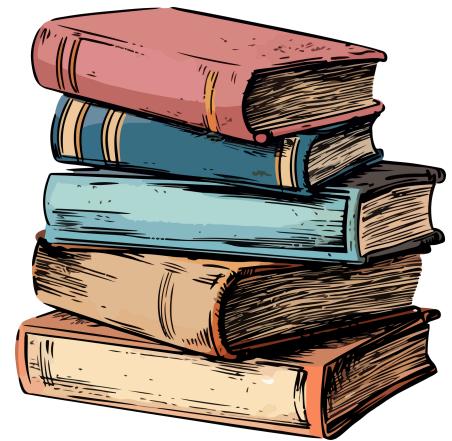


LIBRARY MANAGEMENT SYSTEM



SUBMITTED BY :- Arjun Mishra

REGISTRATION NUMBER:- 25BCY10063

SUBMITTED TO :- VIT Bhopal

ACADEMIC YEAR :- 2025-2026



INTRODUCTION

This project is made to help the library staff in the daily library tasks like add book, add member, borrowing the book etc. In order to save time of the library staff and increase their productivity.

PROBLEM STATEMENT

Library staff face problems like inefficient manual processes, difficulty tracking books, inaccurate records, and a poor user experience due to slow service. This leads to staff inefficiency, misplaced or lost materials, and challenges in integrating digital resources.

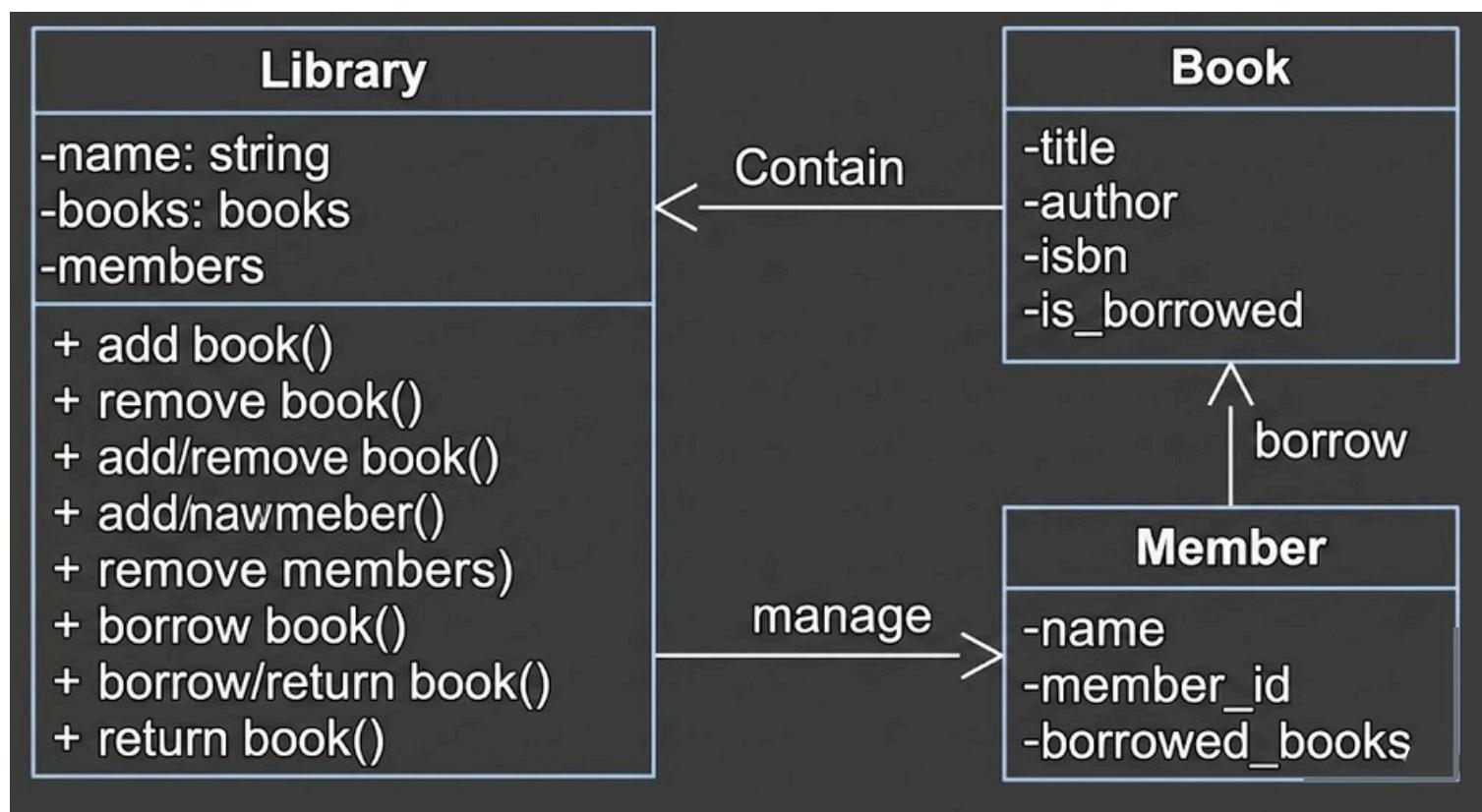
FUNCTIONAL REQUIREMENTS

- User management
- Catalog management
- Transaction management
- Fines and notifications
- Reporting

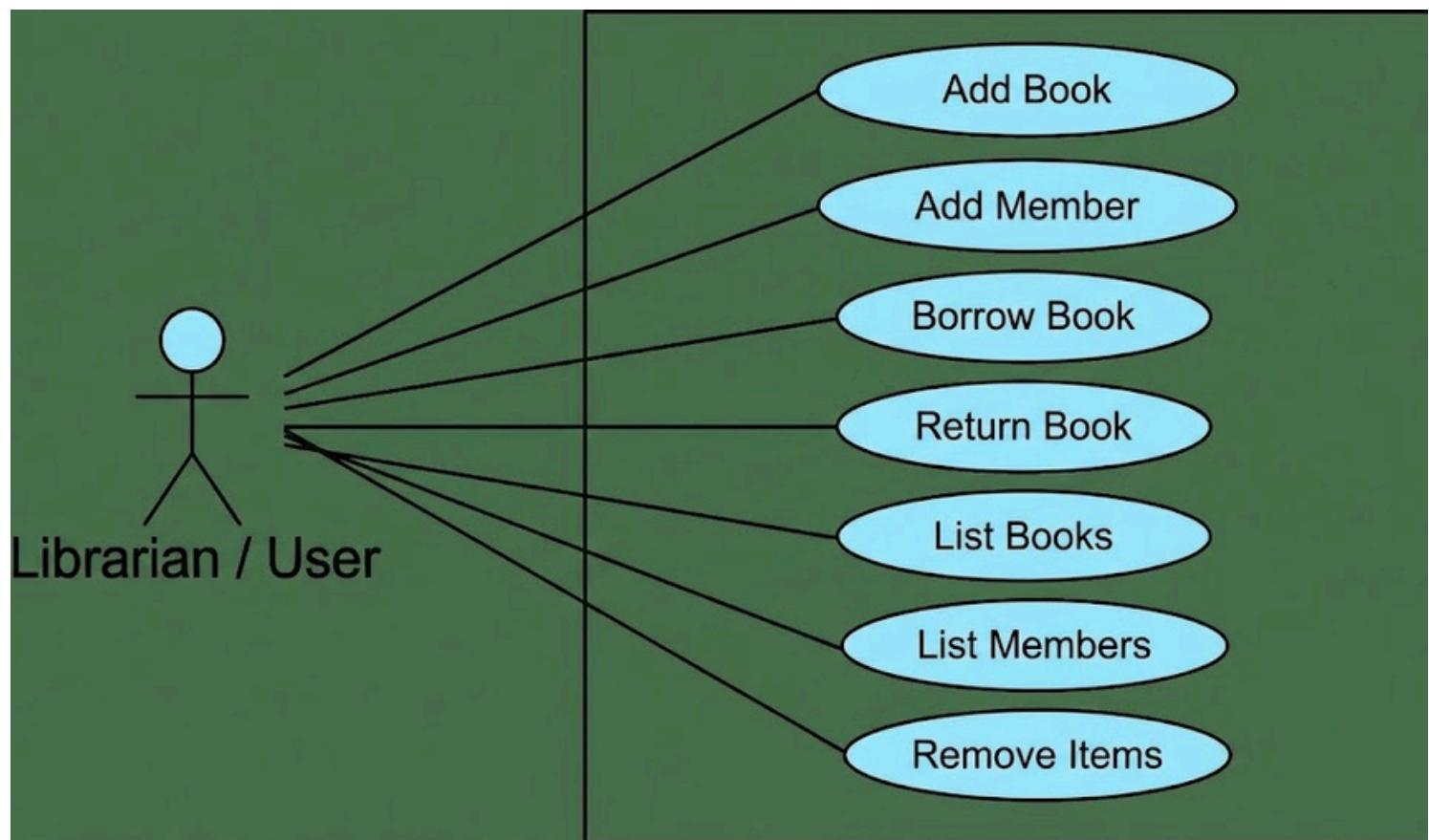
NON-FUNCTIONAL REQUIREMENTS

- Performance: It should be time effective.
- Reliability: Be available and recover from errors
- Usability: Be easy for library staff to use it
- Security: Protect data and prevent unauthorized access.
- Maintainability: Be easy to update and fix.
- Compatibility: Work with various devices and other systems.

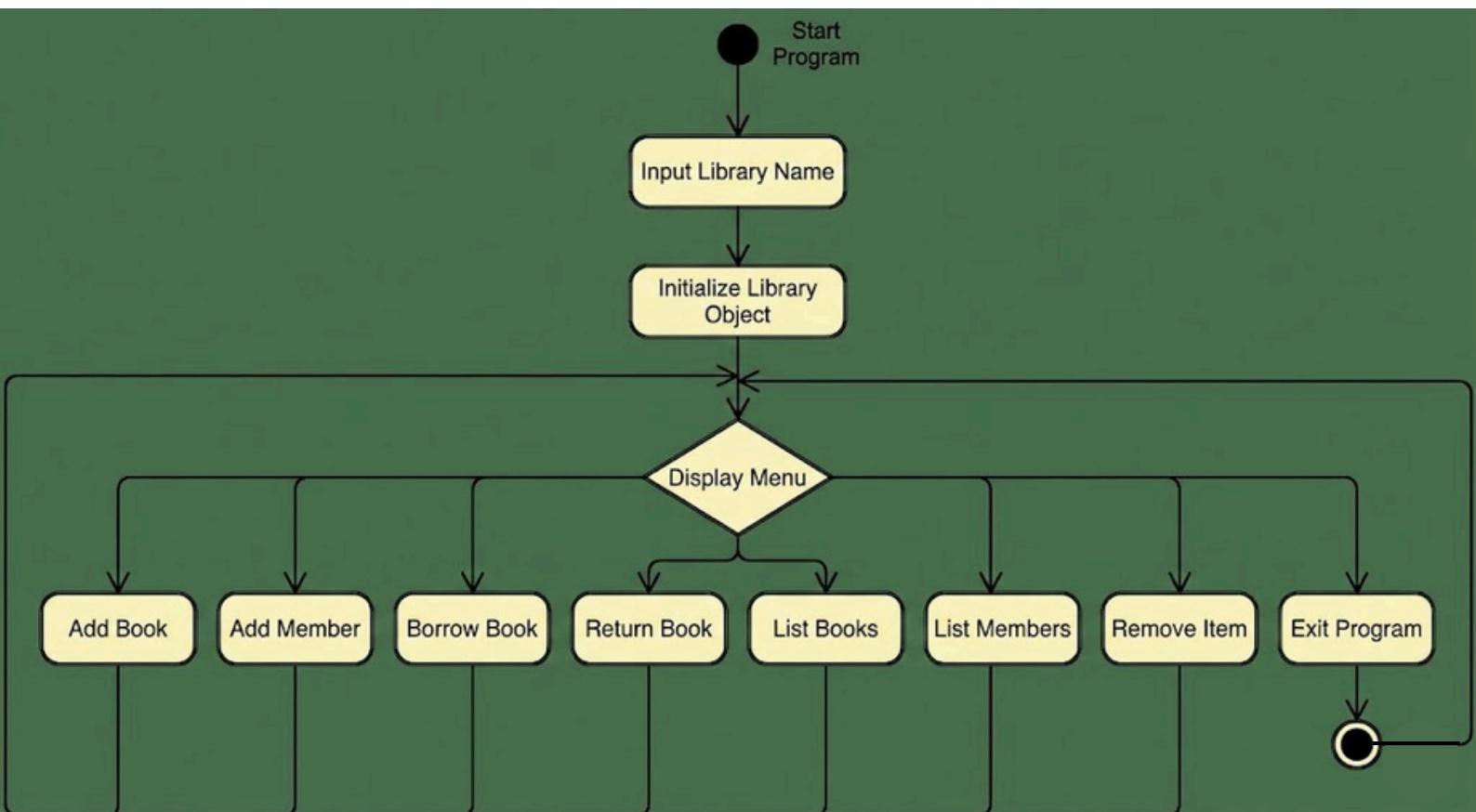
SYSTEM ARCHITECTURE



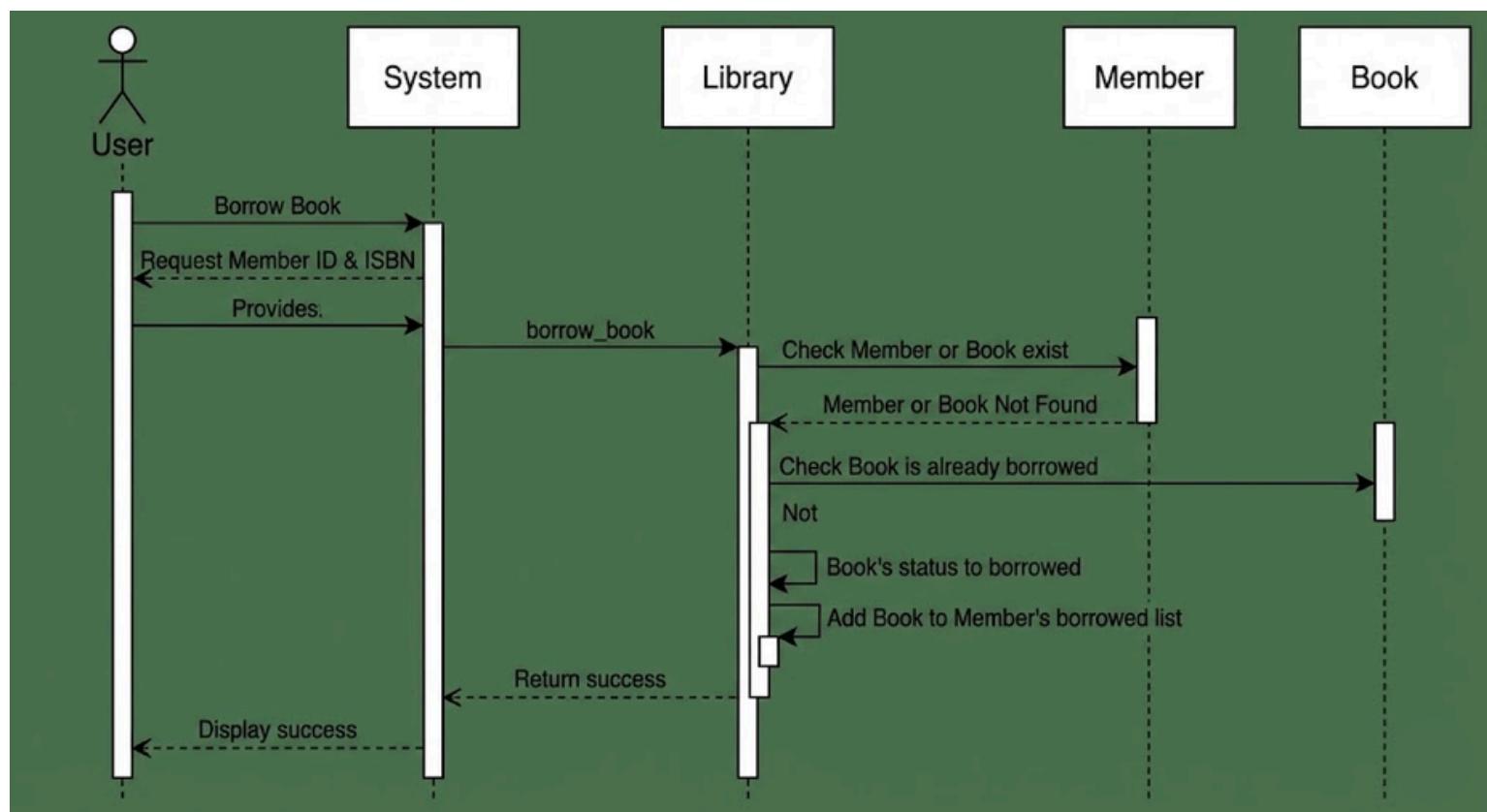
USE CASE DIAGRAM



WORKFLOW DIAGRAM



SEQUENCE DIAGRAM



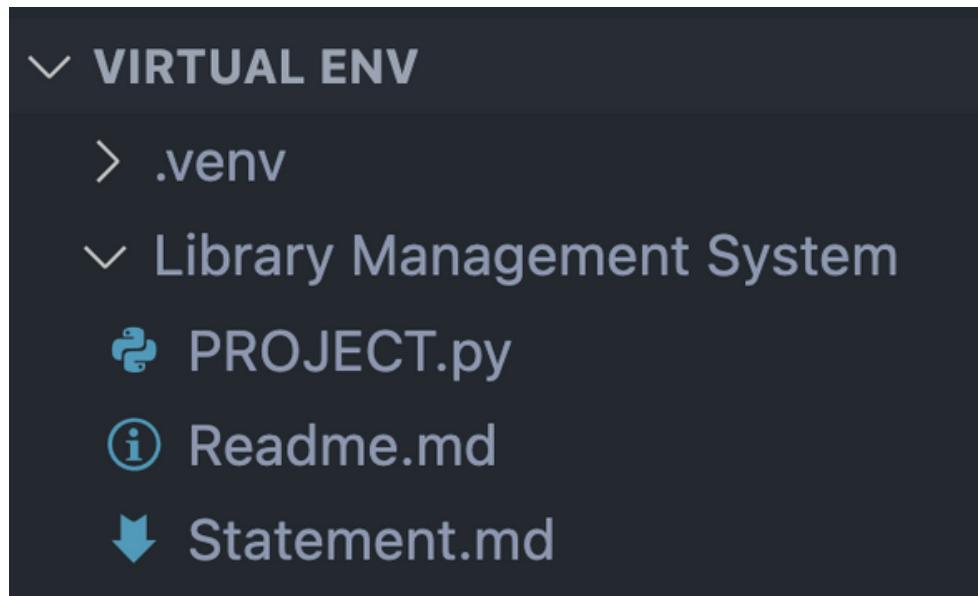
DESIGN DECISIONS & RATIONALE

- Classes
- Modularity and Separation of Concerns
- Dictionaries
- Lists
- Error Handling and User Feedback
- User Interface
- Clear method names
- Comments

IMPLEMENTATION DETAILS

- Book: A digital card holding a book's details (title, author, ISBN) and its borrowing status.
- Member: A digital ID card for a library user, tracking their name, ID, and what books they've borrowed.
- Library: The central manager that keeps track of all books and members, handling all borrowing, returning, and listing operations.

SCREENSHOTS AND RESULTS



Python + ⌂ ⏺ ⏹ ⏷ | ☰ ×

- (.venv) arjunmishra@ARJUNS-MacBook-Air-2 Virtual Env % "/Users/arjunmishra/Documents/Python/Virtual Env/.venv/bin/python" "/Users/arjunmishra/Documents/Python/Virtual Env/Library Management System/PROJECT.py"

Execution of program starts from here :

Enter the name of the library: XYZ LIBRARY

--- Library Menu ---

- 1. Add Book
 - 2. Add Member
 - 3. Borrow Book
 - 4. Return Book
 - 5. List All Books
 - 6. List Available Books
 - 7. List Borrowed Books
 - 8. List All Members
 - 9. Remove Book
 - 10. Remove Member

11. Exit

Enter your choice: 1
Enter book title: Harry Potter

Enter book title: Harry Potter
Enter book authors: JK Rowling

Enter book author: JK Rowl
Enter book ISBN: 123456780

Enter book ISBN: 1234567

Added book: Harry Potter

— Library Menu

--- Library Menu

1. Add Book
2. Add Member

- 2. Add Member
- 3. Borrow Book

- 3. Borrow Book
- 4. Return Book

- 4. Return Book
- 5. List All Books

- 5. List All Books
- 6. List Available Books

- [6. List Available](#)
- [7. List Borrowed](#)

8. List A

9. Remove

10. Remove Member

11. Exit

Enter your choice

Exiting Library M

(.venv) arjunmishra@ARJUNs-MacBook-Air-2:~

TEST APPROACH

- **Unit Testing:** Checks if each small part (like adding a book or borrowing function) works correctly on its own.
- **Integration Testing:** Checks if different parts (like a member borrowing a book) work well together.
- **End-to-End Testing:** Tests the whole system from a user's perspective, simulating how a real person would use it.
- **Manual Testing:** Directly interacting with the program to find any issues by hand.

CHALLENGES FACED

- Environment Set-Up

LEARNING AND KEY TAKEAWAYS

- End to end ML Work Flow.
- Ability to handle multiple complexities.

FUTURE ENHANCEMENTS

- **Data Persistence:** Save library data to a file or database so it's not lost when the program closes.
- **Graphical User Interface (GUI):** Create a visual, click-based interface instead of just text.
- **User Authentication and Roles:** Add a login system with different permissions for librarians and members.
- **Transaction History:** Keep a record of all borrowing and returning activities.

REFERENCES

- Google Collab
- Git-hub

THANK
YOU