

Smallest number of N 8-bit numbers

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SMALLEST NUMBER OF N 8-BIT NUMBERS

AIM

To write an assembly language program to find the smallest of n numbers.

ASSEMBLY LANGUAGE PROGRAM

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C200 LXI H C300 21 ; Load the HL register pair immediately
C201           00 ;
C202           C3 ;
C203 MOV B M    46 ; Move the memory content in to B register
C204 INX H     23 ; Increment the HL register pair
C205 MOV A M   7E ; Move the memory content in the A register
C206 DCR B     05 ; Decrement the B register content
C207 INX H     23 ; Increment the HL register pair
C208 CMP M     BE ; Compare the memory content with the
                accumulator
C209 JC  C20D   DA ; Jump if carry = 1 to C20DH
C20A           0D ;
C20B           C2 ;
C20C MOV A M   7E ; Move the memory content to accumulator
C20D DCR B     05 ; Decrement the B register content
C20E JNZ C207  C2 ; Jump if not zero to C207H
C20F           07 ;
C210           C2 ;
C211 STA  C310 32 ; Store the accumulator at memory location
C212           10 ; C310H
C213           C3 ;
C214 HLT      76 ; Halt the execution

```

EXECUTION - 1

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C300 05 ; Number of input data
C301 A5 ; Input data
C302 33 ; Input data
C303 C6 ; Input data
C304 B7 ; Input data
C305 D8 ; Input data
C310 33 ; Smallest data(Output)

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PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C200	21	LXI H C300	00	00	00	00	00	C3	00	0000	0000 0000
C203	46	MOV B M	00	05	00	00	00	C3	00	0000	0000 0000
C204	23	INX H	00	05	00	00	00	C3	01	0000	0000 0000
C205	7E	MOV A M	A5	05	00	00	00	C3	01	0000	0000 0000
C206	05	DCR B	A5	04	00	00	00	C3	01	0000	0001 0000
C207	23	INX H	A5	04	00	00	00	C3	02	0000	0001 0000
C208	BE	CMP M	A5	04	00	00	00	C3	02	0000	1001 0000
C209	DA	JC C20D	A5	04	00	00	00	C3	02	0000	1001 0000
C20C	7E	MOV A M	33	04	00	00	00	C3	02	0000	1001 0000
C20D	05	DCR B	33	03	00	00	00	C3	02	0000	0001 0100
C20E	C2	JNZ C207	33	03	00	00	00	C3	02	0000	0001 0100
C207	23	INX H	33	03	00	00	00	C3	03	0000	0001 0100
C208	BE	CMP M	33	03	00	00	00	C3	03	0000	0001 0101
C209	DA	JC C20D	33	03	00	00	00	C3	03	0000	0001 0101
C20D	05	DCR B	33	02	00	00	00	C3	03	0000	0001 0001
C20E	C2	JNZ C207	33	02	00	00	00	C3	03	0000	0001 0001
C207	23	INX H	33	02	00	00	00	C3	04	0000	0001 0001
C208	BE	CMP M	33	02	00	00	00	C3	04	0000	0001 0001
C209	DA	JC C20D	33	02	00	00	00	C3	04	0000	0001 0001
C20D	05	DCR B	33	01	00	00	00	C3	04	0000	0001 0001
C20E	C2	JNZ C207	33	01	00	00	00	C3	04	0000	0001 0001
C207	23	INX H	33	01	00	00	00	C3	05	0000	0001 0001
C208	BE	CMP M	33	01	00	00	00	C3	05	0000	0001 0001
C209	DA	JC C20D	33	01	00	00	00	C3	05	0000	0001 0001
C20D	05	DCR B	33	00	00	00	00	C3	05	0000	0101 0101
C20E	C2	JNZ C207	33	00	00	00	00	C3	05	0000	0101 0101
C211	32	STA C310	33	00	00	00	00	C3	05	0000	0101 0101
C214	76	HLT	33	00	00	00	00	C3	05	0000	0101 0101

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
0	1	0	1	0	1	0	1

EXECUTION - 2

C300 03 ; Number of input data
 C301 FF ; Input data
 C302 AB ; Input data
 C303 DE ; Input data
 C310 AB ; Smallest data (O/P)

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C200	21	LXI H C300	00	00	00	00	00	C3	00	0000	0000 0000
C203	46	MOV B M	00	03	00	00	00	C3	00	0000	0000 0000
C204	23	INX H	00	03	00	00	00	C3	01	0000	0000 0000
C205	7E	MOV A M	FF	03	00	00	00	C3	01	0000	0000 0000
C206	05	DCR B	FF	02	00	00	00	C3	01	0000	0001 0000
C207	23	INX H	FF	02	00	00	00	C3	02	0000	0001 0000
C208	BE	CMP M	FF	02	00	00	00	C3	02	0000	1001 0000
C209	DA	JC C20D	FF	02	00	00	00	C3	02	0000	1001 0000
C20C	7E	MOV A M	AB	02	00	00	00	C3	02	0000	1001 0000
C20D	05	DCR B	AB	01	00	00	00	C3	02	0000	0001 0000
C20E	C2	JNZ C207	AB	01	00	00	00	C3	02	0000	0001 0000
C207	23	INX H	AB	01	00	00	00	C3	03	0000	0001 0000
C208	BE	CMP M	AB	01	00	00	00	C3	03	0000	1001 0101
C209	DA	JC C20D	AB	01	00	00	00	C3	03	0000	1001 0101
C20D	05	DCR B	AB	00	00	00	00	C3	03	0000	0101 0101
C20E	C2	JNZ C207	AB	00	00	00	00	C3	03	0000	0101 0101
C211	32	STA C310	AB	00	00	00	00	C3	03	0000	0101 0101
C214	76	HLT	AB	00	00	00	00	C3	03	0000	0101 0101

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
0	1	0	1	0	1	0	1

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