United International University

Department of Computer Science and Engineering

Course Code: CSI 217 | Course name: Data Structure and Algorithms - I Laboratory

 # Assignment 1 / Offline 1

Total Marks: 25 , Deadline: 2 week for given date

Question 1 (10 Marks) - Merge Sort

You are tasked with implementing the Merge Sort algorithm. Write a program that takes an unsorted list of integers as input and returns two lists: one sorted in ascending order and the other sorted in descending order using the Merge Sort algorithm.

Requirements:

- Your program should implement the Merge Sort algorithm from scratch.
- Test your implementation on various input lists to ensure correctness.

Question 2 (15 Marks) - Doubly Linked List Operations

You are given the task of implementing various operations on a Doubly Linked List. Write a class or structure for a Doubly Linked List that includes the following functionalities:

- Insertion: Implement a method to insert a new node at the beginning of the Doubly Linked List.
- Deletion: Implement a method to delete a specified node from the Doubly Linked List.
- Search: Implement a method to search for a given value in the Doubly Linked List.
- Traversal: Implement a method to traverse and print the elements of the Doubly Linked List.
- Size Count: Implement a method to count the number of nodes in the Doubly Linked List.

Requirements:

- Your class should maintain the doubly linked structure.
- Test your class by performing insertion, deletion, searching, traversal, and size count operations on a sample Doubly Linked List.