**Library Management System: New Features Report**

**1. Inventory and Book Management Enhancements**

Book Entity Extended:

* Now tracks totalCopies, availableCopies, location, and status (e.g., AVAILABLE, ON\_LOAN, RESERVED, DAMAGED).
* Enables precise inventory control and real-time status updates for each book.

**2. Borrowing and Returning System**

BorrowTransaction Entity & Service:

* Every borrow and return action is now logged as a transaction.
* Tracks borrow date, due date, return date, and automatically calculates overdue fines.
* Updates book availability in real time.

**3. Reservation System**

Reservation Entity & Service:

* Users can reserve books that are currently unavailable.
* Tracks reservation date, notification status, and fulfillment status.
* Supports future notification integration (e.g., email/SMS).

**4. User Borrowing History and Reservations**

Customer Entity Extended:

* Now maintains a borrowing history and a list of reservations for each user.
* Users can view their own borrowing and reservation records.

**5. Reporting and Analytics**

ReportController:

Provides REST endpoints for:

* Usage reports (borrowing trends, total borrows)
* Inventory reports (total books, inventory status)
* Financial reports (total fines collected)

**6. Error Handling**

Global Exception Handler:

* All API errors are now handled gracefully with user-friendly messages.
* Prevents exposure of internal errors and stack traces.

**7. Role-Based Security**

Access Control:

* Only authorized users (librarians/admins) can add or delete books.
* Customers can only borrow, return, and reserve books.

**System Overview**

The system now supports:

* Full inventory management with real-time updates.
* Secure, logged borrowing and returning of books, including overdue fine calculation.
* Book reservation and notification tracking.
* User-specific borrowing history and reservation records.
* Comprehensive reporting for library usage, inventory, and finances.
* Robust error handling and role-based access control.
* These enhancements make your LMS backend more robust, secure, and feature-rich, supporting both daily library operations and administrative oversight.