Library Management System Manual

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1 Introduction

This manual provides documentation for the Library Management System project implemented in C++. The project includes various classes and structures to manage library transactions, book collection, library cards, and users.
This manual describes the usage and functionality of each component.
To start using the program, please compile and run `main.cpp`

2 Components

2.1 Additionals

The `additional` module represents all functions and structures
(like `Date`, `TimeOfTheDay`) that are responsible for the correct behaviour of the program.

2.2 Fine

The `Fine` class represents a fine associated with a library card.
It is automatically given to a user, once they return a book to the library with delay.

2.3 Transaction

The `Transaction` class represents a transaction between a user and the library.
It provides methods to retrieve the transaction details.

2.4 ReturnTransaction

The `ReturnTransaction` class extends the `Transaction` class and includes an additional attribute `overtime` to tell if the book was returned late.

2.5 BorrowTransaction

The `BorrowTransaction` class extends the `Transaction` class and includes an additional attribute `return_deadline` to indicate the deadline for returning the book. It provides methods to retrieve the return deadline and extend it.

2.6 Book

The `Book` class represents a book in the library. It includes attributes such as title, author, ISBN, and book ID. It also maintains a list of transactions associated with the book. The class provides methods to borrow and return books, retrieve book details, and check if the book is currently borrowed.

2.7 LibraryCard

The `LibraryCard` class represents a library card issued to a user. It includes attributes such as name, surname, ID, start date, and a list of transactions. It also maintains a map of borrowed books and a list of fines associated with the card. The class provides methods to borrow and return books, apply fines, and retrieve card details.

2.8 User

The `User` class represents a library user. It includes attributes such as name, surname, and user ID. It also maintains a library card associated with the user. The class provides methods to retrieve user details.

2.9 Librarian

The `Librarian` class extends the `User` class and represents a librarian. It includes a schedule attribute to define working hours for each day of the week. The class provides methods to retrieve the schedule and change work hours.

2.10 Library

The `Library` class represents a library which is a very big database. It includes a collection of books, users, and librarians. The class provides methods to add and remove books, users, and librarians, issue library cards, manage transactions, and also calculate fines.

3 Usage of REPL

3.1 Exit the program

To exit the program, use the `exit` function.

3.2 Print all available functions

To get a list of all commands, use the `help` function.

3.3 List all books

To get a list of all books that are currently in the library, use the `lsbooks` function.

3.4 List all users

To get a list of all users that are registered in the library database, use the `lsusers` function.

3.5 List all librarians

To get a list of all librarians that are currently hired in the library, use the `lslibrarians` function.

3.6 Add a book

To add a book to the library collection, use the `addBook` function.

3.7 Delete book

To delete a book from the library collection, use the `deleteBook` function.

3.8 Add a user

To add a user to the library database, use the `addUser` function.

3.9 Delete user

To delete a user from the library database, use the `deleteUser` function.

3.10 Hire librarian

To hire a new librarian, use the `hireLibrarian` function.

3.11 Fire librarian

To fire a librarian, use the `fireLibrarian` function.

3.12 Create Library Card

To get access to all books, you have to get an active library card. To do so, use the `createCard` function.

3.13 Borrow a book

To borrow a book, use the `borrowBook` function.

3.14 Return a book

To return a book, use the `returnBook` function.

3.15 Information about a book

To get all information about a certain book, use the `bookInfo` function.

3.16 Information about user

To get info about a certain user, use the `userInfo` function.

3.17 User's borrowed books

To list all books that have been borrowed by user's card, use the `borrowedBooks` function.

3.18 Check card's balance

To check a library card's balance with all fines that have been assigned to user's card, use the `balance` function.

3.19 Information about fines

To list all fines that are currently assigned to a card, use the `lsfines` function.

3.20 Pay off a fine

- To pay off the fine, use the `payFine` function.
- You can pay the whole fine value or a part of it.
- You can pay off multiple fines in one transaction.
- If you pay more money than the sum of all fine values that are currently assigned to the card, the rest of the funds will be returned back.