



A.Y. 2022-2023

Subject: Process Organization and Architecture

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Experiment 6:

Aim: ALP to sort numbers in ascending/descending order.

Ascending Order:

Code:

```
01 DATA SEGMENT
02 STRING1 DB 99H,12H,56H,45H,36H
03 DATA ENDS
04
05 CODE SEGMENT
06 ASSUME CS:CODE,DS:DATA
07 START: MOV AX,DATA
08 MOV DS,AX
09
10 MOV CH,04H
11
12 UP2: MOV CL,04H
13 LEA SI,STRING1
14
15 UP1: MOV AL,[SI]
16 MOV BL,[SI+1]
17 CMP AL,BL
18 JC DOWN
19 MOV DL,[SI+1]
20 XCHG [SI],DL
21 MOV [SI+1],DL
22
23 DOWN: INC SI
24 DEC CL
25 JNZ UP1
26 DEC CH
27 JNZ UP2
28
29 CODE ENDS
30 END START
```

Output:

The screenshot displays an x86 emulator interface. The main window shows the execution of the assembly code. The registers window on the left shows the state of the registers: AX=0756, BX=0099, CX=0000, DX=0045, CS=0711, IP=003A, SS=0710, SP=0000, BP=0000, SI=0004, DI=0000, DS=0710, ES=0700. The memory window on the right shows the string '12 018 6 45 069 E 56 086 U 99 153 0' at address 07100:0000. The variables window on the right shows the string 'STRING1 12h, 36h, 45h, 56h, 99h'.



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Descending Order:

Code:

```
DATA SEGMENT
STRING1 DB 99H,12H,56H,45H,36H
DATA ENDS

CODE SEGMENT
ASSUME CS:CODE,DS:DATA
START: MOV AX,DATA
      MOV DS,AX

      MOV CH,04H

UP2: MOV CL,04H
     LEA SI,STRING1

UP1: MOV AL,[SI]
     MOV BL,[SI+1]
     CMP AL,BL
     JNC DOWN
     MOV DL,[SI+1]
     XCHG [SI],DL
     MOV [SI+1],DL

DOWN: INC SI
     DEC CL
     JNZ UP1
     DEC CH
     JNZ UP2

CODE ENDS
END START
```

Output:

emulator: noname.exe_

file math debug view external virtual devices virtual drive help

Load reload step back single step run step delay ms: 0

registers

	H	L
AX	07	36
BX	00	12
CX	00	00
DX	00	12
CS	0711	
IP	003A	
SS	0710	
SP	0000	
BP	0000	
SI	0004	
DI	0000	
DS	0710	
ES	0700	

0711:003A

Address	Hex	ASCII
07148:	90 144	E
07149:	90 144	E
0714A:	F4 244	r
0714B:	00 000	NULL
0714C:	00 000	NULL
0714D:	00 000	NULL
0714E:	00 000	NULL
0714F:	00 000	NULL
07150:	00 000	NULL
07151:	00 000	NULL
07152:	00 000	NULL
07153:	00 000	NULL
07154:	00 000	NULL
07155:	00 000	NULL
07156:	00 000	NULL
07157:	00 000	NULL
07158:	00 000	NULL
07159:	00 000	NULL
0715A:	00 000	NULL
0715B:	00 000	NULL
0715C:	00 000	NULL
0715D:	00 000	NULL

0711:003A

Address	Instruction
07148:	NOP
07149:	NOP
0714A:	NOP
0714B:	NOP
0714C:	NOP
0714D:	NOP
0714E:	NOP
0714F:	NOP
07150:	NOP
07151:	NOP
07152:	NOP
07153:	NOP
07154:	NOP
07155:	NOP
07156:	NOP
07157:	NOP
07158:	NOP
07159:	HLT
0715A:	ADD [EBX + SI], AL
0715B:	ADD [EBX + SI], AL
0715C:	ADD [EBX + SI], AL
0715D:	ADD [EBX + SI], AL

variables

size: byte elements: 51

edit show as: hex

STRING1 99h, 56h, 45h, 36h, 12h,