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### **Experiment - 8**

**AIM: Study of implementation of Recursion in assembly language.**

**Program to find Factorial:**

**Write your code here:**

DATA\_HERE SEGMENT

N DB 03H ;; FACTORIAL OF 3=3\*2=6 //SHOULD BE DISPLAYED IN O/P

FACT DW ?

DATA\_HERE ENDS

STACK\_HERE SEGMENT

DW 50 DUP(0)

STACK\_TOP LABEL WORD

STACK\_HERE ENDS

CODE\_HERE SEGMENT

ASSUME CS:CODE\_HERE, DS:DATA\_HERE, SS:STACK\_HERE

START:

MOV AX, DATA\_HERE

MOV DS, AX

MOV AX, STACK\_HERE

MOV SS, AX

MOV SP, OFFSET STACK\_TOP

MOV AX, 1

MOV BL, N

MOV BH, 0

CALL FACTORIAL

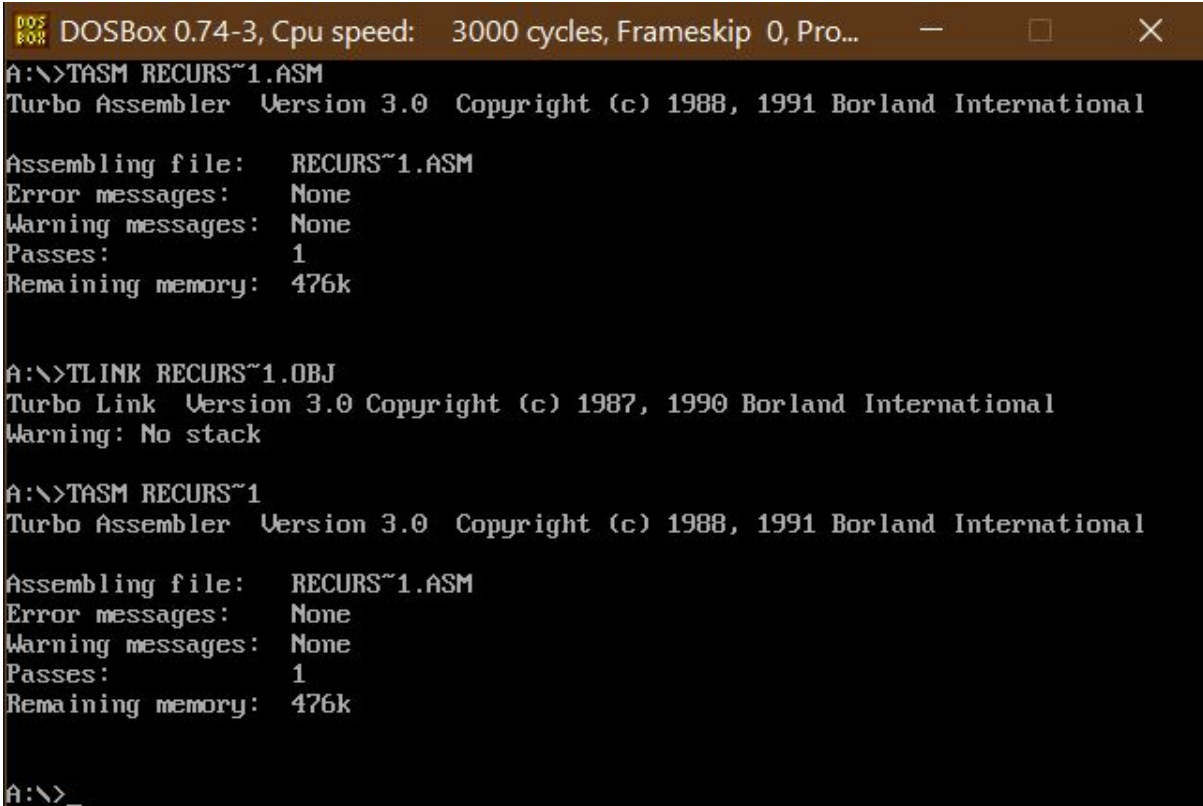
```
MOV FACT, AX
INT 3H

FACTORIAL PROC
CMP BX, 1
JE L1
PUSH BX
DEC BX
CALL FACTORIAL
POP BX
MUL BX

L1:    RET
FACTORIAL ENDP
CODE_HERE ENDS
END START
```

**Compilation /Running and Debugging steps:**

(As given in lab manual as an example of multiplication program on page no:5 of lab manual)



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Pro...
A:\>TASM RECURS~1.ASM
Turbo Assembler Version 3.0 Copyright (c) 1988, 1991 Borland International

Assembling file: RECURS~1.ASM
Error messages: None
Warning messages: None
Passes: 1
Remaining memory: 476k

A:\>TLINK RECURS~1.OBJ
Turbo Link Version 3.0 Copyright (c) 1987, 1990 Borland International
Warning: No stack

A:\>TASM RECURS~1
Turbo Assembler Version 3.0 Copyright (c) 1988, 1991 Borland International

Assembling file: RECURS~1.ASM
Error messages: None
Warning messages: None
Passes: 1
Remaining memory: 476k

A:\>_
```

```

A:\>DEBUG RECURS~1.EXE
-U
0772:0000 B86A07      MOV     AX,076A
0772:0003 8ED8        MOV     DS,AX
0772:0005 B86B07      MOV     AX,076B
0772:0008 8ED0        MOV     SS,AX
0772:000A BC6400      MOV     SP,0064
0772:000D B80100      MOV     AX,0001
0772:0010 8A1E0000     MOV     BL,[0000]
0772:0014 B700        MOV     BH,00
0772:0016 E80400      CALL    001D
0772:0019 A30100      MOV     [0001],AX
0772:001C CC          INT     3
0772:001D 83FB01      CMP     BX,+01
-G=0000

AX=0006  BX=0003  CX=00AB  DX=0000  SP=0064  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=076B  CS=0772  IP=001C  NU UP EI PL NZ NA PE NC
0772:001C CC          INT     3
_

```

### Output:

Screenshots of the output.

```

-G=0000

AX=0006  BX=0003  CX=00AB  DX=0000  SP=0064  BP=0000  SI=0000  DI=0000
DS=076A  ES=075A  SS=076B  CS=0772  IP=001C  NU UP EI PL NZ NA PE NC
0772:001C CC          INT     3
_

```