Bilkent University
CS 353
Final Report

Group 26
Social Networking for Readers

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1. Application System Description

This project is an online database to satisfy different needs of a network between book reader's such as finding new books for readers, discussing books with other readers and purchasing books from writers. The system has two actors. These actors are readers, writers who are grouped as the users. All users have a unique id, name, password and email saved in the system. The user types have a few additional functionalities of their own. Users will use their email and password to login to the system. Readers, through the main page, can see published books and rate them if they read it before for other readers. Readers can also buy the book from the system through filters to find the desired book. Meanwhile writers can publish their books to the system. Finally, admins have additional attributes about forums such as forum id and title. All of these actions are considered as operations with unique IDs and different types for categorization.

Project will have a login system. Login system will provide two options for users. First option is to sign up as a reader and the other option is to sign up as an author. Also there will be unregistered users. These users will only have access to read reviews. Other functionalities will require registration. Registered users will have access to following functions:

1. Write a review about a book.
2. Rate a book.
3. Browse books according to the book's title.
4. Make a list of purchased books.
5. See the authors in the system.
6. Search all the books in the system
    i. Filter title,
    ii. Filter date,
    iii. Filter genre and type.
7. See the system report.

    i. Books prices in ascending order
    ii. User count in the system,
8. Search the authors in the system
    i. Find the authors page and see all the books they published
9. Purchase an ebook.
10. Download e-books that they have purchased.
    i. E-books can be downloaded in pdf format.
11. Publish e-books

The system is basically a social network for books. All types of users will be able to search books, with or without filters such as:

- Price
- Book name
- Genre
- Year
- Rating
- Author

3. Final E/R Diagram

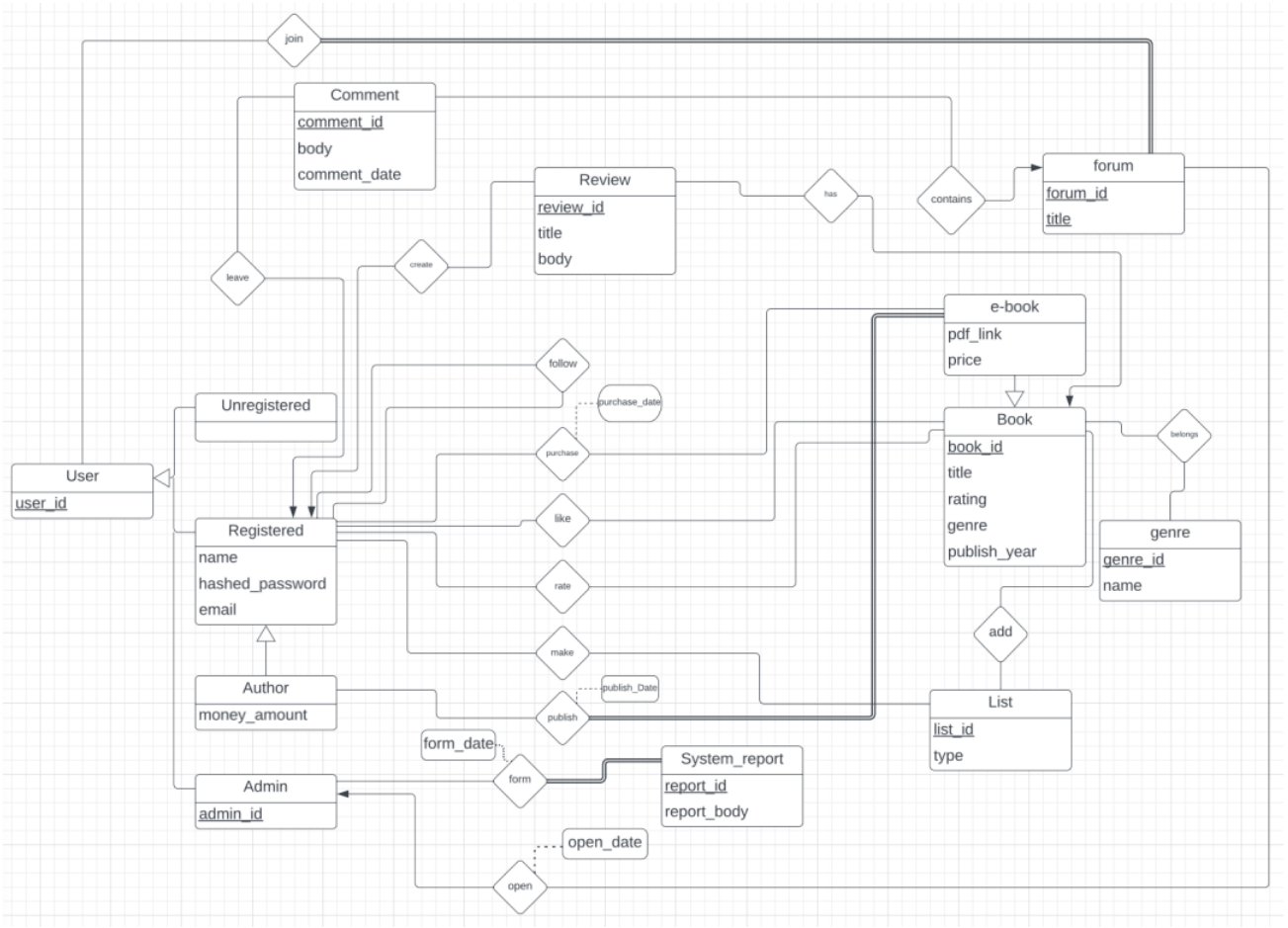


Figure 1: Final E/R Diagram

4. Final Tables

added(list_id: int, book_id: int)
    list_id: Foreign key to list
    book_id: Foreign key to book

admin(user_id: int, admin_id; int)
    user_id: Foreign key to user
    admin_id: Foreign key to admin

author(user_id: int, name: varchar(30), money_amount: int)
    user_id: Foreign key to user

belongs(book_id: int, genre_id: int)
    book_id: Foreign key to book
    genre_id: Foreign key to genre

book(book_id: int, title: varchar(40), rating: float)
    book_id: Primary key of book

comment(comment_id: int, body: varchar(150), date: Date)
    comment_id: Primary key of book

contains(comment_id: int, forum_id: int)
    comment_jd: Foreign key to comment
    forum_id: Foreign key to forum

ebook(book_id: int, pdf_link: link, price: float)
    book_id: Foreign key to book

follow(user_id1: int, user_id2: int)
    user_id1: Foreign key to user
    user_id2: Foreign key to user

form(user_id: int, report_id: int)
    user_id: Foreign key to user
    report_id: Foreign key to report

forum(forum_id: int, title: varchar(150), creation_date: Date)
    forum_id: Primary key of forum

genre(genre_id: int, genre_name: varchar(30))
    genre_id: Primary key of genre

has(review_id: int, book_id: int)
    review_id: Foreign key to review

book_id: Foreign key to book

include(user_id: int, book_id: int)
book_id: Foreign key to book

leave(comment_id: int, user_id: int)
comment_id: Foreign key to comment
user_id: Foreign key to user

like(user_id: int, book_id: int)
user_id: Foreign key to user
book_id: Foreign key to book

list(list_id: int, type: varchar(30))
list_id: Primary key of list

make(user_id: int, list_id: int)
user_id: Foreign key to user
list_id: Foreign key to list

open(user_id: int, forum_id: int)
user_id: Foreign key to user
forum_id: Foreign key to forum

purchase(user_id:int, book_id: int, purchase_date: Date)
user_id: Foreign key to user
book_id: Foreign key to book

rate(user_id: int, book_id: int)
user_id: Foreign key to user
book_id: Foreign key to book

registered(user_id: int, name: varchar(40), hashed_password: varchar(30), email: varchar(60))
user_id: Foreign key to user

review(review_id: int, title: varchar(40), body: varchar(150))
review_id: Primary key of review

system_report(report_id: int, body: varchar(150))
report_id: Primary key of report

user(user_id)
user_id: Primary key of user

5. Implementation Details

In our implementation, we used MySQL as our database management system. Php and Java for the backend and Php for our frontend. In order to set up a local server and construct a database for our website, we used MySQL Workbench. We modified our design report somewhat and used Java scripts to create all of the tables. Additionally, we created scripts for registering admin users (Librarians) and deleting some tables for testing with java language. For our backend, we used mariaDB which is an open source relational database management system compatible with MySQL. We have used php, java and MariaDB to connect the database and process our SQL queries and statements using several functions. We have implemented our frontend using php and some external sources like material UI, geeksForGeeks[1] and etc. Throughout the journey of this application we have encountered lots of problems at lots of stages. Since we learned PHP this semester, it was a new experience for all of us and it took a lot to be better at PHP and write code with it. Because we split the work, it was a little bit painful to connect our frontend and backend.

Group Member Contributions

Efe Karaköylü: backend functionalities(search features and features related authors, reporting with advanced database structures), report writing.

6. Advanced Database Features

6.1. Reports

Total Number of User Count in the system

```php
<?php
$user_count_sql = "SELECT COUNT(user_id) as count_user
                  FROM user";
```

Most Expensive 5 Books With Their Prices

```
$book_prices_sql = "SELECT EB.price, title
                    FROM book B, ebook EB
                    WHERE B.book_id = EB.book_id
                    GROUP BY title
                    ORDER BY price desc LIMIT 5";
```

The Title of the Cheapest Book and It's Price

```
$cheapest_sql = "SELECT B.title, MIN(price) as price
                 FROM ebook EB, book B
                 WHERE EB.book_id = B.book_id";
```

6.2. Views

Book View for being able to show all books (default and ebooks)

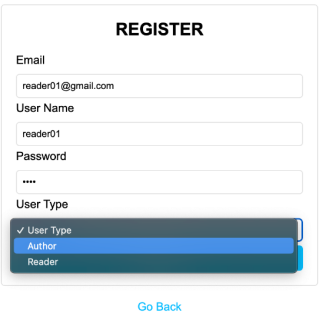
```
String sql  = "CREATE VIEW book_view AS " +
"SELECT B.book_id, B.title, G.genre_name, B.rating, EB.price " +
"FROM book B, genre G, belongs BE, ebook EB " +
"WHERE BE.book_id = B.book_id AND G.genre_id = BE.genre_id AND EB.book_id = B.book_id;";
```

6.3. Constraints

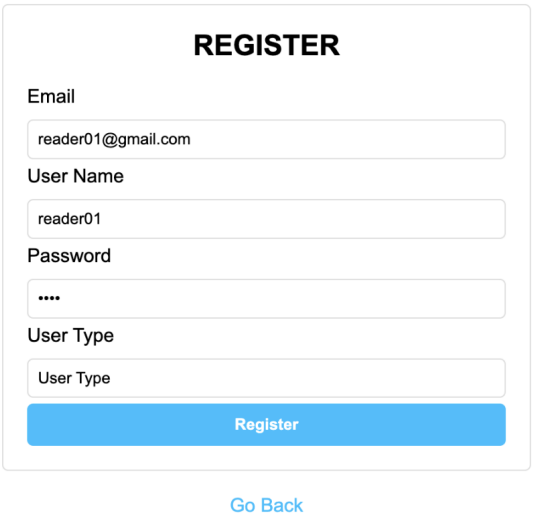
1. Users must register to the system by themselves from register page.
2. They should have a password and name to register to the system.
3. When users want to buy an ebook, they should either add money to their wallet in the system or they should enter their credit card information and buy the e-book directly.
4. When users review a book they should fill all the fields.
5. If a user want to be an author, this process is being done by the admin.
6. Admin should add the specific registered user to the author table manually.
7. Admin should fill all the fields correctly on the author process.

7. User Manual

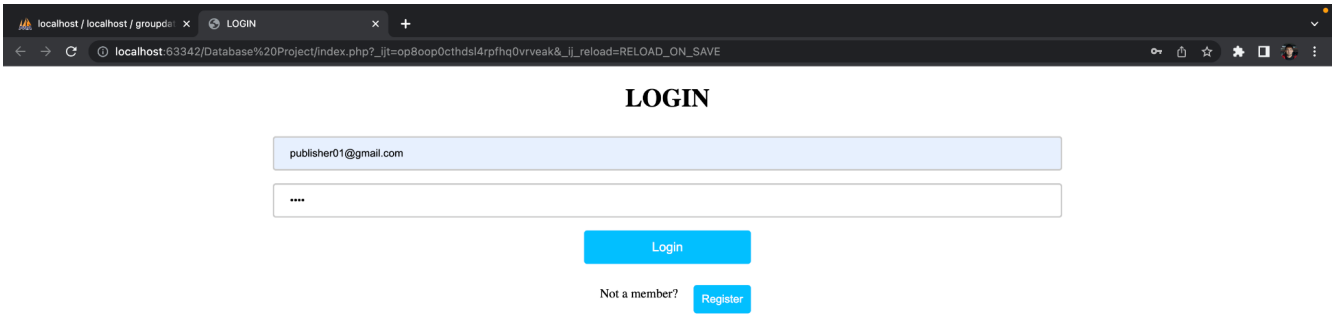
7.1 Register Page



From this page, user can register entering their “Email”, “User Name”, “Password” and user type which is “Author” or “Reader”. After entering the necessary information, they click the “Register” button to finalize the system registration process. After clicking the “Register” system automatically directs to login page.

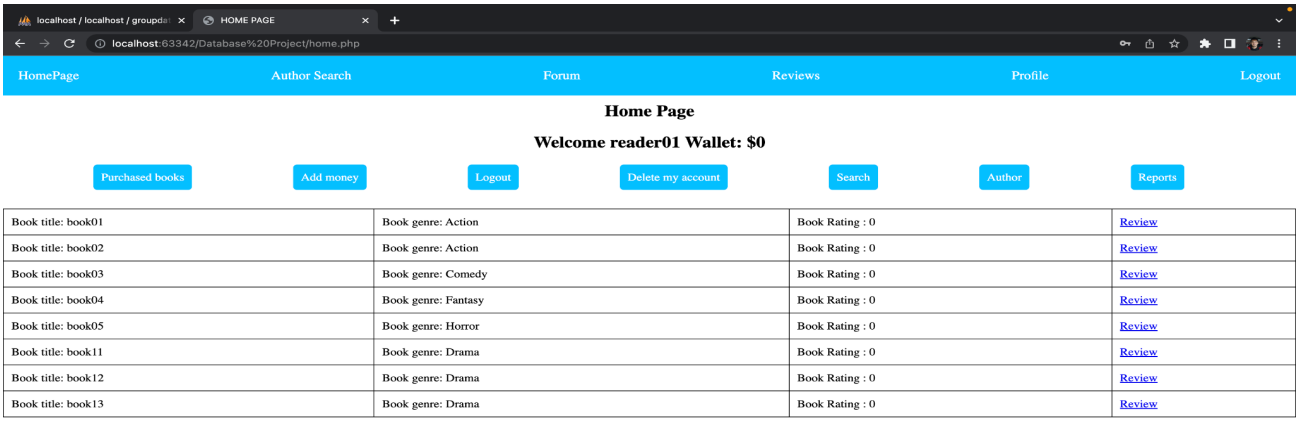


7.2 Login Page

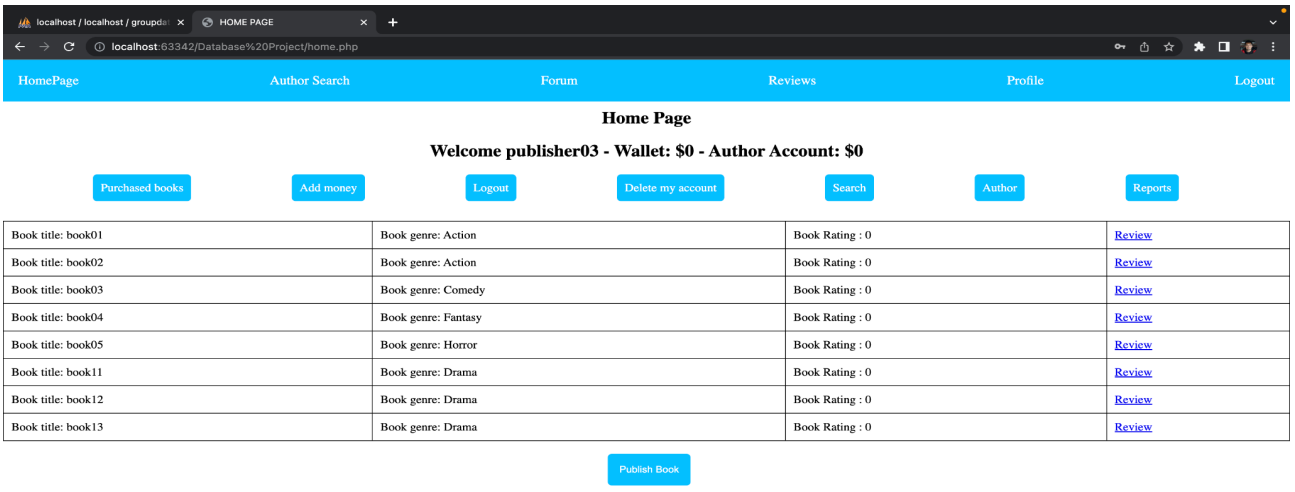


From the page in the above figure, users can log in by typing their email and passwords in the specified sections then click the Login button. From this page, if the user does not have membership that belongs to our site. She can click the register button and she is directed to the register page.

7.2 Home Page

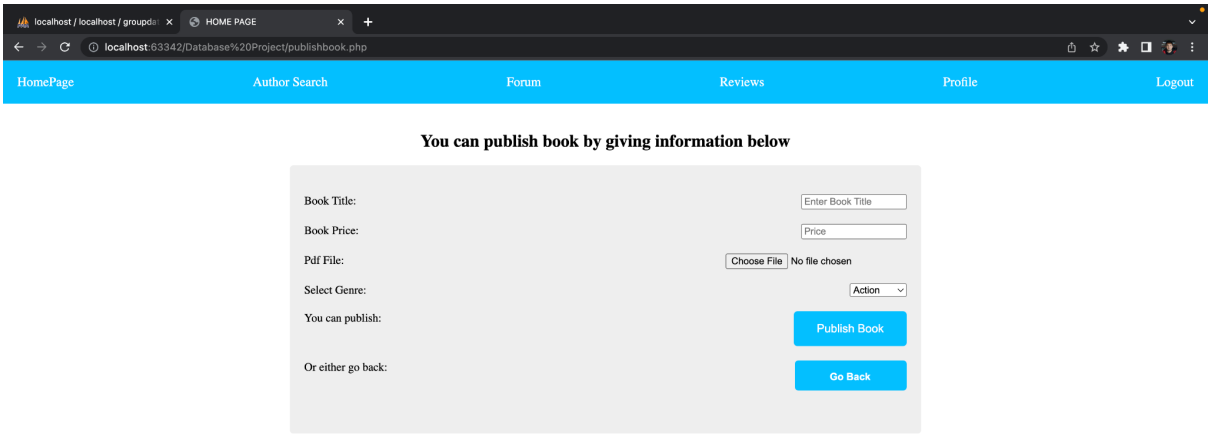


Students can view the current published books of the author from this page as a list. The above page shows the home page of the reader type users. Readers can redirect to other pages using the home page. Under the "Home Page" heading, the system displays the current money of the user. Readers can use their money in the system to purchase books.



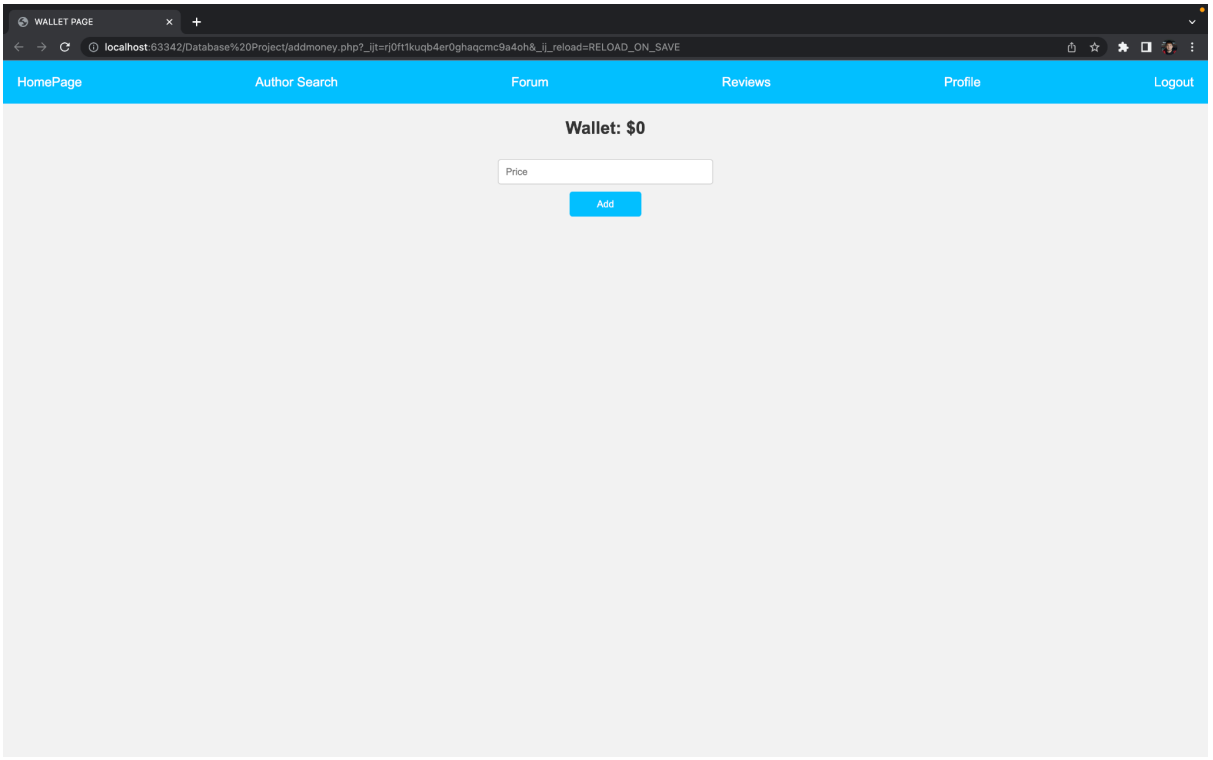
Unlike reader type of users, Authors can publish a book using “Publish Book” button under the list

7.3 Publish Book Page

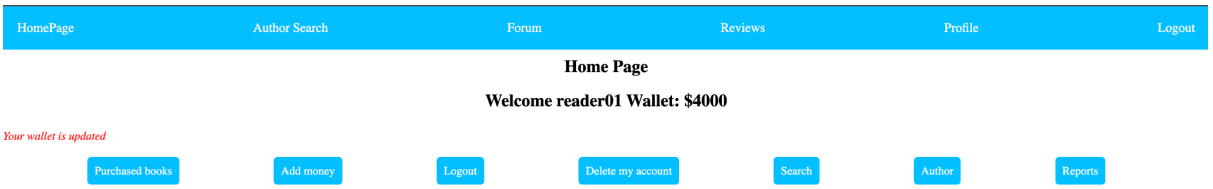


Only users of the author type can publish books from this page. The author should give the book's features by using the "Book Name", "Book Price", "Pdf File"(for uploading e-books), "Select Genre" (for genre selection), and after these selections, authors can publish their book.

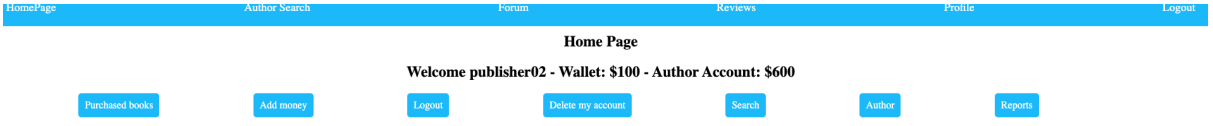
7.4 Add Money Page



In this page, users can see their amount of money in our system. If they wish, they can write the amount of money in the box that is going to be added to their account and by clicking the Add button, the money transfer will be done.

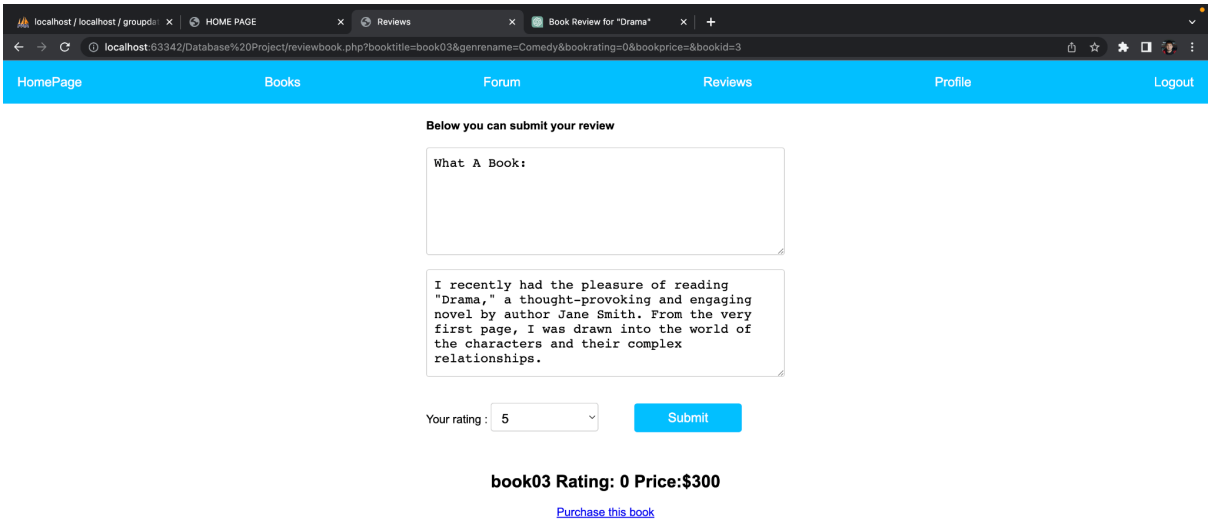


After “Add” selection, the user will be directed to the home page. The money that the user Added to the current wallet will be displayed right after the user added to the system.

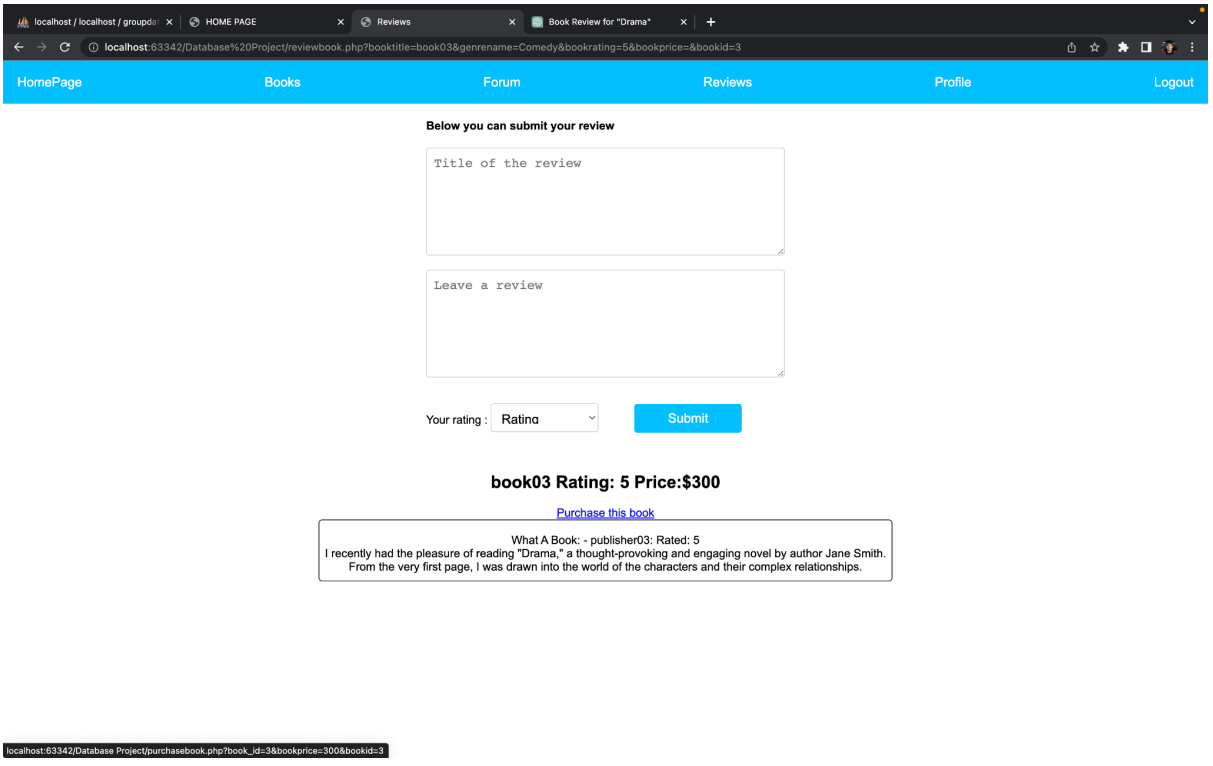


It is also seen on this page that Authors have two different wallets, one is the money they add to the system and the other is the money they earn from the readers by selling books.

7.5 Review Page

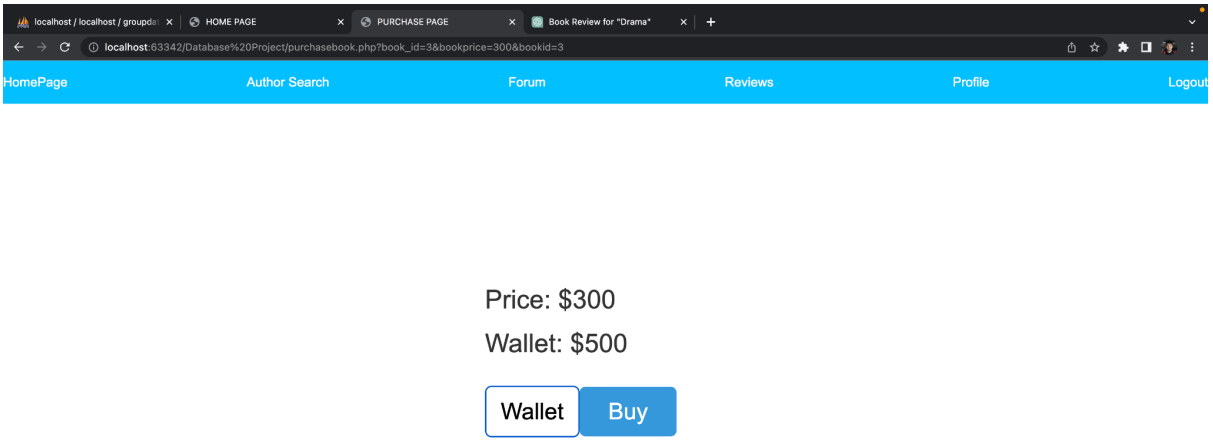


In the review page, users are able to write a review regarding the subject of a specific book. First box stated in the review page contains the title of the review, the second box contains the detailed message which the user wants to send. Also below the boxes there is a rating menu which is scaled from 1 to 5, the user must choose one of them and she is able to rate the book. By clicking the submit button, users can submit their reviews.



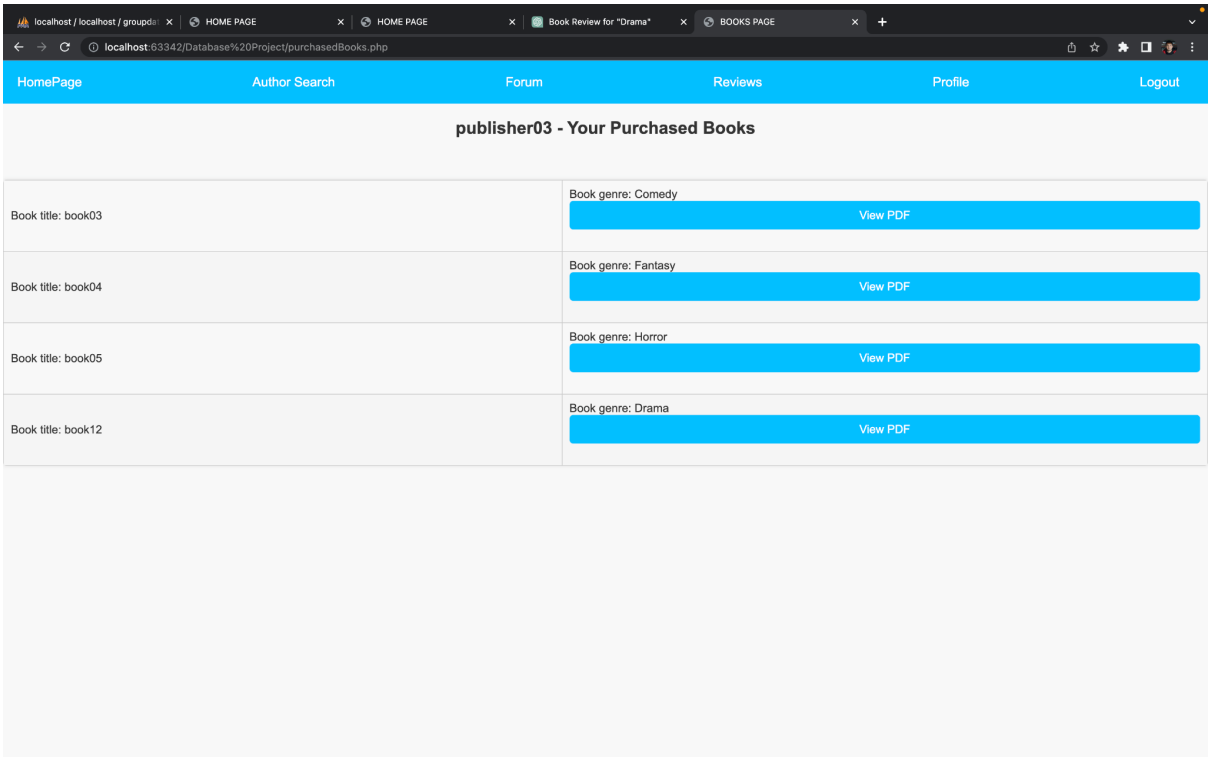
When a review and rate is added. The system automatically conserves this information in the database and serves this information below the review page for every one of the books. Also users can purchase e-books from this page by clicking the purchase the book button.

7.6 Purchase Book Page



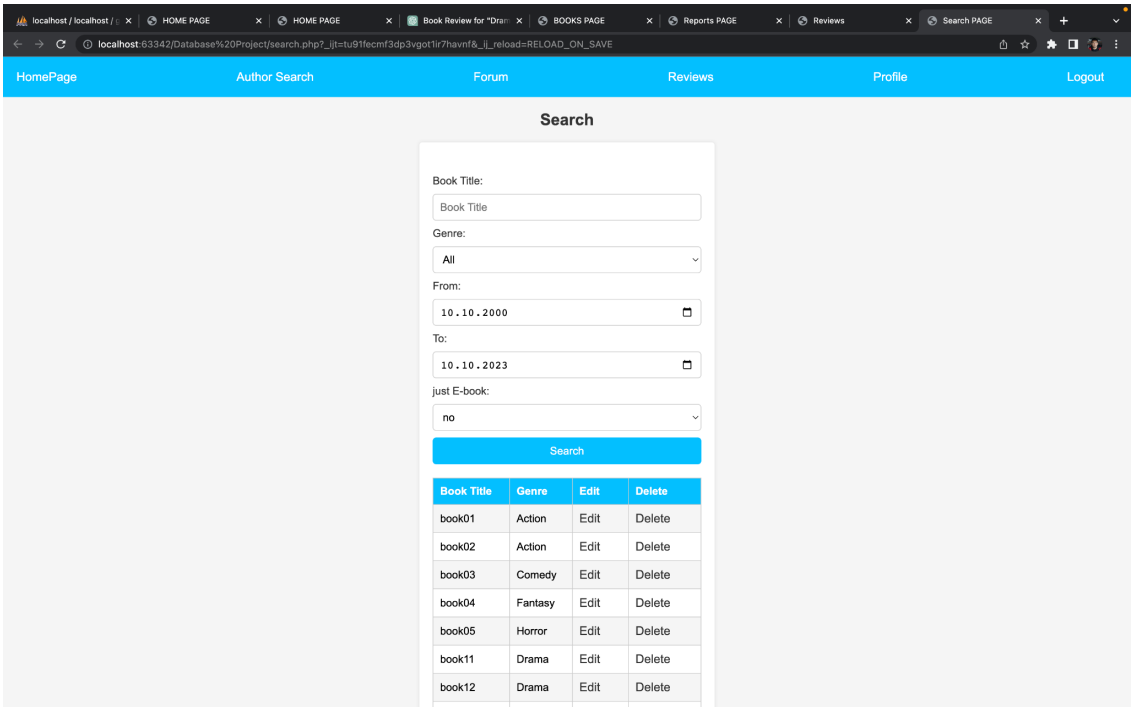
If the user clicks the purchase the book button from the review page of a specific book. The user is directed to this page. In this page, the amount of money the user has and price of the book is displayed. If the user has more money than the book's price, she can buy the book.

7.7 Purchased Book List

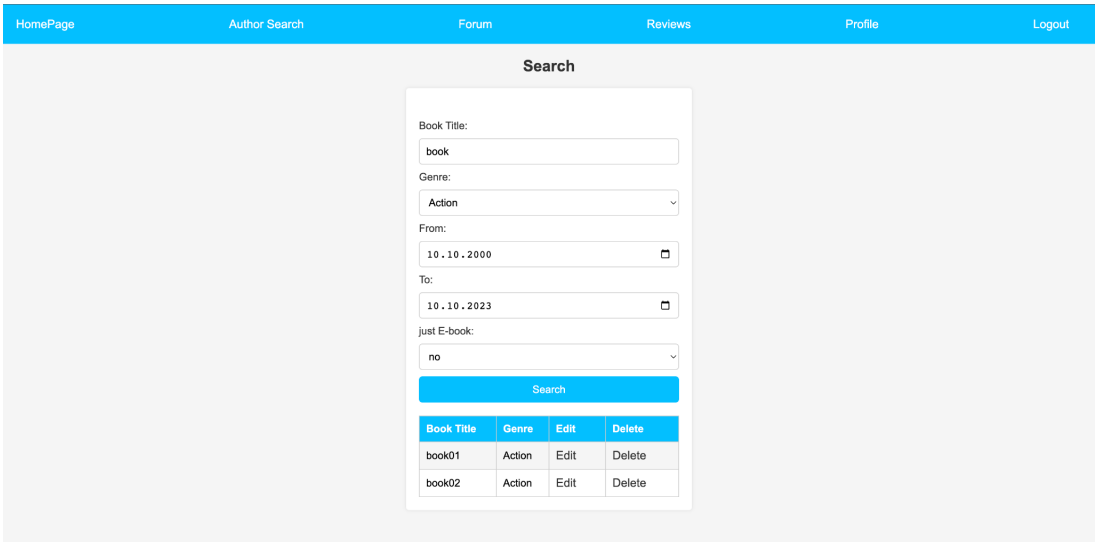


When the user accomplishes a payment process, the e-books, which are bought, are directly added to the user's purchased books list. In this page, users can see the title of the books, the genre of the books and can see the pdf of the books.

7.8 Search Books

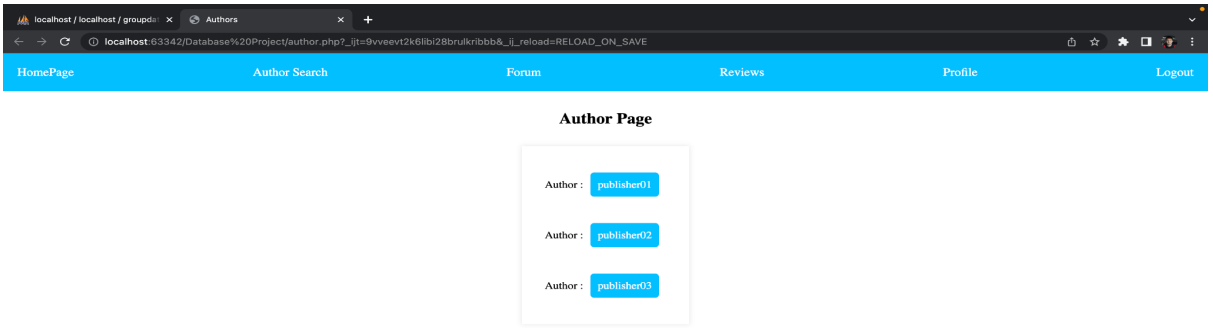


In this page users can search among all the books in the system. There is a list below the “Search” button which shows books in the system which satisfy the filters above. There are several filters to search and find the book. Users can limit their search by using “Book Title”, “Genre”, “From” - “To”, and “just E-book” (filters whether this is an ebook). After clicking the search button, the list under the button is automatically updated according to user filters and needs.

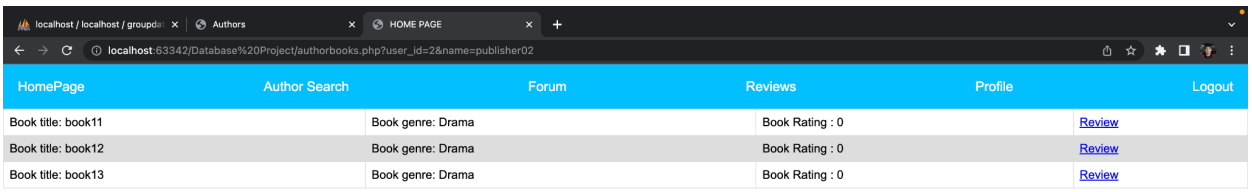


As can be seen, after the search button is clicked, the list is updated and only shows the books which satisfy the search filter needs.

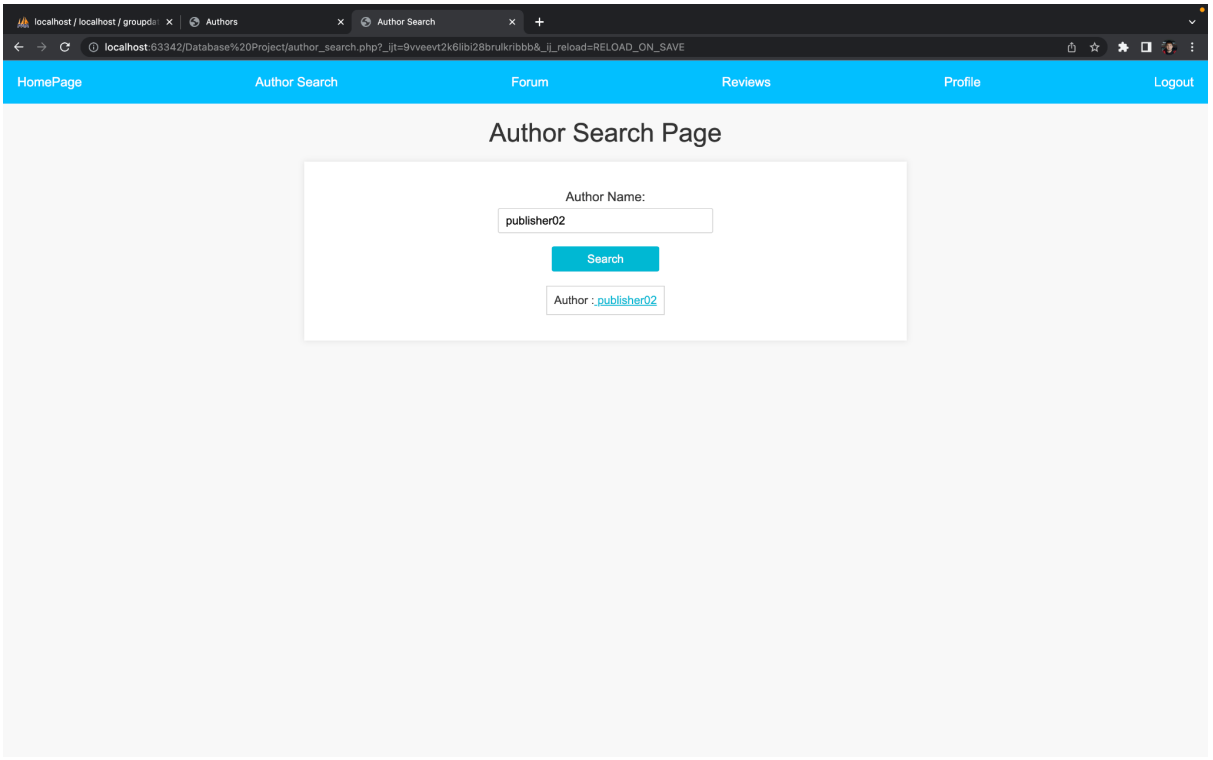
7.9 Author Page



In the above page, users can access all the author names and by clicking the names, after clicking any of the authors, their books will appear with its title, genre, rating as it is shown in the below. Also users can access the write and read review section from this page.

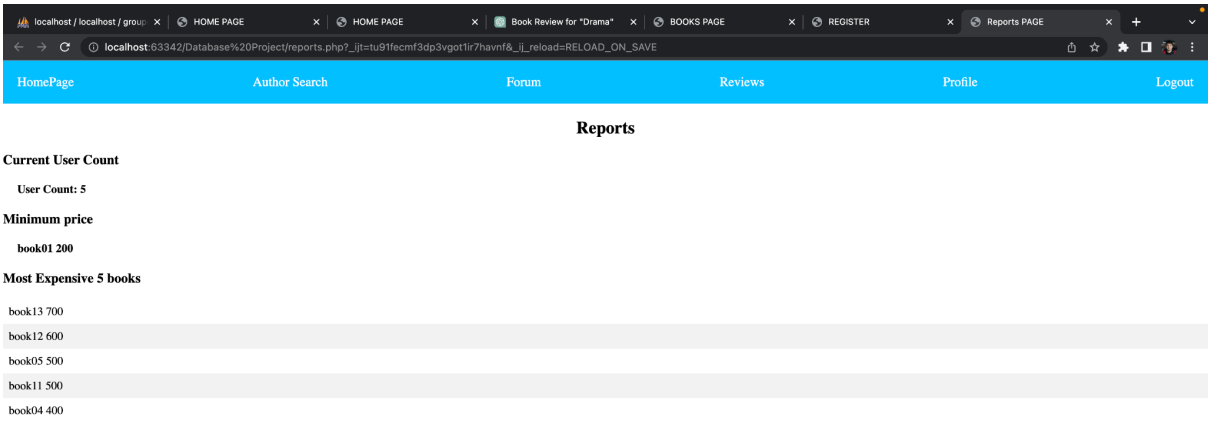


7.10 Author Search Page



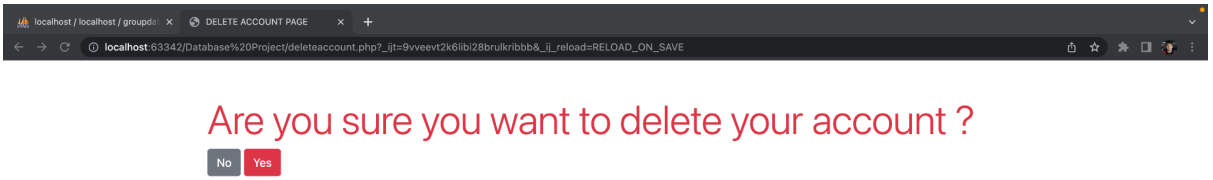
Users can search author names from the Author Search Page, if the received input exists inside of any author name, the names will be displayed after clicking the Search button. In addition to this, users can access the book's details of the specific author by clicking the author username.

7.11 Reports Page



Reports page consist of different information such as total user count, minimum price of the books. In addition to this, in the Report Page the most expensive 5 books are displayed with their price in the descending order.

7.12 Delete Page



In this page, there is no navigation bar or any other destruction that the user can see. This page is designed in a minimalistic way and understandable so that the user will know what he/she is doing. This page is for users to delete their accounts. Users can delete their account by clicking the “Yes” button.

8. Website

Project Code: https://github.com/E-Kerem/Database-Project

9. References

[1] A. Silberschatz, H. F. Korth, and S. Sudarshan, Database system concepts. New York, NY: McGraw-Hill, 2020.

[2] “PHP tutorials,” *GeeksforGeeks*. [Online]. Available: https://www.geeksforgeeks.org/php-tutorials/. [Accessed: 26-Dec-2022].