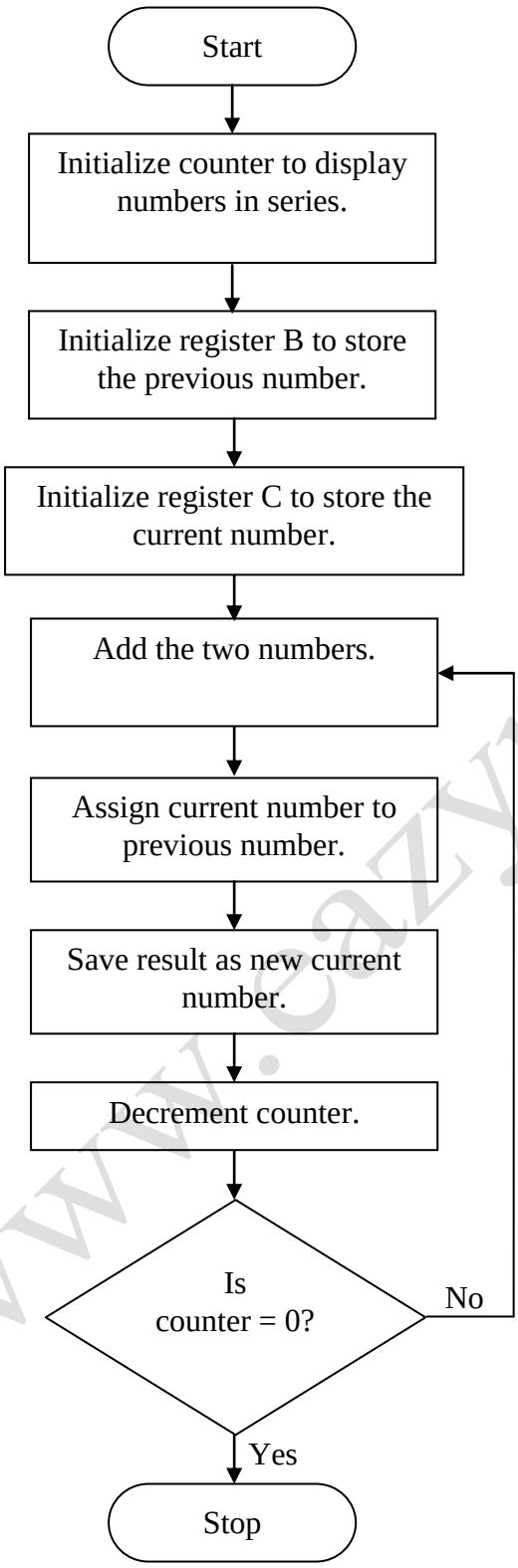
Program 27: Generation of Fibonacci series.

Flowchart:



Program:

Address	Mnemonics	Operand	Opcode	Remarks
2000	MVI	D, 08H	16	Initialize counter to display numbers in series.
2001			08	Immediate value 07H.
2002	MVI	B, 00H	06	Initialize reg. B to store previous number.
2003			00	Immediate value 00H.
2004	MVI	C, 01H	0E	Initialize reg. C to store current number.
2005			01	Immediate value 01H.
2006	LXI	H, 3000H	21	Initialize H-L pair to point to memory.
2007			00	Lower-order of 3000H.
2008			30	Higher-order of 3000H.
2009	MOV	M, B	70	Move 00H from reg. B to memory.
200A	INX	H	23	Increment H-L pair.
200B	MOV	M, C	71	Move 01H from reg. C to memory.
200C	MOV	A, B	78	Move previous number from reg. B to reg. A.
200D	ADD	C	81	Add the two numbers.
200E	MOV	B, C	41	Assign current number to previous number.
200F	MOV	C, A	4F	Save result as new current number.
2010	INX	H	23	Increment H-L pair.
2011	MOV	M, A	77	Move number from reg. A to memory.
2012	DCR	D	15	Decrement counter.
2013	JNZ	200DH	C2	Jump to address 200DH if counter is not zero.
2014			0D	Lower-order of 200DH.
2015			20	Higher-order of 200DH.
2016	HLT		76	Halt.

Explanation:

- This program generates the Fibonacci series. The Fibonacci series is:

  0 1 1 2 3 5 8 13 21 34

- In hexadecimal, it will be:

  00 01 01 02 03 05 08 0D 15 22

- The first two numbers of the series are 0 and 1. The third number is computed as 0 + 1 = 1, fourth number is 1 + 1 = 2, fifth number is 1 + 2 = 3 and so on.
- The count is initialized in register D to display the numbers in series.
- Initialize register B to first number 00H and register C to second number 01H.
- Initialize H-L pair to point to memory location 3000H.

- Move the first two numbers from registers B and C to memory locations 3000H and 3001H.
- Add the two numbers and store the result as first number.
- Increment H-L pair and move the result from accumulator to memory location.
- The next term is then computed by making the result equal to previous number.
- The process is repeated until all the numbers are calculated.

Output:

After Execution:

3000H:	00H
3001H:	01H
3002H:	01H
3003H:	02H
3004H:	03H
3005H:	05H
3006H:	08H
3007H:	0DH
3008H:	15H
3009H:	22H