Library Management System

APROJECT REPORT

Submitted by

Mayank Madan (23BCS10894)

in partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE & ENGINEERING

Chandigarh University

Nov, 2025

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.

SIGNATURE

Dr. Sandeep Singh Kang

BATCH HEAD

BE-CSE

SIGNATURE

SUPERVISOR

BE-CSE

TABLE OF CONTENTS

DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING

CHANDIGARH UNIVERSITY
Discover. Learn. Empower.

Name:Mayank
UID: 23BCS10894
Branch: BE-CSE
Section/Group: KRG-3B
Subject name: Full Stack - 1
Subject code: 23CSH-339

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.

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

- 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

DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING

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.

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.

DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING

ScreenShot