

## **FACTORIAL OF A GIVEN NUMBER**

**EXP NO: 9**

**AIM:** To find the factorial of a given number using 8085 microprocessor.

### **ALGORITHM:**

- 1) Load the data into register B
- 2) To start multiplication set D to 01H
- 3) Jump to step 7
- 4) Decrements B to multiply previous number
- 5) Jump to step 3 till value of B>0
- 6) Take memory pointer to next location and store result
- 7) Load E with contents of B and clear accumulator
- 8) Repeatedly add contents of D to accumulator E times
- 9) Store accumulator content to D
- 10) Go to step 4

### **PROGRAM:**

```
LDA 2001
MOV B,A
MVI C,#01
MVI E,#01
LOOP: MOV D,C
MVI A,00H
LP: ADD E
DCR D
JNZ LP
MOV E,A
INR C
DCR B
JNZ LOOP
```

MOV A,E  
STA 2010  
HLT

**INPUT:**

2001-7

**OUTPUT:**

The screenshot displays the 8085 processor simulator interface. The main window shows the assembly code being executed:

```
1 LDA 2001
2 MOV B,A
3 MVI C,#01
4 MVI E,#01
5 LOOP: MOV D,C
6 MVI A,00H
7 LP: ADD E
8 DCR D
9 JNZ LP
10 MOV E,A
11 INR C
12 DCR B
13 JNZ LOOP
14 MOV A,E
15 STA 2010
16 HLT
```

On the left, the registers window shows the following values:

Register	Value
A	B0
BC	00 08
DE	00 B0
HL	00 00
PSW	00 00
PC	42 1B
SP	FF FF
Int-Reg	00

The flag window shows the following values:

Flag	Value
S	0
Z	1
AC	0
P	1
C	1

The memory window shows the following values:

Address (Hex)	Address	Data
07D1	2001	7
07D2	2002	0
07D3	2003	0
07D4	2004	0
07D5	2005	0
07D6	2006	0
07D7	2007	0
07D8	2008	0
07D9	2009	0
07DA	2010	176
07DB	2011	0
07DC	2012	0
07DD	2013	0
07DE	2014	0

The I/O Ports window shows the following values:

Port	Value
0	- + 00

The Memory window shows the following values:

Memory	Value
0	- + 00

The Assembler Message window shows the following message:

```
Line No Assembler Message
0 Program assembled successfully
```

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