# Project Report

## Abstract

Our online library system provides a comprehensive digital solution for book management, offering user authentication, book borrowing/returning functionality, and personalized settings. The system leverages modern web technologies (HTML, CSS, JavaScript) with local storage for data persistence, creating a seamless user experience without requiring server infrastructure. Key features include secure login/registration, book search, dark/light theme switching, and account management.

## Introduction

Traditional library systems often suffer from inefficient manual processes and lack real-time availability tracking. Our web-based solution addresses these issues by:

- Providing instant access to book availability
- Automating borrowing/returning processes
- Offering personalized user experiences
- Maintaining borrowing history
- Implementing secure authentication

## Literature Review

Existing library management systems frequently have:

- Complex interfaces that hinder usability
- No theme customization options
- Limited search capabilities
- Poor handling of borrowing deadlines
- Inadequate user account management

Our system improves upon these shortcomings with:

- Intuitive, responsive interface
- Dark/light theme toggle
- Real-time book search
- Automatic due date calculation
- Comprehensive account settings

## Methodology

Technical Implementation:

1. Frontend: HTML5, CSS3, JavaScript
2. Data Storage: Browser local storage for persistence
3. Authentication: Secure login/registration system
4. Core Features:
    - Book borrowing with 7-day auto-return
    - Real-time search functionality
    - Theme customization
    - Account management

Key Algorithms:
1. User authentication flow with client-side validation
2. Book status management (borrowed/available)
3. Search filtering algorithm
4. Theme preference persistence

Evaluation
Testing Results:
1. Authentication:
    - Successfully validated username/password requirements
    - Properly handles duplicate usernames
    - Securely manages sessions

2. Book Management:
    - Correctly updates borrowing status
    - Accurately calculates due dates
    - Properly handles returns

3. User Experience:
    - Theme switching works seamlessly
    - Search functionality provides instant results
    - All buttons/links function as expected

Performance:
- Instant response for all operations
- No noticeable lag even with multiple books
- Clean state management

Conclusion
Our online library system successfully delivers a user-friendly, functional platform that addresses common library management challenges. The client-side implementation makes it easy to deploy while providing robust features. Future enhancements could include:
- Server-side integration for multi-device access
- Book reservation system
- Enhanced user profiles with reading history
- Admin dashboard for library staff

Works Distribution
-Hu Qingkai & Liu Jiahao**: Core functionality (login/registration, book borrowing logic, settings module)
-Huang Weijia: UI implementation, CSS styling, code review
- Liu Xiaofan: Theme switching, search functionality, code optimization