

**Name: Syed Muhammad Fahad Fiaz**

**Roll No: BSSEM-S24-036**

**Section: SE 3A**

**Subject: Data Structure and Algorithms**

**Submitted To: Sir Rasikh Ali**

**Submission Date:**

**Assignment 5**

**DSA LAB TASK’S**

**LAB 5:**

**TASK: Singly Linked List (Display Nodes)**

Implement functions to display the first node, last node, Nth node, and centre node of a singly linked list.

**Explanation:**

The code defines a **Singly Linked List** that supports inserting nodes at the beginning, end, a specific position, and finding the center node.

**Classes:**

1. **Node Class**:
   * Represents a list node with data and a pointer next to the next node.
2. **insert\_data Class**:
   * Manages the linked list with a head pointer.
   * Contains functions for inserting nodes and displaying the list.

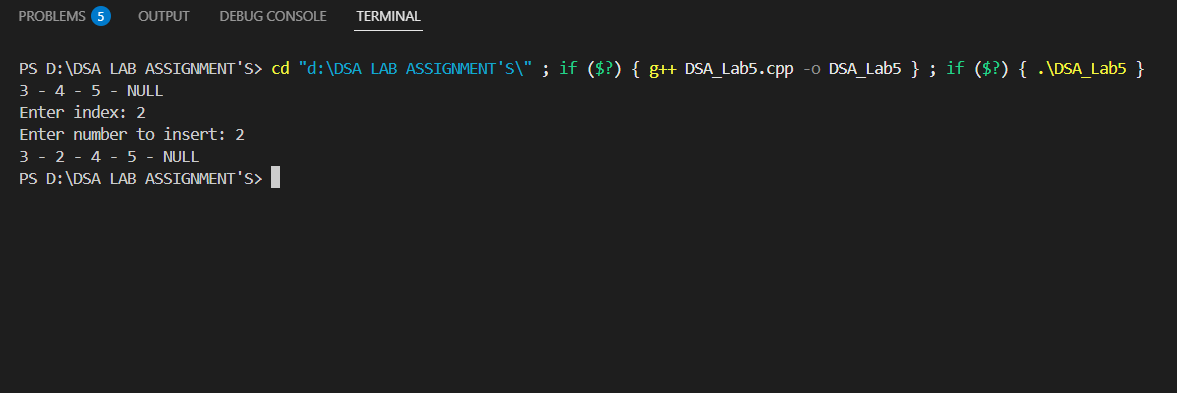
**Functions:**

1. **insert\_at\_first(int val)**:
   * Inserts a node at the beginning of the list.
2. **insert\_at\_last(int val)**:
   * Inserts a node at the end of the list.
3. **display center()**:
   * Finds and displays the middle node using the "slow" and "fast" pointer approach.
4. **nth\_time(int val, int pos)**:
   * Inserts a node at the pos-th position.
5. **display()**:
   * Displays the entire list from start to end.

**Main Function:**

* Initializes the list and inserts values at the beginning and end.
* Asks the user for an index and value to insert at that position.
* Displays the list before and after insertion.

**OUTPUT**

****