MICROPROCESSOR ASSIGNMENTS

NAME : SHRIRANG. R. MHALGI

CLASS : S.E.

DIVISION : B

ROLL NO 222006

PROBLEM STATEMENT :

Write x86 ALP to find the factorial of a given integer number on a command line by using recursion. Explicit stack manipulation is expected in the code.

CODE :

%macro scall 4

mov rax, %1

mov rdi, %2

mov rsi, %3

mov rdx, %4

syscall

%endmacro

;----------

section .data

m1 db "Enter the number : "

m1\_l equ $-m1

m2 db "Factorial of given number is : "

m2\_l equ $-m2

m3 db "Factorial of given number : 00000001",10

m3\_l equ $-m3

;----------

section .bss

num resb 8

ans resb 16

;----------

section .data

global \_start

\_start:

scall 1,1,m1,m1\_l

scall 0,0,num,9

call accept

mov eax,ebx

cmp rax,01

jbe label

call factorial

call display

jmp exit

label : scall 1,1,m3,m3\_l

jmp exit

;------------ exit ------------------

exit:

mov rax,60

mov rdi,0

syscall

;------------ factorial --------------

factorial :

cmp rax,01

je recton1

push rax

dec rax

call factorial

recton : pop rbx

mul ebx

jmp ret\_p

recton1: pop rbx

jmp recton

ret\_p : ret

; -------------- accept ---------------

accept:

mov rsi,num

mov eax,0

mov ebx,0

mov rcx,8

back : rol ebx,4

mov al,[rsi]

cmp al,39h

jbe next

sub al,07h

next : sub al,30h

add ebx,eax

inc rsi

dec rcx

jnz back

ret

;---------------- display----------------

display:

mov rcx,8

mov rbx,ans

back1 : rol eax,4

mov dl,al

and dl,0Fh

cmp dl,09h

jbe next1

add dl,07h

next1 : add dl,30h

mov [rbx],dl

inc rbx

dec rcx

jnz back1

scall 1,1,m2,m2\_l

scall 1,1,ans,8

ret

OUTPUT :

