Project Report
CS254 - Database Systems Lab

Books Review Website

By

Shreesha Bharadwaj (181CO249)

Shruthan R (181CO250)

Table of Contents

1. Introduction

Book Review Website is a website where users will be able to view books and their details, access reviews of books written by fellow users and critics, rate and write reviews of books they have read and share their experience with the reading community. The website uses a third-party API by Goodreads, a leading book review website to pull in ratings and access reviews from a broader audience.
The user will have secure access via a login and can search for books by its ISBN, title or author.

The website has the following features:

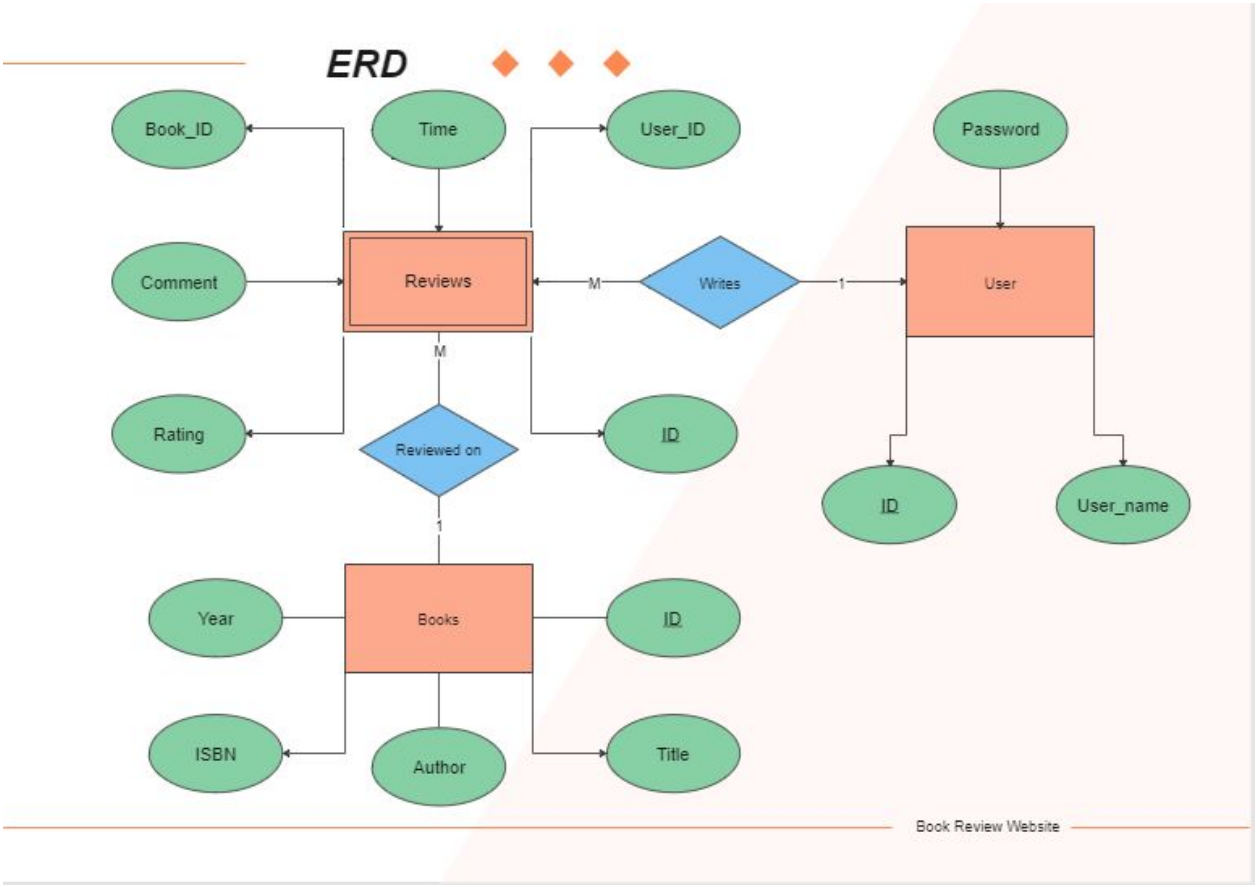
- Secure register, login and logout.
- Search for books using ISBN, title or author's name.
- An individual page containing information, ratings and reviews of the book for every book.
- Submit a review of a book and share it with the community.

The website and the database used in the website are all deployed on the cloud. This not only makes the development of the application and storage of data machine-independent but also allows for a large scale deployment of the project. We have not only considered the design of the database but also tried to incorporate good security practices in the project, which is crucial for any production-level project.

You may access the website at https://book-review-website-dbms.herokuapp.com/.

2. The Database

The following is the ER diagram of our database.



The database consists of three tables:

1. **Books:** The table contains all the data about books like ISBN, title, author's name and year of publication.

Column	Type	Comment
id	integer *Auto Increment* [nextval('books_id_seq')]	
isbn	character varying(20)	
title	text	
author	text	
year	character varying(4)	

This table has the following functional dependencies :

{Isbn} -> {title, author , year }
{Id} -> {isbn , title, author , year }

2. **Reviews:** The table contains data about all the reviews in the database. The ID of the book (BookID) and ID of the user (UserID) are the foreign keys.

Column	Type	Comment
user_id	integer	
book_id	integer	
comment	text	
rating	integer	
id	integer *Auto Increment* [nextval('reviews_id_seq')]	
time	timestamp [now()]	

The functional dependencies are:

{id} -> {user_id , book_id , text , rating, time}
{user_id, book_id} -> {text, rating, time}

3. **User:** The user table contains information about each user and their and login credentials.

Column	Type	Comment
id	integer *Auto Increment* [nextval('users_id_seq')]	
username	text	
hash	text	

The functional dependencies are:
{id} -> {username, hash}

3. Implementation Details:

3.1 Following are the details of the technologies used to implement the project:

- Backend Framework: Flask (Flask is a micro web framework written in Python)
- Frontend: CSS, Bootstrap
- Database: PostgreSQL hosted on Heroku. Accessed through SQLAlchemy in code
- Library for encrypting passwords: Werkzeug

3.2 The different files of the project are described below:

- application.py: The main functional code which implements the backend logic for registering a user, logging in a user, searching for books, adding ratings and reviews and getting data from Goodreads by making an API call.
- import.py: Feeds all the data in books.csv (which contains details about 5000 books) into the database. Note that we have already run this file and inserted the records in to the required table. The code is provided for completeness.
- helpers.py: Used to ensure that the user is logged in for the session.
- templates: This folder contains all the HTML files. Note that the templating language Jinja2 has been used in the files (which is the default templating language for Flask) to appropriately implement the required frontend logic.
- static: This folder contains the file styles.css which has the styles defined for all pages in the website. It also has the Goodreads logo.
- Porcfile: a file necessary to deploy the application to Heroku.

3.3 External services used:

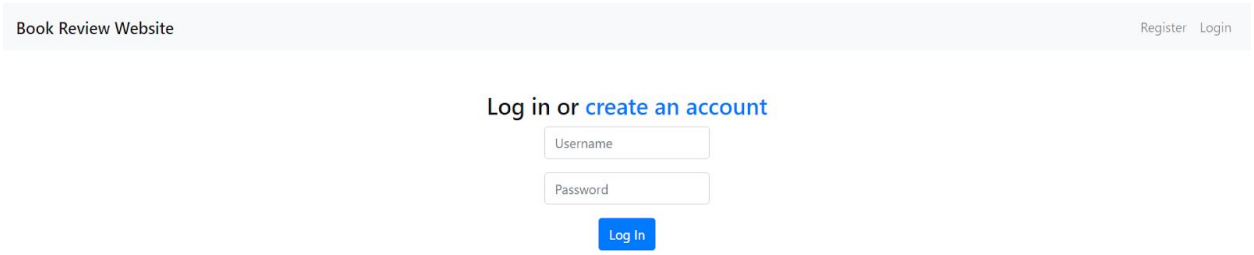
- Heroku: to host the website and the database.
- Goodreads: to get information about books
- Adminer: to access the database easily.

The application has been hosted on Heroku which is a platform as a service (PaaS) that enables developers to build, run, and operate applications entirely in the cloud. All functionalities of the project can be viewed and tested on the URL provided. The application may be run locally also. However, a few environment variables will have to be set as described in the README file.

4. Components of the project:

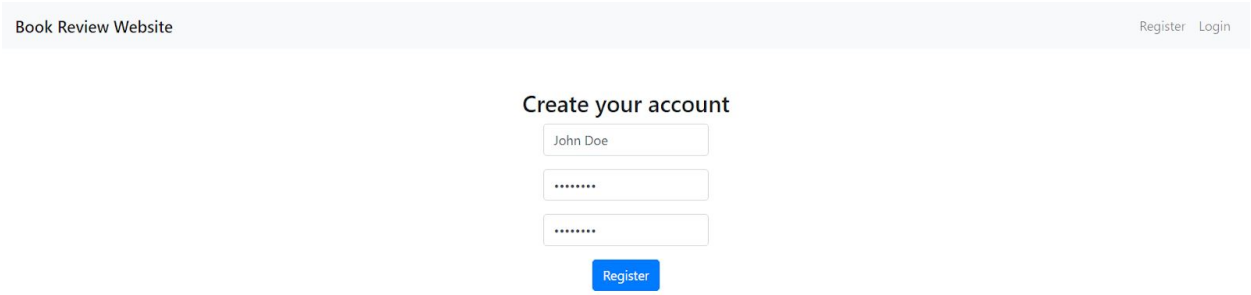
4.1 Landing page:

Visit the URL https://book-review-website-dbms.herokuapp.com/ to arrive at the landing page as below.

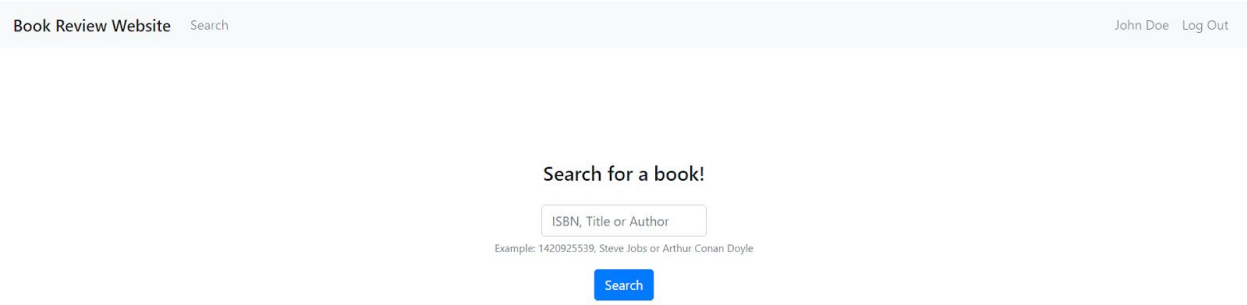


4.2 Registering for an account and logging in:

Click Register on the navbar or click create an account to go to the registration page. Register for an account by entering a username and password.



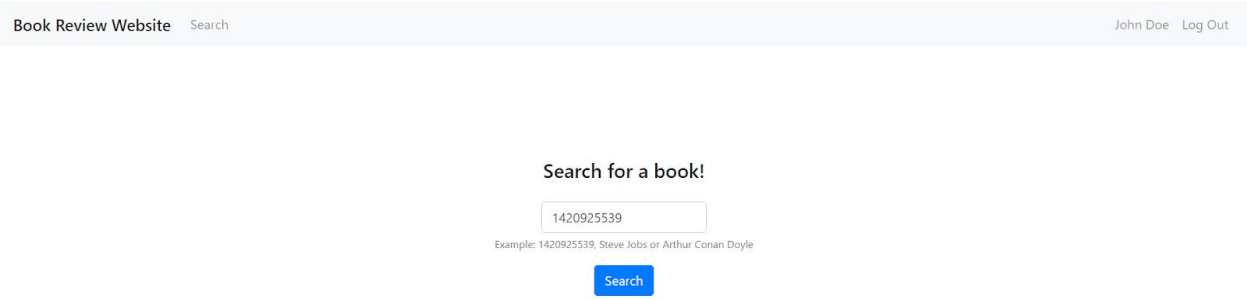
Use the credentials to log in. The following screen appears on logging in.



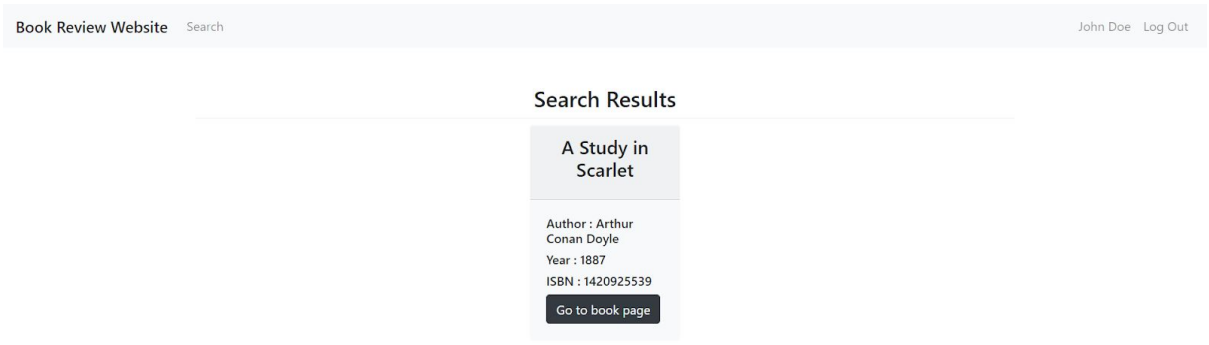
4.3 Searching for a book:

A book can be searched for by either its Title, Author or ISBN number. All three have been demonstrated below.

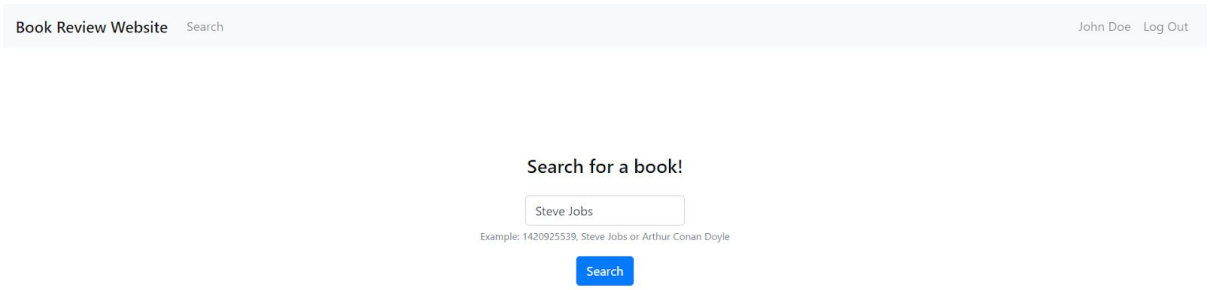
4.3.1 Using ISBN number:



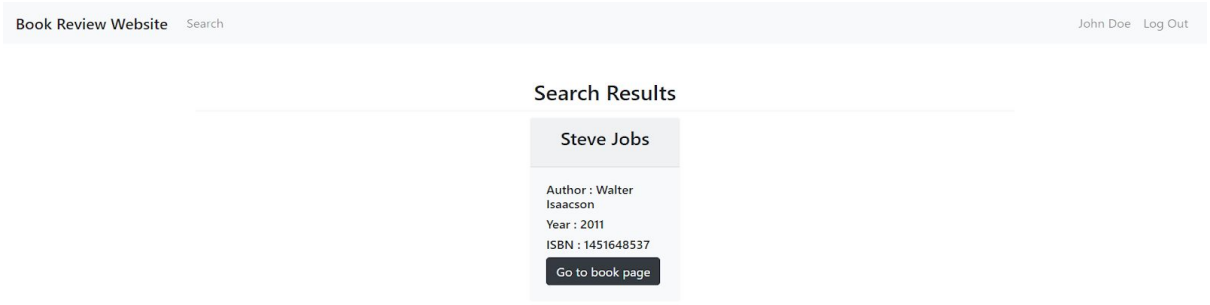
This will lead to a page with exactly one result since ISBN numbers are unique.



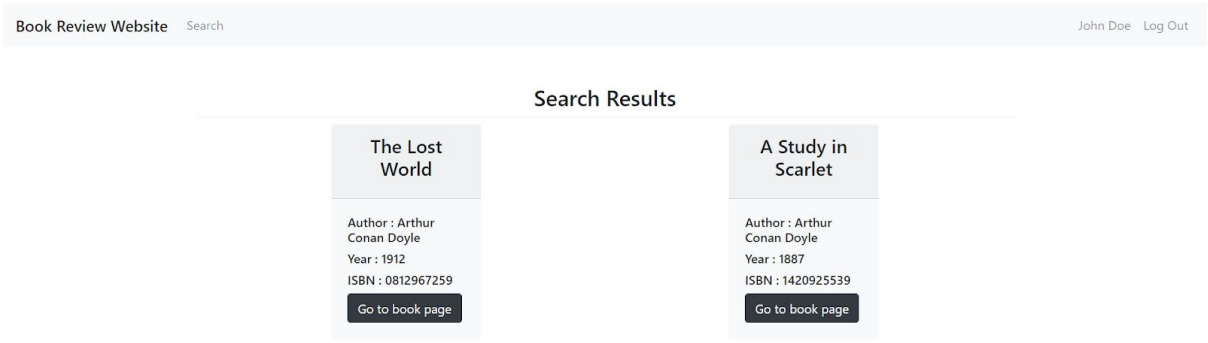
4.3.2 Using the title of the book:



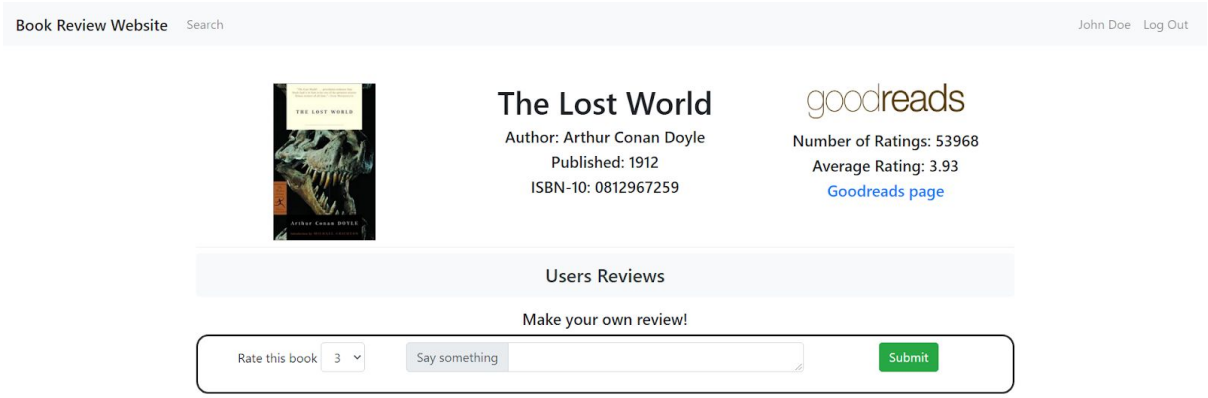
This will lead to a page with the list of all books with the entered title.



4.3.3 Using Author's name:

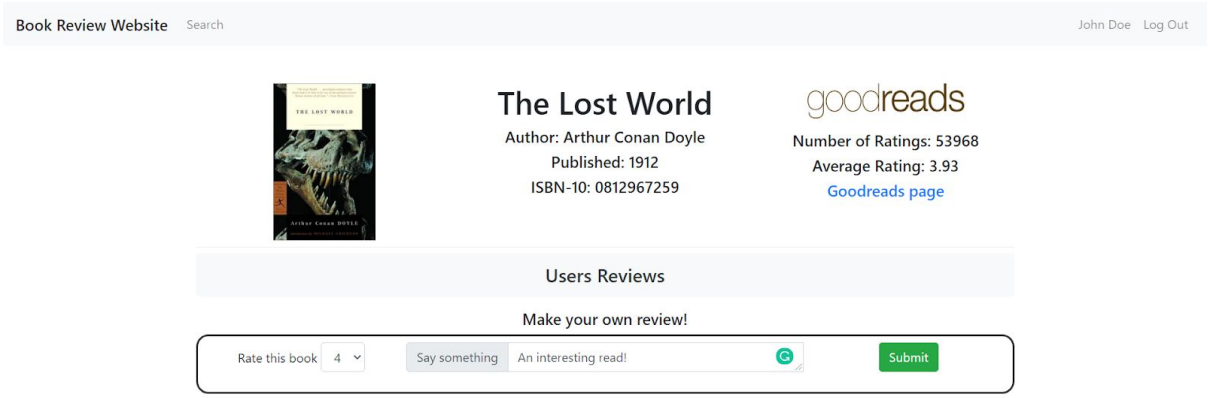


4.4 Book Page:
On clicking the “Go to book page” in any of the above book listings, we get the details of the book as below.

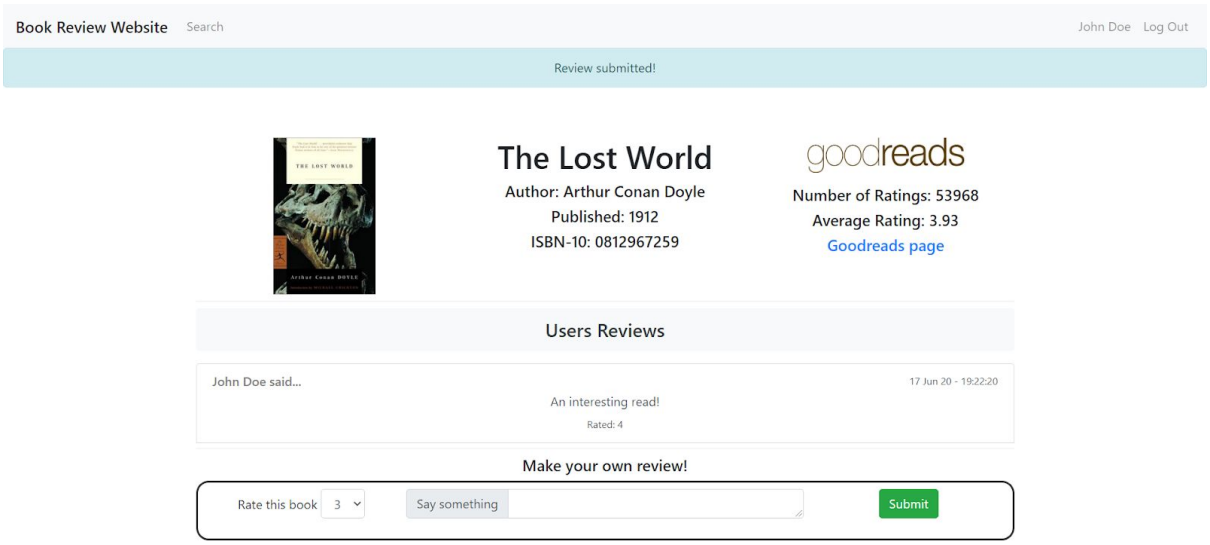


It shows an image of the book, gives its title, author and ISBN-10 number. Also, it shows the rating given to the book and the number of people who have rated it on Goodreads which is a social cataloging website that allows individuals to search freely its database of books, annotations, and reviews. It also allows you to add your own review for the book and displays reviews written by other users (of our website).

4.5 Writing a review:
Below the section of reviews by others, there is a box which allows you to rate the book and write a review as shown below.



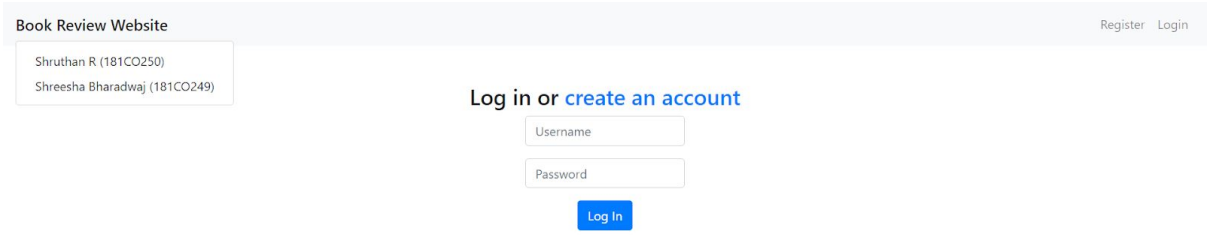
On clicking the Submit button we get:



The writer of the review, timestamp of the review, the rating and the review itself are displayed upon successful submission.

4.6 Team Members:

Clicking on **Book Review Website** on the top-left corner shows the team members.



5. Conclusion

Our project provides a great platform for people to find good books and also share their experience of a book they have read to the world. This is especially useful during this pandemic when staying at home is of utmost priority. Books are a great way to spend time away and our website provides a platform to help your perfect match.

6. Future Scope

In future, the website can be extended to include a book prediction algorithm based on machine learning. The algorithm can be used to recommend a book to the user based on the user's past reads and interested genres.

We can also add a real-time price catalog of the book from various E-commerce sites. The user, if interested in a particular book, can view the prices of the book on various sites and make a decision about buying it. This is also an excellent platform for advertisers and marketing teams from e-commerce sites and bookstores as it connects the user who likes a particular book to the place that's selling it.

Scalability is a key factor in large scale implementation. From our database design and cloud deployment of the website and database, we have made for easy large scale deployments.

7. References:

Python: https://www.python.org/doc/
Flask: https://flask.palletsprojects.com/en/1.1.x/
SQLAlchemy: https://www.sqlalchemy.org/
Workzeug: https://pypi.org/project/Werkzeug/
Heroku: https://devcenter.heroku.com/
Goodreads API: https://www.goodreads.com/api
Adminer: https://www.adminer.org/ and https://adminer.cs50.net/