

Programming Patterns Final Project

Library Management System: Complete Library

Deliverable 1 - Project Description

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Scenario

Our project will be a management system for a library called Complete Library. Complete Library allows your local library to have complete control over all its operations in one place. It will deal with all the library's media, including books, movies, audiobooks, and magazines. A registered librarian would be able to add and remove books from the system and change any book's details. Regular library users can use this system to search books by their title, author, or ISBN as well as find featured books by genre. They will also be able to create an account in order to track their history with your library. Complete Library will be able to keep track of loans, renewals, returns, and holds, and will be able to administer late fees. A user with outstanding late fees cannot rent another book. Additionally, it can generate reports based on book usages so that you can see which books, authors, and genres your readers love the most!

Design Paradigm

1. Librarian

- a. Add and remove a book
- b. Change the details of an existing book
- c. Issue a book to a member
- d. Give a late fee to a member
- e. Generate a report to view loaned books' history
- f. View a member's history

2. Library member

- a. Search for a book
- b. Loan a book
- c. Place a book on hold
- d. Return and renew a book
- e. Pay a late fee
- f. View the complete catalog
- g. View the catalog by genre
- h. View personal history

Expected Output

1. **Late Fees on Overdue Media:**

If a member has taken out something that has exceeded its return date, the system will automatically charge their account with a daily late fee until the item is returned. If a member has unpaid late fees, an error message will appear when they attempt to rent new media, preventing them from doing so.

2. **Media Reservation and Holds:**

If a book is on hold for another user, it will be flagged in the system as "on hold" and unavailable for checkout. When the item is returned and available for the user who placed the hold, an automatic notification (via email or in-app) is sent, along with a deadline for picking up the item.

3. **Account Registration and History Tracking:**

After successful registration, the user will receive an email confirmation. Their account will display a personalized dashboard, showing current loans, due dates, late fees (if any), and a history of previously borrowed media. They will also be able to view options to renew current loans.

4. **Featured Books by Genre:**

Users will see a "Featured" section on the homepage, with media grouped by genre. This section will dynamically update, displaying the most borrowed, top-rated, or newly added media in genres such as fiction, non-fiction, fantasy, etc.

5. **Report Generation for Librarians:**

Librarians can generate detailed reports that show metrics such as the most borrowed books and authors, total loans by genre, and user engagement statistics over specified time periods. These reports will be exportable as PDFs or CSVs.

6. **Book Details Update:**

Upon successfully updating book details, the system will immediately reflect the changes (e.g., new title, updated description, or adjusted stock quantity) across the user interface, and an activity log will show when and who made the updates for auditing purposes.

7. **Outstanding Late Fees Notification:**

When a user with unpaid late fees attempts to borrow or renew media, the system will block the transaction and display a message: "You have unpaid late fees. Please settle your fees to continue." Users will be given a link to pay their fees online via the system's payment gateway.

8. **Renewals and Automatic Renewals:**

When a user attempts to renew an item, the system will check for any active holds on that item. If a hold exists, the renewal will be denied, and a message will appear stating, "This item is on hold for another user and cannot be renewed." If no holds exist, the item will be renewed, and the due date will be updated.

9. **Overdue Book Notification:**

Users will receive an automatic email notification the day after their borrowed media becomes overdue, detailing the late fee per day. The system will continue to send daily reminders until the item is returned, with a real-time update of late fees visible on the user's account dashboard.