CAPSTONE PROJECT

Book Recommendation System

PRESENTED BY

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OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References

PROBLEM STATEMENT

With the ever-growing number of books being published each year, readers often struggle to find books that match their tastes and preferences. Traditional methods such as best-seller lists or general reviews lack personalization. Hence, there's a need for an intelligent system that helps users discover books based on their interests and reading history.

PROPOSED SOLUTION

The proposed Book Recommendation System leverages collaborative filtering and content-based filtering techniques to suggest books personalized to user preferences.

- **Data Collection**: Used public book datasets including user ratings and metadata.
- **Filtering Techniques**:
  - Collaborative Filtering: Based on user similarity and rating patterns.
  - Content-Based Filtering: Based on features like author, title, genre, etc.
- **User Interface**: Simple UI to display top 50 books and get personalized recommendations.
- **Deployment**: Hosted using Flask on Render platform.

SYSTEM APPROACH

- **Technologies Used**:
  - Python, Pandas, NumPy
  - Scikit-learn (for modeling)
  - Flask (for backend)
  - HTML/CSS (for frontend)
  - Render (for deployment)
- **Libraries**:
  - `pandas`, `numpy`, `scikit-learn`, `flask`, `pickle`, `requests`, etc.

ALGORITHM & DEPLOYMENT

Algorithm Used:

- **Collaborative Filtering**: Based on cosine similarity between users or items.
- **Content-Based Filtering**: TF-IDF or metadata similarity.

Data Input:

- Book titles, user ratings, authors, genres, publication years.

Training Process:

- Precomputed similarity matrix based on user ratings and book features.
- Model serialized with `pickle` for quick deployment.

ALGORITHM & DEPLOYMENT

Prediction:

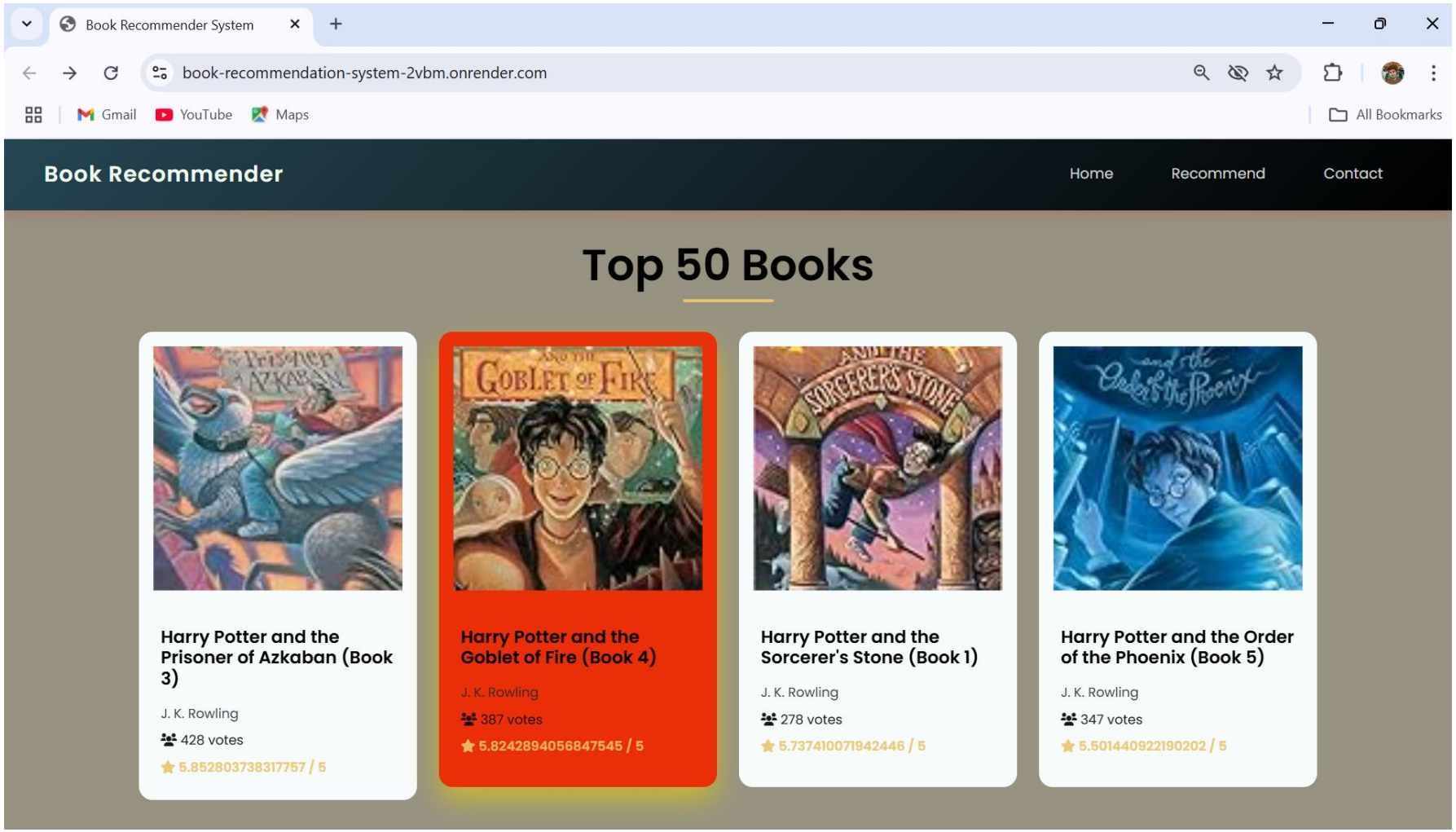
- Given a selected book, return the top 3 most similar books.

Deployment:

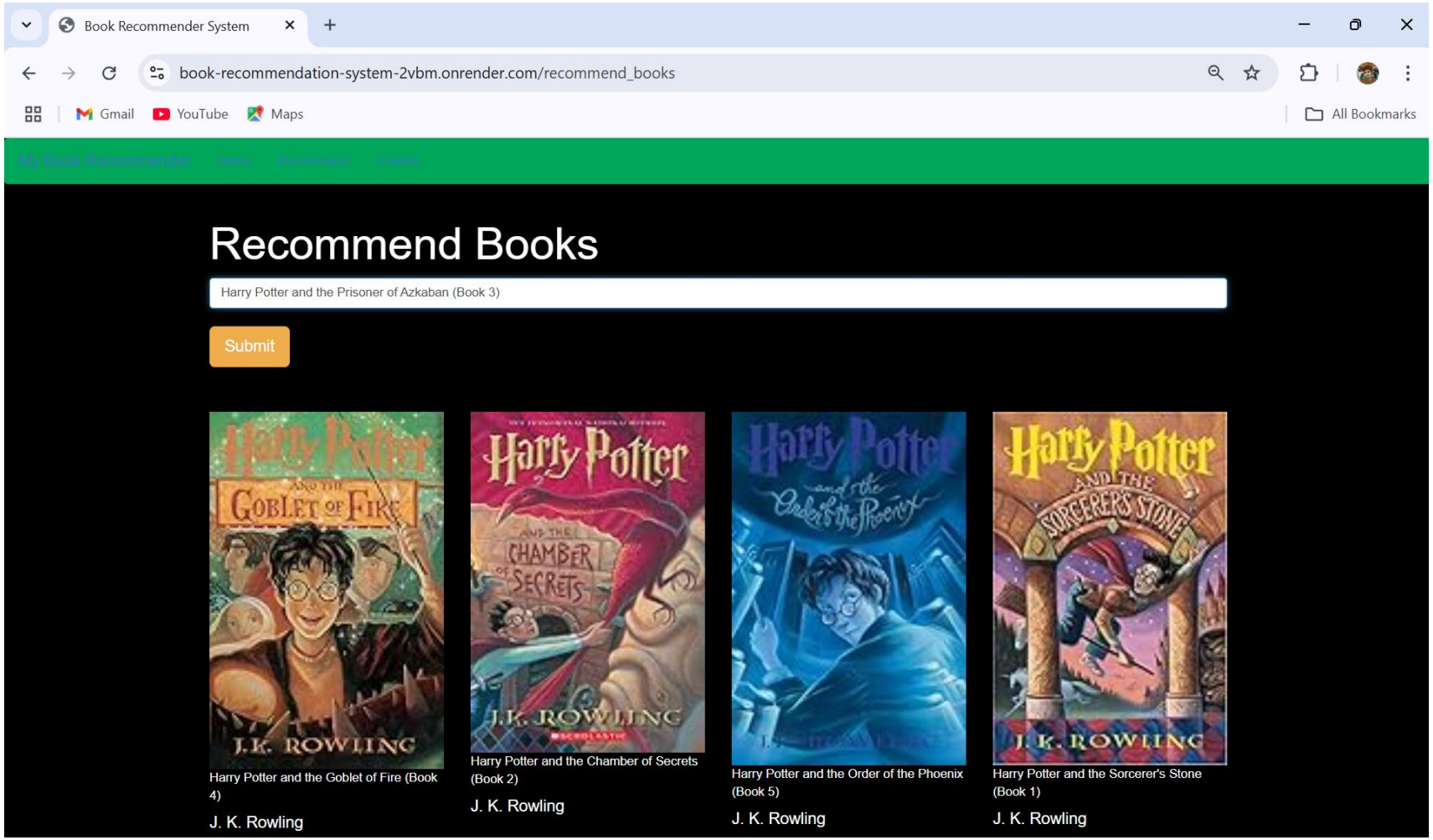
- Web app deployed using Flask.

- Hosted on Render using a free tier service.

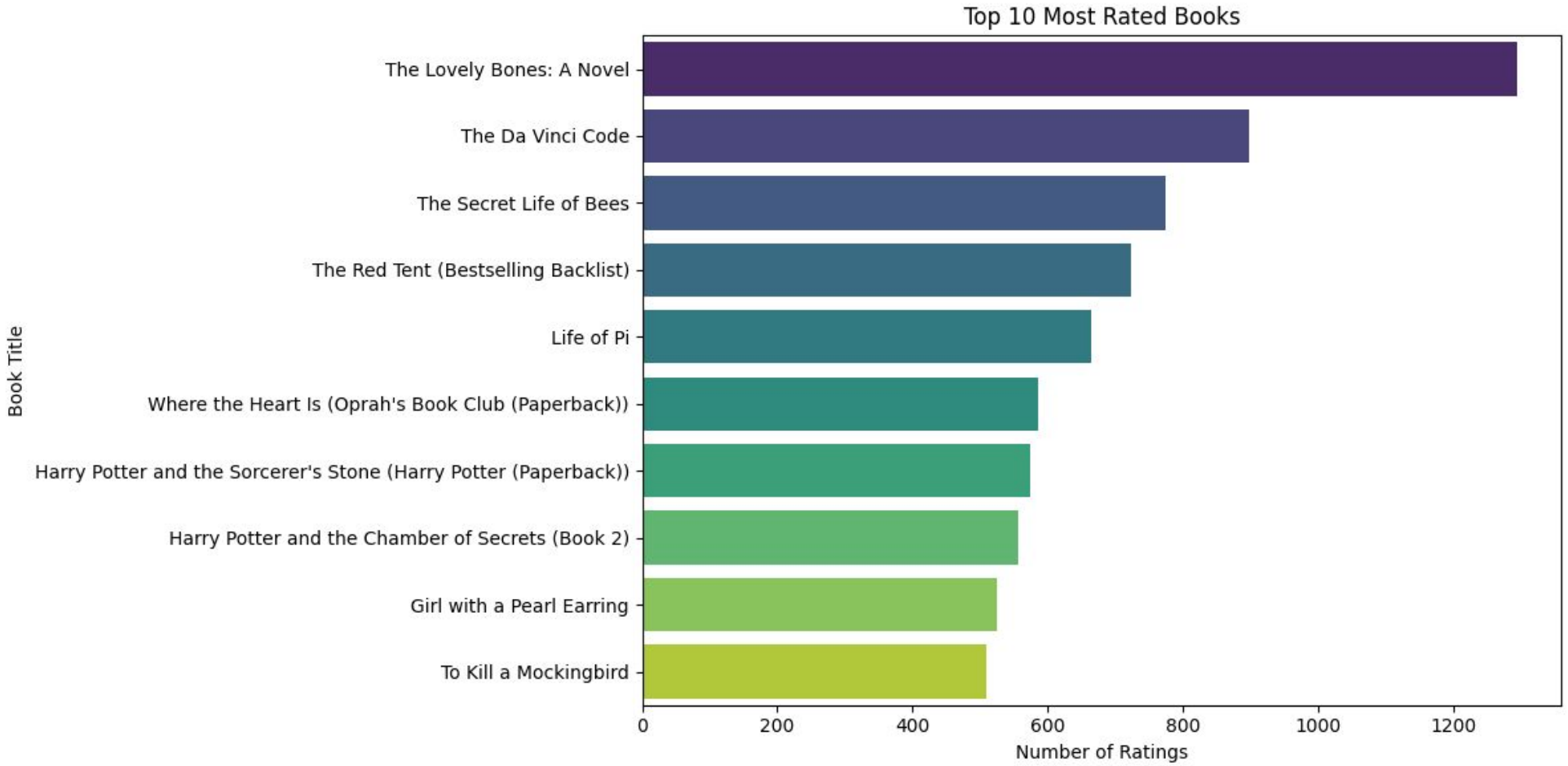
RESULT


Book Recommender System
book-recommendation-system-2vbm.onrender.com
Gmail
YouTube
Maps
All Bookmarks
Book Recommender
Home
Recommend
Contact
Top 50 Books
Harry Potter and the Prisoner of Azkaban (Book 3)
J. K. Rowling
428 votes
5.852803738317757 / 5
Harry Potter and the Goblet of Fire (Book 4)
J. K. Rowling
387 votes
5.8242894056847545 / 5
Harry Potter and the Sorcerer's Stone (Book 1)
J. K. Rowling
278 votes
5.737410071942446 / 5
Harry Potter and the Order of the Phoenix (Book 5)
J. K. Rowling
347 votes
5.501440922190202 / 5

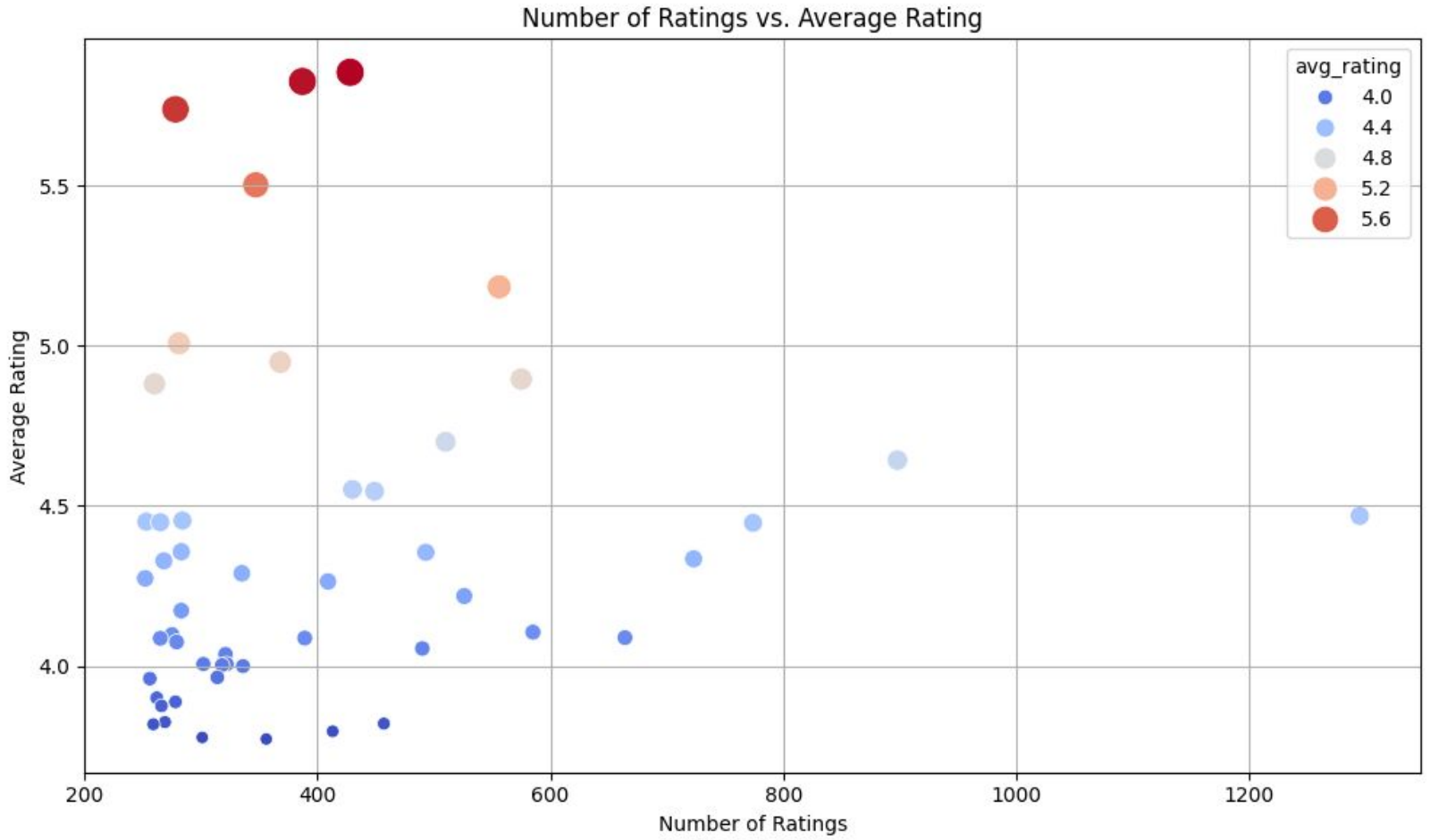
RESULT


Book Recommender System
book-recommendation-system-2vbm.onrender.com/recommend_books
Gmail
YouTube
Maps
All Bookmarks
My Book Recommender
Home
Recommend
Contact
Recommend Books
Harry Potter and the Prisoner of Azkaban (Book 3)
Submit
Harry Potter and the Goblet of Fire (Book 4)
J. K. Rowling
Harry Potter and the Chamber of Secrets (Book 2)
J. K. Rowling
Harry Potter and the Order of the Phoenix (Book 5)
J. K. Rowling
Harry Potter and the Sorcerer's Stone (Book 1)
J. K. Rowling

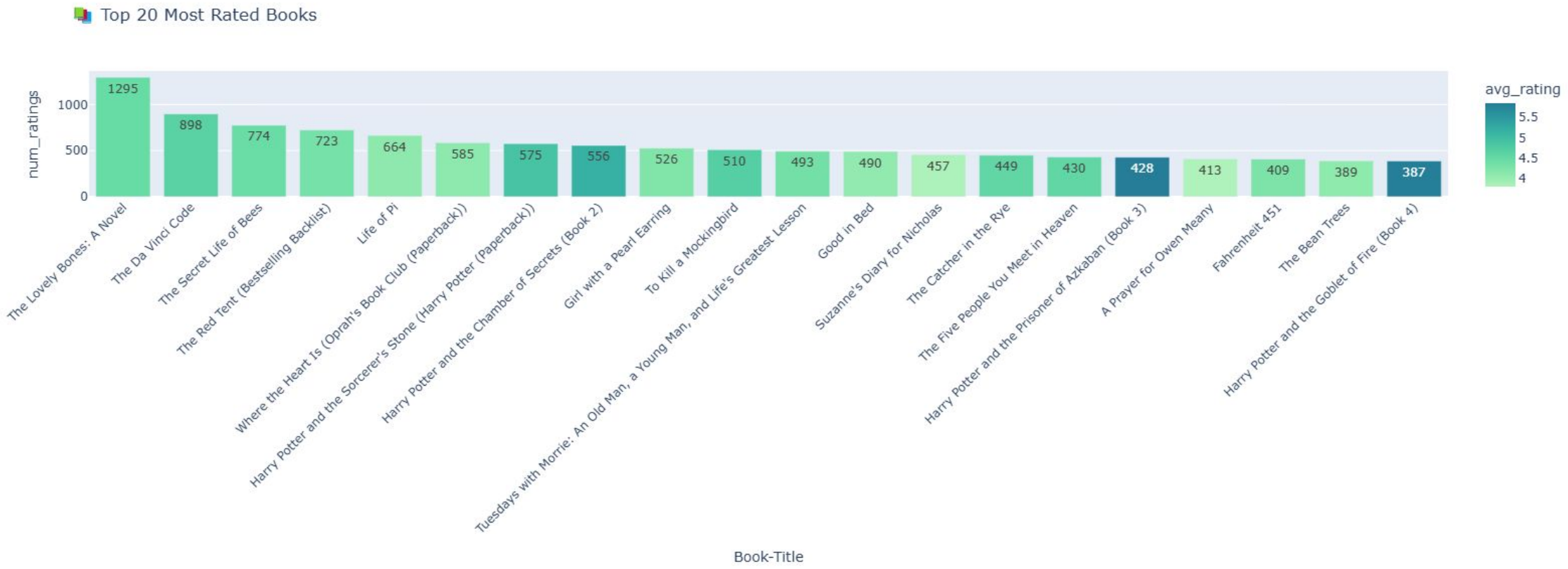
RESULT


Top 10 Most Rated Books
The Lovely Bones: A Novel
The Da Vinci Code
The Secret Life of Bees
The Red Tent (Bestselling Backlist)
Life of Pi
Where the Heart Is (Oprah's Book Club (Paperback))
Harry Potter and the Sorcerer's Stone (Harry Potter (Paperback))
Harry Potter and the Chamber of Secrets (Book 2)
Girl with a Pearl Earring
To Kill a Mockingbird
Book Title
0
200
400
600
800
1000
1200
Number of Ratings

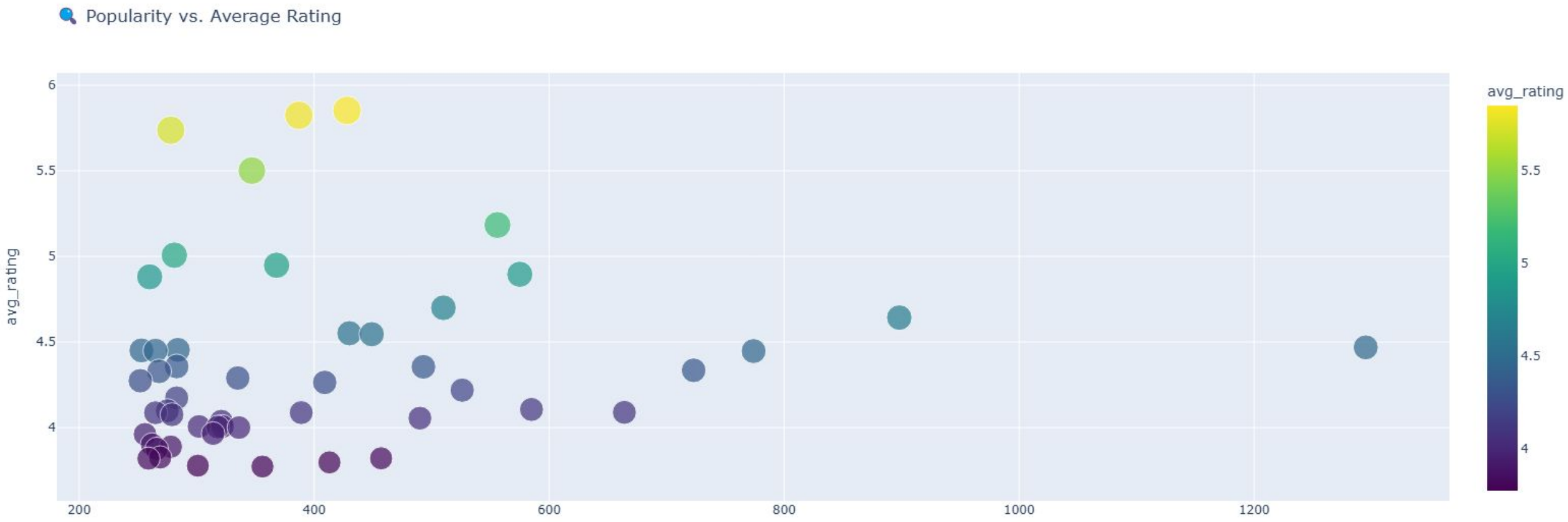
RESULT


Number of Ratings vs. Average Rating
avg_rating
4.0
4.4
4.8
5.2
5.6
Average Rating
5.5
5.0
4.5
4.0
200
400
600
800
1000
1200
Number of Ratings

RESULT


Top 20 Most Rated Books
num_ratings
1000
500
0
1295
898
774
723
664
585
575
556
526
510
493
490
457
449
430
428
413
409
389
387
avg_rating
5.5
5
4.5
4
The Lovely Bones: A Novel
The Da Vinci Code
The Secret Life of Bees
The Red Tent (Bestselling Backlist)
Life of Pi
Where the Heart Is (Oprah's Book Club (Paperback))
Harry Potter and the Sorcerer's Stone (Harry Potter (Paperback))
Harry Potter and the Chamber of Secrets (Book 2)
Girl with a Pearl Earring
To Kill a Mockingbird
Tuesdays with Morrie: An Old Man, a Young Man, and Life's Greatest Lesson
Good in Bed
Suzanne's Diary for Nicholas
The Catcher in the Rye
The Five People You Meet in Heaven
Harry Potter and the Prisoner of Azkaban (Book 3)
A Prayer for Owen Meany
Fahrenheit 451
The Bean Trees
Harry Potter and the Goblet of Fire (Book 4)
Book-Title

RESULT


Popularity vs. Average Rating
avg_rating
6
5.5
5
4.5
4
200
400
600
800
1000
1200
avg_rating
5.5
5
4.5
4

RESULT


Top 30 Authors by Total Ratings
Stephen King
John Grisham
Mary Higgins Clark
Tom Clancy
Sue Grafton
Michael Crichton
V.C. Andrews
R. L. Stine
Anita Shreve
Agatha Christie
Maeve Binchy
Nora Roberts
James Patterson
Dean R. Koontz
Danielle Steel
Janet Evanovich
J. K. Rowling
Sandra Brown
Rich Shapero
Dan Brown
Catherine Coulter
Robin Cook
Anne Rice
JOHN GRISHAM
Nicholas Sparks
Patricia Daniels Cornwell
Barbara Kingsolver
Robert Ludlum
John Sandford

RESULT

Github link

Show Project

Please note: The website will take approximately 1 minute to load after clicking 'Show Project'. Kindly wait while the system initializes.

CONCLUSION

The system provides personalized book recommendations using a hybrid filtering approach.

Easy to use, responsive interface hosted online.

Helps readers explore new titles aligned with their interests.

Demonstrated effective performance with a clean UI and relevant suggestions.

FUTURE SCOPE

Incorporate user login and history tracking for dynamic recommendations.

Use deep learning-based models like BERT for better understanding of book content.

Enable multilingual recommendations.

Expand the dataset for broader genre coverage and global reach.

Add features like “Recently Trending”, “Critic’s Picks”, and “User Reviews”.

REFERENCES

Kaggle Datasets (Books, Ratings)

CampusX YouTube Tutorials and Resources

Render Deployment Platform

GitHub Link: Link

Thank you