Experiment 3
Class: SE Comp
Year: 2020-21
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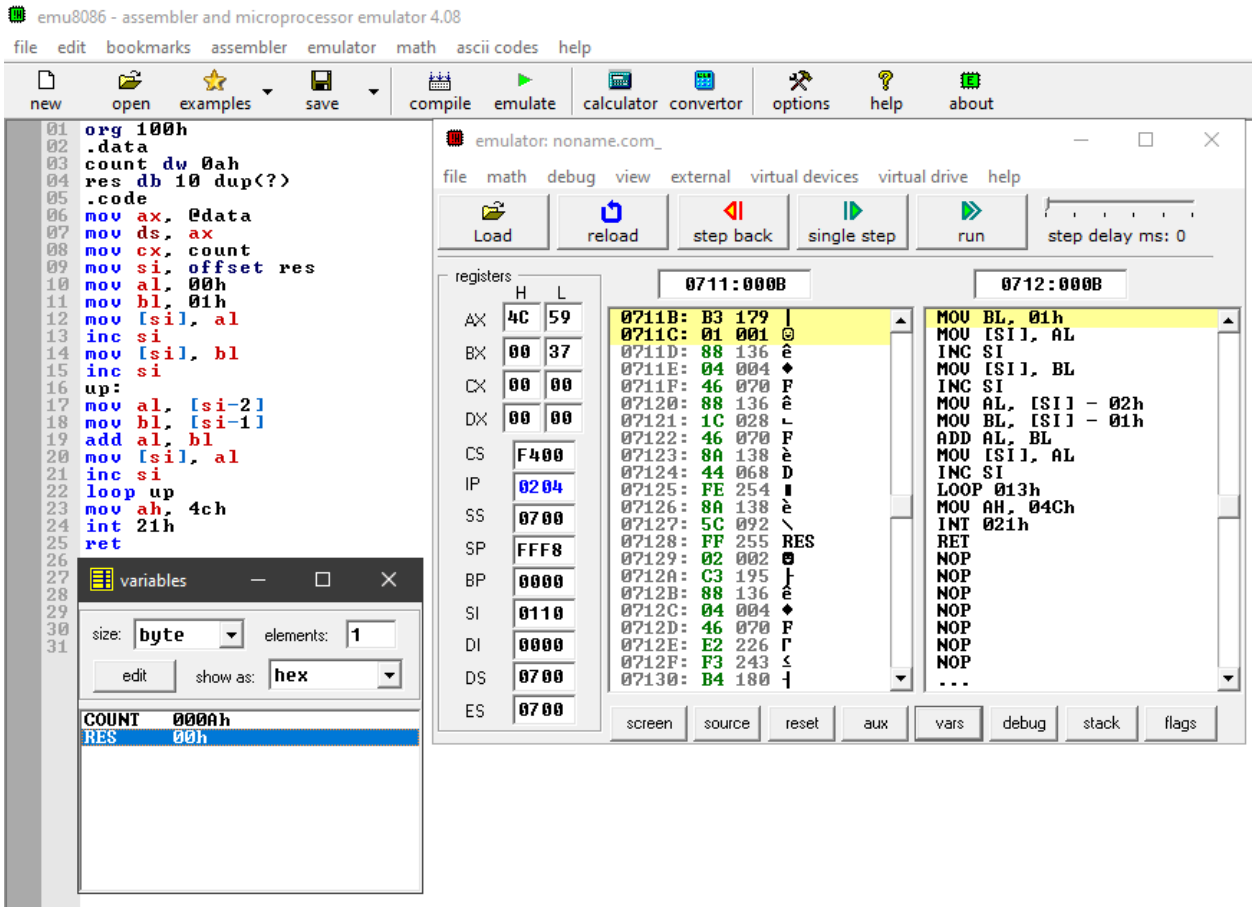
Ascending order:

Code:

```
org 100h
.data
     count dw 0ah
     res db 10 dup(?)
.code
     mov ax, @data
     mov ds, ax
     mov cx, count
     mov si, offset res
     mov al, 00h
     mov bl, 01h
     mov [si], al
     inc si
     mov [si], bl
     inc si
up:
     mov al, [si-2]
     mov bl, [si-1]
     add al, bl
     mov [si], al
     inc si
     loop up
     mov ah, 4ch
     int 21h
ret
```

Output: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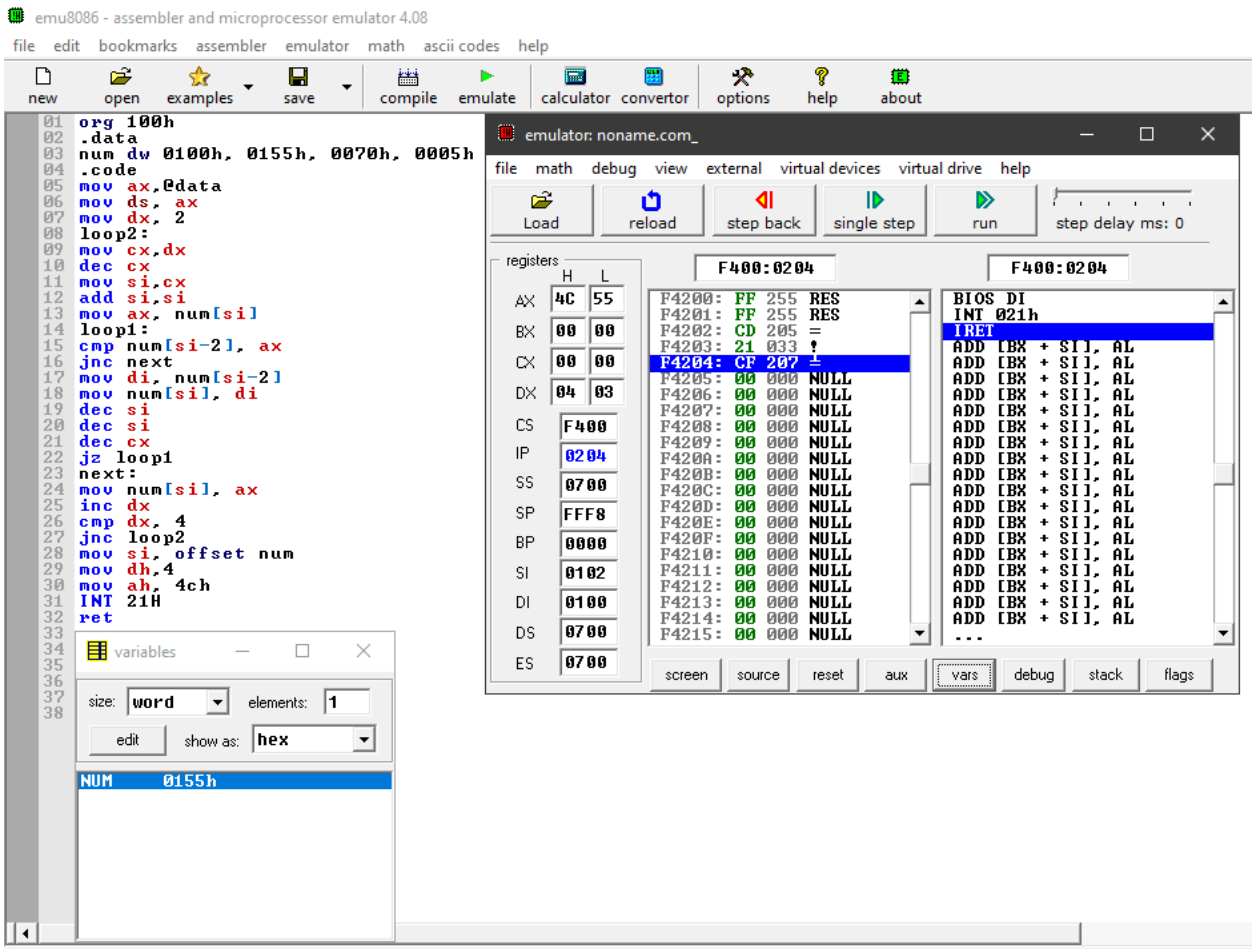
01 org 100h
02 .data
03 count dw 0ah
04 res db 10 dup(?)
05 .code
06 mov ax, @data
07 mov ds, ax
08 mov cx, count
09 mov si, offset res
10 mov al, 00h
11 mov bl, 01h
12 mov [si], al
13 inc si
14 mov [si], bl
15 inc si
16 up:
17 mov al, [si-2]
18 mov bl, [si-1]
19 add al, bl
20 mov [si], al
21 inc si
22 loop up
23 mov ah, 4ch
24 int 21h
25 ret
26
27
28
29
30
31
variables
size: byte elements: 1
edit show as: hex
COUNT 000Ah
RES 00h
emulator: noname.com_
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 4C 59
BX 00 37
CX 00 00
DX 00 00
CS F400
IP 0204
SS 0700
SP FFF8
BP 0000
SI 0110
DI 0000
DS 0700
ES 0700
0711:000B
0712:000B
0711B: B3 179
0711C: 01 001
0711D: 88 136
0711E: 04 004
0711F: 46 070 F
07120: 88 136
07121: 1C 028
07122: 46 070 F
07123: 8A 138
07124: 44 068 D
07125: FE 254
07126: 8A 138
07127: 5C 092 \
07128: FF 255 RES
07129: 02 002
0712A: C3 195
0712B: 88 136
0712C: 04 004
0712D: 46 070 F
0712E: E2 226
0712F: F3 243
07130: B4 180
MOV BL, 01h
MOV [SI], AL
INC SI
MOV [SI], BL
INC SI
MOV AL, [SI] - 02h
MOV BL, [SI] - 01h
ADD AL, BL
MOV [SI], AL
INC SI
LOOP 013h
MOV AH, 04Ch
INT 021h
RET
NOP
NOP
NOP
NOP
NOP
NOP
NOP
...
screen source reset aux vars debug stack flags

Descending order:

Code:

```
org 100h
.data
     num dw 0100h, 0155h, 0070h, 0005h
.code
     mov ax,@data
     mov ds, ax
     mov dx, 2
loop2:
     mov cx,dx
     dec cx
     mov si,cx
     add si,si
     mov ax, num[si]
loop1:
     cmp num[si-2], ax
     jnc next
     mov di, num[si-2]
     mov num[si], di
     dec si
     dec si
     dec cx
     jz loop1
next:
     mov num[si], ax
     inc dx
     cmp dx, 4
     jnc loop2
     mov si, offset num
     mov dh,4
     mov ah, 4ch
     INT 21H
ret
```

Output:



Conclusion:

We successfully wrote assembly language programs to arrange blocks of data in ascending and descending order

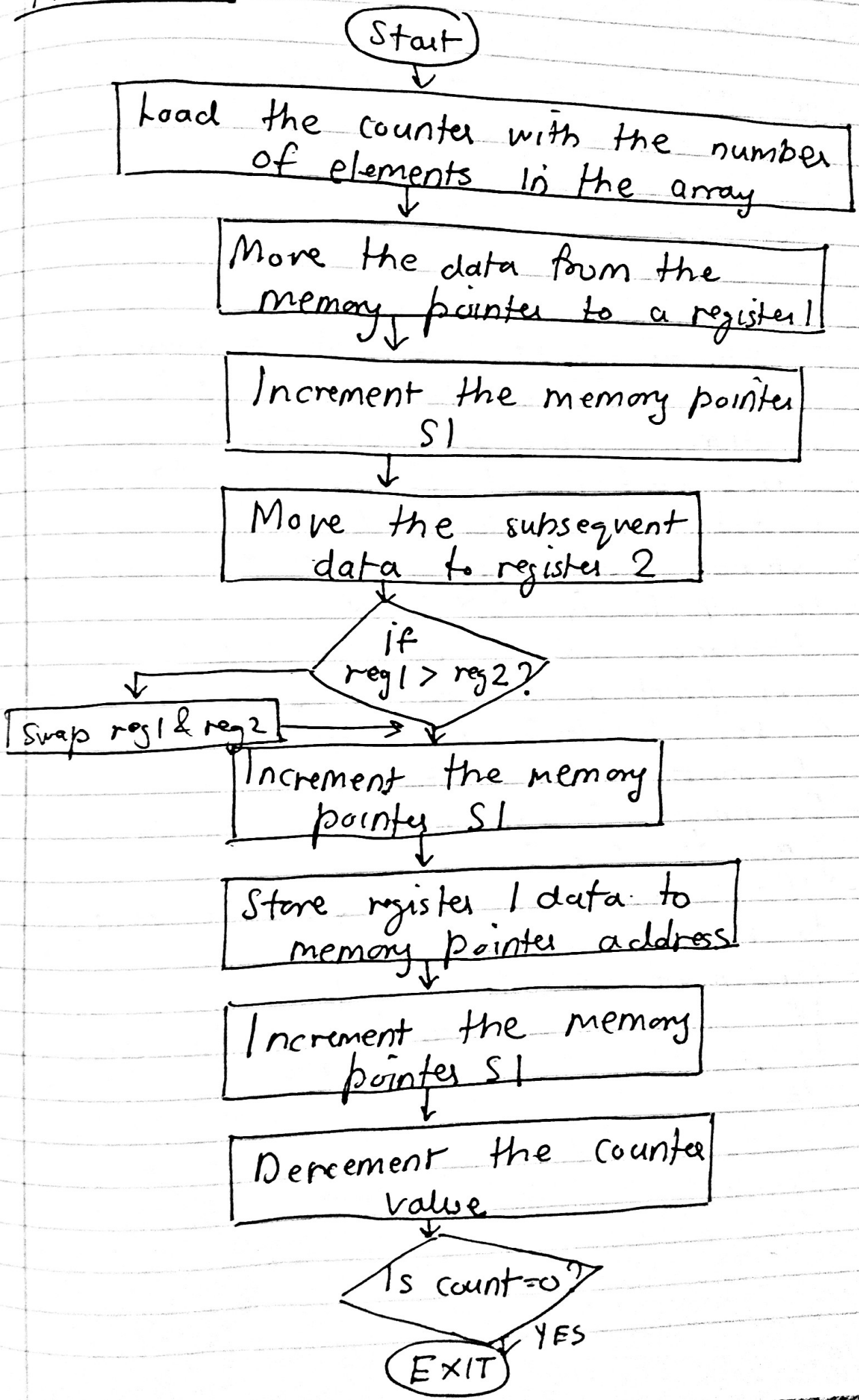
Exp 03

Aim: To arrange the block of data in Ascending order.

Algorithm:

- Initialize counter 1
- Initialize point 1 to first memory location
- Initialize point 2 to second memory location & Initialize counter 2
- Move contents at pointer 1 to AX & Move contents at pointer 2 to BX
- Compare values of AX & BX & Jump to step 12 if AX < BX
- Exchange values of AX & BX
- Set pointer 1 to data in AX and set pointer 2 point to data in BX
- Increment both pointers by 2
- Decrement 2 when not equal to zero jump to step 5
- If counter 2 is not equal to zero jump to step 2
- Halt.

Flow chart:


Start
Load the counter with the number of elements in the array
Move the data from the memory pointer to a register 1
Increment the memory pointer SI
Move the subsequent data to register 2
if reg1 > reg2?
Swap reg1 & reg2
Increment the memory pointer SI
Store register 1 data to memory pointer address
Increment the memory pointer SI
Decrement the counter value
Is count=0?
YES
EXIT

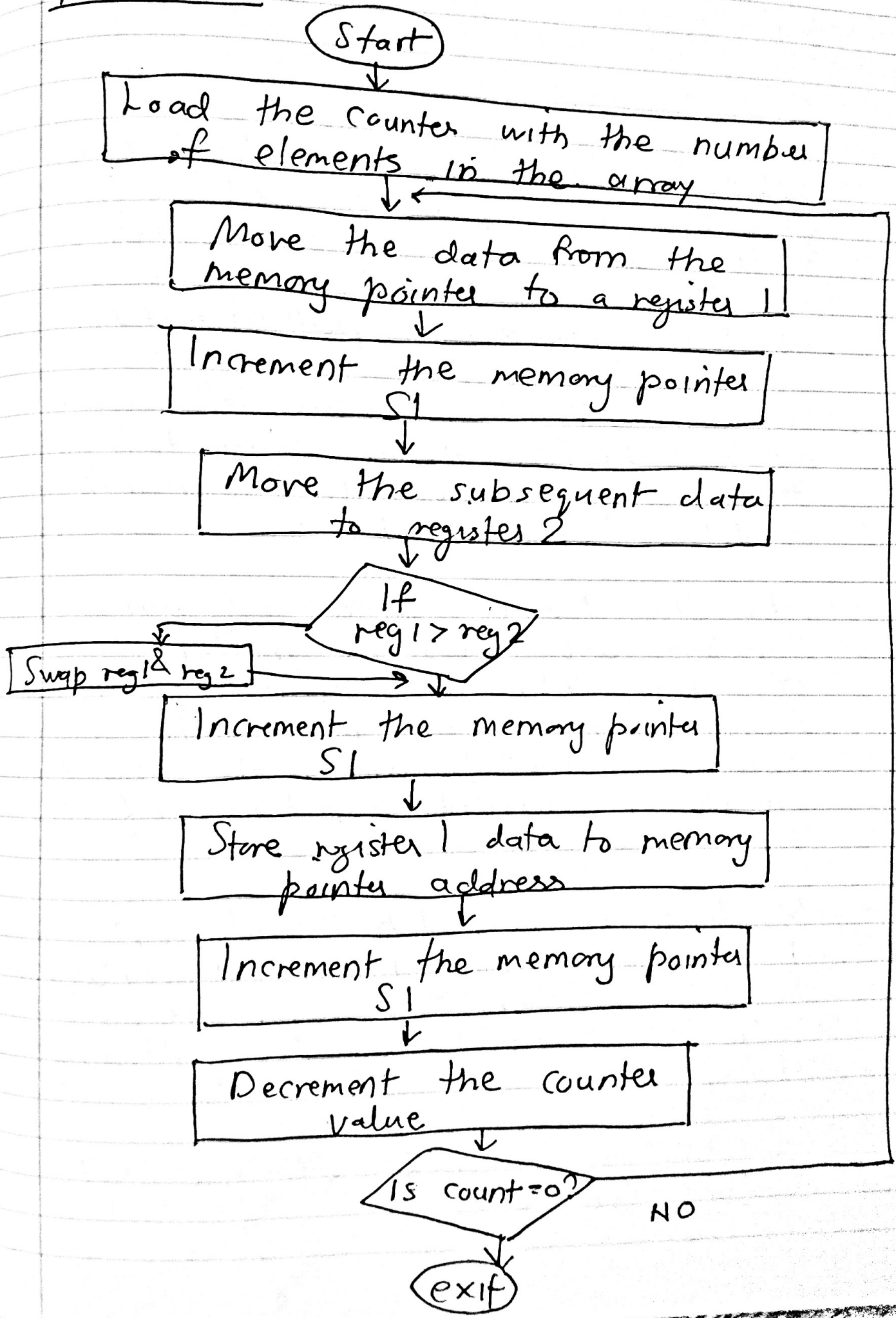
b) Descending order

Aim: To arrange the block of data in Descending order

Algorithm:

- Initialize counter 1
- Initialize point 1 to frist memory location
- Initialize point 2 to second memory location & Initialize counter 2
- Move contents at pointer 1 to AX & Move contents at pointer 2 to BX
- Compare values of AX & BX and Jump to step 12 if AX > BX
- Exchange values of AX & BX
- Set pointer 1 pointer to data in AX & set pointer 2 point to data in BX
- Increment both pointers 2
- Decrement 2 when not equal to zero jump to step 5
- If counter 2 is not equal to zero, jump to step 5
- Decrement counter 1 by 1
- If counter 1 is not equal to zero jump to step 2
- Halt

Flow Chart :


Start
Load the counter with the number of elements in the array
Move the data from the memory pointer to a register 1
Increment the memory pointer SI
Move the subsequent data to register 2
If reg1 > reg2
Swap reg1 & reg2
Increment the memory pointer SI
Store register 1 data to memory pointer address
Increment the memory pointer SI
Decrement the counter value
Is count=0?
NO
exit