**National University of Computer and Emerging Sciences**



Laboratory Manual 06

for

Data Structures Lab

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| Section | BDS-3A |
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**Objectives:**

In this lab, students will practice:

1. Recursion
2. Merge Sort

**TASK 1:**

You are required to write a recursive function named **'IsMember'** that accepts a number X, size of array and the elements of array 'ARR'; and determines if a given number X is present in the array 'ARR' or not. In each recursive step, you can compare only 1 element of 'ARR' to X. If the number X is found in ARR return 0, else return -1.

**TASK 2:**

Implement a C++ program having function **sum\_digit(int x)** to recursively sum the digits in a positive integer.

For example, if the number input by the user is 795, then the first call to function will be sum\_digit(795), the next recursive call will be sum\_digit(21) because 7+9+5 is 21. The next recursive call will be to sum\_digit(3).

**TASK 3:**

Write a recursive C++ program that recursively flip a float array. You’ll need to take starting index, ending index, array and size as parameters.

e.g:

Array: 1.0, 5.4, 0.85, 91.2, 6.5

Array after recursion: 6.5, 91.2, 0.85, 5.4, 1.0

**TASK 4:**

Write a C++ program to sort given array using **Merge Sort**.

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| --- | --- | --- | --- | --- | --- | --- |
| **2** | **1** | **10** | **7** | **3** | **6** | **5** |

**Sample Output:**

Unsorted array: 2, 1, 10, 7, 3, 6, 5

Sorted Array: 1, 2, 3, 5, 6, 7, 10

