

16-BIT MULTIPLICATION

EXP7:

AIM: To write an assembly language program to implement 16-bit multiplication using 8085 processor.

ALGORITHM:

- 1) Load the first data in HL pair.
- 2) Move content of HL pair to stack pointer.
- 3) Load the second data in HL pair and move it to DE.
- 4) Make H register as 00H and L register as 00H.
- 5) ADD HL pair and stack pointer.
- 6) Check for carry if carry increment it by 1 else move to next step.
- 7) Then move E to A and perform OR operation with accumulator and register D.
- 8) The value of operation is zero, then store the value else go to step 3.

PROGRAM:

```
LHLD 2050
SPHL
LHLD 2052
XCHG
LXI H,0000H
LXI B,0000H
AGAIN: DAD SP
JNC START
INX B
START: DCX D
MOV A,E
ORA D
JNZ AGAIN
SHLD 2054
MOV L,C
MOV H,B
SHLD 2055
HLT
```

INPUT:

Start: 2050 OK

Address (Hex)	Address	Data
0802	2050	45
0803	2051	7
0804	2052	99
0805	2053	16
0806	2054	103
0807	2055	117
0808	2056	0
0809	2057	0
080A	2058	0
080B	2059	0
080C	2060	0
080D	2061	0
080E	2062	0
080F	2063	0
0810	2064	0

Line No Assembler Message

0 Program assembled successfully

OUTPUT:

GNUSim8085 - 8085 Microprocessor Simulator

File Reset Assembler Debug Help

Registers: A 00, BC 00 75, DE 00 00, HL 00 75, PSW 00 00, PC 42 22, SP 07 2D, Int-Reg 00. Flag: S 0, Z 1, AC 0, P 1, C 0.

Decimal - Hex Conversion: 0 To Hex, 0 To Dec.

I/O Ports: 0 To Hex, 0 To Dec.

Memory: 0 To Hex, 0 To Dec.

Load me at: 1 LALD 2050, 2 RDHL, 3 LALD 2052, 4 XCHG, 5 LRI H, 0000H, 6 LRI B, 0000H, 7 AGAIN: DAD BP, 8 JNC START, 9 INC B, 10 START: DCR D, 11 MOV A, B, 12 ORA D, 13 JNZ AGAIN, 14 SHLD 2054, 15 MOV L, C, 16 MOV B, B, 17 SHLD 2052, 18 HLT.

Start: 2050 OK

Address (Hex)	Address	Data
0802	2050	45
0803	2051	7
0804	2052	99
0805	2053	16
0806	2054	103
0807	2055	117
0808	2056	0
0809	2057	0
080A	2058	0
080B	2059	0
080C	2060	0
080D	2061	0
080E	2062	0
080F	2063	0
0810	2064	0

Line No Assembler Message

0 Program assembled successfully

Simulator: Idle

RESULT: Thus the program was executed successfully using 8085 processor simulator.