Data Structures and Algorithms

Lab Task 5

Topic: Linked List

Scenario:

Q. No.1: You are a software developer working for a hospital that manages patient check-ins. Patients arrive, register, get treated, and leave. The hospital needs a dynamic system that can:

- Add new patients
- Remove treated patients
- Search a patient by ID
- Display all current patients

Since the number of patients changes continuously, the hospital wants a **linked list–based system**.

Your Task

Write a C++ program using a **Singly Linked List** where each patient has:

- Patient ID

Implement the following operations:

1. **Insert a new patient at the end** (new check-in)
2. **Insert a patient at the beginning** (emergency patient)
3. **Display all patients**

Rubric

Criteria	Excellent (10)	Good (7)	Fair (5)	Poor (2)
Understanding & Problem Modeling	Complete mapping of scenario to linked list; clear explanation.	Minor missing details.	Partially explains mapping.	Poor or no relevant explanation.

Linked List Implementation	All operations implemented correctly (insert begin/end,).	Minor logical issue in 1 operation.	Multiple issues or missing an operation.	Mostly incorrect or incomplete.
Code Quality & Comments	Clear, well-commented, readable.	Some comments missing.	Poor structure, few comments.	No comments, unreadable.
Testing & Output	All operations tested with meaningful output.	Good test cases.	Limited tests.	No tests or incorrect output.