

Ques - 4

MP & MC

Admission. U

S6 CSE

Roll no: 5

Aim:- Write and ~~write~~ ^{assembly} language program to sort numbers in ascending order in an array of n numbers

Algorithm.

- 1) Initialize the data segment memory
- 2) initialize the number of elements counter
- 3) initialize the comparison counter
- 4) Load the numbers into respective registers
- 5) Compare the elements. If first element < second element
go to step 6 else go to next step
- 6) Swap the numbers in the memory
- 7) Increment memory pointer & decrement the comparison counter
- 8) Is count = 0? if yes go to next step else go to step 11.
- 9) Decrement the element counter
- 10) Is count not 0? go to step 5 else go to next step
- 11) Stop.

Data Segment

ARR DW 012H, 0144H, 3001H 0003H, 0002H

COUNT EQU 05H.

DATA ENDS.

CODE SEGMENT.

START: MOV AX, DATA

MOV DS, AX

MOV DX, COUNT - 1

BACK: MOV CX, DX

MOV SI, OFFSET LIST

AGAIN: MOV AX, [SI]

LODP AX, [SI+2]

JC GO

XCHG AX, [SI+2]

XCHG AX, [SI]

GO: INC SI

INC SI

LOOP AGAIN

DEC DX

JNZ BACK

INT 03H

CODE ENDS.

END START

END.

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

File Edit Search View Options Help

C:\SORT.ASM

```
data segment
list dw 4444h,3333h,2222h,1111h,0000h
count equ 05h

data ends
code segment
assume ds:data, cs:code
start:
    mov ax,data
    mov ds,ax
    mov dx,count - 1
back:  mov cx,dx
    mov si,offset list
l1:    mov ax,[si]
    cmp ax,[si+2]
    jc l2
    xchg ax,[si+2]
    xchg ax,[si]

l2:    inc si
    inc si
```

F1=Help

Line:1 Col:1

dosbox-0.74-3.conf

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

File Edit Search View Options Help

C:\SORT.ASM

```
    mov ax,data
    mov ds,ax
    mov dx,count - 1
back: mov cx,dx
      mov si,offset list
11:   mov ax,[si]
      cmp ax,[si+2]
      jc 12
      xchg ax,[si+2]
      xchg ax,[si]

12:   inc si
      inc si

      loop 11
      dec dx
      jnz back
      int 03h

code ends
end start
```

F1=Help

Line:30

Col:1

dosbox-0.74-3.conf

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

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

C:\>debug sort.exe

-g

AX=1111 BX=0000 CX=0000 DX=0000 SP=0000 BP=0000 SI=0002 DI=0000
DS=076A ES=075A SS=0769 CS=076B IP=0020 NU UP EI PL ZR NA PE NC
076B:0020 CC INT 3

-d ds:0000

| | | |
|-----------|---|------------------|
| 076A:0000 | 00 00 11 11 22 22 33 33-44 44 00 00 00 00 00 00 |""33DD..... |
| 076A:0010 | BB 6A 07 8E D8 BA 04 00-8B CA BE 00 00 8B 04 3B | .j.....; |
| 076A:0020 | 44 02 72 05 87 44 02 87-04 46 46 E2 F0 4A 75 E8 | D.r..D...FF..Ju. |
| 076A:0030 | CC E9 11 01 B8 2F 00 50-8B 46 FC 8B 56 FE 05 0C |/.P.F..U... |
| 076A:0040 | 00 52 50 E8 EA 48 83 C4-04 50 E8 7B 0E 83 C4 04 | .RP..H...P.{.... |
| 076A:0050 | 3D FF FF 74 03 E9 ED 00-C4 5E FC 26 8A 47 0C 2A | =..t.....^.&.G.* |
| 076A:0060 | E4 40 50 8B C3 BC C2 05-0C 00 52 50 E8 C1 48 83 | .@P.....RP..H. |
| 076A:0070 | C4 04 50 8D 86 FA FE 50-E8 17 73 83 C4 06 8B B6 | ..P....P..s..... |