

## Assignment 11

**TITLE :** Implement x86 program to find the factorial of a number.

**CODE:**

```
%macro scall 4 ;macro for read/write system
call mov rax,%1 mov rdi,%2 mov rsi,%3 mov
rdx,%4 syscall
%endmacro

;----- DATA SECTION -----
-Section .data title:db "----- Factorial Program ---
---",0x0A
db "Enter Number : ",0x0A
title_len: equ $-title factMsg: db
"Factorial is :", 0x0A
factMsg_len: equ $-factMsg cnt:
db 00H cnt2:db 02H num_cnt:
db 00H

;----- BSS SECTION -----
Section .bss number:resb 2 factorial:resb 8

;----- TEXT SECTION -----
Section .text global _start _start:
scall 1,1,title,title_len scall 0,0,number,2
mov rsi,number ;convert no.from ascii to
hex call AtoH ;converted number is stored
in "bl" mov rax,rbx FACTORIAL: cmp
rax,01H jbe exit;;code to complete call
fact_proc mov rbx,rax mov rdi,factorial call
HtoA_value
scall 1,1,factorial,8
;Exit System call
exit:
mov rax,60
mov rdi,0
syscall

;----- FACT PROCEDURE -----
fact_proc:
```

```

cmp bl,01H
jne do_calc
mov ax,1 ret
do_calc:
push rbx dec
bl call
fact_proc
pop rbx mul
bl
ret

```

;----- ASCII to HEX Conversion Procedure -----

```

-AtoH: ;result hex no is in bl mov byte[cnt],02H mov bx,00H hup:
rol bl,04 mov al,byte[rsi] cmp al,39H JBE HNEXT SUB al,07H
HNEXT:
sub al,30H
add bl,al
INC rsi
DEC byte[cnt]
JNZ hup
ret

```

;-----HEX TO ASCII CONVERSION METHOD FOR VALUE(2 DIGIT) -----

```

HtoA_value: ;hex_no to be converted is in ebx //result is stored in rdi/user defined
variable mov byte[cnt2],08H aup1: rol ebx,04 mov cl,bl and cl,0FH CMP CL,09H jbe
ANEXT1 ADD cl,07H ANEXT1:
add cl, 30H
mov
byte[rdi],cl
INC rdi dec
byte[cnt2] JNZ
aup1 ret

```

## OUTPUT:

A terminal window titled 'stes@stes: ~' with standard window controls. The terminal shows the compilation and execution of a program. The user runs 'nasm -f elf64 Exp11.asm', then 'ld -o Exp11 Exp11.o', and finally './Exp11'. The program outputs '----- Factorial Program -----', prompts 'Enter Number :', and the user enters '12'. The program then outputs '00000000' before returning to the shell prompt. The prompt '(base)' is visible on the first three lines.

```
(base) stes@stes:~$ nasm -f elf64 Exp11.asm
(base) stes@stes:~$ ld -o Exp11 Exp11.o
(base) stes@stes:~$ ./Exp11
----- Factorial Program -----
Enter Number :
12
00000000(base) stes@stes:~$
(base) stes@stes:~$
```