



Bilkent University

Department of Computer Engineering

CS353 Term Project Final Report

Social Cataloging Platform for Books: BookCase

Assigned TA

Mustafa Can Çavdar

Group 12

Ahmet Cemal Alıcıoğlu

Beril Canbullan

Kübra Okumuş

Ömer Faruk Kayar

1. Application Description	3
2. Final E/R Diagram	4
3. Table Schemas	6
3.1 Accounts	6
3.2 Users	6
3.3 Librarians	6
3.4 Challenges	6
3.5 joins	7
3.6 Friends	7
Relational Model	7
3.7 Author_accounts	7
3.8 Authors	7
3.9 Author_genre	7
3.10 follows	8
3.11 author_data	8
Relational Model	8
3.12 Books	8
3.13 Book_genre	8
3.14 Rate	8
3.15 Lists	9
3.16 list_includes	9
3.17 comments	9
3.18 comment_on	9
3.19 Likes	10
3.20 recommends	10
3.21 Writes	10
3.22 Reply	10
3.23 Editions	11
3.25 Publishers	11
3.26 Publishes	11
3.27 progress	11
3.28 Series	12
3.29 Bookshelves	12
3.30 bookshelf_includes	12

3.31 part_of_series	12
4. Implementation Details	12
5. Advanced Database Features	13
5.1 Views	13
5.1.2	13
5.2 Reports	14
5.2.1 Most popular challenges report	14
5.3 Triggers	14
5.4 Constraints	14
5.5 Stored Procedures	15
6. User's Manual	15
4.3 Home Page	16
4.4 Book Page	17
4.5 Add Book Page	18
4.6 User Profile Page	18
4.7 Create Challenge Page	19
4.8 Challenge Page	20
4.9 Author Page	21
4.10 List Page	22
7. Website and References	23

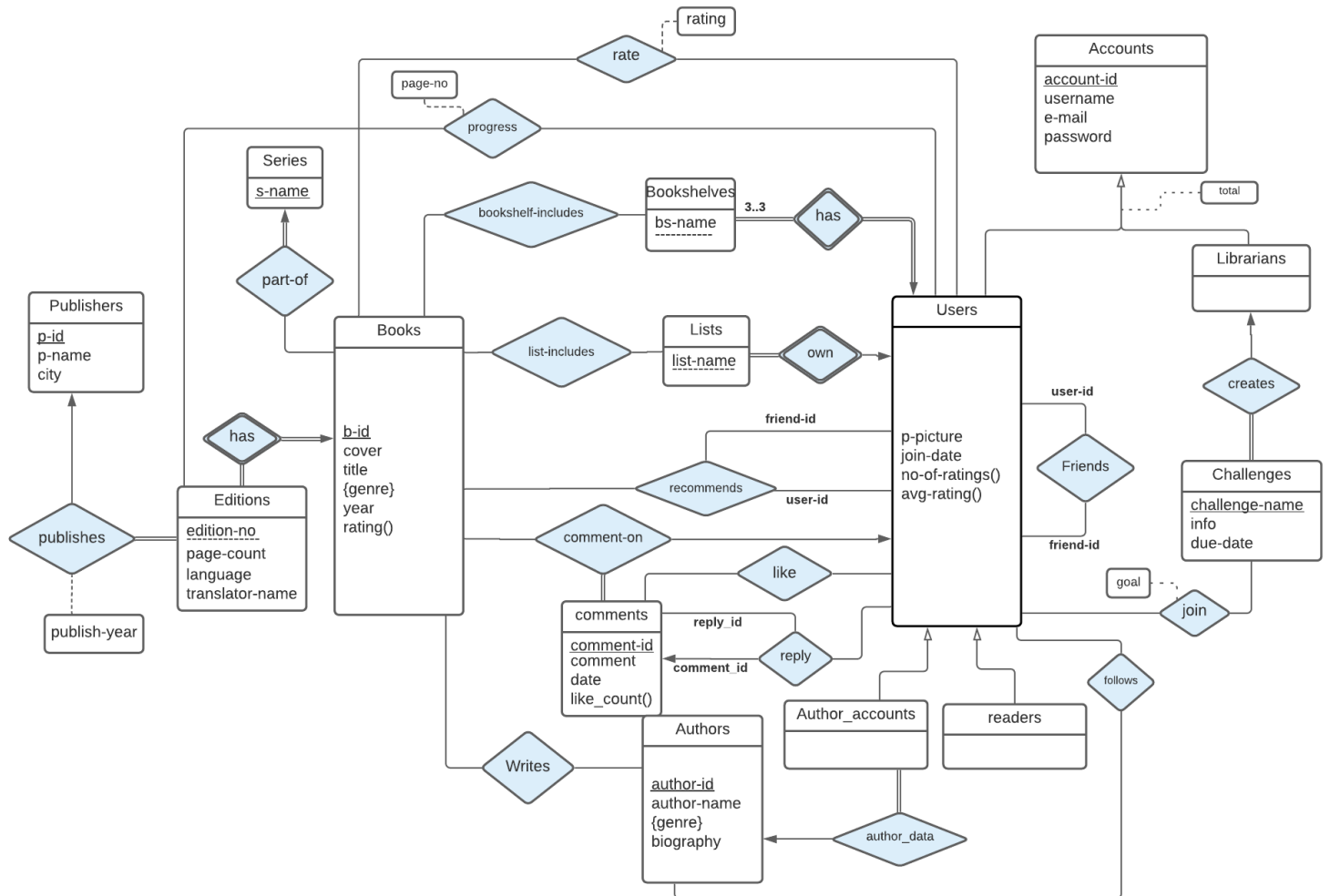
1. Application Description

Our website has many features which are interaction between readers and authors, reading challenges and cataloging reading activities. In order to access cataloging and reading challenges features the user needs to be registered into the system with a username, password and email address. These reading challenges and book additions and regulations are prepared by librarians which can be considered as administrators of the system.

Users can be classified as authors and readers. Users can interact with each other such as adding each other as friends and following authors. Users will be able to recommend books to their friends. Books have different attributions like genres and authors which makes them easier to locate at the search bar. Also, a published year range can be used to search through the database. All the authors on the registered books should be registered on the system.

Librarians can edit the books and registered authors. They will be arranging challenges between users to keep them motivated and encourage them to read more. Apart from social interaction, users are able to give ratings on books and make comments on them. Also, they can put the books on three different bookshelves which consist of the books that they have read, currently reading and planning to read. In this way, the users will be able to experience the convenience of keeping track of their reading activity on an online platform. Moreover, there can be customized lists made by users. We are managing these lists to let the users share these with their friends if they wish.

2. Final E/R Diagram



3. Table Schemas

3.1 Accounts

Relational Model

accounts(account_id, username, e_mail, password)

3.2 Users

Relational Model

users(user_id, p_picture, join_date)

FK: user_d references accounts(account_id)

3.3 Librarians

Relational Model

librarians(librarian_id)

FK: librarian_id references accounts(account_id)

3.4 Challenges

Relational Model

challenges(challenge_name, librarian_id, Info, due_date)

FK: librarian_id references librarians(librarian_id)

3.5 joins

Relational Model

joins(challenge_name, user_id, goal)

FK: challenge_name references challenges(challenge_name)

FK: user_id references users(user_id)

3.6 Friends

Relational Model

friends(user_id, friend_id)

FK: user_id references users(user_id)

FK: friend_id references users(user_id)

3.7 Author_accounts

Relational Model

author_accounts(author_id)

FK: author_id references users(user_id)

3.8 Authors

Relational Model

authors(author_id, author_name, biography)

3.9 Author_genre

Relational Model

author_genre(author_id, genre)

FK: author_id references authors(author_id)

3.10 follows

Relational Model

follows(user_id, author_id)

FK: user_id references users(user_id)

FK: author_id references authors(author_id)

3.11 author_data

Relational Model

author_data(account_d, author_id)

FK: account_id references author_accounts(author_id)

FK: author_id references authors(author_id)

3.12 Books

Relational Model

books(b_id, cover, title, year)

3.13 Book_genre

Relational Model

book_genre(b_id, genre)

FK: b_id references books(b_id)

3.14 Rate

Relational Model

rate(b_id, user_id, rating)

FK: b_id references books(b_id)

FK: user_id references users(user_id)

3.15 Lists

Relational Model

lists(list_name, user_id)

FK: user_id references users(user_id)

3.16 list_includes

Relational Model

list_includes(list_name, user_id, b_id)

FK: list_name, user_id references lists(list_name, user_id)

FK: b_id references books(b_id)

3.17 comments

Relational Model

comments(comment_id, comment, date)

3.18 comment_on

Relational Model

comment_on(b_id, comment_id, user_id)

FK: b_id references books(b_id)

FK: comment_id references comments(comment_id)

FK: user_id references users(user_id)

3.19 Likes

Relational Model

likes(user_id, comment_id)

FK: user_id references users(user_id)

FK: comment_id references comments(comment_id)

3.20 recommends

Relational Model

recommends(user_id, friend_id, b_id)

FK: user_id references users(user_id)

FK: friend_id references users(user_id)

FK: b_id references books(b_id)

3.21 Writes

Relational Model

writes(author_id, b_id)

FK: author_id references authors(author_id)

FK: b_id references books(b_id)

3.22 Reply

Relational Model

reply(reply_id, user_id, comment_id)

FK: reply_id references comments(comment_id)

FK: comment_id references comments(comment_id)

FK: user_id references users(user_id)

3.23 Editions

Relational Model

editions(b_id, edition_no, page_count, language, translator_name)

FK: b_id references books(b_id)

3.25 Publishers

Relational Model

publishers(p_id, p_name, city)

3.26 Publishes

Relational Model

publishes(p_id, b_id, edition_no, publish_year)

FK: p_id references publishers(p_id)

FK: {b_id, edition_no} references editions(b_id, edition_no)

3.27 progress

Relational Model

progress(user_id, b_id, edition_no, page_no)

FK: (b_id, edition_no) references editions(b_id, edition_no)

FK: user_id references users(user_id)

3.28 Series

Relational Model

series(s_name)

3.29 Bookshelves

Relational Model

bookshelves(bs_name, user_id)

FK: user_id references users(user_id)

3.30 bookshelf_includes

Relational Model

bookshelf_includes(bs_name, user_id, b_id)

FK: (bs_name, user_id) references bookshelves(bs_name, user_id)

FK: b_id references books(b_id)

3.31 part_of_series

Relational Model

part_of_series(s_name, b_id)

FK: s_name references series(s_name)

FK: b_id references books(b_id)

4. Implementation Details

We discuss the functional components and implementation details of our project in this section.

For the implementation of this project, we used PHP for back-end development; HTML, CSS for front-end development. For the database, we used a MySQL server for database management and InnoDB as the database engine.

One of the problems we have faced in this project was throughout the website, the server would need to hold the logged user information in between every page. To solve this problem, we have put the id of the logged in user into a PHP global array \$_SESSION.

The other problem we have encountered was about the sign up implementation. At first, we only made insertion to the accounts table. As we forget to make insertions to the users table, insertions to the other tables which have foreign key references to the users caused problems. It is solved after making the necessary insertions.

Responsibilities of group members:

Ahmet Cemal Alicioğlu: Book page, author page, user page

Beril Canbula: List page, Bookshelf page

Ömer Faruk Kaya: Add Book, Add Author, debugging

Kübra Okumuş: Login, sign up, home pages, Challenges

5. Advanced Database Features

5.1 Views

5.1.1 Books Sorted By Rating

This view is used in the home page to make books always be sorted by rating when searching.

```
with book_rating(b_id, avg) as
    (select b_id, avg(rating)
     from rate
     group by b_id)
create view sorted_books as
    (select *
     from books natural join book_rating
     order by rate);
```

5.2 Reports

5.2.1 Most Popular Challenges Report

This report gives the top 5 challenges with most contenders.

```
select challenge-name
from ( select challenge-name, count(*) as cnt
      from Challenges natural join join
```

```
where due-date > curdate()  
group by challenge-name  
order by cnt  
limit 5);
```

5.2.2 Most Read Genre Report

This report gives the genre that has been read the most, assuming a book is read by a user if it is added to their 'read' bookshelf

```
with genre_count(genre, cnt) as  
    (select genre, count(*)  
    from book_genre natural join bookshelf_includes  
    where bs_name = 'read'  
    group by genre),  
select genre  
from genre_count  
where cnt in (select max(cnt) from genre_count);
```

5.3 Triggers

→ Create Bookshelves for a new User

When a new user is created, three new bookshelves of that user will be created automatically through a trigger. The names of the bookshelves are "read", "to-read" and "currently-reading."

→ Giving a Rating or Changing a Rating to a Book

When a user rates a book, the average rating is recalculated and updated accordingly.

→ Liking a Comment or a Reply

When a comment or reply is liked, the like count of that reply is updated.

→ **Joining a Challenge**

When a new user joins a challenge the top 5 most popular challenges in the home page will be updated accordingly.

5.4 Constraints

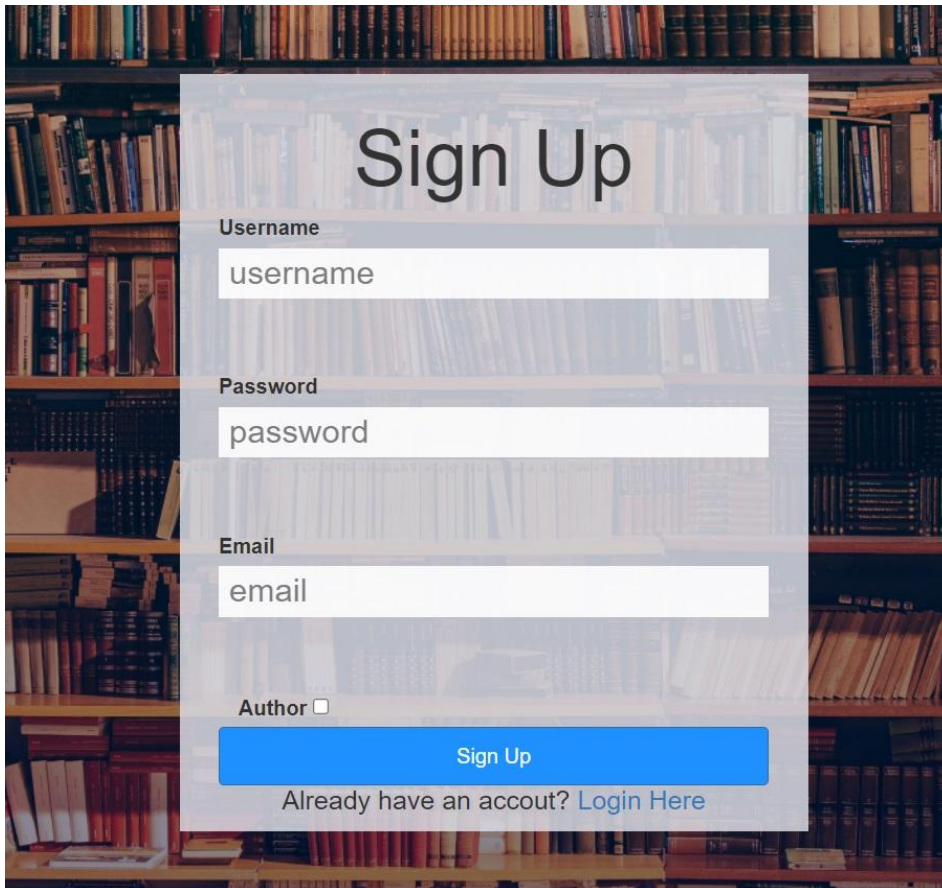
- A user must be logged-in to use the website
- Librarians cannot create challenges with the same name.
- Users can only give one rating to a book.
- Users cannot join a challenge after its due date.
- A book can be in at most one bookshelf of a user.
- A book cannot be a part of in two different series
- Users cannot create lists with the same name

5.5 Stored Procedures

- Since user's lists, bookshelves and followed authors are displayed both in the home page and in a user's profile, this procedure can be a stored procedure.
- Also, we plan on using stored procedures to implement searching for multiple objects like books, authors, genres and users.

6. User's Manual

6.1 Sign Up

A semi-transparent white form is centered over a background image of a bookshelf filled with books. The form has a title 'Sign Up' at the top. Below it are three input fields labeled 'Username', 'Password', and 'Email'. The 'Username' field contains the text 'username', the 'Password' field contains 'password', and the 'Email' field contains 'email'. Below these fields is a checkbox labeled 'Author'. At the bottom of the form is a blue button with the text 'Sign Up'. Below the button is a link that says 'Already have an accout? Login Here' (note the typo 'accout').

Sign Up

Username
username

Password
password

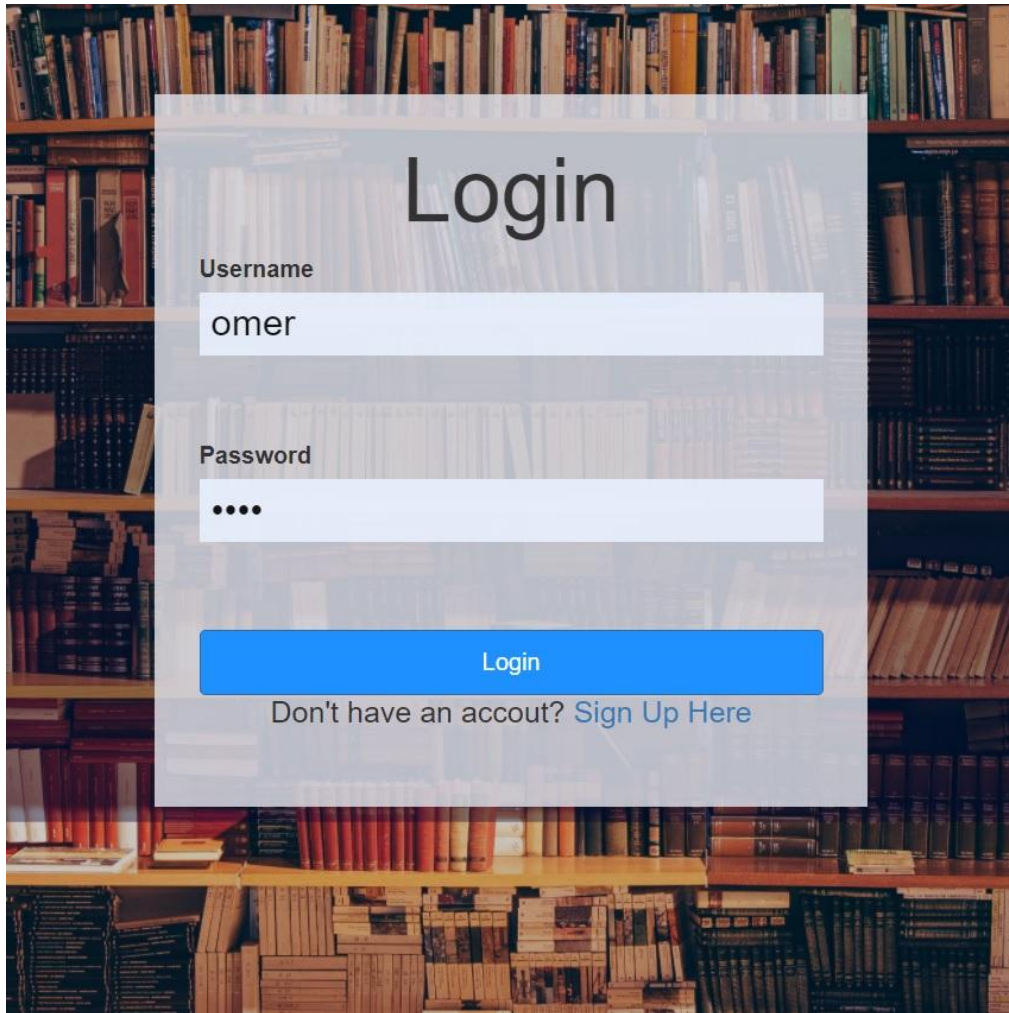
Email
email

Author ☐

Sign Up

Already have an accout? [Login Here](#)

6.2 Login

A login form is centered on the screen, overlaid on a background image of a bookshelf filled with books. The form has a light gray background and rounded corners. It contains a title, two input fields, a login button, and a link for new users.

Login

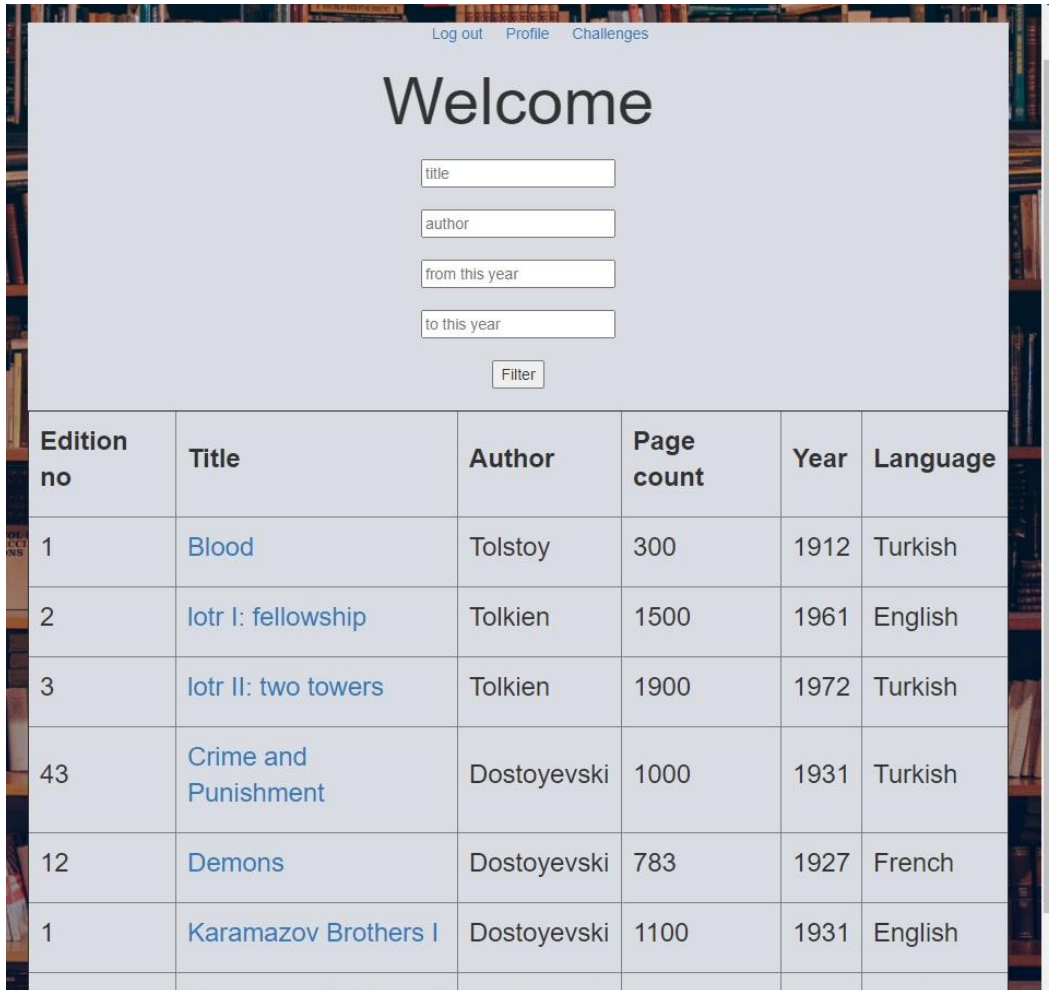
Username

Password

Login

Don't have an account? [Sign Up Here](#)

6.3 User Home Page



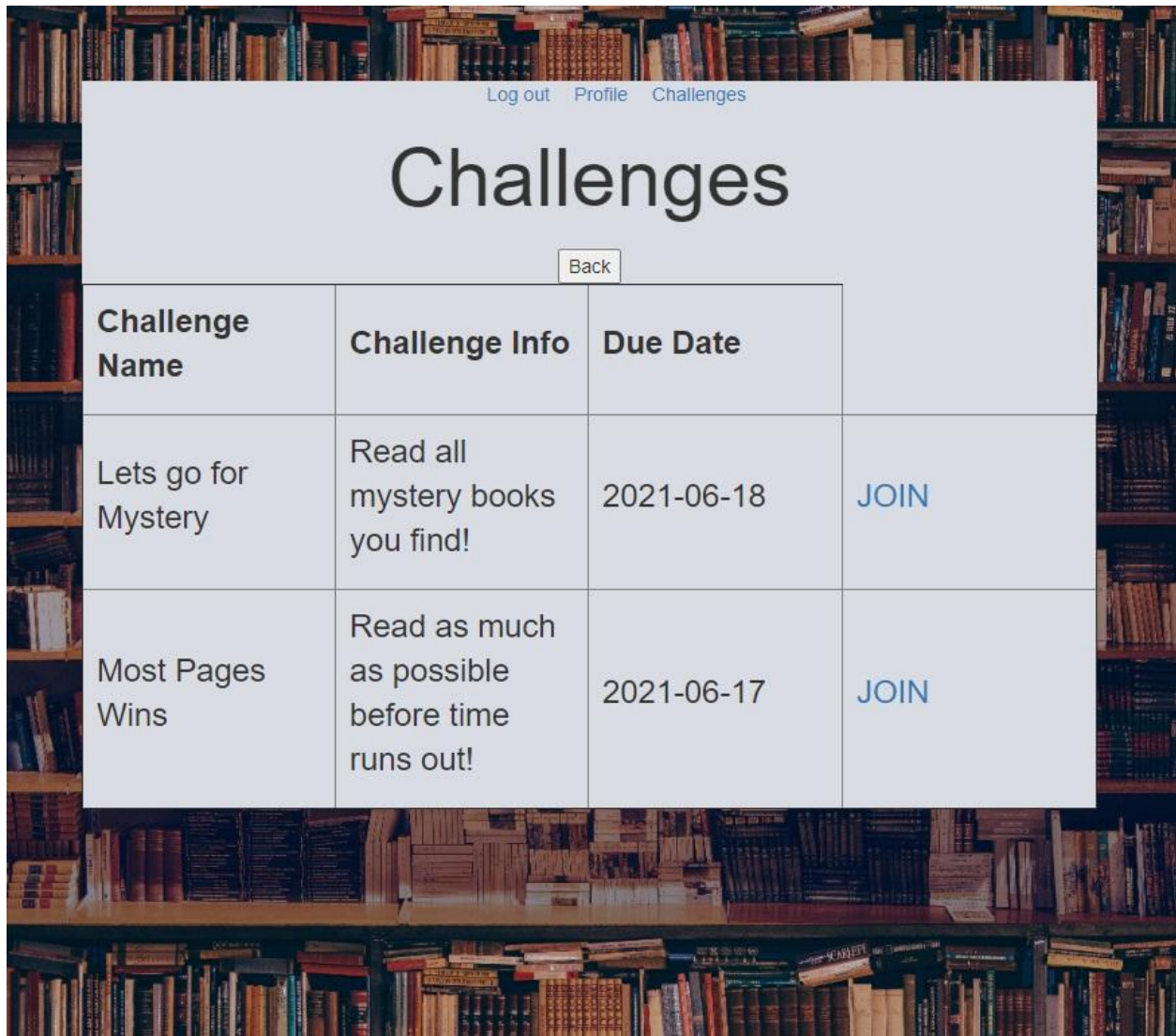
The screenshot shows a user home page with a light blue background. At the top, there are three links: "Log out", "Profile", and "Challenges". Below these is a large "Welcome" heading. Under the heading, there are four search input fields: "title", "author", "from this year", and "to this year". A "Filter" button is located below the year fields. Below the search area is a table with six columns: "Edition no", "Title", "Author", "Page count", "Year", and "Language". The table contains several rows of book data, with some titles highlighted in blue.

Edition no	Title	Author	Page count	Year	Language
1	Blood	Tolstoy	300	1912	Turkish
2	lotr I: fellowship	Tolkien	1500	1961	English
3	lotr II: two towers	Tolkien	1900	1972	Turkish
43	Crime and Punishment	Dostoyevski	1000	1931	Turkish
12	Demons	Dostoyevski	783	1927	French
1	Karamazov Brothers I	Dostoyevski	1100	1931	English

Using the top three buttons, user can log out, go to their profiles and list challenges.

In the home page, users can search for books using title, author and range search books using years. Clicking the title of a book here redirects user to the book page.

6.4 User Challenges Page

The screenshot shows a web interface for a library's challenge system. At the top, there are navigation links: "Log out", "Profile", and "Challenges". The main heading is "Challenges". Below it is a "Back" button. A table lists two challenges. The first challenge is "Lets go for Mystery" with a due date of "2021-06-18" and a "JOIN" button. The second challenge is "Most Pages Wins" with a due date of "2021-06-17" and a "JOIN" button. The background of the page is a dense collection of books on shelves.

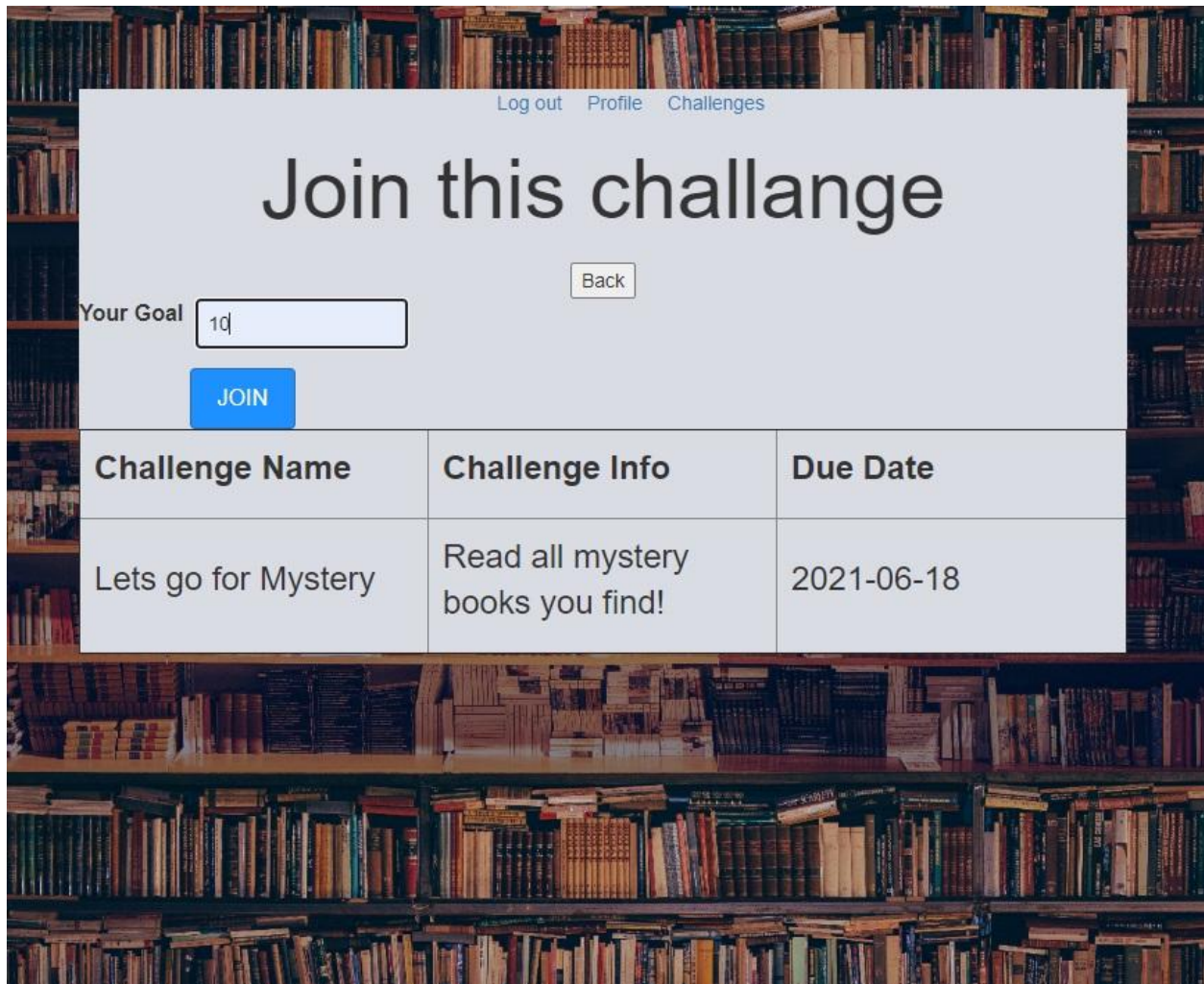
[Log out](#) [Profile](#) [Challenges](#)

Challenges

[Back](#)

Challenge Name	Challenge Info	Due Date	
Lets go for Mystery	Read all mystery books you find!	2021-06-18	JOIN
Most Pages Wins	Read as much as possible before time runs out!	2021-06-17	JOIN

6.5 User Join Challenges Page



Log out Profile Challenges

Join this challenge

[Back](#)

Your Goal

[JOIN](#)

Challenge Name	Challenge Info	Due Date
Lets go for Mystery	Read all mystery books you find!	2021-06-18

6.6 User Profile Page

[Log out](#) [Profile](#) [Home](#)

Name: ahmet

Join Date: 2021-05-17

0 ratings
avg rating: NA

Friends:

2 friends
[kubra](#) [beril](#)

Followed Authors:

0 followed authors

Bookshelves

bookshelf	count
Currently Reading	0
Read	0
To read	0

list name

Create List

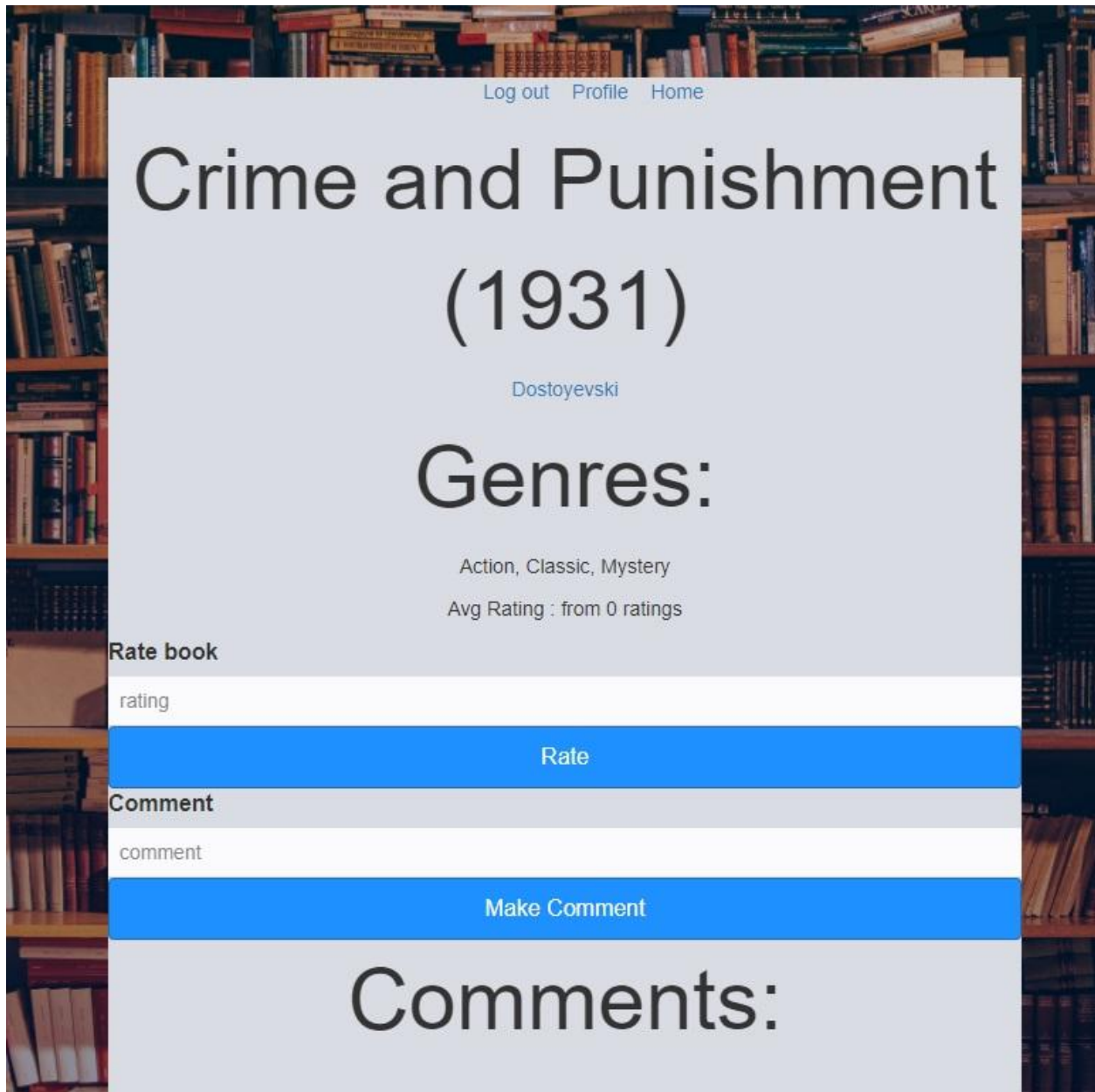
Lists

list
best_mystery
fav_novels

Joined Challenges

Challenge Name	Challenge Info	Due Date
Dont forget the classics	Lets remember the best classics	2021-06-15

6.7 Book Page



The image shows a book page for 'Crime and Punishment (1931)' by Dostoyevski. The page is set against a background of a bookshelf. At the top, there are links for 'Log out', 'Profile', and 'Home'. The title 'Crime and Punishment (1931)' is prominently displayed in a large, dark font. Below the title, the author's name 'Dostoyevski' is shown in a smaller, blue font. The section 'Genres:' is followed by the text 'Action, Classic, Mystery'. Below this, it says 'Avg Rating : from 0 ratings'. There are two main interactive sections: 'Rate book' and 'Comment'. The 'Rate book' section includes a text input field labeled 'rating' and a blue button labeled 'Rate'. The 'Comment' section includes a text input field labeled 'comment' and a blue button labeled 'Make Comment'. At the bottom, the word 'Comments:' is displayed in a large, dark font.

[Log out](#) [Profile](#) [Home](#)

Crime and Punishment (1931)

Dostoyevski

Genres:

Action, Classic, Mystery

Avg Rating : from 0 ratings

Rate book

rating

Rate

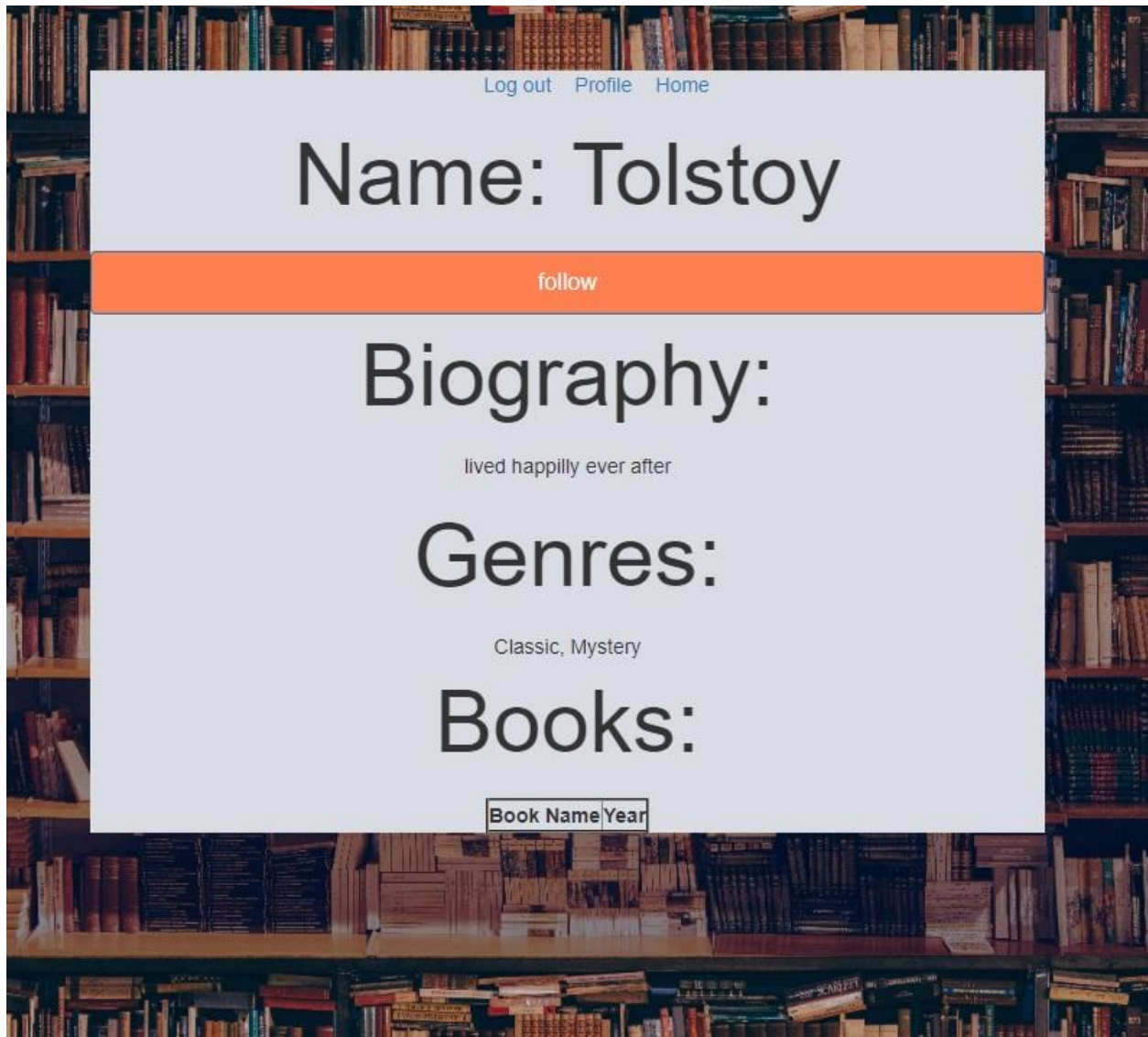
Comment

comment

Make Comment

Comments:

6.8 Author Page



6.9 List Page

Log out Profile Home

Name: fav_novels

Books:

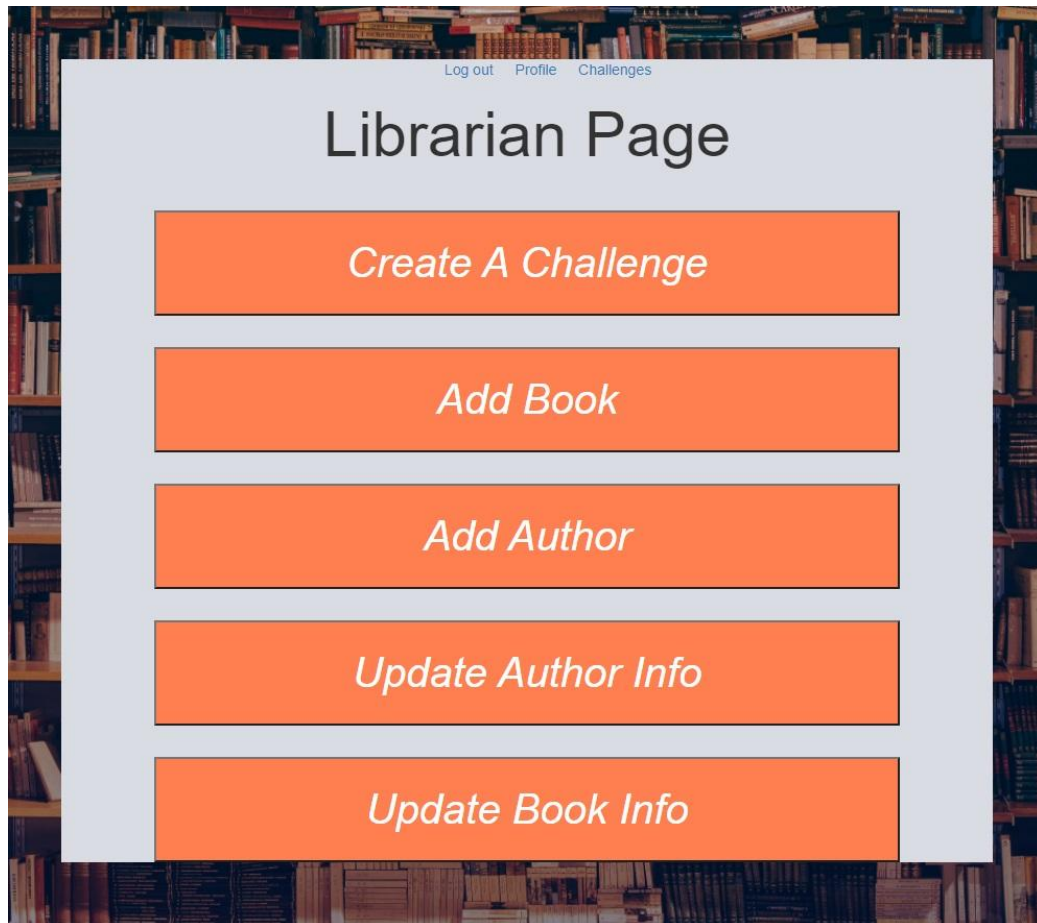
book title

add/remove book

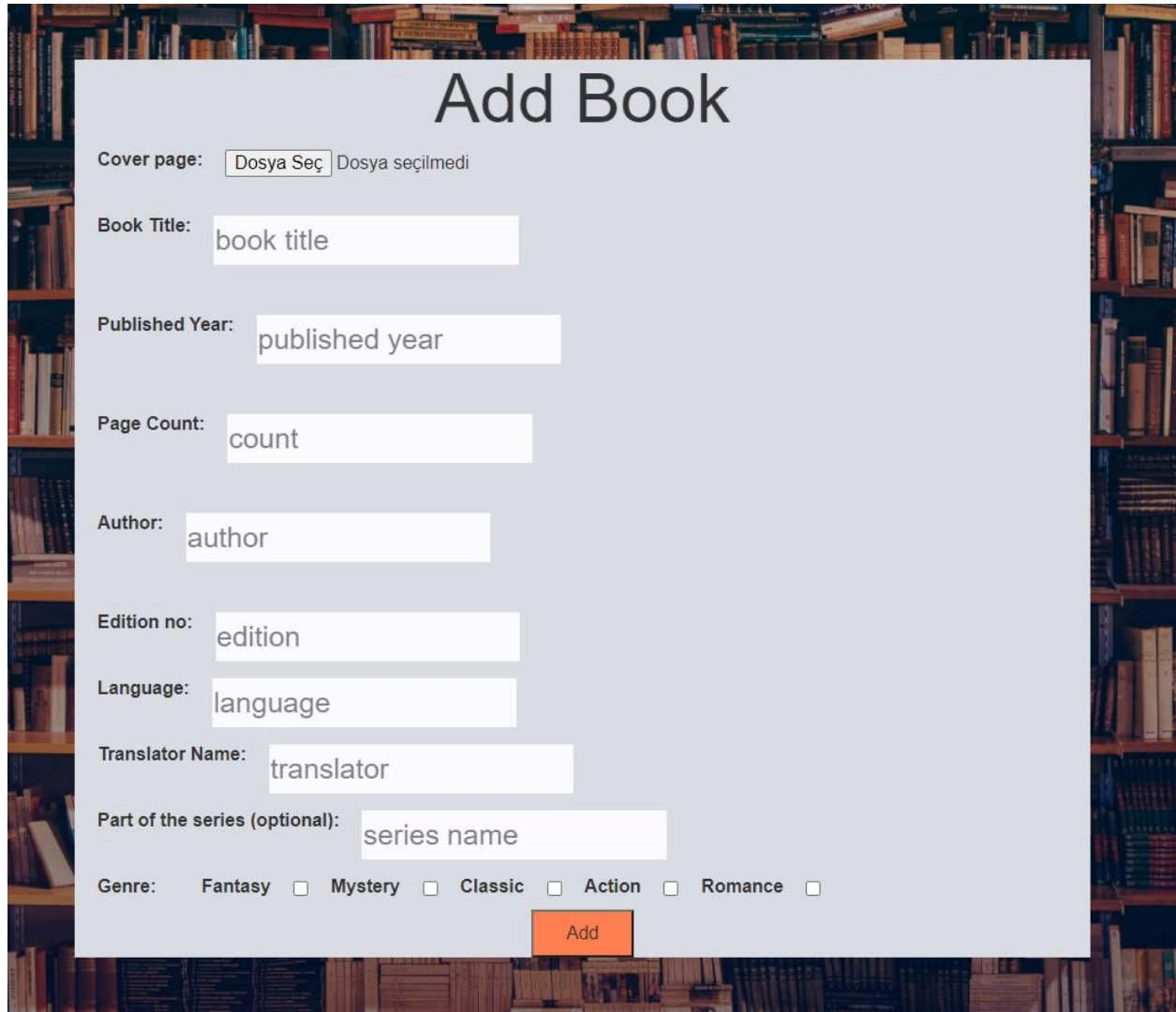
no	Book Name	Year
----	-----------	------

delete list

6.10 Librarian Home Page



6.11 Librarian Add Book Page

The image shows a web form titled "Add Book" set against a background of bookshelves. The form is a light blue rectangle with a title "Add Book" in large black font at the top center. Below the title, there are several input fields and a checkbox. The "Cover page:" label is followed by a dropdown menu showing "Dosya Seç" and the text "Dosya seçilmedi". The "Book Title:" label is followed by a text input field containing "book title". The "Published Year:" label is followed by a text input field containing "published year". The "Page Count:" label is followed by a text input field containing "count". The "Author:" label is followed by a text input field containing "author". The "Edition no:" label is followed by a text input field containing "edition". The "Language:" label is followed by a text input field containing "language". The "Translator Name:" label is followed by a text input field containing "translator". The "Part of the series (optional):" label is followed by a text input field containing "series name". Below these fields, the "Genre:" label is followed by a row of checkboxes for "Fantasy", "Mystery", "Classic", "Action", and "Romance". All checkboxes are currently unchecked. At the bottom center of the form is an orange "Add" button.

Add Book

Cover page: Dosya seçilmedi

Book Title:

Published Year:

Page Count:

Author:

Edition no:

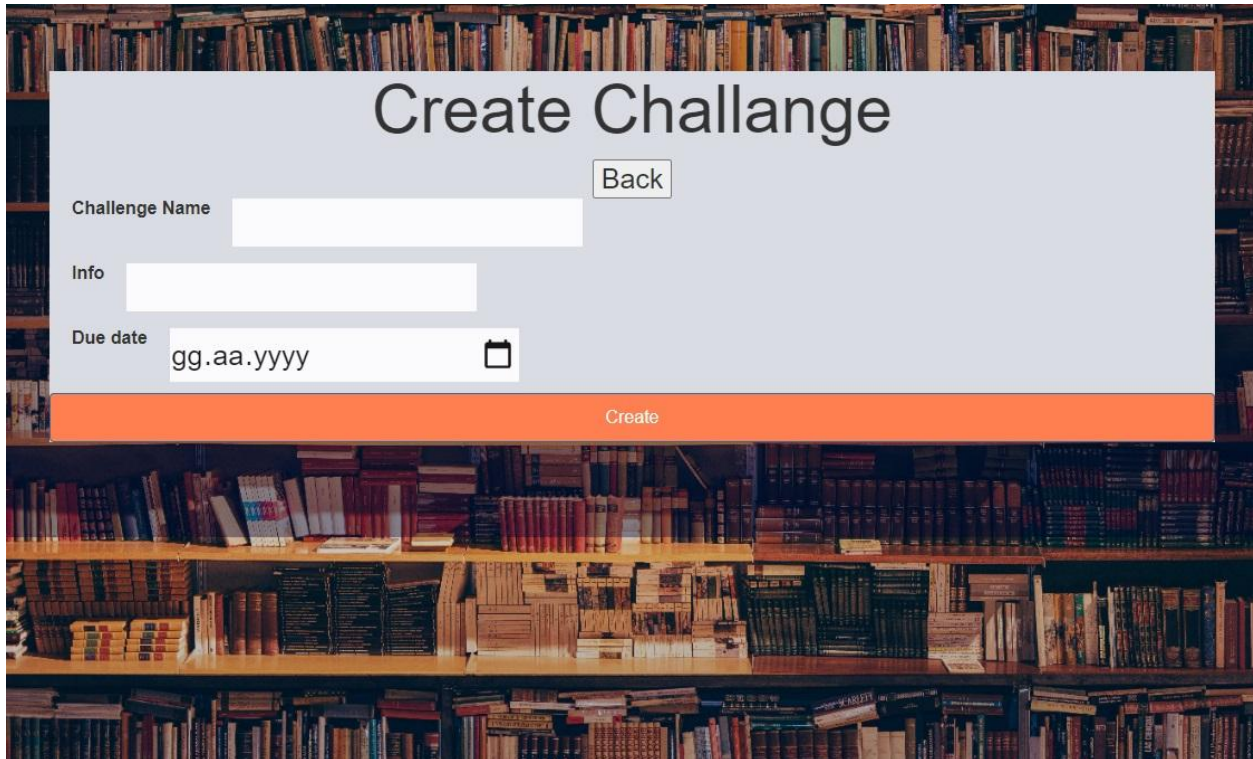
Language:

Translator Name:

Part of the series (optional):

Genre: Fantasy ☐ Mystery ☐ Classic ☐ Action ☐ Romance ☐

6.12 Librarian Create Challenge Page


The image shows a web interface for creating a challenge, overlaid on a background of bookshelves. The interface has a light blue header area with the title "Create Challenge" in a large, dark font. Below the title, there is a "Back" button. The main form area is white and contains three input fields: "Challenge Name", "Info", and "Due date". The "Due date" field is pre-filled with "gg.aa.yyyy" and has a calendar icon to its right. At the bottom of the form, there is an orange "Create" button.

Create Challenge

Back

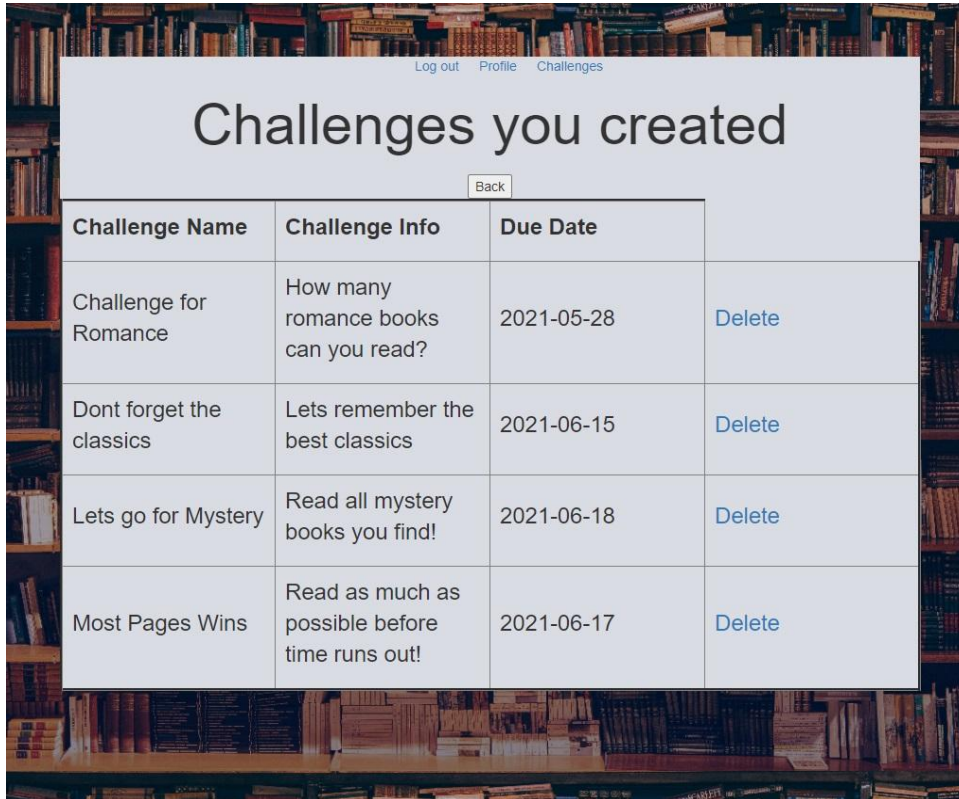
Challenge Name

Info

Due date 

Create

6.13 Librarian Challenges Page

The screenshot shows a web interface for a librarian's challenges page. At the top, there are navigation links: "Log out", "Profile", and "Challenges". The main heading is "Challenges you created". Below this is a "Back" button. A table lists four challenges with columns for "Challenge Name", "Challenge Info", "Due Date", and a "Delete" link. The challenges are: "Challenge for Romance" (due 2021-05-28), "Dont forget the classics" (due 2021-06-15), "Lets go for Mystery" (due 2021-06-18), and "Most Pages Wins" (due 2021-06-17). The background of the page is a bookshelf filled with books.

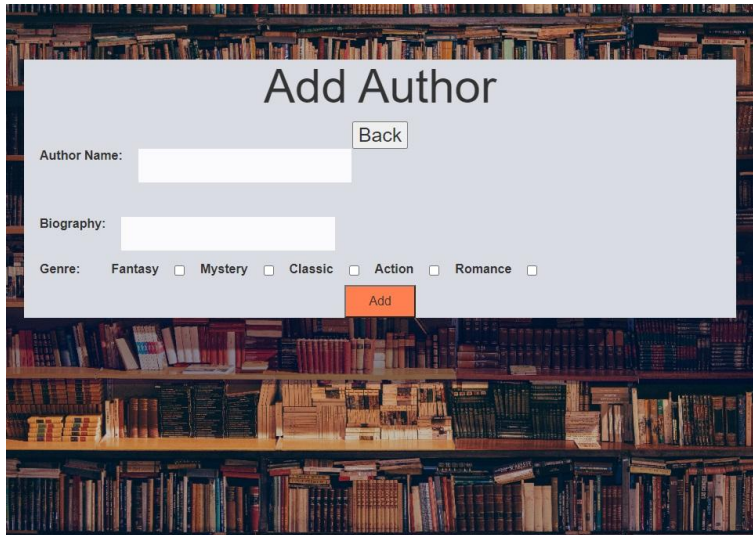
Log out Profile Challenges

Challenges you created

[Back](#)

Challenge Name	Challenge Info	Due Date	
Challenge for Romance	How many romance books can you read?	2021-05-28	Delete
Dont forget the classics	Lets remember the best classics	2021-06-15	Delete
Lets go for Mystery	Read all mystery books you find!	2021-06-18	Delete
Most Pages Wins	Read as much as possible before time runs out!	2021-06-17	Delete

6.14 Librarian Add Author Page



The screenshot shows a web form titled "Add Author" centered on a background of bookshelves filled with books. The form has a light blue header with the title. Below the header, there is a "Back" button in the top right corner. The form contains two text input fields: "Author Name:" and "Biography:". Below these fields, there is a "Genre:" label followed by five radio button options: "Fantasy", "Mystery", "Classic", "Action", and "Romance". At the bottom of the form is an orange "Add" button.

7. Website and References

Project website:

<https://cemalahmet.github.io/book-catalog-project-cs-353/>

[1] O. Chandler, "About Goodreads," *Goodreads*, 2007. [Online]. Available:

<https://www.goodreads.com/about/us>. [Accessed: 24-Feb-2021].