

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 "**Mayank Madan**" who carried out the project work under my supervision.

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1. PROJECT NAME

WeatherVista — Real-Time Weather Monitoring Dashboard

2. REFERENCE WEBSITE LINK

- Spring Boot Documentation – <https://spring.io>
- Thymeleaf Template Engine – <https://www.thymeleaf.org>
- MySQL Database – <https://www.mysql.com>
- Bootstrap 5 Documentation – <https://getbootstrap.com>

3. PROJECT DESCRIPTION

The **Library Management System (LMS)** is a full-stack web application designed to manage and automate all library-related operations efficiently.

It provides functionalities for managing **books, users (students), and lending/return transactions** using a clean and interactive web interface. The project is built with **Spring Boot (Java)** for the backend and **Thymeleaf + HTML + CSS + Bootstrap** for the frontend, along with **MySQL** as the database.

Tech Stack Overview:

- **Frontend:** HTML5, CSS3, Bootstrap 5, Thymeleaf
- **Backend:** Spring Boot (Java), RESTful APIs
- **Database (optional):** MySQL
- **Tools Used:** VS Code / IntelliJ IDEA, Maven, GitHub

4. PROBLEM STATEMENT

Traditional library record management using paper or Excel sheets is inefficient and error-prone. It becomes difficult to maintain records of books, users, and issue/return history manually.

The Library Management System aims to:

- Maintain accurate book inventory and user data.
- Track book issues and returns.
- Reduce manual workload for librarians.
- Improve accessibility with a user-friendly digital system.



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5. HIGH LEVEL DESIGN

Frontend

Frontend

- **Technology:** HTML5, CSS3, Bootstrap 5, Thymeleaf (template engine)
- **Features:**
 - Responsive web pages for managing books and users.
 - Forms for adding, editing, and viewing book/user details.
 - Tables showing real-time data from the database.
 - Error handling and validation messages using Thymeleaf.

Backend

- **Technology:** Java Spring Boot (v3.x)
- **Features:**
 - RESTful Controller architecture (BookController, UserController, IssueController).
 - Service Layer for business logic.
 - Spring Data JPA with MySQL integration.
 - Automatic database table creation using JPA Entities.

Database Schema

- **Tables:**
 - books (id, title, author, quantity)
 - users (id, name, email)
 - issue_records (id, book_id, user_id, issue_date, return_date, status)

6. Key Features

User Features

- Add and View Books
- Add and View Users

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- Issue and Return Books
- Track issued book history
- Search and filter books by title or author

Admin Features

- Manage all users and books
- Update or delete records
- View all active and returned book transactions

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Technical Features

- MVC Architecture (Controller, Service, Repository)
- Spring Boot auto-configuration
- JPA & Hibernate ORM mapping
- Thymeleaf dynamic page rendering
- MySQL relational database

SYSTEM FLOW

1. The user (librarian) logs into the application.
2. The librarian can **add books** and **register new users**.
3. A book can be **issued** to a user through the issue form.
4. The system decreases the quantity of that book.
5. On **return**, the system updates the return date and increases book quantity.
6. Admin can monitor all transactions through the dashboard.



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FUTURE SCOPE

- Add role-based login (Admin, Student).
- Integrate email notifications for due/return reminders.
- Implement advanced search and sorting filters.
- Add analytics dashboard (most issued books, active users).
- Introduce REST API support for mobile app integration.
- Add book cover upload and digital reading links.

Conclusion

The **Library Management System** simplifies and automates the process of managing books, users, and transactions within a library.

It demonstrates practical implementation of **Spring Boot**, **JPA**, **MySQL**, and **Thymeleaf** for building a complete full-stack web application.

This project highlights strong concepts of **backend development**, **database management**, and **frontend integration**, making it ideal as a full-stack mini-project or college submission.

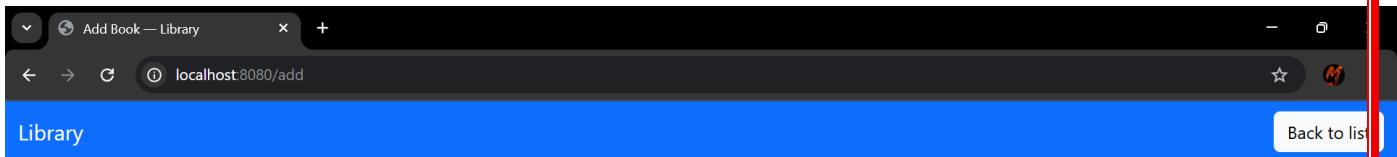
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