National University of Computer and Emerging Sciences
Lahore Campus

Computer Org. & Assembly Lang.

Date: October 23, 2024

Course Instructor(s)

Mr. Salman Mubarik

Mid Term Exam

Total Time (Hrs):	**1.5hr**
Total Marks:	**30**
Total Questions:	**2**

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Roll No   Section   Student Signature

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Attempt all the questions.

Question #01   [10]

Write a subroutine in assembly language that creates three **Byte** type arrays: **ArrayA** , **ArrayB** , and **ArrayC** , each containing **6 elements**. The arrays should follow the below rules for each element:

ArrayA[i+1] = ArrayA[i] + ArrayC[i]   **[3]**

ArrayB[i+1] = ArrayC[i]   ArrayB[i]   **[3]**

ArrayC[i] = ArrayA[i] + ArrayB[i]   **[3]**

where i is the index of the element and will range from 0 to 5.

Initial Conditions:

ArrayA[0] = 1   and   ArrayB[0] = 2   **[1]**

Your program should:

1.   Use BX as the offset register to access array elements.
2.   Do not use loops to fill or process the arrays.
3.   Use appropriate registers and addressing techniques for calculating the next element based on the given rules.
4.   Display the final values of the arrays.

Sample Output:

ArrayA: 1, 3, 6, 12, 25, 52

ArrayB: 2, 1, 2, 3, 7, 14

ArrayC: 3, 4, 8, 15, 32, 66

Question #02   [20]

Write an assembly language program that calculates and prints the Fibonacci series up to the nth term using recursion. The value of n (the number of terms in the series) will be provided as input by the user.

The Fibonacci series is defined as:

F(0) = 0

F(1) = 1

F(n) = F(n 1) + F(n 2) for n $\geq$ 2

Your program should:

1. Handle base cases for F(0) and F(1) correctly.   **[4]**

2.Prompt the user to input the value of n (n $\leq$ 10 to avoid integer overflow).   **[6]**

3. Use a recursive procedure to calculate the Fibonacci number for each position.   **[5]**

4. Print the Fibonacci series up to the nth term on screen.   **[5]**

Sample Input/Output Displayed on screen should be:

Input: 5

Output: 0 1 1 2 3