

## EXPERIMENT 3

### Aim :

Write a program to Add 16-bit Numbers.

### Requirements :

8085 Simulator IDE Software.

### Procedure :

1. Go to the tools and select assembler. Write the code in assembler window.
2. Go to the tools and select assemble & load in assembler window or press F8.
3. Check for errors and fix them.
4. Go to 8085 Simulator IDE and open simulation and start or press F1.
5. Open memory editor from tools option. Enter the 1<sup>st</sup> value at the memory location defined by LHL D.
6. Again open simulation and start or press F1.
7. Open memory editor from tools option. Enter the 2<sup>nd</sup> value at the memory location defined by LHL D.
8. Again open simulation and start or press F1.
9. Again open memory editor to observe the final result.

### Program to Add 16-bit Numbers :

<u>Address</u>	<u>Mnemonics</u>	<u>Operands</u>	<u>Comments</u>
0000H	MVI C	00H	Initialize register C with 00H to store carry
0002H	LHLD	0050H	Load H-L pair with 1 <sup>st</sup> value from memory location 0050H
0005H	XCHG		Exchange contents of H-L pair with D-E pair
0006H	LHLD	0060H	Load H-L pair with 2 <sup>nd</sup> value from memory location 0060H
0009H	DAD D		Add register pair D-E with H-L & store the result in H-L
000AH	JNC	000EH	If carry is present , go to next step else go to 000EH
000DH	INR C		Increment register C by 1
000EH	SHLD	0070H	Store the value of H-L pair at memory location 0070H
0011H	MOV A , C		Move the content of register C to Accumulator
0012H	STA	0080H	Store the value of Accumulator at memory location 0080H
0015H	HLT		End of program

### Screenshots :

```
0001      MVI C , 00H
0002      LHLD 0050H
0003      XCHG
0004      LHLD 0060H
0005      DAD D
0006      JNC 000EH
0007      INR C
0008      SHLD 0070H
0009      MOV A , C
0010      STA 0080H
0011      HLT
```

```
0001 0001 0000 0E 00      MVI C , 00H
0002 0002 0002 2A 50 00    LHLD 0050H
0003 0003 0005 EB          XCHG
0004 0004 0006 2A 60 00    LHLD 0060H
0005 0005 0009 19          DAD D
0006 0006 000A D2 0E 00    JNC 000EH
0007 0007 000D 0C          INR C
0008 0008 000E 22 70 00    SHLD 0070H
0009 0009 0011 79          MOV A , C
0010 0010 0012 32 80 00    STA 0080H
0011 0011 0015 76          HLT
0012 0012 0016
0013 0013 0016
0014 Number of errors = 0
```

**Output :**

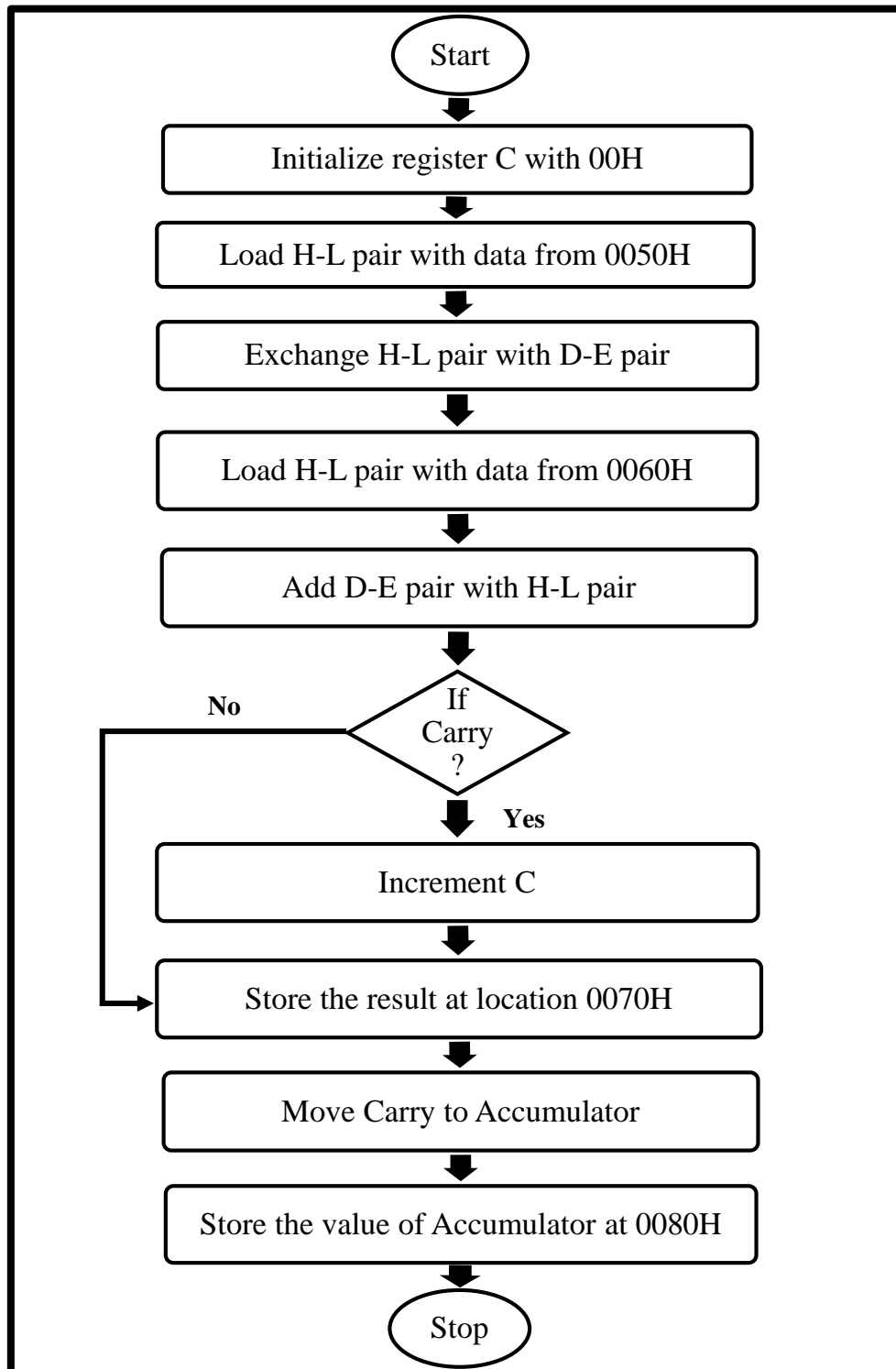
<u>Before Execution</u>		<u>After Execution</u>			
1 <sup>st</sup> value (at 0050H) :					
H	L	Result of Addition (at 0070H)		97H (0071H)	37H (0070H)
9BH	7EH				
2 <sup>nd</sup> value (at 0060H) :					
H	L	Carry (at 0080H)		00H (0081H)	01H (0080H)
FBH	B9H				

The screenshot shows the 8085 Simulator IDE interface. The menu bar includes File, Simulation, Rate, Tools, Options, and Help. The Program Location is set to C:\Program Files\8085 Simulator IDE\ADD\w\w.obj. The Last Instruction and Next Instruction are both HLT. The Program Status Word shows A=01, F=2B. The Main Registers show B=FF, C=01, D=9B, E=7E. The Data Pointer shows H=97, L=37, and (HL)=00. The Simulation Statistics show Clock Cycles Counter at 102 and Instructions Counter at 11. The Program Counter and Stack Pointer show PC=0015 and SP=FFFF. The Flag Register shows S=0, Z=0, AC=1, P=0, CF=1. The Interrupt Control section includes buttons for RESET, TRAP, RST 7.5, RST 6.5, RST 5.5, and INTR.

The screenshot shows the Memory Editor window. The address range 0 to F is displayed at the top. The memory contents are shown in a table format. The address 0050 is highlighted in yellow, and the value 7E 9B is shown. The address 0060 is highlighted in yellow, and the value B9 FB is shown. The address 0070 is highlighted in yellow, and the value 37 97 is shown. The address 0080 is highlighted in yellow, and the value 01 00 is shown.

Address	Value
0000	0E 00 2A 50 00 EB 2A 60 00 19 D2 0E 00 0C 22 70
0010	00 79 32 80 00 76 00 00 00 00 00 00 00 00 00 00
0020	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0030	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0040	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0050	7E 9B 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0060	B9 FB 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0070	37 97 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0080	01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0090	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00A0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00B0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00C0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00D0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00E0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00F0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

**Flow Chart :**



**Result :**

Program to Add 16-bit Numbers was implemented successfully.