A

SYNOPSIS

of

MINOR PROJECT

On

Library Management (in C)

Submitted by

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Problem Statement:

Libraries face challenges in managing book records, user data, and lending processes efficiently. Manual systems can be error-prone and time-consuming, leading to difficulties in tracking borrowed books, managing inventory, and keeping user information up to date.

Brief Description:

This Library Management System is a C-based application designed to manage library records, including book details and user information. The system allows adding, modifying, searching, and deleting records for both users and books. It also manages the lending process by tracking book availability and borrower details.

Objective and Scope:

The primary objective of this project is to create an efficient and user-friendly system to manage library operations. The scope includes:

- Maintaining accurate records of books and users.
- Facilitating easy search and retrieval of information.
- Automating the lending process.
- Ensuring data integrity and security.

Methodology:

The system is developed in the C programming language, focusing on file management techniques to handle record storage. The main components and their detailed functionalities are as follows:

1. Password Screen:

- **Purpose**: Ensures authorized access to the system.
- **Functionality**: The system prompts the user for a password before granting access to the main menu. This prevents unauthorized users from accessing and potentially modifying the library records.

2. Main Menu Screen:

- **Purpose**: Provides navigation options for different functionalities.
- **Functionality:** After successful login, the user is presented with a main menu offering options to navigate to the User Panel, Book Panel, or to exit the system. The menu ensures that the user can easily access all parts of the system.

3. User Panel:

- **Purpose**: Manages user-related operations.
- **Functionality**:

1. **Add User**: Allows the librarian to add new users by entering details such as Student ID, First Name, Last Name, Gender, and Phone Number. This information is stored in user_Records.txt.
2. **Modify User**: Enables the librarian to update existing user information. The librarian can search for a user by their Student ID and then make necessary changes to their details.
3. **List User** :Displays a list of all users in the system, showing their details for easy reference.
4. **Search User**: Provides the ability to search for a user by their name or

Student ID, making it easy to find specific user information.

5. **Delete User**: Allows the librarian to remove a user from the system by their Student ID, ensuring that only current users are listed.

4. **Book Panel**:

- **Purpose**: Manages book-related operations.
- **Functionality**:

1. **Add Book**: Enables the librarian to add new books to the library's collection by entering details such as Book ID, Book Name, Author Name, Publisher, and Quantity. This information is stored in book_Records.txt.
2. **Modify Book**: Allows the librarian to update book details. The librarian can search for a book by its Book ID and then modify the relevant information.
3. **List Book**: Displays a list of all books in the library, including their details and available quantities.
4. **Rent Book**: Manages the lending process by checking book availability and updating records when books are borrowed. If the desired book is available, it records the borrower's information and decreases the available quantity.
5. **Search Book**: Provides the ability to search for books by name, showing their details and available quantities.
6. **Delete Book**: Allows the librarian to remove a book from the system by its Book ID, ensuring that only currently available books are listed.

5. **End Screen**:

- **Purpose**: Properly terminates the program.

- **Functionality** : The end screen ensures that all files are properly closed and that the system exits gracefully. It may also display a goodbye message to the user.

Hardware and Software Requirements:

- **Hardware**:

  A computer with standard specifications (processor, RAM, storage).

- **Software**:

  1. **Operating System**: Windows/Linux/MacOS
  2. **Compiler**: GCC or any compatible C compiler
  3. **Text Editor**: Any standard text editor (e.g., Notepad++, VS Code)

Technologies:

- **Programming Language**: C
- **File Management**: Handling user and book records through text files (user_Records.txt and book_Records.txt)

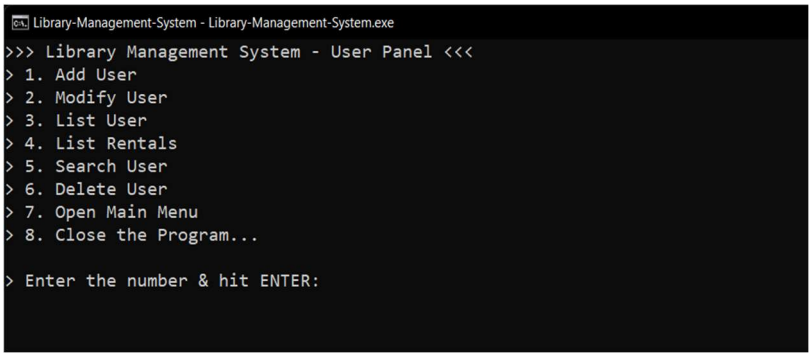
Testing Techniques:

- **Unit Testing**: Individual functions will be tested to ensure they work correctly.
- **Integration Testing**: Combined functions will be tested to verify they interact properly.

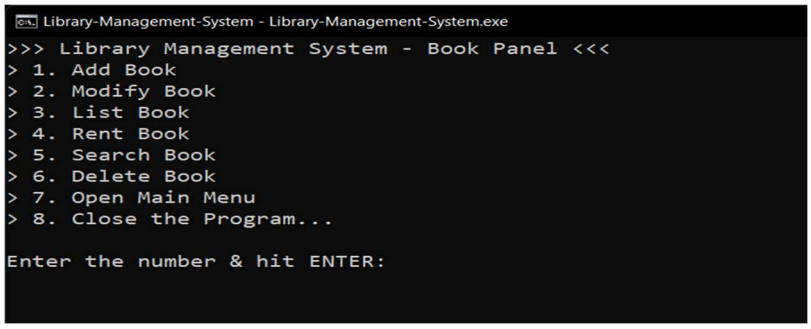
- **User Acceptance Testing**: The system will be tested by potential users to ensure it meets their requirements.

Project Snapshots :

- **User Pannel**



- **Book Pannel**



- **List of books rental**

```
>>> List of Books Rental <<<
------------------------------

> Rent User: Amit
> Rent Book(s): God_of_small_things

> Rent User: Raj
> Rent Book(s): Midnight_Children

> Rent User: Anita
> Rent Book(s): Inheritance_of_loss

> Rent User: Rahul
> Rent Book(s): A_suitable_boy

> Rent User: Neha
> Rent Book(s): The_white_tiger

> Rent User: Vikram
> Rent Book(s): Programming_in_modern_c++


Press any key to get back to User Panel.
```

- **Searching user**

```
Search by First name of the student: Amit

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>>> Record Found <<<
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> Full Name: Amit sharma
> Gender: M
> Student-ID: 9
> Phone Number: 8123655484
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Press any key to redirect back to Panel.
```

- **Modify user**

```
Enter the name of the person you want to modify the detail: Priya

---------------------------------------------
>>> Record Found, Allowing Modifications <<<
---------------------------------------------

> Enter First Name: Akash
> Enter Last Name: Singh
> Enter Gender: M
> Enter Student ID: 2
> Enter Phone Number: 4845164589


Processing your changes....
```

- **List Books**

```
>>> List of Books Record <<<
------------------------------

------------------------------
> Book Name: God_of_small_things
> Auhtor: Arundhati_roy
> Publisher: Indiaink
> Book ID: 1
> Quantity: 5
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> Book Name: Midnight_Children
> Auhtor: Salman_Rushdie
> Publisher: Jonathan_cape
> Book ID: 2
> Quantity: 8
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> Book Name: Inheritance_of_loss
> Auhtor: Kiran_desai
> Publisher: Atlantic_monthly_press
> Book ID: 3
> Quantity: 3
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Project Contribution:

This project contributes to understanding file management in C, enhancing knowledge of record handling, and providing a practical solution for library management. It serves as a learning tool for students and developers to explore the implementation of a functional management system using C programming.