SHRI RAMDEOBABA COLLEGE OF ENGINEERING AND MANAGEMENT

III Sem BTech
CSE A

DSA ASSIGNMENT
TA - 2

GROUP MEMBERS :
Maitri Markandeywar (5)
Prerna Chourasia (10)
Rishabh Jain (54)
Sahil Hedau (56)
Shreyash Sahu (62)
Smit Khobragade (Team Lead) (64)

COURSE COORDINATOR
Prof. Hirkani Padwad

PROBLEM STATEMENT :

Our main objective in this project is to create a library management system wherein students can issue books and the admin or librarian can update/delete the record of books kept in the library.

OBJECTIVES :

The main objective of the Library Management System is to provide an efficient and user-friendly way for librarians to manage their library collections and students. The System aims to streamline the process of borrowing and returning books, reduce errors and mismanagement, and increase the overall efficiency of library management.

FEATURES :

The Library Management System has the following features :
- ADD New Books To The Library
- DELETE Books From The Library
- ADD New Students To The Library
- DELETE Students From The Library
- Borrow Or Return Books
- Calculate The Fine Amount
- Search About The Data About A Student

TECH STACK :

The Library Management System is developed using the C programming language. The program is implemented as a command-line interface (CLI) to provide a simple and efficient way for librarians to interact with the System.

SYSTEM ARCHITECTURE :

The Library Management App has a modular architecture, consisting of several independent components that work together to provide the desired functionality. The main components of the system are:

- Book management module: Handles adding, and deleting books from the library.
- Student management module: Handles adding, and deleting patrons from the library.
- Main Management Module : Which Handles all the Modules for The library Management system.

DS USED :

- HASH MAPS
- LINKED LIST
- ARRAYS
- STRUCTURES

Future Improvements :

The following features could be added to improve the Library Management App in the future:
- Graphical User Interface (GUI): A GUI could be added to the app to provide a more user-friendly interface for librarians.

CONCLUSION :

The Library Management App is a useful tool for librarians to manage their book collections and patrons efficiently. The app provides an easy-to-use interface that simplifies the process of managing books and patrons. With the modular architecture of the app, future improvements can be easily added to provide additional functionality.

Link To The Project : GITHUB LINK (Master Branch)

Contributions By INDIVIDUALS :

MAITRI MARK : CLI Interface, input_data and display function in books.h

PRERNA CHOURASIA : CLI Interface, my_data function in students.h

RISHAB JAIN : Debugging, displayStudent function in students.h, Initialise students

SAHIL HEDAU : CLI Interface, Maintaining Main Function, SLL function, Books.h Module

SHREYASH SAHU : SLL function, Hash table, student.h module, initializing books.

SMIT KHOBRAGADE : Fine Functions, Initialise students, Hash Table, Books Module, Management of project.

OUTPUT :

```
PS C:\Users\LENOVO\OneDrive\Documents\GitHub\Library_Manag
ystem\" ; if ($?) { gcc main.c -o main } ; if ($?) { .\mai

***********************************************
*                                             *
*                                             *
*              WELCOME TO LIBRARY             *
*                                             *
*                                             *
***********************************************


Enter 1 to start library: 1
BOOK inserted at end
BOOK inserted at end
BOOK inserted at end
BOOK inserted at end
BOOK inserted at end

Student data inserted!



****************** Main Menu ******************
*                                             *
*            Enter 1 for Admin Panel.         *
*            Enter 2 for Student Panel.       *
*            Enter 3 to end program.          *
*                                             *
***********************************************
Enter: 1


****************** Admin Menu ******************
*                                             *
*           Enter 1 to add new book.          *
*       Enter 2 to display data of all books. *
```

```
*        Enter 3 to display data of all students.  *
*              Enter 4 to Calculate Fine             *
*           Enter 5 to return to Main menu.          *
*                                                    *
******************************************************
ENTER : 2

BOOKS DATA :

---------- BOOK ----------
Book ID is : 101
Book name : Mathematics
Available no. of books : 4
Books issued : 0
--------------------------

---------- BOOK ----------
Book ID is : 102
Book name : Life
Available no. of books : 6
Books issued : 0
--------------------------

---------- BOOK ----------
Book ID is : 103
Book name : Pschychology
Available no. of books : 9
Books issued : 0
--------------------------

---------- BOOK ----------
Book ID is : 104
Book name : Basic_C
Available no. of books : 4
Books issued : 0
--------------------------
```

```
Books issued : 0
--------------------------


---------- BOOK ----------
Book ID is : 105
Book name : Logic_design
Available no. of books : 8
Books issued : 0
--------------------------



****************** Admin Menu ******************
*                                                   *
*             Enter 1 to add new book.              *
*       Enter 2 to display data of all books.       *
*     Enter 3 to display data of all students.      *
*              Enter 4 to Calculate Fine            *
*          Enter 5 to return to Main menu.          *
*                                                   *
*****************************************************
ENTER : 3

--------- Student (ID 46) Data ---------
Student Name : Gaurav
Issued Books with ID : 0 0 0 0

--------- Student (ID 51) Data ---------
Student Name : Poushik
Issued Books with ID : 0 0 0 0

--------- Student (ID 56) Data ---------
Student Name : Sahil
Issued Books with ID : 0 0 0 0

--------- Student (ID 57) Data ---------
Student Name : Samrat
```

```
--------- Student (ID 57) Data ---------
Student Name : Samrat
Issued Books with ID : 0 0 0 0

--------- Student (ID 58) Data ---------
Student Name : Sarang
Issued Books with ID : 0 0 0 0

--------- Student (ID 60) Data ---------
Student Name : Saurabh
Issued Books with ID : 0 0 0 0

--------- Student (ID 61) Data ---------
Student Name : Shreyansh
Issued Books with ID : 0 0 0 0

--------- Student (ID 62) Data ---------
Student Name : Shreyash
Issued Books with ID : 0 0 0 0

--------- Student (ID 64) Data ---------
Student Name : Smit
Issued Books with ID : 0 0 0 0

--------- Student (ID 70) Data ---------
Student Name : Yash
Issued Books with ID : 0 0 0 0


****************** Admin Menu ******************
*                                                   *
*             Enter 1 to add new book.              *
*       Enter 2 to display data of all books.       *
*     Enter 3 to display data of all students.      *
*              Enter 4 to Calculate Fine            *
*          Enter 5 to return to Main menu.          *
```

```
File   Edit   Selection   View   Go   Run   Terminal   Help

PROBLEMS   DEBUG CONSOLE   OUTPUT   TERMINAL

*          Enter 5 to return to Main menu.          *
*                                                   *
*****************************************************
ENTER : 5


****************** Main Menu ******************
*                                             *
*          Enter 1 for Admin Panel.           *
*          Enter 2 for Student Panel.         *
*          Enter 3 to end program.            *
*                                             *
***********************************************
Enter: 2


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
*******************************************
Enter: 1
Enter your ID: 56
Enter Book ID to be issued: 101
BOOK ISSUED!


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
```

```
Temp*      ⊗ 0 ⚠ 0     Live Share
```

```
File   Edit   Selection   View   Go   Run   Terminal   Help

PROBLEMS   DEBUG CONSOLE   OUTPUT   TERMINAL

*          Enter 3 to print your data.          *
*          Enter 4 to return to Main menu.      *
*                                               *
*************************************************
Enter: 1
Enter your ID: 56
Enter Book ID to be issued: 102
BOOK ISSUED!


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
*******************************************
Enter: 1
Enter your ID: 56
Enter Book ID to be issued: 103
BOOK ISSUED!


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
*******************************************
Enter: 1
Enter your ID: 56
Enter Book ID to be issued: 104
BOOK ISSUED!
```

```
Temp*      ⊗ 0 ⚠ 0     Live Share
```

```
File   Edit   Selection   View   Go   Run   Terminal   Help

PROBLEMS   DEBUG CONSOLE   OUTPUT   TERMINAL

Enter Book ID to be issued: 104
BOOK ISSUED!


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
*******************************************
Enter: 1
Enter your ID: 56
Enter Book ID to be issued: 105
You can only issue 4 books at a time.


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
*******************************************
Enter: 3
Enter your id: 56

--------- Sahil's Data ---------
ID : 56
Issued Books with ID : 101 102 103 104


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
```

```
Temp*      ⊗ 0 ⚠ 0     Live Share
```

```
File   Edit   Selection   View   Go   Run   Terminal   Help

PROBLEMS   DEBUG CONSOLE   OUTPUT   TERMINAL

************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
*******************************************
Enter: 2
Enter your id: 56
Enter book id to be returned: 102
BOOK RETURNED SUCCESSFULLY!


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
*******************************************
Enter: 2
Enter your id: 56
Enter book id to be returned: 105
The user has not issued such a book


************** Student Menu ***************
*                                         *
*          Enter 1 to issue book.         *
*          Enter 2 to return book.        *
*          Enter 3 to print your data.    *
*          Enter 4 to return to Main menu.*
*                                         *
*******************************************
```

```
Temp*      ⊗ 0 ⚠ 0     Live Share
```

```
**************************************************
Enter: 3
Enter your id: 56

--------- Sahil's Data ---------
ID : 56
Issued Books with ID : 101 103 104 0


************** Student Menu ***************
*                                          *
*             Enter 1 to issue book.       *
*             Enter 2 to return book.      *
*          Enter 3 to print your data.     *
*          Enter 4 to return to Main menu. *
*                                          *
*******************************************
Enter: 1
Enter your ID: 64
Enter Book ID to be issued: 101
BOOK ISSUED!


************** Student Menu ***************
*                                          *
*             Enter 1 to issue book.       *
*             Enter 2 to return book.      *
*          Enter 3 to print your data.     *
*          Enter 4 to return to Main menu. *
*                                          *
*******************************************
Enter: 4


***************** Main Menu *****************
*                                              *
*            Enter 1 for Admin Panel.          *
```

```
***************** Main Menu ******************
*                                              *
*            Enter 1 for Admin Panel.          *
*            Enter 2 for Student Panel.        *
*            Enter 3 to end program.           *
*                                              *
***********************************************
Enter: 1


***************** Admin Menu ******************
*                                              *
*            Enter 1 to add new book.          *
*       Enter 2 to display data of all books.  *
*     Enter 3 to display data of all students. *
*            Enter 4 to Calculate Fine         *
*          Enter 5 to return to Main menu.     *
*                                              *
***********************************************
ENTER : 2

BOOKS DATA :

----------- BOOK -----------
Book ID is : 101
Book name : Mathematics
Available no. of books : 2
Books issued : 2
---------------------------

----------- BOOK -----------
Book ID is : 102
Book name : Life
Available no. of books : 6
Books issued : 0
---------------------------
```

```
Book name : Life
Available no. of books : 6
Books issued : 0
---------------------------

----------- BOOK -----------
Book ID is : 103
Book name : Pschychology
Available no. of books : 8
Books issued : 1
---------------------------

----------- BOOK -----------
Book ID is : 104
Book name : Basic_C
Available no. of books : 3
Books issued : 1
---------------------------

----------- BOOK -----------
Book ID is : 105
Book name : Logic_design
Available no. of books : 8
Books issued : 0
---------------------------



***************** Admin Menu ******************
*                                              *
*            Enter 1 to add new book.          *
*       Enter 2 to display data of all books.  *
*     Enter 3 to display data of all students. *
*            Enter 4 to Calculate Fine         *
*          Enter 5 to return to Main menu.     *
*                                              *
***********************************************
```

```
*          Enter 5 to return to Main menu.     *
*                                              *
***********************************************
ENTER : 3

--------- Student (ID 46) Data ---------
Student Name : Gaurav
Issued Books with ID : 0 0 0 0

--------- Student (ID 51) Data ---------
Student Name : Poushik
Issued Books with ID : 0 0 0 0

--------- Student (ID 56) Data ---------
Student Name : Sahil
Issued Books with ID : 101 103 104 0

--------- Student (ID 57) Data ---------
Student Name : Samrat
Issued Books with ID : 0 0 0 0

--------- Student (ID 58) Data ---------
Student Name : Sarang
Issued Books with ID : 0 0 0 0

--------- Student (ID 60) Data ---------
Student Name : Saurabh
Issued Books with ID : 0 0 0 0

--------- Student (ID 61) Data ---------
Student Name : Shreyansh
Issued Books with ID : 0 0 0 0

--------- Student (ID 62) Data ---------
Student Name : Shreyash
Issued Books with ID : 0 0 0 0
```

```
Issued Books with ID : 0 0 0 0

--------- Student (ID 62) Data ---------
Student Name : Shreyash
Issued Books with ID : 0 0 0 0

--------- Student (ID 64) Data ---------
Student Name : Smit
Issued Books with ID : 101 0 0 0

--------- Student (ID 70) Data ---------
Student Name : Yash
Issued Books with ID : 0 0 0 0


***************** Admin Menu ********************
*                                              *
*          Enter 1 to add new book.            *
*      Enter 2 to display data of all books.   *
*      Enter 3 to display data of all students.*
*          Enter 4 to Calculate Fine           *
*          Enter 5 to return to Main menu.      *
*                                              *
************************************************
ENTER : 5


***************** Main Menu *******************
*                                             *
*          Enter 1 for Admin Panel.           *
*          Enter 2 for Student Panel.         *
*          Enter 3 to end program.            *
*                                             *
***********************************************
Enter: 2
```

```
*                                                    *
*****************************************************
Enter: 2


************** Student Menu ***************
*                                        *
*          Enter 1 to issue book.        *
*          Enter 2 to return book.       *
*          Enter 3 to print your data.   *
*          Enter 4 to return to Main menu.*
*                                        *
******************************************
Enter: 3
Enter your id: 56

--------- Sahil's Data ---------
ID : 56
Issued Books with ID : 101 103 104 0


************** Student Menu ***************
*                                        *
*          Enter 1 to issue book.        *
*          Enter 2 to return book.       *
*          Enter 3 to print your data.   *
*          Enter 4 to return to Main menu.*
*                                        *
******************************************
Enter: 2
Enter your id: 56
Enter book id to be returned: 101
BOOK RETURNED SUCCESSFULLY!

************** Student Menu ***************
*                                        *
```

```
************** Student Menu ***************
*                                        *
*          Enter 1 to issue book.        *
*          Enter 2 to return book.       *
*          Enter 3 to print your data.   *
*          Enter 4 to return to Main menu.*
*                                        *
******************************************
Enter: 2
Enter your id: 56
Enter book id to be returned: 103
BOOK RETURNED SUCCESSFULLY!


************** Student Menu ***************
*                                        *
*          Enter 1 to issue book.        *
*          Enter 2 to return book.       *
*          Enter 3 to print your data.   *
*          Enter 4 to return to Main menu.*
*                                        *
******************************************
Enter: 2
Enter your id: 56
Enter book id to be returned: 104
BOOK RETURNED SUCCESSFULLY!


************** Student Menu ***************
*                                        *
*          Enter 1 to issue book.        *
*          Enter 2 to return book.       *
*          Enter 3 to print your data.   *
*          Enter 4 to return to Main menu.*
*                                        *
******************************************
```

```
*          Enter 4 to return to Main menu.*
*                                        *
******************************************
Enter: 3
Enter your id: 56

--------- Sahil's Data ---------
ID : 56
Issued Books with ID : 0 0 0 0


************** Student Menu ***************
*                                        *
*          Enter 1 to issue book.        *
*          Enter 2 to return book.       *
*          Enter 3 to print your data.   *
*          Enter 4 to return to Main menu.*
*                                        *
******************************************
Enter: 4


***************** Main Menu *******************
*                                             *
*          Enter 1 for Admin Panel.           *
*          Enter 2 for Student Panel.         *
*          Enter 3 to end program.            *
*                                             *
***********************************************
Enter: 1


***************** Admin Menu ********************
*                                              *
*          Enter 1 to add new book.            *
*      Enter 2 to display data of all books.   *
*      Enter 3 to display data of all students.*
```
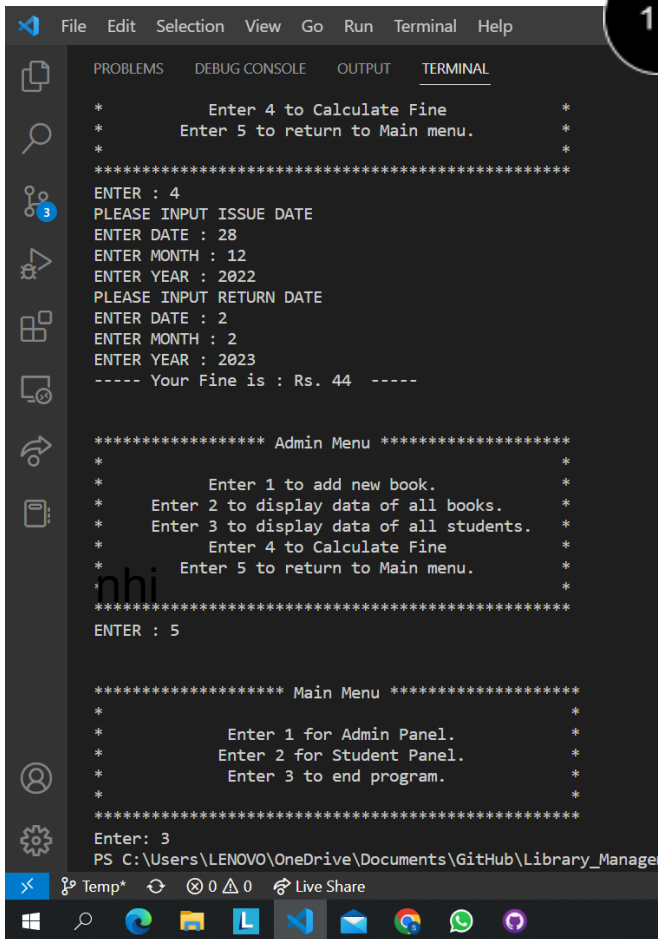
```
*              Enter 4 to Calculate Fine              *
*          Enter 5 to return to Main menu.            *
*                                                     *
*******************************************************
ENTER : 4
PLEASE INPUT ISSUE DATE
ENTER DATE : 28
ENTER MONTH : 12
ENTER YEAR : 2022
PLEASE INPUT RETURN DATE
ENTER DATE : 2
ENTER MONTH : 2
ENTER YEAR : 2023
----- Your Fine is : Rs. 44  -----


****************** Admin Menu ******************
*                                              *
*            Enter 1 to add new book.          *
*     Enter 2 to display data of all books.    *
*     Enter 3 to display data of all students. *
*            Enter 4 to Calculate Fine         *
*         Enter 5 to return to Main menu.      *
*                                              *
************************************************
ENTER : 5


****************** Main Menu ******************
*                                             *
*            Enter 1 for Admin Panel.         *
*            Enter 2 for Student Panel.       *
*            Enter 3 to end program.          *
*                                             *
***********************************************
Enter: 3
PS C:\Users\LENOVO\OneDrive\Documents\GitHub\Library_Manage
```