**Project report**

Data Structures and Algorithms

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**Project name :**

Library Management System

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**Library Management System Using DSA in Java**

**1. Introduction :**

The Library Management System (LMS) is designed to help manage library resources effectively.

**2. Objectives :**

1. To implement a structured system for managing books and members.
2. To optimize search and retrieval processes using appropriate data structures.
3. To demonstrate the practical application of DSA concepts in a real-world scenario

**3. System Features :**

**Book Management**

* Add, remove, and update book details.
* Search for books using title.

**Member Management**

* Add, remove, and update member details.
* Maintain borrowing history for each member.

**Borrow/Return Transactions**

* Issue books to members.

**Additional Features :**

* List all available and borrowed books

1. **Data structure used:**

**LinkedList**:

* To manage borrowing history and maintain a queue for overdue books.

 **ArrayList**:

* For storing and displaying available and borrowed books.

 **Binary Search Tree (BST)**:

* To implement search functionality for books based on multiple fields.

 **Stack**:

* For tracking recently issued or returned books.

**System Architecture**

**Modules**

* **Book Module**: Handles all book-related operations.
* **Member Module**: Manages member records and borrowing history.

**Workflow**

1. **Admin Tasks**: Add books, members, and manage inventory.
2. **User Tasks**: Borrow and return books, search library catalog.