Assignment No. 8

Assignment No. 9

Title: find factorial of given number

problem statement -

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

Objective -

To understand how to use stack segment for recursion.

Outcome =

student will study recursion using stack in ALP.

s/w & h/w used:

core dual: i3/i5/i7
os linux 32/64 bit
editor: gedit
Assembler: NASM
debugger: gdB

theory:-

PUSH - push operand onto the stack

push decrements the stack pointer by 2 if operand size - attribute of the instruction is 16-bit, otherwise it decrements stack pointer by 4 push the places the operand on the new top of stack which is pointed to by stack pointer.

The 80386 push esp instruction pushes the value of esp as it existed before the instruction This differs from the 8086, where push sp pushes new value. (decrement by 2)

POP → pop word from the stack.

pop replaces the previous contents of the memory, the register or the segment register operand with, addressed by SS:sp (address. size attribute of 16-bit) SS: ESP (address size, attribute of 32-bit.

Stack pointer SP is incremented by 2 for an operand size of 16-bit or by 4 for an operand size of 32-bit factorial

product of all positive integer less than or equal to given positive integer

e.g. 5 f = 5×4×3×2×1 = 120

Algorithm :

i) start

ii) Accept the number from user

iii) convert the number into hex

iv) compare accepted number with 1. if it is equal to 1 to goto step 5 else push the number on stack & decrement the number & goto step 4

v) pop content of stack & multiply with number

vi) Repeat step until stack become empty.

vii) convert the number from hex to ascii

viii) print the number

ix) end.

Conclusion :-

In this way we studied the use of Stack & recursively find the factorial of number with stack operation (push & pop)