

Library Management System

A PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report “**Library Management System**” is the bonafide work of "**Ayush Kohli**" who carried out the project work under my supervision.

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1. PROJECT NAME

Library Management System

2. REFERENCE WEBSITE LINK

<https://spring.io/projects/spring-boot>

Other References:

- React Documentation (react.dev)
- MySQL Official Docs (<https://dev.mysql.com/doc>)
- Axios (<https://axios-http.com>) for frontend-backend integration

3. PROJECT DESCRIPTION

The Library Management System is a full-stack web application built using React.js (frontend) and Spring Boot (backend) with a MySQL database. It is designed to automate and digitalize all library operations — such as managing books, members, and book issues — through a single interactive platform.

The system enables an Admin to securely log in, add/update/delete books and members, and record when books are issued or returned. The frontend provides a clean and responsive interface, while the backend ensures secure and efficient data handling through RESTful APIs.

Tech Stack Overview:

Layer	Technology	Description
Frontend	React.js, Axios	User interface, API requests, and navigation
Backend	Spring Boot (Java), REST APIs	Handles business logic and database operations
Database	MySQL	Stores all book, member, and issue records
API Layer	REST endpoints	Connects frontend and backend

4. PROBLEM STATEMENT

Traditional library systems rely on manual record-keeping, leading to:

Users need a unified dashboard that:

- Time-consuming processes
- Data inaccuracy and redundancy
- Difficulty tracking issued or returned books.

The system ensures **fast, reliable, and easy-to-use** operations through a modern full-stack web application architecture.

5. HIGH LEVEL DESIGN

Frontend

- **Technology:** React.js, HTML5, CSS3, JavaScript (ES6+), Axios
- **Features:**
 - Admin Login Page
 - Book Management Module (Add, Edit, Delete, View)
 - Member Management Module (Add, Edit, Delete, View)
 - Issued Books Module (Issue / Return functionality)
 - Responsive and user-friendly layout

Backend

- **Technology:** Java Spring Boot (v3.x)
- **Endpoints:**
 - /admin/login → Validate admin credentials
 - /books → Get/Add/Edit/Delete books
 - /members → Manage member data
 - /issued-books → Manage issue/return transactions
- **Responsibilities:**
 - Handle CRUD operations through REST APIs
 - Validate admin login
 - Communicate with MySQL database
 - Return JSON responses to React frontend

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Database (MySQL)

Tables:

1. admin – stores admin login credentials
2. books – stores book information
3. members – stores library members' details
4. issued_books – records issued and returned books

6. Key Features

User Features

- **Admin Login:** Secure login authentication for admin access
- **Book Management:** Add, view, update, and delete book details
- **Member Management:** Add and maintain member records
- **Issue/Return Management:** Track issued and returned books with live updates
- **Automatic Quantity Update:** Reduces or increases stock when books are issued/returned

Technical Features

- REST API-based communication between frontend and backend
- Axios integration for sending HTTP requests from React
- Entity-Repository-Service-Controller architecture in Spring Boot
- Automatic database table creation using JPA
- Modular, maintainable full-stack design
- Cross-Origin Resource Sharing (CORS) for React–Spring Boot connection

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7. SYSTEM FLOW

Step-by-Step Flow:

1. Admin Login:

- Admin enters credentials in Login.js
- React sends POST request to /admin/login
- Spring Boot verifies credentials using AdminService and database

2. Book Management:

- Admin can view all books (/books)
- Add a new book using form → POST request → backend saves in MySQL
- Edit or delete books directly from UI

3. Member Management:

- Admin can view, add, or update member details
- All data saved in members table\

4. Issue Book:

- Admin selects member and book → sends POST to /issued-books/{bookId}/{memberId}
- Backend reduces book quantity and adds issue record in issued_books

5. Return Book:

- PUT request to /issued-books/{issueId}/return
- Backend updates record, marks “returned = true” and restores quantity

6. Frontend Updates:

- React dynamically updates all lists (Books, Members, Issued Books)
- No manual page reload required

8. FUTURE SCOPE

1. **JWT Authentication:**
Implement secure token-based login for Admins and Members.
2. **Role-Based Access:**
Add different user roles (Admin, Member, Librarian).
3. **Fine Calculation:**
Automatically calculate fines for late book returns.
4. **Email Notifications:**
Send alerts/reminders for due or overdue books.
5. **Search and Filter:**
Implement live search and category-based filtering.
6. **Dashboard Analytics:**
Show total books, issued books, and members using charts.
7. **Cloud Deployment:**
Host the application on AWS/Render for live use.
8. **Dark Mode UI:**
Add theme toggle for better UX.

9. Conclusion

The Library Management System successfully demonstrates a full-stack implementation of a modern CRUD-based web application using React, Spring Boot, and MySQL. It automates library operations and provides a secure, responsive, and user-friendly admin interface.

This project highlights practical skills in:

- REST API development
- Database integration with JPA
- React-based dynamic UI
- Full-stack data flow and architecture

The system is scalable, extendable, and provides a solid foundation for future enhancements like role-based security and analytics dashboards.

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Screenshots:

Admin Login

Username

Password

Login

Library Management Books Add Book Members Add Member Issued Books Issue Book



Books List

Add Book

ID	Title	Author	Publisher	Category	ISBN	Published Date	Total Copies	Available Copies	Actions	
6	Godaan	Munshi Premchand	Rajpal and Sons	Novel	9788126715025	1936-01-01	10	8	Edit	Delete
7	Ghalib Ki Shayari	Mirza Ghalib	Indian Press	Poetry	9788171672678	1869-06-01	6	5	Edit	Delete
8	Raag Darbari	Shrilal Shukla	Rajkamal Prakashan	Satire	9788126712147	1968-09-01	12	10	Edit	Delete
9	Aag Ka Darya	Qurratulain Hyder	Rajkamal Prakashan	Historical Novel	9788126715247	1959-04-15	8	6	Edit	Delete
10	Chitralekha	Bhagwati Charan Verma	Rajpal and Sons	Philosophical Novel	9788170287934	1934-11-10	9	7	Edit	Delete
11	SUNRISE	Nishant	Nishant	Poet	demo	2004-12-27	10	8	Edit	Delete
12	Shivam	s	sdemo	demo	www	4201-02-25	10	8	Edit	Delete

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Library Management Books Add Book Members Add Member Issued Books Issue Book

Add New Book

Title

Author

Publisher

Category

Isbn

Published Date

dd-mm-yyyy

Total Copies

Available Copies

Save Book

Library Management Books Add Book Members Add Member Issued Books Issue Book

Members List

Add Member

ID	Name	Email	Phone	Address	Actions
15	Aarav Sharma	aravtttt.sharma2@example.com	9876543220	Delhi	<div>EditDelete</div>
16	Zara Khan	zara.khan2@example.com	9876543221	Lucknow	<div>EditDelete</div>
17	Rahul Verma	rahul.verma2@example.com	9876543222	Jaipur	<div>EditDelete</div>
18	Faiz Ahmad	faiz.ahmad2@example.com	9876543223	Bhopal	<div>EditDelete</div>
19	Ananya Singh	ananya.singh2@example.com	9876543224	Patna	<div>EditDelete</div>
20	Nishant Rejra	nishantrejra@gmail.com	7894564567	demo	<div>EditDelete</div>
21	John Doe	john@example.com	9876543210	123 Main Street	<div>EditDelete</div>

Issued Books

Issue Book

ID	Book Title	Member Name	Issue Date	Return Date	Actions
1	Raag Darbari	Aarav Sharma	2025-11-09	2025-11-09	<div>Delete</div>
2	Aag Ka Darya	Rahul Verma	2025-11-10	2025-11-10	<div>Delete</div>