int     21h
                mov     ah, 1h          ; obtain input from keyboard.
                int     21h
                sub     al, 30h         ; convert user input to a digit.
                mov     cl, al          ; mov to cl and use it as loop counter.
                mov     ch, 0           ; ch is used to store the sum.
startofloop:
                cmp     cl, 0           ; end loop if counter reaches 0.
                je     endofloop
                dec     cl              ; decrement loop counter.
                lea     dx, prompt2     ; display prompt2
```

```

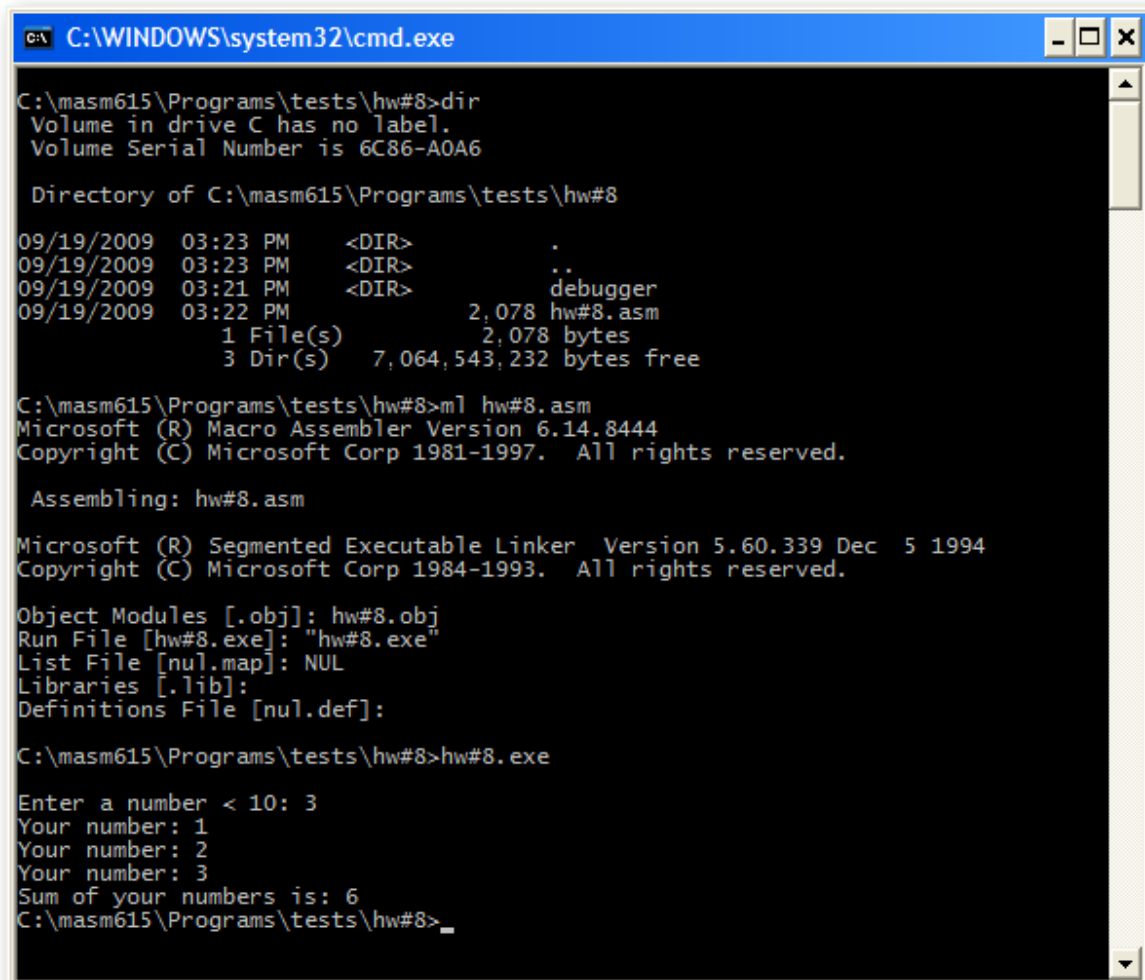
        mov     ah, 9h
        int     21h
        mov     ah, 1h          ; obtain input from the keyboard
        int     21h
        sub     al, 30h        ; convert it to a digit.
        add     ch, al         ; add to ch.
        jmp     startofloop    ; loop again.
endofloop:
        add     ch, 30h        ; convert ch back to character.
        lea    dx, result      ; print out result message
        mov     ah, 9h
        int     21h
        mov     dl, ch         ; print out the character which is the sum
        mov     ah, 2h
        int     21h

        mov     al, 0          ; return code of 0
        mov     ah, 4ch        ; function code for exit to os
        int     21h
prog    endp
        end     prog

```

## Program Output

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```
C:\WINDOWS\system32\cmd.exe
C:\masm615\Programs\tests\hw#8>dir
Volume in drive C has no label.
Volume Serial Number is 6C86-A0A6

Directory of C:\masm615\Programs\tests\hw#8

09/19/2009  03:23 PM    <DIR>          .
09/19/2009  03:23 PM    <DIR>          ..
09/19/2009  03:21 PM    <DIR>          debugger
09/19/2009  03:22 PM                2,078 hw#8.asm
             1 File(s)                2,078 bytes
             3 Dir(s)  7,064,543,232 bytes free

C:\masm615\Programs\tests\hw#8>ml hw#8.asm
Microsoft (R) Macro Assembler Version 6.14.8444
Copyright (C) Microsoft Corp 1981-1997.  All rights reserved.

Assembling: hw#8.asm

Microsoft (R) Segmented Executable Linker Version 5.60.339 Dec  5 1994
Copyright (C) Microsoft Corp 1984-1993.  All rights reserved.

Object Modules [.obj]: hw#8.obj
Run File [hw#8.exe]: "hw#8.exe"
List File [nul.map]: NUL
Libraries [.lib]:
Definitions File [nul.def]:

C:\masm615\Programs\tests\hw#8>hw#8.exe

Enter a number < 10: 3
Your number: 1
Your number: 2
Your number: 3
Sum of your numbers is: 6
C:\masm615\Programs\tests\hw#8>
```