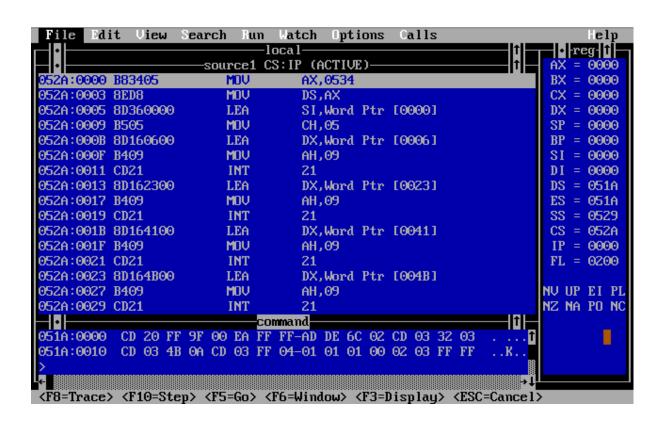
```
File Edit Search View Options Help
                                       C:\MASM\BUBBLESO.ASM
 .model small
display macro msg
       lea dx,msg
       mov ah,09h
       int 21h
endm
.data
list db 02h,01h,34h,0F4h,09h,05h
number egu $-list
msg1 db Odh, Oah,"1>>sort in ascending order$"
msg2 db Odh, Oah,"2>>sort in descending order$"
msg3 db Odh, Oah,"3>>exit$"
msg4 db Odh, Oah,"enter your choice::$"
msg5 db Odh, Oah,"invalid choice entered$"
.code
start
         : mov ax,@data
            mov ds,ax
             lea si,list
            mov ch, number-1
                                       cl stores the nummber of elements in a list
            display msg1
                                       :display the menu
            display msg2
            display msg3
Commands for manipulating files
```

```
File Edit Search
                      View Options Help
                             C:\MASM\BUBBLESO.ASM
         display msg3
         display msg4
         mo∨ ah,01h
         int 21h
         sub al,30h
         cmp al,01h
                           :input=1?sort in ascending order
         je ascsort
         cmp al,02h
                           :input=2?sort in descending order
         je dessort
         cmp al,03h
                           :input=3?exit
         je final
         display msg5
         jmp final
ascsort: mov si,offset list
         mov cl,00h
                             ; j value
         mov bh,ch
         sub bh,bl
                             :n-1-i
npass: cmp cl,bh
       jnc next
       mov al,[si]
Commands for manipulating files
```

```
File Edit Search View Options Help
                            C:\MASM\BUBBLESO.ASM
       mov al,[si]
       mov bp,01h
       cmp al,ds:[bp][si]
       jc _nope
       xchg al,[si+1]
       xchg [sil,al
_nope: inc cl
       inc si
       jmp npass
next: inc bl
      cmp bl,ch
      jc again1
      jmp final
dessort: mov bl,00h
again1: mov si,offset list
        mov cl,00h
                          ; j value
        mov bh,ch
        sub bh,bl
                      :n-1-i
Commands for manipulating files
```

```
File Edit Search View Options Help
C:\MASM\BUBBLESO.ASM
npass1: cmp cl,bh
         jnc next
         mov al,[si]
         mov bp,01h
         cmp al,ds:[bp][si]
        jnc _nope1
xchg al,[si+1]
         xchg [sil,al
_nope1: inc cl
         inc si
         jmp npass1
next1: inc bl
        cmp bl,ch
        jc again1
final: mov ah,4ch
        int 21h
end start
```

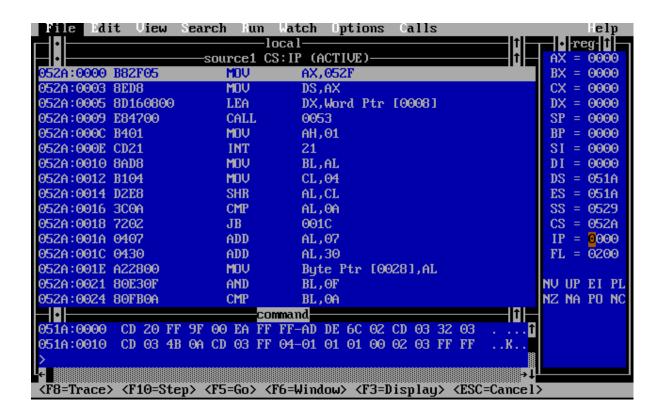
```
Z:\>c:
C:\>cd masm
C:\MASM>edit bubblesort.asm
C:\MASM>masm_bubblesort;;
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.
 51446 + 465098 Bytes symbol space free
     0 Warning Errors
     O Severe Errors
C:\MASM>bubblesort
1>>sort in ascending order
2>>sort in descending order
3>>exit
enter your choice::1
C:\masm>
C:\MASM>cv bubblesort
```



```
File Edit Search View Uptions Help
                              Ĉ:∖MASM∖ASCÎIUAL.ASM ¦
.model small
.data
msg1 db Odh,Oah,"enter alphanumeric character $"
res db 02 dup(0)
.code
mov ax,@data
mov ds,ax
lea dx,msg1
call disp
mov ah,01h
int 21h
mov bl,al
mov cl,4
shr al,cl
cmp al,0ah
jc<sup>°</sup>digit
add al,07h
digit: add al,30h
       mov res,al
       and bl,Ofh
       cmp bl,0ah
Commands for manipulating files
```

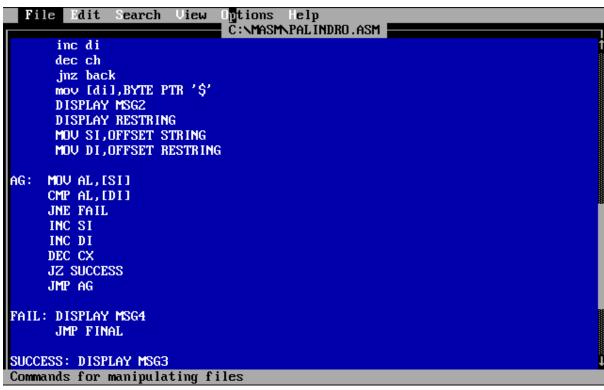
```
File Edit Search View Options Help
                            C:\MASM\ASCIIVAL.ASM
       cmp bl,0ah
       jc digit1
       add bl,07h
digit1: add bl,30h
                                                    П
        mov res+1,bl
        mo∨ ah,00h
        mov al,03h
        int 10
mo∨ ah,02h
mo∨ bh,00h
mo∨ dh,0ch
mo∨ d1,28h
int 10h
mov res+2,'$'
lea dx,res
call disp
mov ah,4ch
int 21h
Commands for manipulating files
```

```
disp proc near
mov ah,09h
int 21h
ret
disp endp
end
Commands for manipulating files
```



```
File Edit Search View Options Help
                                     C:\MASM\PALINDRO.ASM
 .model small
display macro msg
           lea dx,msg
           mov ah,09h
           int 21h
endm
.data
msg1 db Odh,Oah,"enter the string:$"
msg2 db Odh,Oah,"reverse string: $"
msg3 db Odh,Oah,"input string is a palindrome $"
msg4 db Odh,Oah,"input string is not a palindrome $"
string db 80h dup(?)
restring db 80h dup(?)
.code
start: mov ax,@data
         mov ds,ax
         display msg1
          take the string from keyboard character by character
         mov si, offset string
         xor cl,cl
Commands for manipulating files
```

```
File Ddit Search View Options Help
                            C:\MASM\PALINDRO.ASM
       xor cl,cl
again: mov ah,01h
       int 21h
       cmp al,0dh
       je next
       mov [si],al
       inc si
       inc cl
       jmp again
next: mov [si],BYTE PTR '$'
      string input over.....
      dec si
      mov ch,cl
      reverse the string and store it in restring
      mov di, offset restring
back: mov al,[si]
      mov [di],al
      dec si
      inc di
Commands for manipulating files
```





```
C:\MASM>EDIT PALINDROME.ASM
C:\MASM>MASM PALINDROME;;
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981–1985, 1987. All rights reserved.
 51640 + 464904 Bytes symbol space free
     0 Warning Errors
     O Severe Errors
C:\MASM>PALINDROME
enter the string:MADAM
reverse string: MADAM
input string is a palindrome
C:\MASM>PALINDROME
enter the string:BMSCE
reverse string: ECSMB
input string is not a palindrome
C:\MASM>
```

