Objective:

Develop a simplified library management system using C#. The system should allow users to perform basic operations such as adding, updating, and deleting books, as well as borrowing and returning books.

Requirements:

1. **Book Management:**
    - Implement functionality to add, update, and delete books.
    - Each book should have at least the following properties: Title, Author, ISBN, and Availability Status.
2. **User Management:**
    - Implement functionality to add, update, and delete users.
    - Each user should have properties such as UserID, Name, and a list of borrowed books.
3. **Borrowing and Returning Books:**
    - Implement functionality for a user to borrow a book.
    - Ensure a book cannot be borrowed if it is not available.
    - Implement functionality for a user to return a borrowed book.
4. **Design Patterns and OO Practices:**
    - Use appropriate design patterns where necessary (e.g., Factory Pattern for creating books, Singleton Pattern for the library manager).
    - Follow object-oriented principles, such as encapsulation, inheritance, and polymorphism.
    - Demonstrate the use of interfaces and abstract classes where applicable.
5. **Error Handling and Validation:**
    - Implement robust error handling and input validation.
    - Ensure that invalid operations (e.g., borrowing a book that is already borrowed) are properly handled and communicated to the user.
6. **Unit Tests:**
    - Write unit tests for the main functionalities using a testing framework like NUnit or MSTest.
    - Ensure that the tests cover various edge cases and scenarios.

Submission Guidelines:

1. Create a GitHub repository and push your code there. Share the link with us.
2. Include a README file that explains how to set up and run your application, as well as any assumptions you made.
3. Provide instructions on how to run the unit tests.
4. Your code will be evaluated based on correctness, code quality, design patterns usage, problem-solving skills, and attention to detail.

Bonus:

- Implement a simple user interface using a simple web application
- Add search functionality to find books by title, author, or ISBN.