

# **Assignment on ICE2122 Data Structures and Algorithms Lab**

## **Linked List**

With this assignment, you will work with linked lists and implement various operations on them. You will also explore the practical applications of linked lists.

### **Objective 1:**

- Understand linked list structure and pointer manipulation.
- Implement the fundamental linked list operations.

### **Task 1:**

- ✓ Create a singly linked list.
- ✓ Insert nodes at the beginning, end, and a specific position.
- ✓ Delete nodes from beginning, end, and by value.
- ✓ Display all elements in the list.
- ✓ Count the number of nodes (length).

### **Objective 2:**

- Perform searching and traversal operations in linked lists.

### **Task 2:**

- ✓ Search for a given element in the list (linear search).
- ✓ Display all elements greater/less than a given value.
- ✓ Reverse traversal (using recursion, since singly linked list can't go backward).
- ✓ Find and display the maximum and minimum values.

### **Objectives 3:**

- Perform non-trivial manipulations on a list.
- Explore sorting and reordering with links, not array indices.

### **Task 3:**

- ✓ Remove duplicate elements (without sorting).
- ✓ Find the middle element of a linked list.
- ✓ Rearrange the list such that all even elements appear before odd ones.
- ✓ Reorder list in pattern: A<sub>0</sub> → A<sub>n</sub> → A<sub>1</sub> → A<sub>n-1</sub> → ...

**Students are recommended to complete this assignments on/before 4<sup>th</sup> November 2025 and prepare to sit for CT-1 (Linear Array and Linked List) which will be held 11<sup>th</sup> November 2025.**