Library Management System

CRN: 21438 **GROUP 10**

This project is designed to manage and store book information electronically based on the needs of students. The system facilitates continuous tracking of all available books, enabling students and library managers to search for desired books efficiently.

Admin and student users can search for specific books, and the system is handy for colleges to monitor book issuances and returns and calculate fines accurately. Automating these tasks helps eliminate the possibility of manual errors, ensuring precise tracking of information such as issue dates, return deadlines, and fine details.

Manual efforts are significantly reduced by utilizing the system, allowing for a seamless flow of library activities. The input data types available to the database include Integer, String, Double, Date and Time, binary, and structured data.

Critical Information Stored in the Database:

- **Admin Login:** Admins administer the system by adding or removing e-books managing the system effectively.
- **User Login:** Students register and create accounts, logging in with their ten-digit mobile numbers and email IDs.
- **Add and Update Books:** Admins can add new books to the system, provide details, and update existing information.
- **Search Option:** Both admin and students can search for books by entering the book's name.
- **View Order:** Admins can view orders placed for books.
- **Place Order:** Students can order books, and the system automatically adjusts the available quantity.
- **Calculate Fine:** Students can check issue and expiry dates for borrowed books and calculate fines if necessary.

Advantages of the System:

- **Paperless Management:** The system eliminates paperwork by electronically managing all book-related information.
- **Real-time Updates:** Admins can keep the system up-to-date with new book arrivals, allowing students to access the latest information without visiting the library.
- **Organized Book Inventory:** Books are systematically arranged in different categories, making it easy for users to search and locate them.
- **Efficiency and Resource Savings:** The system streamlines processes, saving human effort and resources in library management.

DATABASE DESCRIPTION

In here we're working on a software application design to efficiently manage the operations and resources of a library using MongoDB as the database backend. MongoDB is a popular NoSQL database that provides scalability and flexibility, making it suitable for storing and managing diverse types of data in a library setting. The key features include Book Catalogue, User Management, Borrowing and Returning, Searching, Availability, Fine Management.

Overall, this system built on MongoDB provides a scalable and robust platform for libraries to efficiently manage their resources, improve user experience, and streamline administrative tasks.

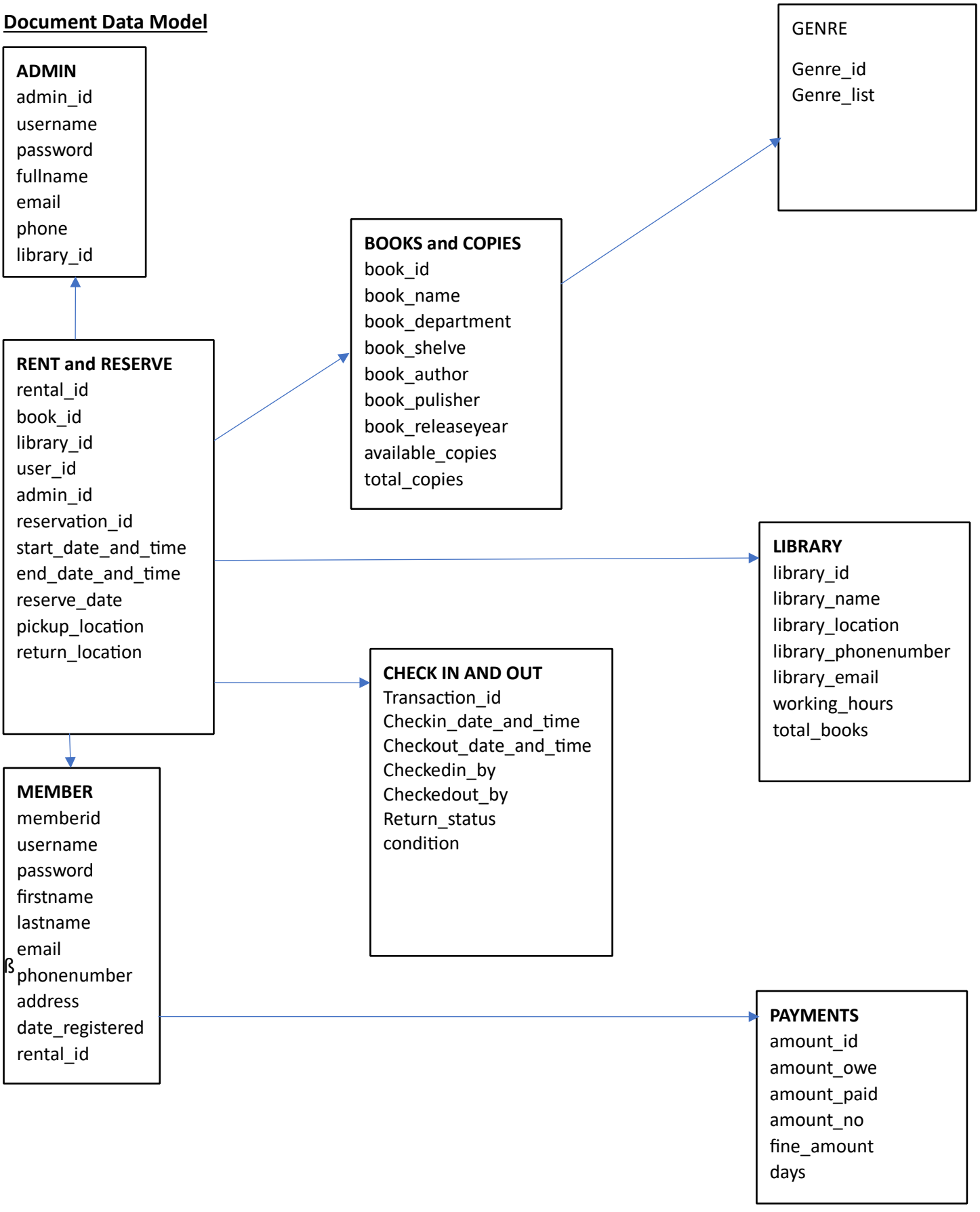
Database Description:

This Database has multiple collections to store data of books and copies, members, rent and reserve, payments, genre, admin. The collection books store the data that includes name, author, publisher, department, shelve, and number of units available of a particular book, which helps user to find the desired book effectively. The member collection store user data such as First name, Last name, email, mobile number, address, and username password. An admin collection is introduced to store their credentials and the specific library they work. An admin can perform CRUD operations to manage the book availability and rentals. The website will be used by multiple Libraries at different locations within an organization. Hence, we'll use the library collection to maintain the information of every library. Rentals and fines information are stored in two more different collection for effective querying. The collections can be described briefly as,

- Admin Collection – Stores information about system administrators.
- Member Collection – Manages user data including Name, email, borrowed books and fines.
- Books and Copies Collection – Contains details about books such as title, author, genre, and availability.
- Library Collections – Stores information about the library itself like name, address, and contact details.
- Rentals Collection – Tracks rental transactions including user ID, book ID, dates, and status.
- Payments Collection – Manages financial data related to fines, payments, and transactions.

Each collection contains documents with specific fields relevant to its purpose, allowing for efficient storage and retrieval of data related to library operations, user management, book tracking, and financial transactions. This model helps in organizing information and maintaining the integrity of library system data in a NoSQL environment like MongoDB.

Document Data Model



SAMPLE DATA

COLLECTION – 1 (ADMIN)

```
_id: ObjectId('65f7792125e5c6232170eb0b')
username : "admin"
password : "password"
fullname : "ADMIN SINGH"
email : "adminsingh@yahoo.com"
phonenumber : 9876543210
library_id : ObjectId('65f77b0625e5c6232170eb0d')
```

COLLECTION – 2 (MEMBER)

```
_id: ObjectId('65f780dc25e5c6232170eb1b')
username : "DEF"
password : "AFG?123"
firstname : "DEF"
lastname : "HIJ"
email : "DEF@gmail.com"
phonenumber : 9876787897
address : "2806, Overland park"
date_registered : Timestamp({ t: 0, i: 0 })
rental_id : ObjectId('65f7812d25e5c6232170eb1c')
```

COLLECTION – 3 (BOOKS and COPIES)

```
_id: ObjectId('65f784af25e5c6232170eb2d')
name : "Harry Potter"
department : "Fiction"
genre : "Sci-Fi"
shelve : "H4"
author : "J K Rowling"
publisher : "Universal Distributors"
release_year : 2001
available_units : 76
total_units : 100
library_id : ObjectId('65f784f325e5c6232170eb2e')
```

COLLECTION – 4 (LIBRARY)

```
_id: ObjectId('65f77c0b25e5c6232170eb10')
name : "ABC"
location : "Warrensburg"
phonenumber : 8765432109
email : "operations@ABC.COM"
book_id : "65f77c1525e5c6232170eb11"
user_id : "65f77c1825e5c6232170eb12"
```

COLLECTION – 5 (RENT AND RESERVE)

```
_id: ObjectId('6609fad58a5c16a245ed77e8')
rental_id : ObjectId('6609fae48a5c16a245ed77e9')
book_id : ObjectId('6609fae78a5c16a245ed77ea')
library_id : ObjectId('6609faeb8a5c16a245ed77eb')
user_id : ObjectId('6609faef8a5c16a245ed77ec')
admin_id : ObjectId('6609faf38a5c16a245ed77ed')
reservation_id : ObjectId('6609faf78a5c16a245ed77ee')
start_date and time : Timestamp({ t: 0, i: 0 })
end_date and time : Timestamp({ t: 0, i: 0 })
reserve_date : Timestamp({ t: 0, i: 0 })
pickup_location : "Lees Summit"
return_location : "Warrensburg"
```

COLLECTION – 6 (PAYMENTS)

```
_id: ObjectId('65f77dab25e5c6232170eb17')
owe : 3.50
paid : 2.00
number : 0.50
fine_amount : 1.00
days : 5
```

COLLECTION-7 (CHECKIN AND CHECKOUT)

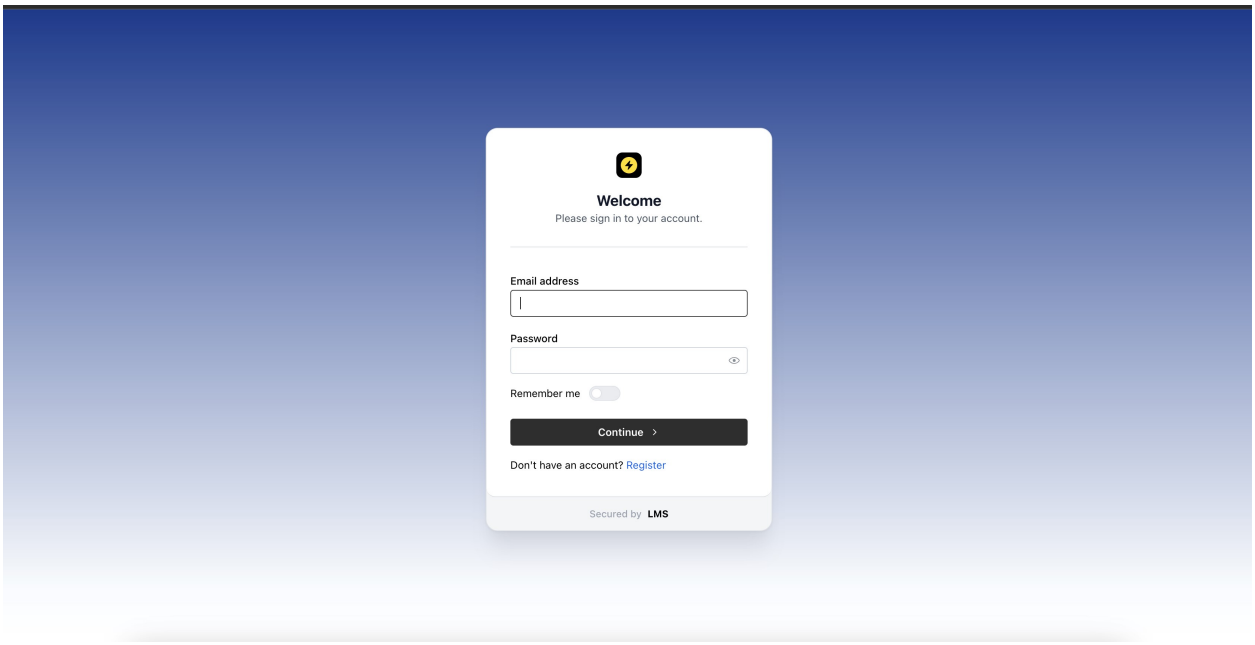
```
_id: ObjectId('6609ff398a5c16a245ed77f1')
Transaction_id : ObjectId('6609ff438a5c16a245ed77f2')
checkin_date_time : Timestamp({ t: 0, i: 0 })
checkout_date_time : Timestamp({ t: 0, i: 0 })
checkedin_by : "ABC"
checkedout_by : "ABC"
return_status : "Return"
condition : "Good"
```

COLLECTION-8 (GENRE)

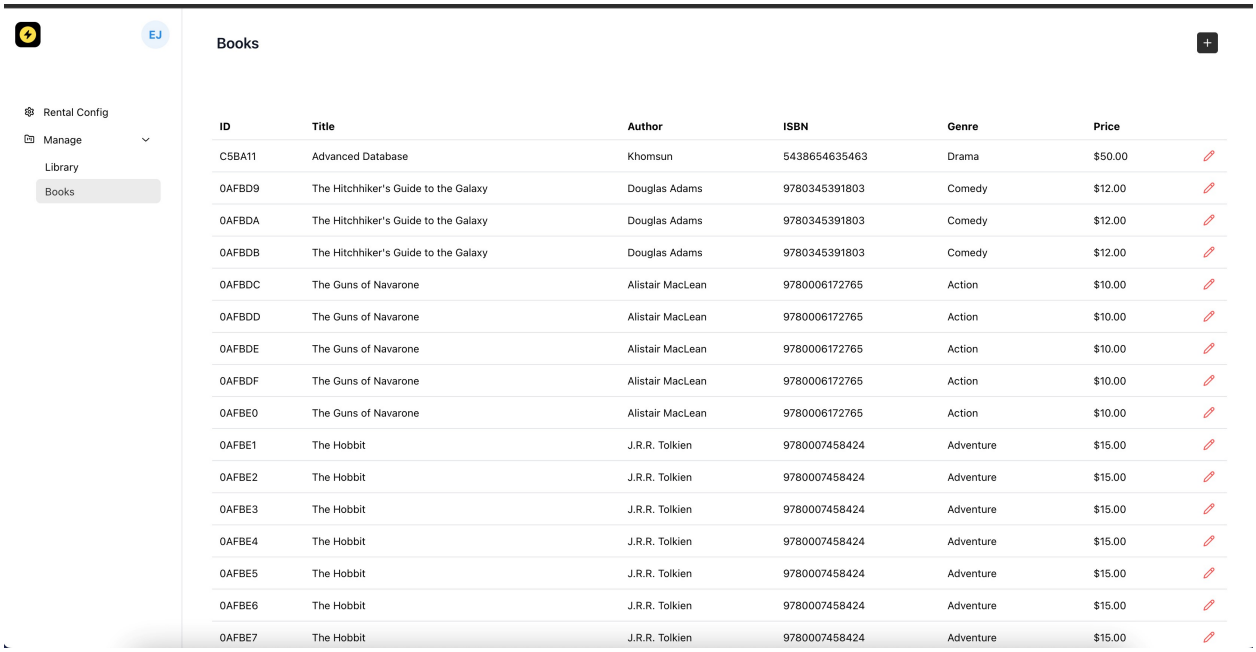
```
_id: ObjectId('660a02df8a5c16a245ed77f8')
Genre_id : ObjectId('660a02ea8a5c16a245ed77f9')
Genre_list : "Fiction"
```

User Interface Screenshots

1. Login Page:

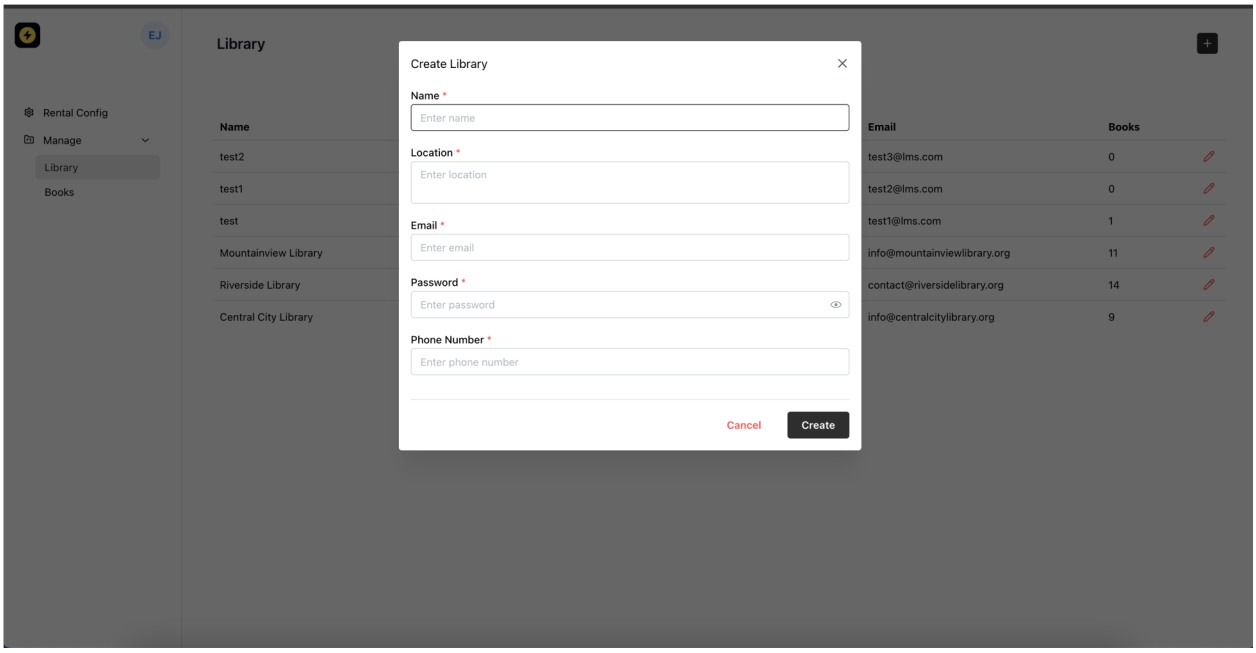


2. Admin Dashboard:

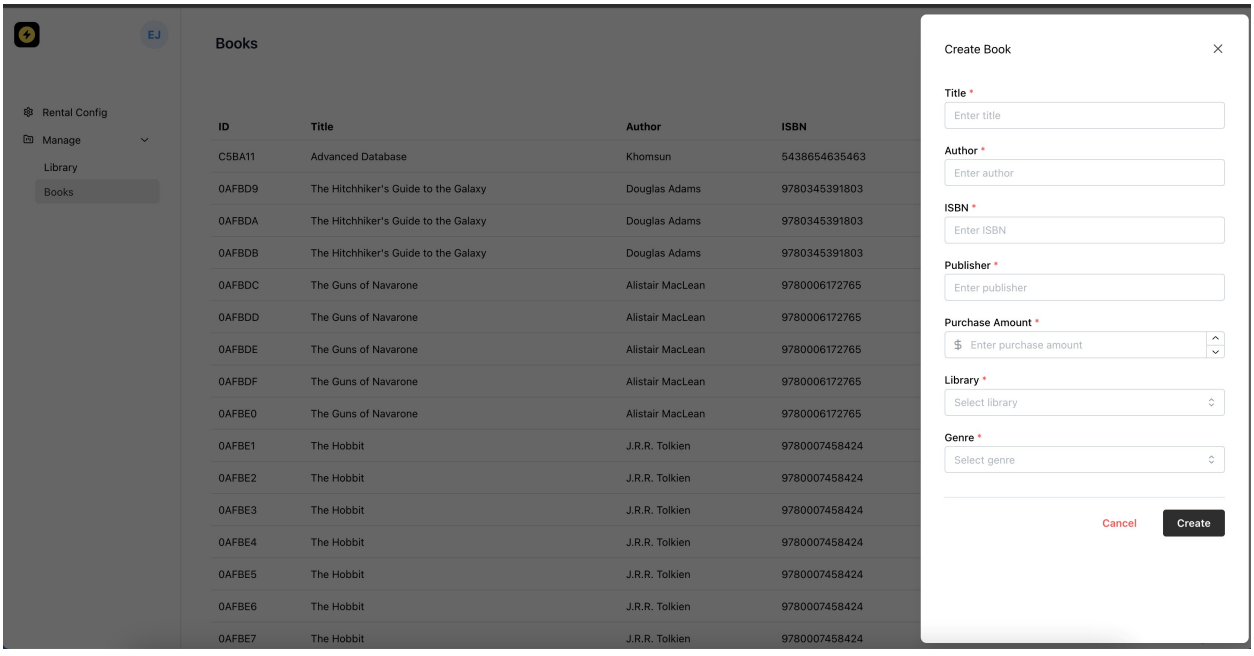


ID	Title	Author	ISBN	Genre	Price
C5BA11	Advanced Database	Khomsun	5438654635463	Drama	$50.00
0AFBD9	The Hitchhiker's Guide to the Galaxy	Douglas Adams	9780345391803	Comedy	$12.00
0AFBDA	The Hitchhiker's Guide to the Galaxy	Douglas Adams	9780345391803	Comedy	$12.00
0AFBDB	The Hitchhiker's Guide to the Galaxy	Douglas Adams	9780345391803	Comedy	$12.00
0AFBDC	The Guns of Navarone	Alistair MacLean	9780006172765	Action	$10.00
0AFBDD	The Guns of Navarone	Alistair MacLean	9780006172765	Action	$10.00
0AFBDE	The Guns of Navarone	Alistair MacLean	9780006172765	Action	$10.00
0AFBDF	The Guns of Navarone	Alistair MacLean	9780006172765	Action	$10.00
0AFBE0	The Guns of Navarone	Alistair MacLean	9780006172765	Action	$10.00
0AFBE1	The Hobbit	J.R.R. Tolkien	9780007458424	Adventure	$15.00
0AFBE2	The Hobbit	J.R.R. Tolkien	9780007458424	Adventure	$15.00
0AFBE3	The Hobbit	J.R.R. Tolkien	9780007458424	Adventure	$15.00
0AFBE4	The Hobbit	J.R.R. Tolkien	9780007458424	Adventure	$15.00
0AFBE5	The Hobbit	J.R.R. Tolkien	9780007458424	Adventure	$15.00
0AFBE6	The Hobbit	J.R.R. Tolkien	9780007458424	Adventure	$15.00
0AFBE7	The Hobbit	J.R.R. Tolkien	9780007458424	Adventure	$15.00

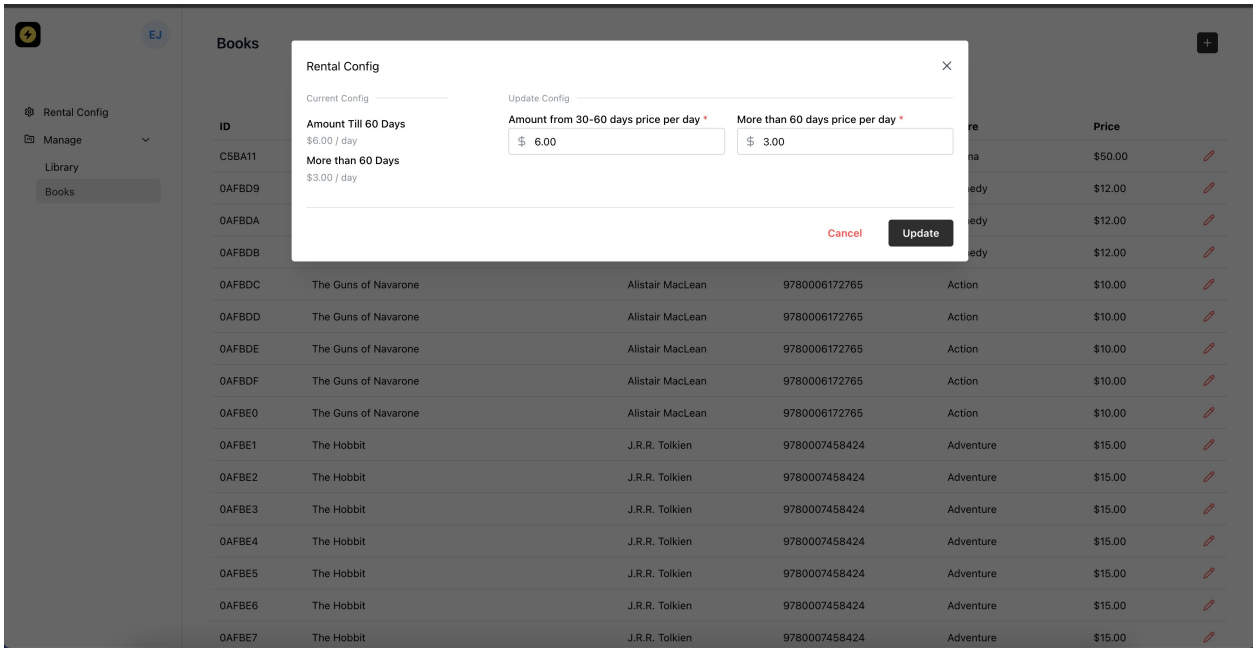
3. Crea8ng a Library:



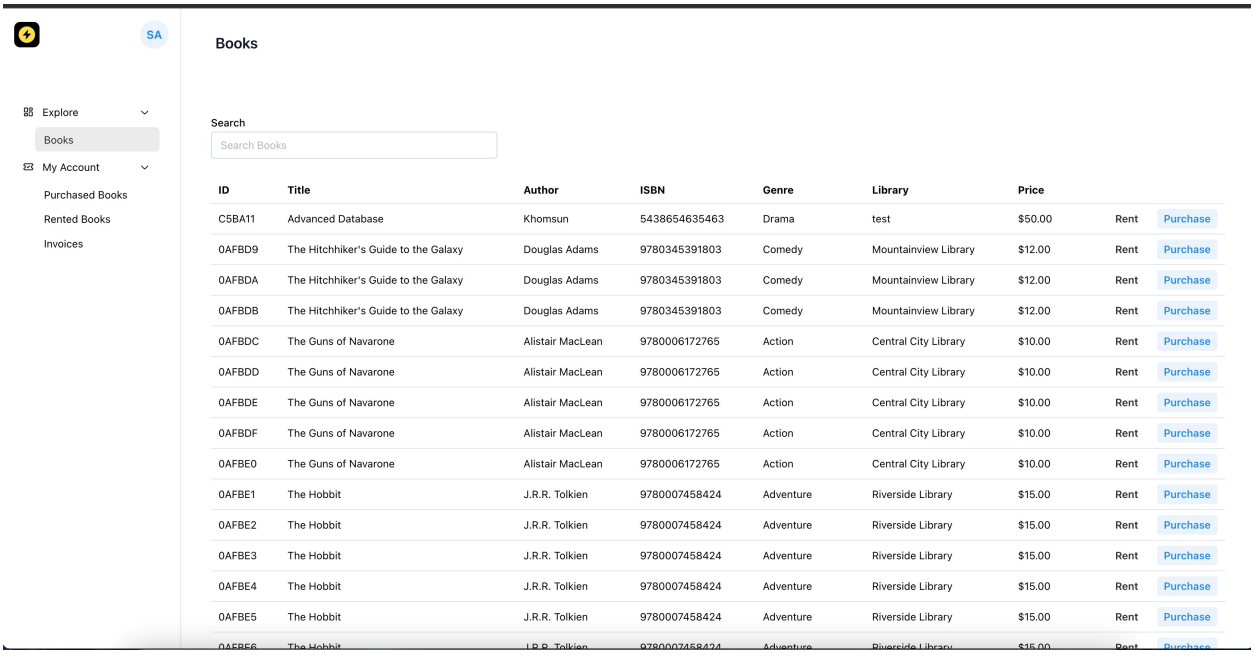
4. Crea8ng a Book:



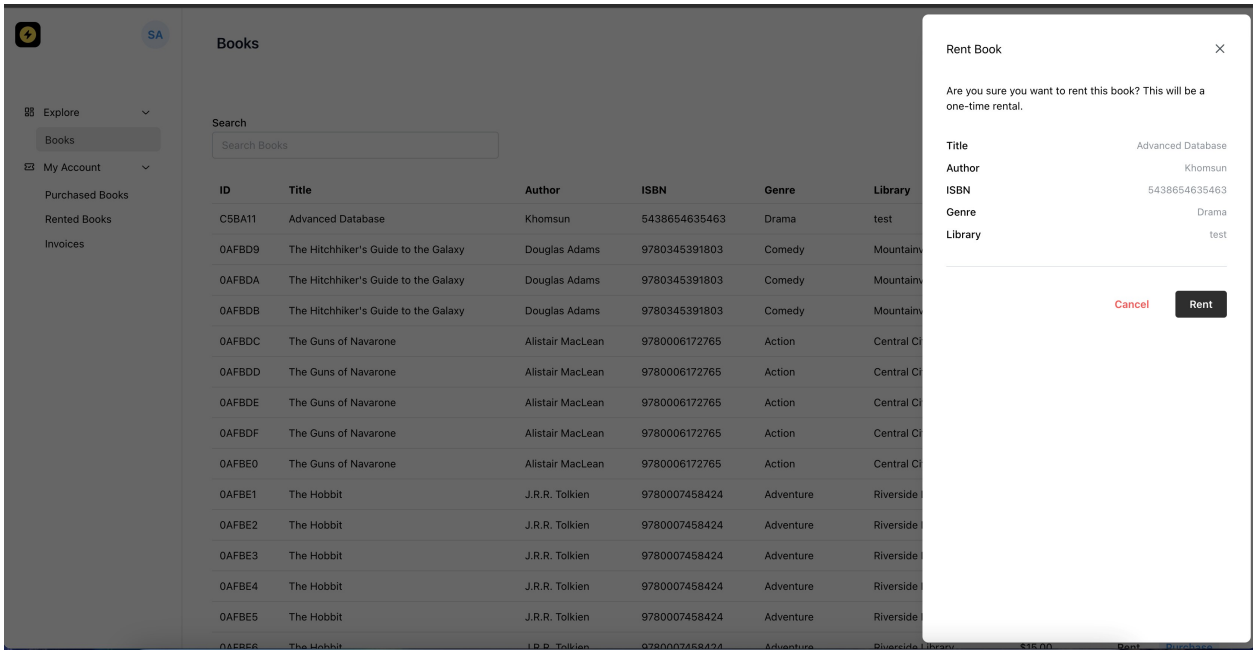
5. Rental Configura8on:



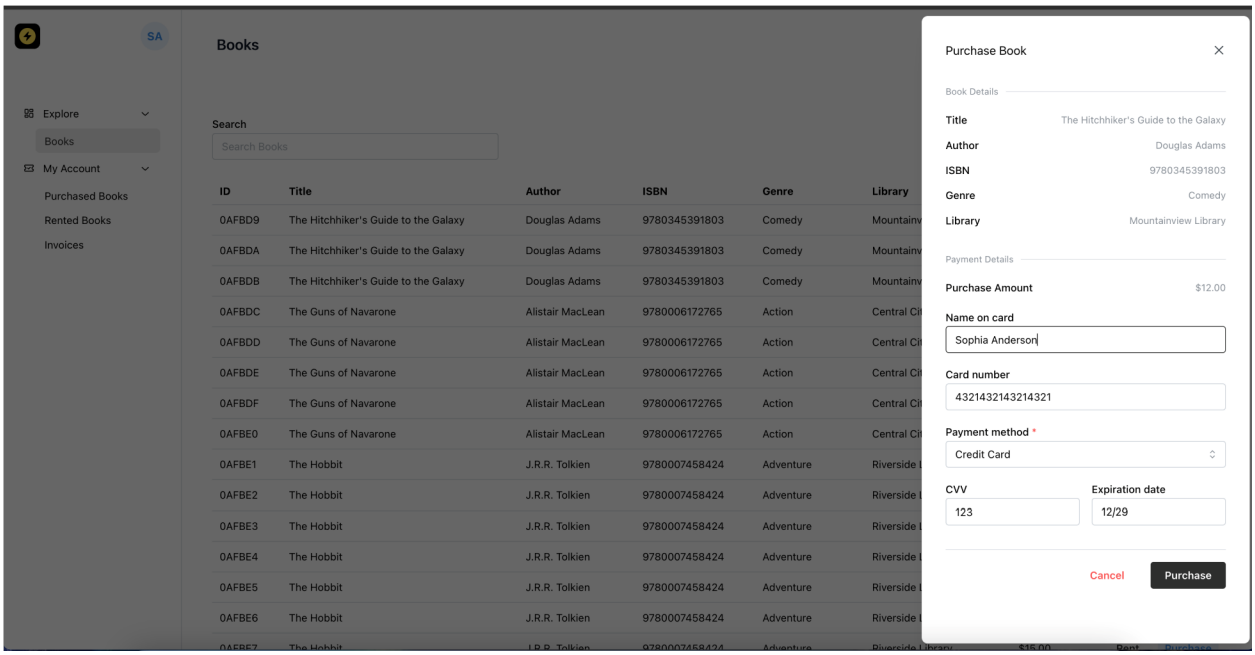
6. User dashboard:



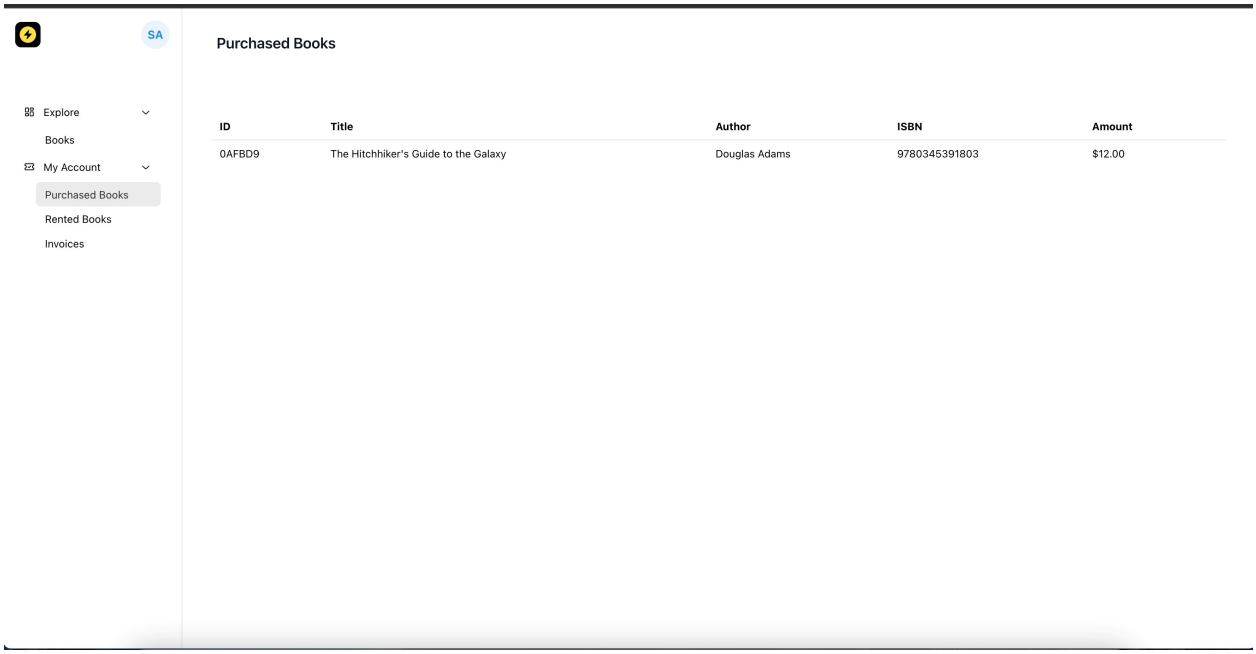
7. Ren8ng a book:



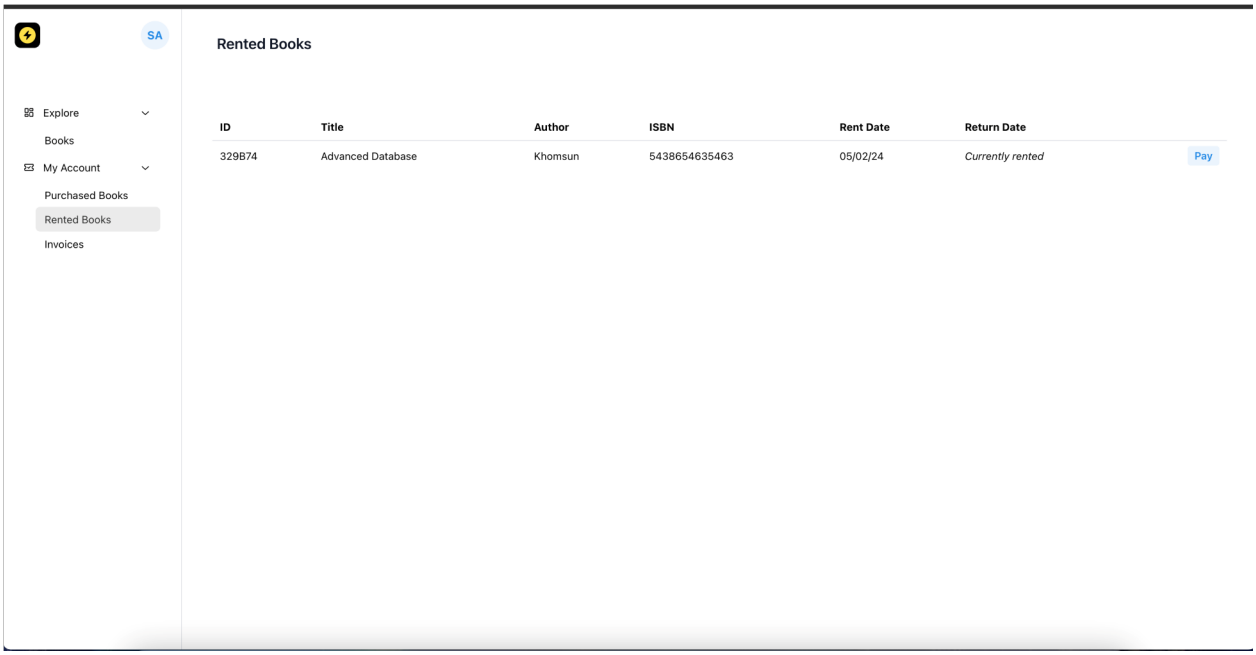
8. Purchasing a book:



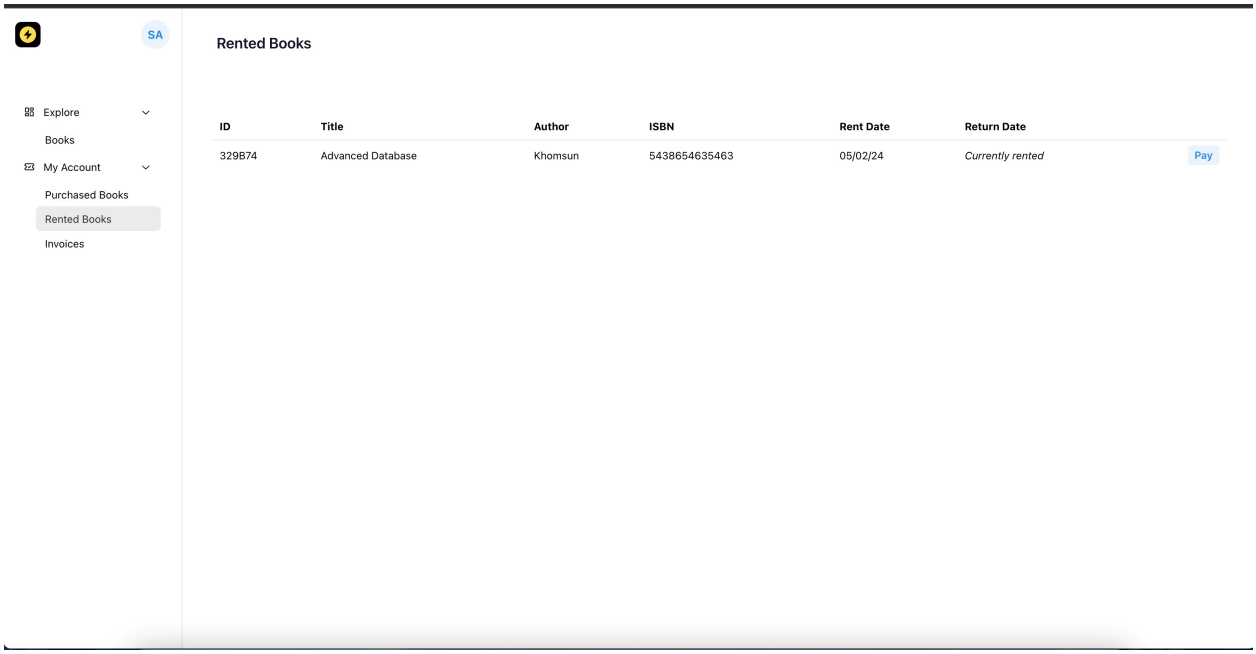
9. Purchased books:



10. Rented books:



11. Invoice page:



12. Reset password prompt: