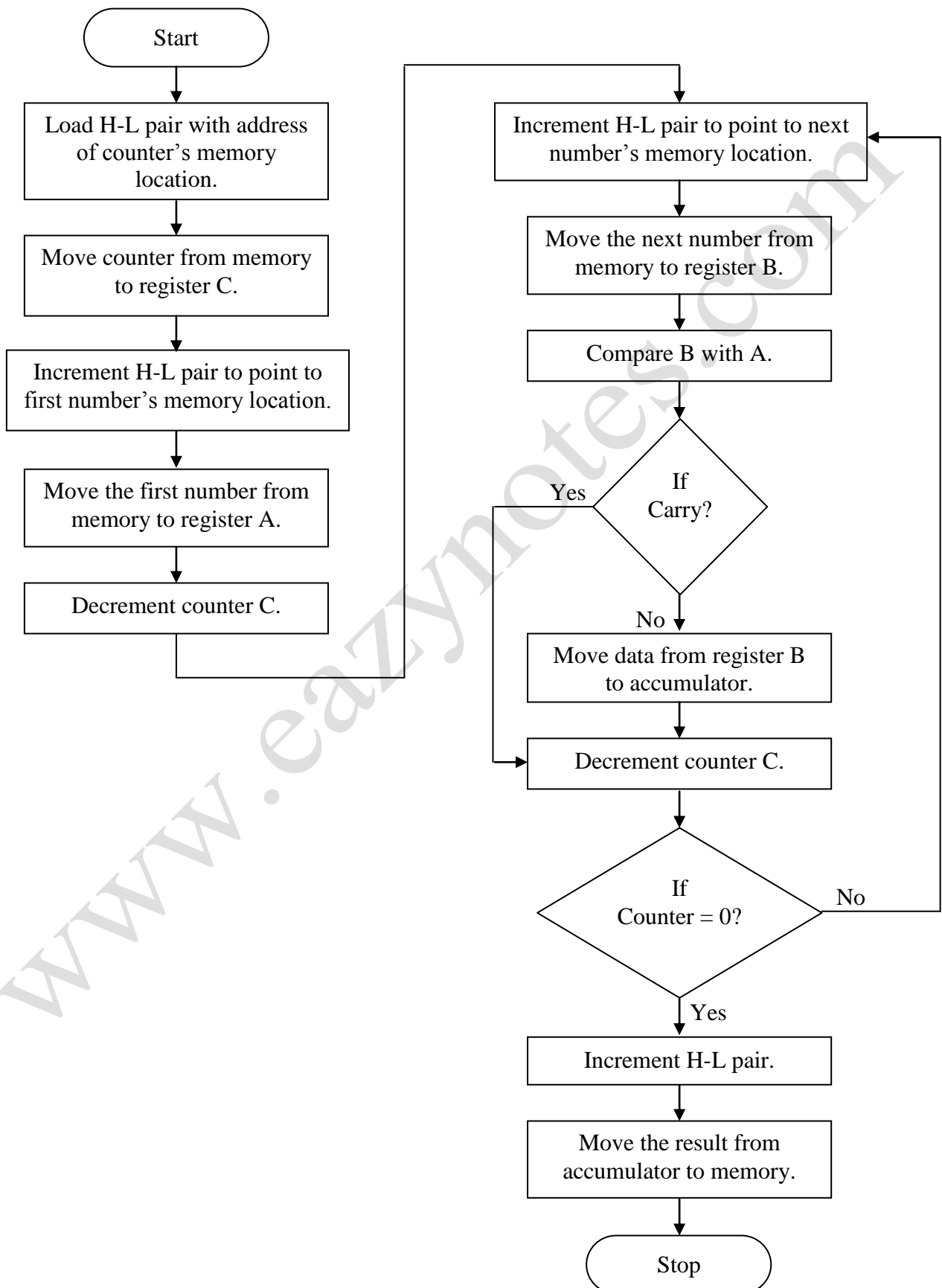


Program 21: Smallest from an array.**Flowchart:**

Program:

Address	Mnemonics	Operand	Opcode	Remarks
2000	LXI	H, 3000H	21	Load H-L pair with address 3000H.
2001			00	Lower-order of 3000H.
2002			30	Higher-order of 3000H.
2003	MOV	C, M	4E	Move counter from memory to reg. C.
2004	INX	H	23	Increment H-L pair.
2005	MOV	A, M	7E	Move the 1 st number from memory to reg. A.
2006	DCR	C	0D	Decrement counter.
2007	INX	H	23	Increment H-L pair.
2008	MOV	B, M	46	Move the next number from memory to reg. B.
2009	CMP	B	B8	Compare B with A.
200A	JC	200EH	DA	Jump to address 200EH if there is no carry.
200B			0E	Lower-order of 200EH.
200C			20	Higher-order of 200EH.
200D	MOV	A, B	78	Move smallest from reg. B to reg. A.
200E	DCR	C	0D	Decrement counter.
200F	JNZ	2007H	C2	Jump to address 2007H if counter is not zero.
2010			07	Lower-order of 2007H.
2011			20	Higher-order of 2007H.
2012	INX	H	23	Increment H-L pair.
2013	MOV	M, A	77	Move the result from reg. A to memory.
2014	HLT		76	Halt.

Explanation:

- This program finds the smallest number in an array.
- Initially, the counter is initialized with the size of an array.
- Then, two numbers are moved to registers A and B, and compared.
- After comparison, the smallest of two must be in accumulator. If it is already in accumulator, then its fine, otherwise it is moved to accumulator.
- Counter is decremented and checked whether it has reached zero. If it has, the loop terminates otherwise, the next number is moved to register and compared.
- Let us assume that the memory location 3000H stores the counter. The next memory locations store the array.
- Initially, H-L pair is loaded with the address of the counter and is moved to register C.
- Then, H-L pair is incremented to point to the first number in the array.

- The first number is moved from memory to accumulator and counter is decremented by one.
- H-L pair is again incremented and second number is moved to register B.
- The two numbers are compared.
- After comparison, if $A > B$, then $CF = 0$, and if $A < B$, then $CF = 1$.
- Carry flag is checked for carry. If there is no carry, it means B is smaller than A and it is moved to accumulator.
- Counter is decremented and checked whether it has become zero.
- If it hasn't become zero, it means there are numbers left in the array. In this case, the control jumps back to increment the H-L pair and moves the next number to register B.
- This process continues until counter becomes zero, i.e. all the numbers in the array are compared.
- At last, H-L pair is incremented and the smallest number is moved from accumulator to memory.

Output:**Before Execution:**

3000H:	05H (Counter)
3001H:	15H
3002H:	01H
3003H:	65H
3004H:	E2H
3005H:	83H

After Execution:

3006H:	01H
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