

# LIBRARY MANAGEMENT SYSTEM

Using C++ & DSA



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# PROBLEM STATEMENT

A library needs a digital system to manage book records, including adding, searching, issuing, returning, and sorting books. The system should be efficient and user-friendly.



# SOLUTION

A Library Management System using C++ and DSA to:

- Store book details using Doubly Linked List
- Allow operations like adding, deleting, and searching books
- Enable issuing & returning books with Boolean Flags
- Implement Bubble Sort for sorting books



# DATA STRUCTURES & ALGORITHMS USED



## Data Structures Used

- ✓ Doubly Linked List (For efficient book storage and navigation)
- ✓ Queue (Optional) (For issuing requests - FIFO approach)

## Algorithms Used

- ✓ Bubble Sort (Sorting books alphabetically by title)
- ✓ Linear Search (To find books by title or author)

# PSEUDOCODE

```
BEGIN
    WHILE True DO
        DISPLAY menu options
        INPUT user choice
        SWITCH choice:
            CASE 1: ADD a book to the doubly linked list
            CASE 2: DELETE a book from the list
            CASE 3: SEARCH for a book by title
            CASE 4: DISPLAY all books
            CASE 5: ISSUE a book by setting isIssued = True
            CASE 6: RETURN a book by setting isIssued = False
            CASE 7: COUNT total books
            CASE 8: SHOW books by a specific author
            CASE 9: SORT books using Bubble Sort
            CASE 10: EXIT program
        END SWITCH
    END WHILE
END
```



# ALGORITHM

Step 1: Initialize the Library Management System with a Doubly Linked List.

Step 2: Show a menu with options (Add, Delete, Search, Issue, Return, Sort, Exit).

Step 3: Based on user input:

If Add Book → Insert in Doubly Linked List

If Delete Book → Search & remove from Doubly Linked List

If Search Book → Traverse Doubly Linked List

If Issue/Return Book → Modify the isIssued flag

If Sort Books → Apply Bubble Sort

Step 4: Display the updated book list.

Step 5: Repeat until the user chooses to exit.