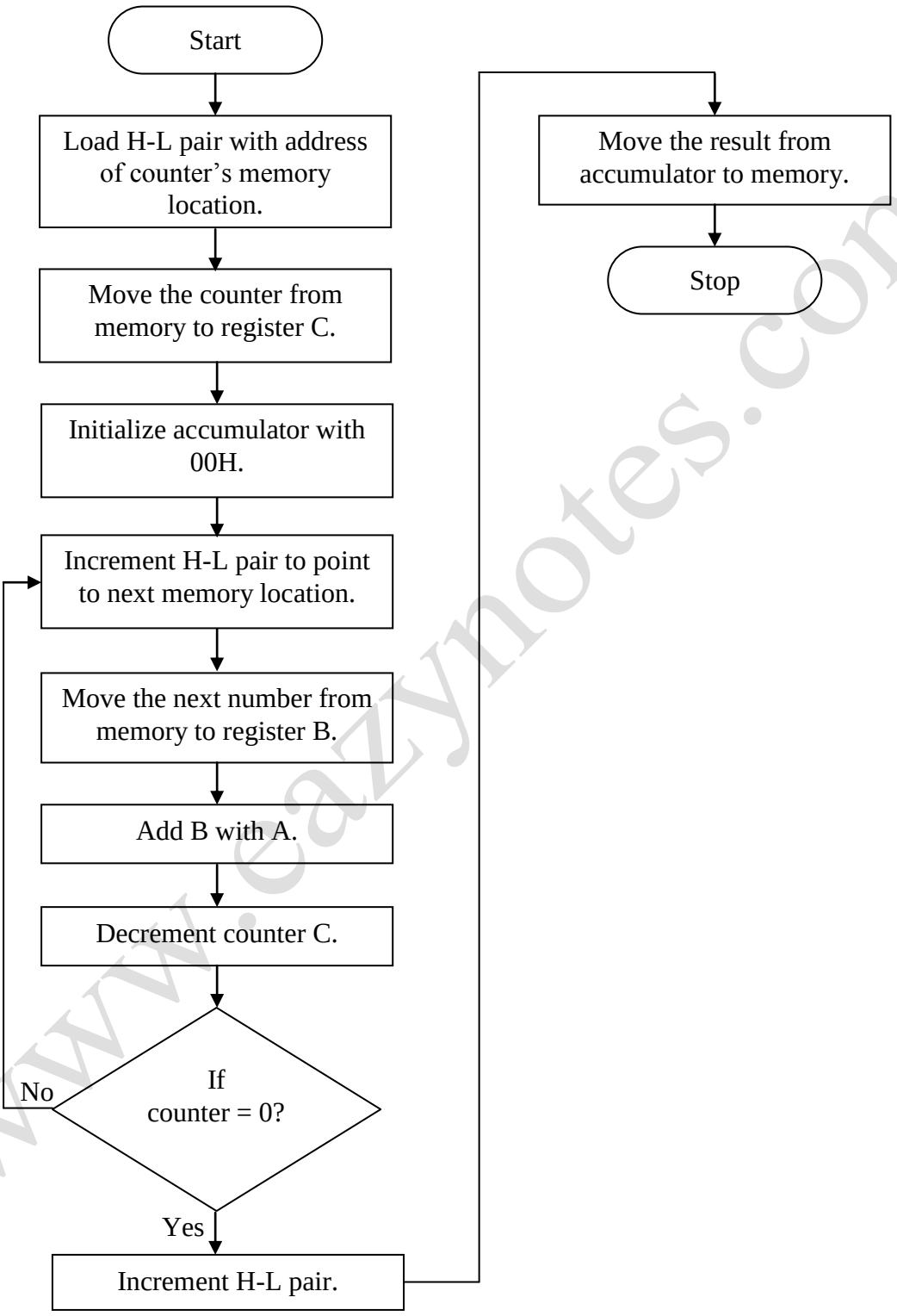
Program 22: Sum of series of 8-bit numbers.

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	MVI	A, 00H	3E	Initialize accumulator with 00H.
2005			00	Immediate value 00H.
2006	INX	H	23	Increment H-L pair.
2007	MOV	B, M	46	Move next number from memory to reg. B.
2008	ADD	B	80	Add B with A.
2009	DCR	C	0D	Decrement counter.
200A	JNZ	2006H	C2	Jump to address 2006H if counter is not zero.
200B			06	Lower-order of 2006H.
200C			20	Higher-order of 2006H.
200D	INX	H	23	Increment H-L pair.
200E	MOV	M, A	77	Move the result from reg. A to memory.
200F	HLT		76	Halt.

Explanation:

- This program finds the sum of numbers in an array.
- In order to find the sum of numbers, first the counter must be initialized with the size of an array and accumulator must be initialized to zero.
- Then, first number is moved to register B and added with accumulator.
- After addition, the counter is decremented and checked whether it has reached zero. If it has, the loop terminates otherwise, the next number is moved to register B and added.
- 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.
- Accumulator is initialized with 00H.
- Then, H-L pair is incremented to point to the first number in the array and it is moved to register B.
- Register B is added with accumulator and the result is stored in accumulator.
- Then, 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 added.
- At last, H-L pair is incremented and the result is moved from accumulator to memory.

Output:

Before Execution:

3000H:	05H (Counter)
3001H:	02H
3002H:	04H
3003H:	03H
3004H:	02H
3005H:	01H

After Execution:

3006H:	0CH