National University of Computer and Emerging Sciences

Lab Manual

"Subroutines"

COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE

Course Instructor	Miss Aleena Ahmed
Lab Instructor(s)	Maham Saleem
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Department of Computer Science
FAST-NU, Lahore, Pakistan

Task 1

Dry run the code given in q1.asm, and answer the questions asked in comments. You are not allowed to run the code in debugger.

Task 2

See sum_sub_routine.asm file.

1. In this file, there is a sub routine that takes as parameter the address of array and the number of elements in it.
2. The sub routine finds the sum of elements and stores the sum in memory.
3. This routine is using some registers such as bx, bp, ax, cx for the task. When the routine exits, the values of these registers are not the original values.

To Do: Change the sub routine so that the original values of these register (those registers that are used by the routine) is unchanged after running the routine. You must not use memory for storing the registers; also, you are not allowed to change the logic. The program must run fine after you have added your own code (Hint: Temporarily push the registers on the stack and pop them before returning from the routine. Do not use pusha / popa instructions).

Task 3:

Write the sub-routine to calculate factorial. The sub-routine should take as parameter the number to calculate the factorial and returns factorial in AX register.

Task 4:

Write a sub-routine power that takes as parameter x and y and returns the answer of x raise to the power of y in AX register.