



Library Management System

System Requirements Specification

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System Requirements

- **Functional Requirements:**

1. User sign-up with role specification (admin, student, librarian).
2. User login with authentication.
3. Edit personal profile information (username, password, age, gender).
4. Admin manages user accounts (delete/ban/unban accounts, change passwords).
5. Add a book with details (name, genre, copies).
6. Remove books from storage.
7. Search books by name or genre.
8. Sort books by name or rating.
9. Borrow books (check availability).
10. Record interest in unavailable books.
11. Request to extend borrowing period (3 max, 1 week each).
12. Return borrowed books and mark them as available.
13. Rate and review books.
14. View reviews for books.
15. Calculate overdue fines (\$1/day/book).

- **Non-Functional requirements:**

1. System must persist data using text files.

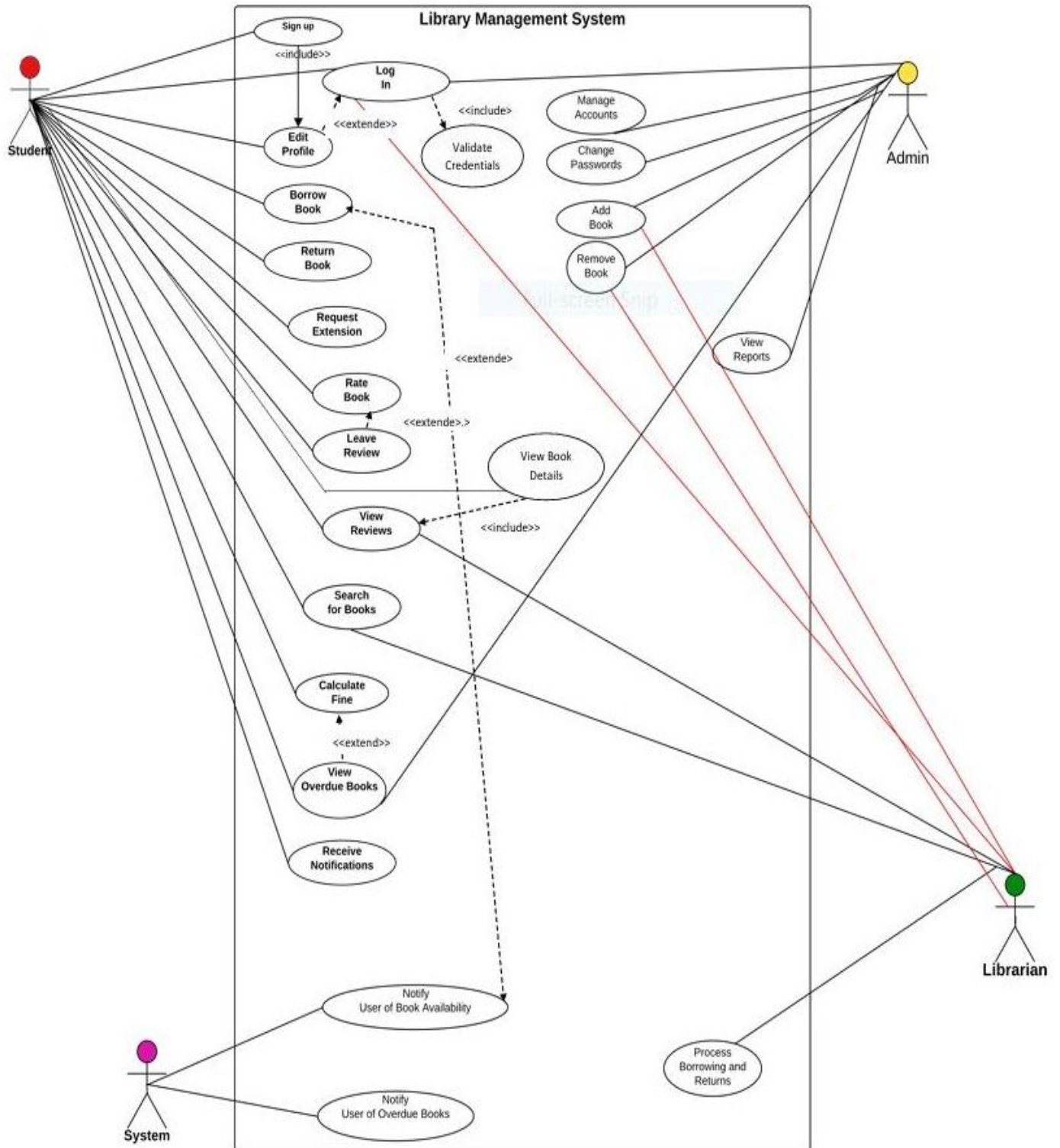
2. The application should handle up to 1000 concurrent users.

3. Response time for any operation should not exceed 2 seconds.

4. The system must provide notifications for availability and overdue books.

5. User-friendly interface for role-based menus.

Use case diagram



Use Case Description

Use Case 1: Manage Accounts

Actor: Admin

Description: The admin manages user accounts by creating, updating, or deleting accounts as necessary.

Preconditions: Admin must be logged in.

Basic Flow:

- 1.Admin selects the "Manage Accounts" option.
- 2.The system displays a list of all user accounts.
- 3.Admin chooses to create a new account, modify an existing account, or delete an account.
- 4.The system processes the requested operation and updates the database.
- 5.Admin is shown a confirmation message.

Extensions:

.If the admin enters invalid input (e.g., username already exists), the system displays an error message and allows retry.

Postconditions:

.The user database is updated to reflect the changes made by the admin.

Use Case 2: Borrow Book

Actor: Student

Description: A student borrows an available book from the library system.

Preconditions:

- .Student must be logged in.
- .The book must be available for borrowing.

Basic Flow:

- 1.Student searches for the desired book using the search function.
- 2.The system displays the search results, including book availability.
- 3.Student selects the book and clicks on the "Borrow" option.
- 4.The system checks the book's availability and assigns it to the student.
- 5.The due date for returning the book is displayed to the student.

Extensions:

.If the book is unavailable, the system offers the option to notify the student when it becomes available.

Postconditions:

- .The book's status is updated to "borrowed."
- .The borrowing record is added to the student's profile.

Use Case 3: Process Borrowing and Returns

Actor: Librarian

Description: The librarian processes book borrowings and returns, ensuring accurate updates to the inventory.

Preconditions: The librarian must be logged in.

Basic Flow:

- 1.Librarian selects the "Process Borrowing and Returns" option.
- 2.The system displays a list of pending borrowing and return requests.
- 3.The librarian selects a request to process.
- 4.The system updates the book's status and notifies the corresponding student.
- 5.Librarian is shown a confirmation message.

Extensions:

.If the book being returned is overdue, the system calculates the fine and displays it to the librarian.

Postconditions:

- .Book status is updated.
 - .Any applicable fines are logged.
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Use Case 4: Notify User of Overdue Books

Actor: System

Description: The system automatically notifies students of books that are overdue.

Preconditions: The system has access to the borrowing records.

Basic Flow:

- 1.System checks all borrowing records for overdue books.
- 2.For each overdue book, the system generates a notification containing the details (title, overdue duration, fine amount).
- 3.The notification is sent to the corresponding student.

Extensions:

.If the student has exceeded the maximum allowed overdue duration, the system notifies the admin for further action.

Postconditions:

- .Notifications are sent to all affected students.
- .Overdue records are flagged for follow-up.