

St. Francis Institute of Technology

Class: SE-ITA/ITB Semester: IV; A.Y. 2023-2024

Subject: Microprocessor Lab

Experiment – 6: Linear search for a given element in an array

1. Aim:

Write an ALP to search for a given element in an array.

2. Requirements

DOSBox (an x86 emulator with DOS), Turbo Assembler, Turbo Debugger

3. Pre-Experiment Exercise

Algorithm:

- a. Initialize an array of 8 bit numbers and the number that is to be searched.
- b. Use a MACRO to display messages on the output screen.
- c. Define a procedure to compare the number with all elements in the array.
- d. If the number equals any of the elements of the array, then print “Number found” else print “Number not found”

4. Laboratory Exercise:

Procedure:

- a. Open DOSbox and go to TASM.
- b. Open a new document using the command - edit <filename>.asm
- c. Write the Program and save the changes to the same file.
- d. Assemble the program using the command - tasm <filename.asm>
- e. If any errors are displayed, then change the code in <filename>
- f. If no errors are displayed, execute the command - tlink <filename>.obj to create the executable file.
- g. Next execute the command - <filename>
- h. Check the result displayed.

5. Post Experiment Exercise:

a. Results/Calculations/Observations:

Attach screenshots, one of number found in the array and another of number not found in the array along with the ALP.

b. Questions:

- i. Write an ALP in TASM to find the largest number in an array. Attach appropriate screenshots.
- ii. Explain different types of loop instructions used in 8086.
- iii. Explain ALP commands to generate interrupt.

c. Conclusion:

Write the conclusion/comments based on the experiment performed and the output obtained.

d. References:

Mention two book references and two web references.

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

Code:

```
model small
stack 10h
data segment
    arr dB 25h,13h,06h,0Ah,43h
    msg1 dB "Number found $"
    msg2 dB "Number not found $"
    element dB 06h : 20h
data ends
print macro msg
    mov ah,09h
    lea dx,msg
    int 21h
endm
code segment
    assume cs:code,ds:data
start:
    mov ax, data
    mov ds, ax
    lea si, arr
    mov cx, 05h
    mov bl, element
up: cmp bl, [si]
    je found
    inc si
    loop up
    print msg2
    jmp exit
found: print msg1
exit: mov ah, 4ch
    int 21h
code ends
end start
```

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

When Number is 06

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX
Z:\>mount c c://tasm
Drive C is mounted as local directory c://tasm\

Z:\>c://

C:\>cd TASM

C:\TASM>edit EXP6.asm

C:\TASM>tasm EXP6.asm
Turbo Assembler Version 2.51 Copyright (c) 1988, 1991 Borland International

Assembling file: EXP6.asm
Error messages: None
Warning messages: None
Passes: 1
Remaining memory: 490k

C:\TASM>tlink EXP6.obj
Turbo Link Version 4.0 Copyright (c) 1991 Borland International

C:\TASM>EXP6
Number found
C:\TASM>_
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486]
cs:0000 B8B144 mov ax,44B1 ax 44B1 c=0
cs:0003 8ED8 mov ds,ax bx 0000 z=0
cs:0005 BE0000 mov si,0000 cx 0000 s=0
cs:0008 B90500 mov cx,0005 dx 0000 o=0
cs:000B 8A1E2300 mov bl,[0023] si 0000 p=0
cs:000F 3A1C cmp bl,[si] di 0000 a=0
cs:0011 740D je 0020 bp 0000 i=1
cs:0013 46 inc si sp 0010 d=0
cs:0014 E2F9 loop 000F ds 449D
cs:0016 B409 mov ah,09 es 449D
cs:0018 BA1200 mov dx,0012 ss 44AD
cs:001B CD21 int 21 cs 44AE
cs:001D EB08 jmp 0027 ip 0003
cs:001F 90 nop
cs:0020 B409 mov ah,09

ds:0000 CD 20 FF 9F 00 EA FF FF = f 0
ds:0008 AD DE E5 01 00 15 AF 01 i r 0 0
ds:0010 00 15 7D 02 1C 0F 92 01 0 0 0 0
ds:0018 01 01 01 00 02 FF FF FF 000 0
ds:0020 FF FF FF FF FF FF FF FF ss:0012 8E44
ss:0010 B1B8
ss:000E 3302
ss:000C 44AE
ss:000A 0003

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486] ds:0023 = 06
cs:0000 B8B144 mov ax,44B1
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A1E2300 mov bl,[0023]
cs:000F 3A1C cmp bl,[si]
cs:0011 740D je 0020
cs:0013 46 inc si
cs:0014 E2F9 loop 000F
cs:0016 B409 mov ah,09
cs:0018 BA1200 mov dx,0012
cs:001B CD21 int 21
cs:001D EB08 jmp 0027
cs:001F 90 nop
cs:0020 B409 mov ah,09

ds:0000 25 13 06 04 43 4E 75 6D %!!+CNum
ds:0008 62 65 72 20 66 6F 75 6E ber foun
ds:0010 64 24 4E 75 6D 62 65 72 d$Number
ds:0018 20 6E 6F 74 20 46 6F 75 not Fou
ds:0020 6E 64 24 06 00 00 00 00 nd$+

ax 44B1 c=0
bx 0000 z=0
cx 0005 s=0
dx 0000 o=0
si 0000 p=0
di 0000 a=0
bp 0000 i=1
sp 0010 d=0
ds 44B1
es 449D
ss 44AD
cs 44AE
ip 000B

ss:0018 05B9
ss:0016 0000
ss:0014 BED8
ss:0012 8E44
ss:0010 B1B8

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486] ds:0002 = 06
cs:0000 B8B144 mov ax,44B1
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A1E2300 mov bl,[0023]
cs:000F 3A1C cmp bl,[si]
cs:0011 740D je 0020
cs:0013 46 inc si
cs:0014 E2F9 loop 000F
cs:0016 B409 mov ah,09
cs:0018 BA1200 mov dx,0012
cs:001B CD21 int 21
cs:001D EB08 jmp 0027
cs:001F 90 nop
cs:0020 B409 mov ah,09

ds:0000 25 13 06 04 43 4E 75 6D %!!+CNum
ds:0008 62 65 72 20 66 6F 75 6E ber foun
ds:0010 64 24 4E 75 6D 62 65 72 d$Number
ds:0018 20 6E 6F 74 20 46 6F 75 not Fou
ds:0020 6E 64 24 06 00 00 00 00 nd$+

ax 44B1 c=1
bx 0006 z=0
cx 0003 s=0
dx 0000 o=0
si 0002 p=0
di 0000 a=0
bp 0000 i=1
sp 0010 d=0
ds 44B1
es 449D
ss 44AD
cs 44AE
ip 000F

ss:0018 05B9
ss:0016 0000
ss:0014 BED8
ss:0012 8E44
ss:0010 B1B8

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[ ]-CPU 80486-
cs:0020 B409 mov ah,09
cs:0022 BA0500 mov dx,0005
cs:0025 CD21 int 21
cs:0027 B44C mov ah,4C
cs:0029 CD21 int 21
cs:002B 0000 add [bx+si],al
cs:002D 0000 add [bx+si],al
cs:002F 0025 add [di],ah
cs:0031 13060443 adc ax,[4304]
cs:0035 4E dec si
cs:0036 756D jne 00A5
cs:0038 626572 bound sp,[di+72]
cs:003B 20666F and [bp+6F],ah
cs:003E 756E jne 00AE
cs:0040 64244E and fs:al,4E
ax 44B1 c=0
bx 0006 z=1
cx 0003 s=0
dx 0000 o=0
si 0002 p=1
di 0000 a=0
bp 0000 i=1
sp 0010 d=0
ds 44B1
es 449D
ss 44AD
cs 44AE
ip 0020
ds:0000 25 13 06 04 43 4E 75 6D %!!CNum
ds:0008 62 65 72 20 66 6F 75 6E ber foun
ds:0010 64 24 4E 75 6D 62 65 72 d$Number
ds:0018 20 6E 6F 74 20 46 6F 75 not Fou
ds:0020 6E 64 24 06 00 00 00 00 nd$
ss:0018 05B9
ss:0016 0000
ss:0014 BED8
ss:0012 8E44
ss:0010 B1B8
F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[ ]-CPU 80486-
44AE:0020 B409 mov ah,09
44AE:0022 BA0500 mov dx,0005
44AE:0025 CD21 int 21
44AE:0027 B44C mov ah,4C
44AE:0029 CD21 int 21
44AE:002B 0
44AE:002D 0
44AE:002F 0
44AE:0031 1
44AE:0035 4
44AE:0036 7
44AE:0038 6
44AE:003B 20656F and [bp+6F],ah
44AE:003E 756E jne 00AE
44AE:0040 64244E and fs:al,4E
ax 0192 c=1
bx 1D09 z=0
cx F5E8 s=1
dx 1D09 o=0
si 09D2 p=0
di F5E8 a=0
bp 0100 i=1
sp 0106 d=1
ds 1D09
es 01BD
ss 0192
cs 0000
ip 0000
44B1:0000 25 13 06 04 43 4E 75 6D %!!CNum
44B1:0008 62 65 72 20 66 6F 75 6E ber foun
44B1:0010 64 24 4E 75 6D 62 65 72 d$Number
44B1:0018 20 6E 6F 74 20 46 6F 75 not Fou
44B1:0020 6E 64 24 06 00 00 00 00 nd$
44AD:0018 05B9
44AD:0016 0000
44AD:0014 BED8
44AD:0012 8E44
44AD:0010 B1B8
Terminated, exit code 177
OK Help
```

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

When number is 20

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX
Z:\>mount c c://tasm
Drive C is mounted as local directory c://tasm\

Z:\>c://

C:\>cd TASM

C:\TASM>edit EXP6.asm

C:\TASM>tasm EXP6.asm
Turbo Assembler Version 2.51 Copyright (c) 1988, 1991 Borland International

Assembling file: EXP6.asm
Error messages: None
Warning messages: None
Passes: 1
Remaining memory: 490k

C:\TASM>tlink EXP6.obj
Turbo Link Version 4.0 Copyright (c) 1991 Borland International

C:\TASM>EXP6
Number not Found
C:\TASM>
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[ ]-CPU 80486-
cs:0000 B8B144 mov ax,44B1
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A1E2300 mov bl,[0023]
cs:000F 3A1C cmp bl,[si]
cs:0011 740D je 0020
cs:0013 46 inc si
cs:0014 E2F9 loop 000F
cs:0016 B409 mov ah,09
cs:0018 BA1200 mov dx,0012
cs:001B CD21 int 21
cs:001D EB08 jmp 0027
cs:001F 90 nop
cs:0020 B409 mov ah,09

ds:0000 CD 20 FF 9F 00 EA FF FF = f 0
ds:0008 AD DE E5 01 00 15 AF 01 i 0 0 0 0
ds:0010 00 15 7D 02 1C 0F 92 01 0 0 0 0
ds:0018 01 01 01 00 02 FF FF FF 000 0
ds:0020 FF FF FF FF FF FF FF FF

ss:0012 8E44
ss:0010 B1B8
ss:000E FFFF
ss:000C 0000
ss:000A 0000

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486] ds:0023 = 20
cs:0000 B8B144 mov ax,44B1
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A1E2300 mov bl,[0023]
cs:000F 3A1C cmp bl,[si]
cs:0011 740D je 0020
cs:0013 46 inc si
cs:0014 E2F9 loop 000F
cs:0016 B409 mov ah,09
cs:0018 BA1200 mov dx,0012
cs:001B CD21 int 21
cs:001D EB08 jmp 0027
cs:001F 90 nop
cs:0020 B409 mov ah,09
ax 44B1 c=0
bx 0000 z=0
cx 0005 s=0
dx 0000 o=0
si 0000 p=0
di 0000 a=0
bp 0000 i=1
sp 0010 d=0
ds 44B1
es 449D
ss 44AD
cs 44AE
ip 000B
ds:0000 25 13 06 04 43 4E 75 6D %!!+CNum
ds:0008 62 65 72 20 66 6F 75 6E ber foun
ds:0010 64 24 4E 75 6D 62 65 72 d$Number
ds:0018 20 6E 6F 74 20 46 6F 75 not Fou
ds:0020 6E 64 24 20 00 00 00 00 nd$
ss:0018 05B9
ss:0016 0000
ss:0014 BED8
ss:0012 8E44
ss:0010 B1B8
F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486] ds:0001 = 13
cs:0000 B8B144 mov ax,44B1
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A1E2300 mov bl,[0023]
cs:000F 3A1C cmp bl,[si]
cs:0011 740D je 0020
cs:0013 46 inc si
cs:0014 E2F9 loop 000F
cs:0016 B409 mov ah,09
cs:0018 BA1200 mov dx,0012
cs:001B CD21 int 21
cs:001D EB08 jmp 0027
cs:001F 90 nop
cs:0020 B409 mov ah,09
ax 44B1 c=1
bx 0020 z=0
cx 0004 s=0
dx 0000 o=0
si 0001 p=0
di 0000 a=0
bp 0000 i=1
sp 0010 d=0
ds 44B1
es 449D
ss 44AD
cs 44AE
ip 000F
ds:0000 25 13 06 04 43 4E 75 6D %!!+CNum
ds:0008 62 65 72 20 66 6F 75 6E ber foun
ds:0010 64 24 4E 75 6D 62 65 72 d$Number
ds:0018 20 6E 6F 74 20 46 6F 75 not Fou
ds:0020 6E 64 24 20 00 00 00 00 nd$
ss:0018 05B9
ss:0016 0000
ss:0014 BED8
ss:0012 8E44
ss:0010 B1B8
F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

```
DOS BOX  DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...  —  □  ×
≡ File View Run Breakpoints Data Options Window Help  READY
[ ]-CPU 80486- 1 [ + ]
cs:0027 B44C      mov     ah,4C      ax 4CB1      c=1
cs:0029 CD21      int      21      bx 0020      z=0
cs:002B 0000      add     [bx+si],al    cx 0000      s=0
cs:002D 0000      add     [bx+si],al    dx 0012      o=0
cs:002F 0025      add     [di],ah      si 0005      p=1
cs:0031 13060443   adc     ax,[4304]     di 0000      a=0
cs:0035 4E        dec     si           bp 0000      i=1
cs:0036 756D      jne     00A5         sp 0010      d=0
cs:0038 626572     bound  sp,[di+72]    ds 44B1
cs:003B 20666F     and     [bp+6F],ah   es 449D
cs:003E 756E      jne     00AE         ss 44AD
cs:0040 64244E     and     fs:al,4E     cs 44AE
cs:0043 756D      jne     00B2         ip 0029
cs:0045 626572     bound  sp,[di+72]
cs:0048 206E6F     and     [bp+6F],ch

ds:0000 25 13 06 04 43 4E 75 6D %!!*CNum
ds:0008 62 65 72 20 66 6F 75 6E ber foun
ds:0010 64 24 4E 75 6D 62 65 72 d$Number
ds:0018 20 6E 6F 74 20 46 6F 75 not Fou
ds:0020 6E 64 24 20 00 00 00 00 nd$

ss:0018 05B9
ss:0016 0000
ss:0014 BED8
ss:0012 8E44
ss:0010 B1B8

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

```
DOS BOX  DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...  —  □  ×
≡ File View Run Breakpoints Data Options Window Help  STATUS
[ ]-CPU 80486- 1 [ + ]
44AE:0027 B44C      mov     ah,4C      ax 0192      c=1
44AE:0029 CD21      int      21      bx 1D09      z=0
44AE:002B 0      cx F5E8      s=1
44AE:002D 0      dx 1D09      o=0
44AE:002F 0      si 09D2      p=0
44AE:0031 1      di F5E8      a=0
44AE:0035 4      bp 0100      i=1
44AE:0036 7      sp 0106      d=1
44AE:0038 6      ds 1D09
44AE:003B 20656F     and     [bp+6F],ah   es 01BD
44AE:003E 756E      jne     00AE         ss 0192
44AE:0040 64244E     and     fs:al,4E     cs 0000
44AE:0043 756D      jne     00B2         ip 0000
44AE:0045 626572     bound  sp,[di+72]
44AE:0048 206E6F     and     [bp+6F],ch

Terminated, exit code 177
OK Help

ds:0000 25 13 06 04 43 4E 75 6D %!!*CNum
ds:0008 62 65 72 20 66 6F 75 6E ber foun
ds:0010 64 24 4E 75 6D 62 65 72 d$Number
ds:0018 20 6E 6F 74 20 46 6F 75 not Fou
ds:0020 6E 64 24 20 00 00 00 00 nd$

44AD:0018 05B9
44AD:0016 0000
44AD:0014 BED8
44AD:0012 8E44
44AD:0010 B1B8
```


Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

POST EXP: Write an ALP in TASM to find the largest number in an array.
Attach appropriate screenshots.

Code:

```
model small
data segment
    arr db 25h, 13h, 06h, 01h, 43h
    element db 00h
data ends
code segment
    assume cs:code, ds:data
start:
    mov ax, data
    mov ds, ax
    lea si, arr
    mov cx, 05h
    mov al, [si]
    dec cx
up: inc si
    cmp al, [si]
    jnc next
    mov al, [si]
next: loop up
    mov element, al
    mov ah, 4ch
    int 21h
code ends
end start
```

Output:

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486]
cs:0000 B8AF44 mov ax,44AF
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A04 mov al,[si]
cs:000D 49 dec cx
cs:000E 46 inc si
cs:000F 3A04 cmp al,[si]
cs:0011 7302 jnb 0015
cs:0013 8A04 mov al,[si]
cs:0015 E2F7 loop 000E
cs:0017 A20500 mov [0005],al
cs:001A B44C mov ah,4C
cs:001C CD21 int 21
cs:001E 0000 add [bx+si],al

ds:0000 CD 20 FF 9F 00 EA FF FF = f 0
ds:0008 AD DE E5 01 00 15 AF 01 i r 0 0
ds:0010 00 15 7D 02 1C 0F 92 01 0 0 0 0
ds:0018 01 01 01 00 02 FF FF FF 0 0 0 0
ds:0020 FF FF FF FF FF FF FF FF

ss:0002 6568
ss:0000 6474
ss:FFFF FFFF
ss:FFFC 44AD
ss:FFFA 0011

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu

```

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486]
cs:0000 B8AF44 mov ax,44AF
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A04 mov al,[si]
cs:000D 49 dec cx
cs:000E 46 inc si
cs:000F 3A04 cmp al,[si]
cs:0011 7302 jnb 0015
cs:0013 8A04 mov al,[si]
cs:0015 E2F7 loop 000E
cs:0017 A20500 mov [0005],al
cs:001A B44C mov ah,4C
cs:001C CD21 int 21
cs:001E 0000 add [bx+si],al

ds:0000 25 13 06 01 43 00 B4 09 %!! 0C 0
ds:0008 BA 12 00 CD 21 EB 08 90 || 0 0 0 0
ds:0010 B4 09 BA 05 00 CD 21 B4 0 0 0 0
ds:0018 4C CD 21 00 00 00 00 00 L=?
ds:0020 25 13 06 04 43 4E 75 6D %!! 0 0 CNum

ss:0008 6864
ss:0006 742E
ss:0004 706C
ss:0002 6568
ss:0000 6474

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu

```

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486]
cs:0000 B8AF44 mov ax,44AF
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A04 mov al,[si]
cs:000D 49 dec cx
cs:000E 46 inc si
cs:000F 3A04 cmp al,[si]
cs:0011 7302 jnb 0015
cs:0013 8A04 mov al,[si]
cs:0015 E2F7 loop 000E
cs:0017 A20500 mov [0005],al
cs:001A B44C mov ah,4C
cs:001C CD21 int 21
cs:001E 0000 add [bx+si],al

ds:0000 25 13 06 01 43 00 B4 09 %!!<EC }o
ds:0008 BA 12 00 CD 21 EB 08 90 ||< =!<E
ds:0010 B4 09 BA 05 00 CD 21 B4 }o||< =!<
ds:0018 4C CD 21 00 00 00 00 00 L=?
ds:0020 25 13 06 04 43 4E 75 6D %!!<+CNum

ax 4425 c=0
bx 0000 z=0
cx 0001 s=0
dx 0000 o=0
si 0003 p=1
di 0000 a=0
bp 0000 i=1
sp 0000 d=0
ds 44AF
es 449D
ss 44AC
cs 44AD
ip 000E

ss:0008 6864
ss:0006 742E
ss:0004 706C
ss:0002 6568
ss:0000 6474

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[CPU 80486] ds:0004 = 43
cs:0000 B8AF44 mov ax,44AF
cs:0003 8ED8 mov ds,ax
cs:0005 BE0000 mov si,0000
cs:0008 B90500 mov cx,0005
cs:000B 8A04 mov al,[si]
cs:000D 49 dec cx
cs:000E 46 inc si
cs:000F 3A04 cmp al,[si]
cs:0011 7302 jnb 0015
cs:0013 8A04 mov al,[si]
cs:0015 E2F7 loop 000E
cs:0017 A20500 mov [0005],al
cs:001A B44C mov ah,4C
cs:001C CD21 int 21
cs:001E 0000 add [bx+si],al

ds:0000 25 13 06 01 43 00 B4 09 %!!<EC }o
ds:0008 BA 12 00 CD 21 EB 08 90 ||< =!<E
ds:0010 B4 09 BA 05 00 CD 21 B4 }o||< =!<
ds:0018 4C CD 21 00 00 00 00 00 L=?
ds:0020 25 13 06 04 43 4E 75 6D %!!<+CNum

ax 4425 c=0
bx 0000 z=0
cx 0001 s=0
dx 0000 o=0
si 0004 p=0
di 0000 a=0
bp 0000 i=1
sp 0000 d=0
ds 44AF
es 449D
ss 44AC
cs 44AD
ip 000F

ss:0008 6864
ss:0006 742E
ss:0004 706C
ss:0002 6568
ss:0000 6474

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

Name: Vishal Rajesh Mahajan
Class: SE INFT A

Roll No: 63
EXP No.: 6

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[ ] CPU 80486 ds:0004 = 43
cs:0000 B8AF44 mov ax,44AF ax 4425 c=1
cs:0003 8ED8 mov ds,ax bx 0000 z=0
cs:0005 BE0000 mov si,0000 cx 0001 s=1
cs:0008 B90500 mov cx,0005 dx 0000 o=0
cs:000B 8A04 mov al,[si] si 0004 p=1
cs:000D 49 dec cx di 0000 a=0
cs:000E 46 inc si bp 0000 i=1
cs:000F 3A04 cmp al,[si] sp 0000 d=0
cs:0011 7302 jnb 0015 ds 44AF
cs:0013 8A04 mov al,[si] es 449D
cs:0015 E2F7 loop 000E ss 44AC
cs:0017 A20500 mov [0005],al cs 44AD
cs:001A B44C mov ah,4C ip 0013
cs:001C CD21 int 21
cs:001E 0000 add [bx+si],al
ds:0000 25 13 06 01 43 00 B4 09 %!!*EC }o
ds:0008 BA 12 00 CD 21 EB 08 90 ||* =!dE
ds:0010 B4 09 BA 05 00 CD 21 B4 }o||* =!}
ds:0018 4C CD 21 00 00 00 00 00 L=?
ds:0020 25 13 06 04 43 4E 75 6D %!!*CNum
ss:0008 6864
ss:0006 742E
ss:0004 706C
ss:0002 6568
ss:0000 6474
F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File View Run Breakpoints Data Options Window Help
[ ] CPU 80486
44AD:0000 B8AF44 mov ax,44AF ax 0192 c=1
44AD:0003 8ED8 mov ds,ax bx 02F4 z=0
44AD:0005 BE0000 mov si,0000 cx 0990 s=1
44AD:0008 B90500 mov cx,0005 dx F5DA o=0
44AD:000B 8A04 mov al,[si] si 0019 p=0
44AD:000D 49 dec cx di 0FA6 a=0
44AD:000E 46 inc si bp 0100 i=1
44AD:000F 3A04 cmp al,[si] sp 0106 d=1
44AD:0011 7302 jnb 0015 ds 1D09
44AD:0013 8A04 mov al,[si] es 02F4
44AD:0015 E2F7 loop 000E ss 0192
44AD:0017 A20500 mov [0005],al cs 0000
44AD:001A B44C mov ah,4C ip 0000
44AD:001C CD21 int 21
44AD:001E 0
44AF:0000 2
44AF:0008 B
44AF:0010 B
44AF:0018 4
44AF:0020 2
Terminated, exit code 67
OK Help
44AC:0008 6864
44AC:0006 742E
44AC:0004 706C
44AC:0002 6568
44AC:0000 6474
```