SOURCE CODE

NAME: PRIYANKA SURESH SALUNKE
CLASS: SE COMPUTER 1
PRN: F19111151

```
;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.



%macro print 2
mov rax,1
mov rdi, 1
mov rsi, %1
mov rdx, %2
syscall
%endmacro



;Macro to exit from Program
%macro exitprog 0
mov rax, 60
xor rdi,rdi
syscall
%endmacro

;Macro to accept input
%macro gtch 1
mov rax, 0
mov rdi, 0
mov rsi, %1
mov rdx, 1
syscall
%endmacro
```

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```
section .data

nwline db 10

m0 db 10,13,"Program to calculate factorial of a given number",10,10

l0 equ $-m0

m2 db 10,"Enter Number (2 digit HEX no) : "

l2 equ $-m2

m4 db 10,"The factorial is : "

l4 equ $-m4

factorial  dq 1



section .bss

no1 resq 1

input resb 1

output resb 1


section .text

global _start

_start :


print m0,l0


print m2,l2    ; Display message

call getnum


mov [no1],rax     ; Accept number

gtch input                    ;To read and discard ENTER key pressed.


mov rcx,[no1]
```

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```
call facto

mov rax,00


print m4,l4

mov rax, qword[factorial]


call disphx16       ; displays a 8 digit hex number  in rax



exitprog



facto:

push rcx

cmp rcx,01

jne ahead

jmp exit2



ahead:  dec rcx


call facto


exit2:    pop rcx

          mov rax,rcx

          mul qword[factorial]

          mov qword[factorial],rax

ret
```

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```
; Procedure to get a 2 digit hex no from user

; number returned in rax


getnum:

mov cx,0204h

mov rbx,0


ll2:

push rcx            ; syscall destroys rcx. Rest all regs are preserved

gtch input

pop rcx

mov rax,0

mov al,byte[input]

sub rax,30h

cmp rax,09h

jbe skip1

sub rax,7



skip1:

shl rbx,cl

add rbx,rax

dec ch

jnz ll2

mov rax,rbx

ret


disphx16:   ; displays a 16 digit hex number passed in rax

mov rbx,rax

mov cx,1004h    ;16 digits to display and 04 count to rotate
```

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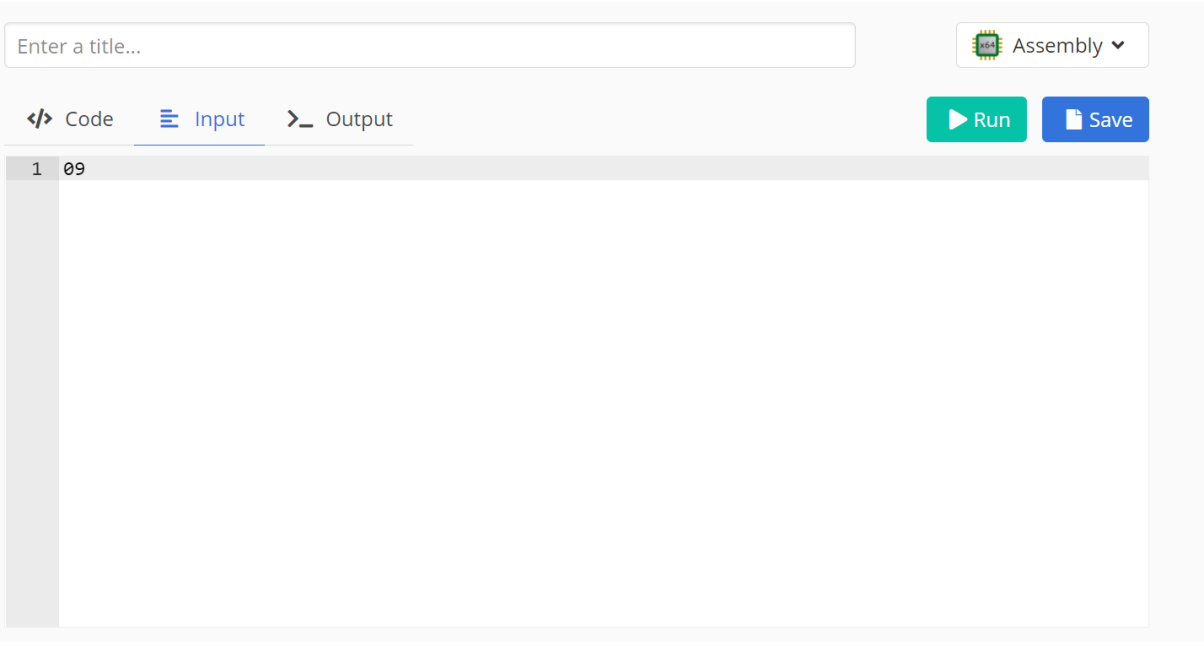
```
ll6:

rol rbx,cl

mov rdx,rbx

and rdx,0fh

add rdx,30h

cmp rdx,039h

jbe skip4

add rdx,7


skip4:

mov byte[output],dl

push rcx

print output,1

pop rcx

dec ch

jnz ll6

ret
```

INPUT:



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OUTPUT: