DSA Lab Task 2

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Date:

12-02-2025

Operation Flow Explanation A

1. Add Medicine

What the operation does

The **Add Medicine** operation allows the user to insert a new medicine record into the pharmacy inventory.
The user provides:

- Medicine ID
- Name
- Quantity
- Price

The system then stores this information as a new node.

Data Structure that supports it

Singly Linked List

Why this Data Structure is suitable

- In a linked list, adding a new node at the beginning is very efficient (O(1) time).
- No shifting or rearranging is needed, unlike arrays.
- Memory is allocated dynamically, so it can store unlimited medicines until system memory is full.

How the user interacts with it

The user selects **Option 1: Add Medicine** from the menu.
They enter the required details, and the system immediately inserts the new medicine at the head of the linked list.

2. Search Medicine

What the operation does

The **Search Medicine** operation allows the user to find a medicine by its unique ID.
If found, the system displays:

- Name
- Quantity

- Price

Otherwise, it shows "Medicine Not Found".

Data Structure that supports it

Singly Linked List

Why this Data Structure is suitable

- The linked list allows sequential searching by traversing node by node.
- No need for contiguous memory.
- Even if the list grows large, traversal remains simple and predictable.

How the user interacts with it

The user selects **Option 3: Search Medicine**, enters the ID, and the program searches through each linked node until a match is found.

3. Delete Medicine

What the operation does

The **Delete Medicine** operation removes a medicine record from the inventory based on its ID. If found, the node is removed and memory is freed.

Data Structure that supports it

Singly Linked List

Why this Data Structure is suitable

- Deletion in a linked list is efficient because only pointer adjustments are required.
- Unlike arrays, no shifting of elements is needed.
- Works well even with dynamic and frequently updated data.

How the user interacts with it

The user selects **Option 4: Delete Medicine**, enters the ID, and the system traverses the list to delete the matching node.