Project Requirements

Timeframe:

5 days

Features:

- Add, remove, and list books.
- Add, remove, and list library members.
- Borrow and return books.
- Display available and borrowed books.

Project Structure

The project is divided into classes to demonstrate OOP principles:

- **Book**: Represents a book with fields like ID, Title, Author, and Availability.
- **Member**: Represents a library member with fields like ID, Name, and a list of borrowed books.
- **Library**: Manages collections of books and members, and handles operations like borrowing and returning books.
- **Program**: Contains the main menu and user interaction logic.

Examples of the console output

Below are examples of the console output for the Library Management System project when running various operations. These examples illustrate how the program interacts with the user through the console menu and displays results for key functionalities. The outputs are based on the provided C# code and simulate typical user interactions.

Example 1: Adding Books and Listing Them

User Interaction:

1. User selects option 1 to add a book.
2. User enters book details.
3. User selects option 7 to list all books.

Example 2: Adding a Member and Borrowing a Book

User Interaction:

1. User adds a member.
2. User borrows a book for that member.
3. User lists members and books to see the updated status.

Example 3: Attempting to Borrow an Unavailable Book

User Interaction:

1. User tries to borrow a book that is already borrowed.
2. System displays an error message.

Example 4: Returning a Book and Removing a Member

User Interaction:

1. User returns a borrowed book.
2. User removes the member.
3. User lists books and members to verify.

Example 5: Error Handling (Invalid Input)

User Interaction:

1. User enters an invalid option in the menu.
2. User tries to remove a non-existent book.

Console Output:

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 1
Enter Book ID: 1
Enter Title: The Great Gatsby
Enter Author: F. Scott Fitzgerald
Book 'The Great Gatsby' added successfully.

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 1
Enter Book ID: 2
Enter Title: 1984
Enter Author: George Orwell
Book '1984' added successfully.

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 7
Books in Library:
ID: 1, Title: The Great Gatsby, Author: F. Scott Fitzgerald, Available: True
ID: 2, Title: 1984, Author: George Orwell, Available: True

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 3
Enter Member ID: 101
Enter Name: Alice Smith
Member 'Alice Smith' added successfully.

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 5
Enter Book ID: 1
Enter Member ID: 101
Alice Smith borrowed 'The Great Gatsby'.

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 7
Books in Library:
ID: 1, Title: The Great Gatsby, Author: F. Scott Fitzgerald, Available: False
ID: 2, Title: 1984, Author: George Orwell, Available: True
Library Management System

1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 8
Library Members:
ID: 101, Name: Alice Smith, Borrowed Books: 1

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 5
Enter Book ID: 1
Enter Member ID: 101
Book is not available.

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 6
Enter Book ID: 1
Enter Member ID: 101
Alice Smith returned 'The Great Gatsby'.
Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book

6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 4
Enter Member ID: 101
Member 'Alice Smith' removed successfully.

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 7
Books in Library:
ID: 1, Title: The Great Gatsby, Author: F. Scott Fitzgerald, Available: True
ID: 2, Title: 1984, Author: George Orwell, Available: True

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 8
Library Members:

Library Management System
1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 10
Invalid option. Try again.
Library Management System

1. Add Book
2. Remove Book
3. Add Member
4. Remove Member
5. Borrow Book
6. Return Book
7. List Books
8. List Members
9. Exit
Select an option: 2
Enter Book ID: 999
Book not found.