

Library Management System - Project Report By Sukhada Inamdar

1. Project Overview

This project is a console-based Library Management System developed in Python. It simulates the operations of a library, such as managing books, registering members, issuing and returning books, and generating overdue reports. The system uses CSV files as a lightweight database and implements authentication with password hashing using bcrypt.

2. Learning Goals

- Design a mini-database using CSV files
- Model many-to-many relationships (Members ↔ Loans)
- Practice login systems, user roles, and password hashing
- Implement CRUD operations and due-date logic

3. System Roles

- Librarian: Add/delete books, register members, issue/return books, view overdue list
- Member: Search catalogue, check availability, view own loan history

4. File Schema

- books.csv: ISBN, Title, Author, CopiesTotal, CopiesAvailable
- members.csv: MemberID, Name, PasswordHash, Email, JoinDate
- loans.csv: LoanID, MemberID, ISBN, IssueDate, DueDate, ReturnDate

5. Step-by-Step Build Plan

- Setup: Create models and CSV storage helpers
- Auth: Register/login with bcrypt hashing
- Librarian Menu: Add, remove, issue, return, view overdue
- Member Menu: Search catalogue, view loans
- Business Rules: Issue (CopiesAvailable--), Return (CopiesAvailable++)
- Overdue Report: Show loans past due date
- Validation: Check for duplicates, invalid ISBNs, password mismatch
- Testing: Use pytest for issue-return
- CLI Support: Add --data-dir flag with argparse

6. Technology Stack

- Language: Python 3
- Libraries: bcrypt, csv, datetime, dataclasses
- Tools: pytest (for testing)
- Storage: CSV files

7. Console Snapshot

=== Librarian Dashboard ===

1. Add Book
2. Register Member
3. Issue Book
4. Return Book
5. Overdue List
6. Logout

> Example=

3

ISBN to issue: 9780132350884

Member ID: 1001

✓ Book issued. Due on 29-May-2025.

8. Conclusion

The Library Management System successfully implements the key features of a real-world library using a simple and accessible console interface. The project improves understanding of file handling, user authentication, and software design principles in Python.