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EXPERIMENT NO 10

Title of experiment : Largest and smallest number in an array of data.

Equipment required : GNU Simulator.

Theory :

Algorithm for only smallest number.

1.Load the address of the first element of the array in HL pair.
2. Move the count to B - reg.
3. Increment the pointer.
4. Get the first data in A - reg.
5. Decrement the count.
6. Increment the pointer.
7. Compare the content of memory addressed by HL pair with that of A - reg.
8. If carry = 1, go to step 10 or if Carry = 0 go to step 9.
9. Move the content of memory addressed by HL to A - reg.
10. Decrement the count.
11. Check for Zero of the count. If ZF = 0, go to step 6, or if ZF = 1 go to next step.
12. Store the smallest data in memory.
13. Terminate the program.

Algorithm for only largest number.

1.Load H-L pair with address of first operand's memory location.

2.Move the first operand from memory to accumulator.

3.Increment H-L pair to point to next memory location.

4.Move the second operand from memory to register B.

5.Compare B with A.

If carry?

Yes→Move data from register B to accumulator.

No→Increment H-L pair.

6.Move the result from accumulator to memory.

Program code :

;smallest of n numbers

```
LXI H,1100
MOV C,M
INX H
DCR C
MOV A,M
loop: INX H
CMP M
JC skip
MOV A,M
skip: DCR C
JNZ loop
STA 1109
HLT
```

;largest of n numbers

LXI H,1100

MOV C,M

INX H

DCR C

MOV A,M

loop: INX H

CMP M

JNC skip

MOV A,M

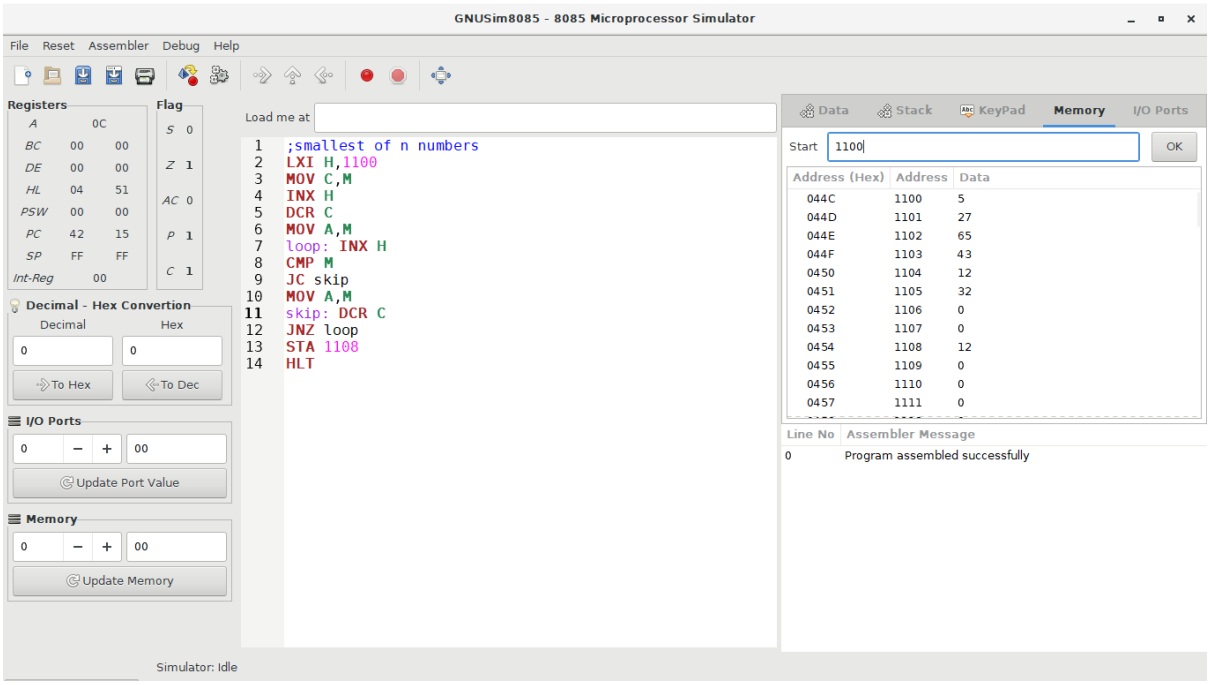
skip: DCR C

JNZ loop

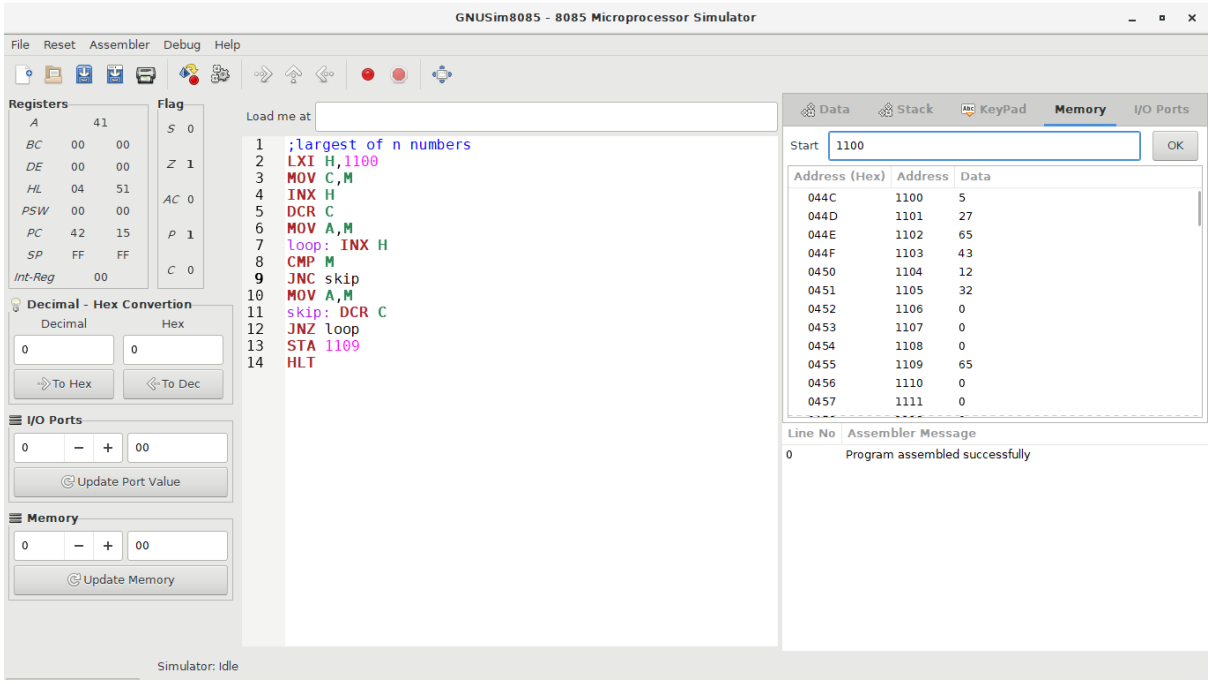
STA 1109

HLT

Smallest of n numbers :



Largest of n numbers :



Conclusion : These are ways to design subtractor and comparator.