Sir Syed University of Engineering & Technology (SSUET)
Software Engineering Department

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Section: "B"

PROJECT REPORT

Project Title: Book Reccomendation System

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TEAM PROFILE

1. **ZEHRA HASSAN** **(2021F-SE-316)**
   (Coding,GUI,Report)

2. **SAMEEN NADIR** **(2021F-SE-063)**
   (Coding,GUI,Report)

1. PROBLEM DOMAIN

The project involves creating a book recommendation system that offers personalized suggestions based on user preferences for genre, author, and title. The need for such a system arises from the overwhelming volume of available literature and the desire to enhance user satisfaction in book discovery. Objectives include personalization, accuracy, user engagement, scalability, and seamless integration. Stakeholders include readers, developers, content providers, and business owners. The expected impact includes increased user satisfaction, reading engagement, revenue, and brand loyalty. The initial scope is a web-based platform with potential for future expansion. Overall, the project aims to revolutionize book discovery and create a positive reading experience.

2. PROPOSED TREATMENT

The proposed treatment for the book recommendation system involves developing a Tkinter-based graphical user interface (GUI) in Python, comprising two main components: the recommendation engine and the user interface.

Recommendation Engine:

- Data Preprocessing: Load 'books.csv' using Pandas, handle missing values, and combine relevant information into 'combined_features.'

- Feature Extraction: Use TfidfVectorizer to convert combined features into a TF-IDF matrix.

- Similarity Computation: Calculate cosine similarity between books using linear_kernel, resulting in a similarity matrix.

- Machine Learning Model: Train a k-Nearest Neighbors (k-NN) classifier on the TF-IDF matrix and 'liked' column.

- Prediction Function: Define `predict_like_knn` to predict user preferences based on input features.

- Recommendation Function: Create `get_recommendations_knn` to filter the dataset and provide recommended books.

Graphical User Interface (GUI):

- Tkinter GUI Classes: Define two classes, `BookRecommendationGUI` and `BookRecommendationResultGUI`, for the user interface.

- Input Handling: Allow users to input book title, author name, and genre. Process inputs on clicking "Recommend Books."

- Error Handling: Display an error message using `messagebox.showinfo` if no input is provided.

- Result Presentation: Display recommendations in a new window, showcasing book details.

- Styling: Style GUI elements using ttk, incorporating a background image for visual appeal.

- Scalability: Design the system to handle a growing dataset and user base, providing a user-friendly experience.

3. PLAN OF WORK

The plan of work involves conducting research on book recommendation systems, setting up the project environment, implementing a recommendation engine, designing a Tkinter-based graphical user interface (GUI), integrating components, testing for functionality and usability, creating documentation, and deploying the application. It emphasizes user training, feedback collection, and iterative improvement. Team collaboration is considered if applicable. The plan aims to ensure a well-organized, user-friendly book recommendation system with scalability and continuous enhancement in mind..

4. PROJECT SCHEDULING

Make a Gantt chart, showing your project schedule including task names and the time allotted to each task. Attach screenshots of your Gantt chart.

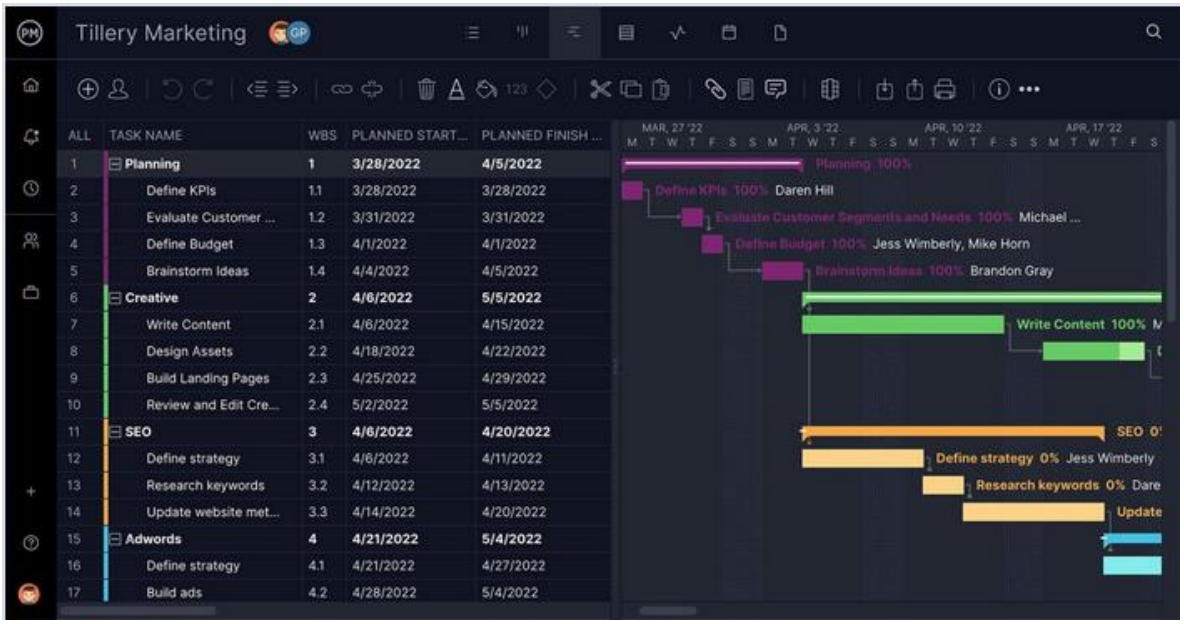


Figure 4.1: Sample Gantt Chart

OR

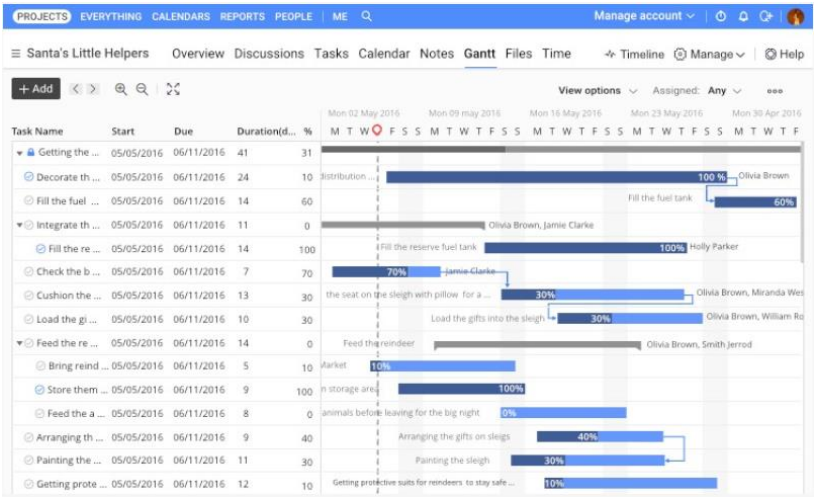


Figure 4.2: Sample Gantt Chart

5. SOFTWARE AND HARDWARE SPECIFICATIONS

Software:

1. Python(Jupyter Notebook): The primary programming language used for developing the application.

2. Tkinter: A Python GUI toolkit for creating the graphical user interface.

3. Pandas: A data manipulation library for handling the dataset ('books.csv') and data preprocessing.

4. scikit-learn: A machine learning library for implementing the recommendation engine and k-Nearest Neighbors classifier.

5. PIL (Pillow): Python Imaging Library for working with images.

6. NumPy: A library for numerical operations (used implicitly by scikit-learn).

7. Operating System:The code is written to be compatible with any operating system that supports Python and the required libraries. The specified file paths should be adjusted based on the user's operating system.

Hardware:

1. Processor: Capable of running Python scripts and handling machine learning computations.

2. RAM: Adequate RAM for handling dataset operations and machine learning model training.

3. Storage: Sufficient storage for dataset storage and application files.

6. BLOCK DIAGRAM

Below is a sample block diagram. Make one for your project that should clarify overall concepts of your project. The principal parts or functions should be represented by blocks connected by lines that show the relationships of the blocks.

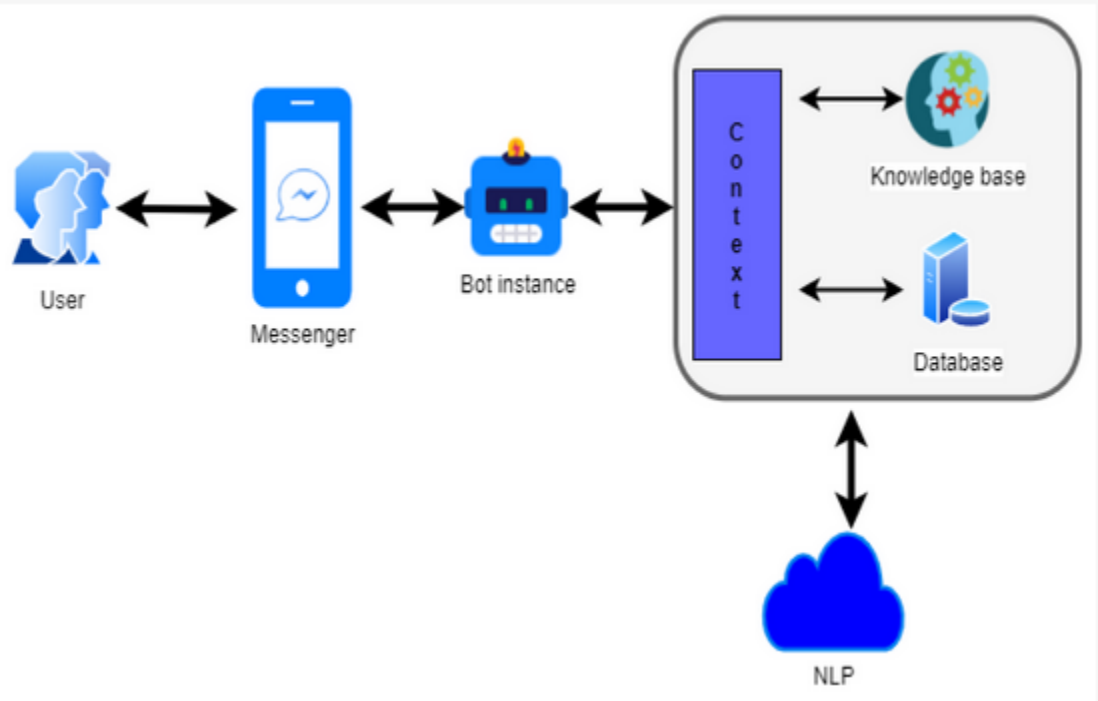


Figure 6.1: Sample Block Diagram

7. SYSTEM FLOW DIAGRAM

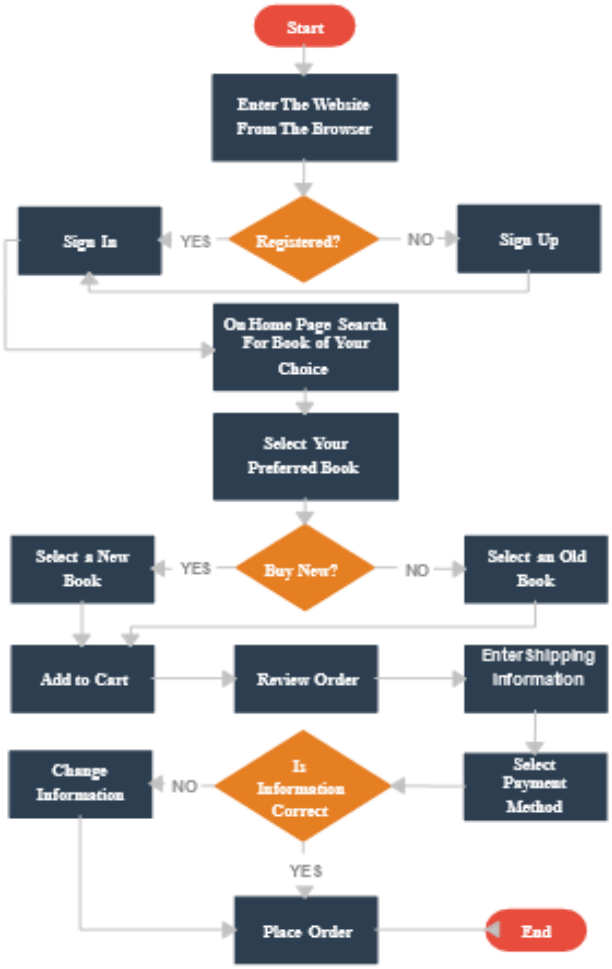


Figure 7.1: Sample System Flow Diagram

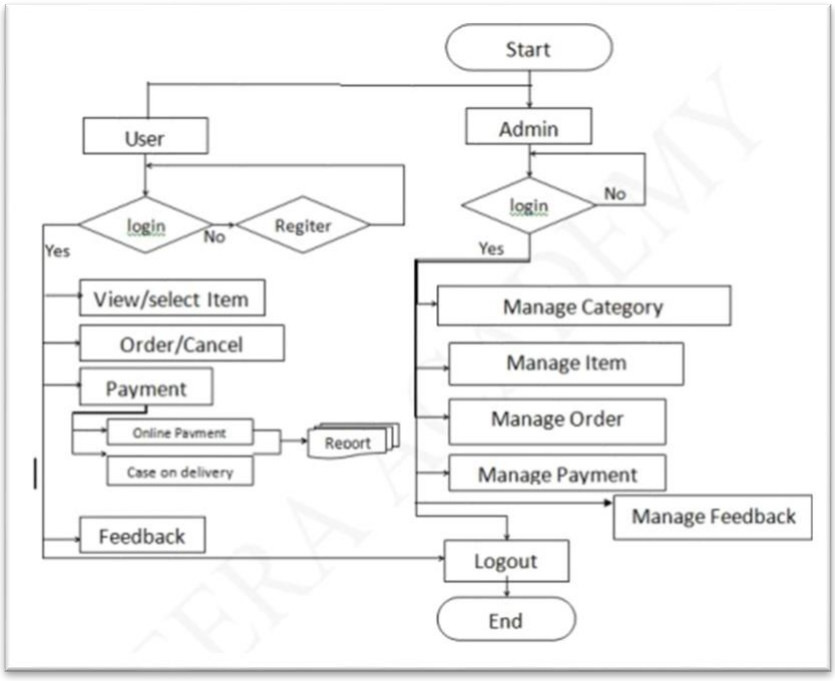
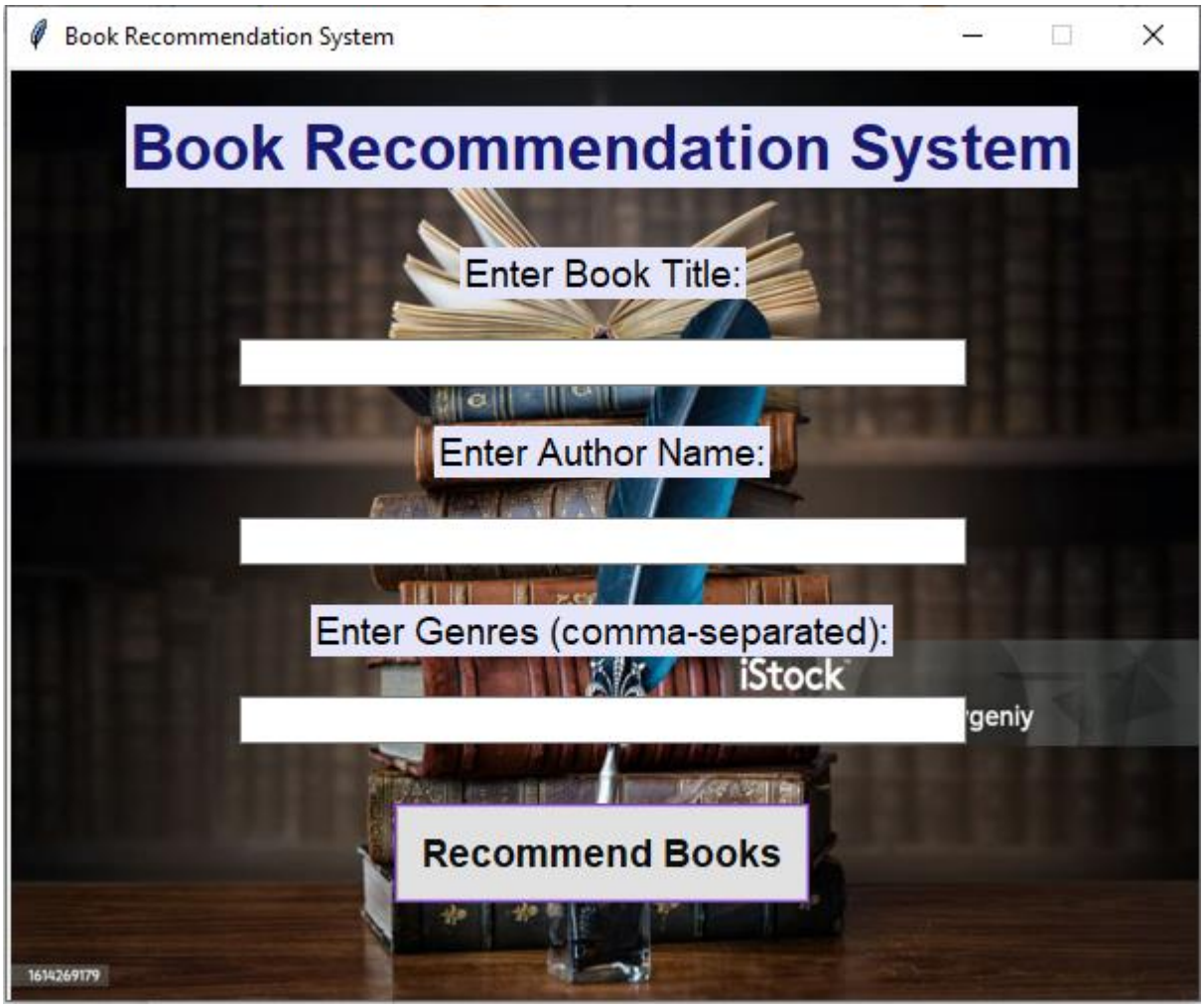


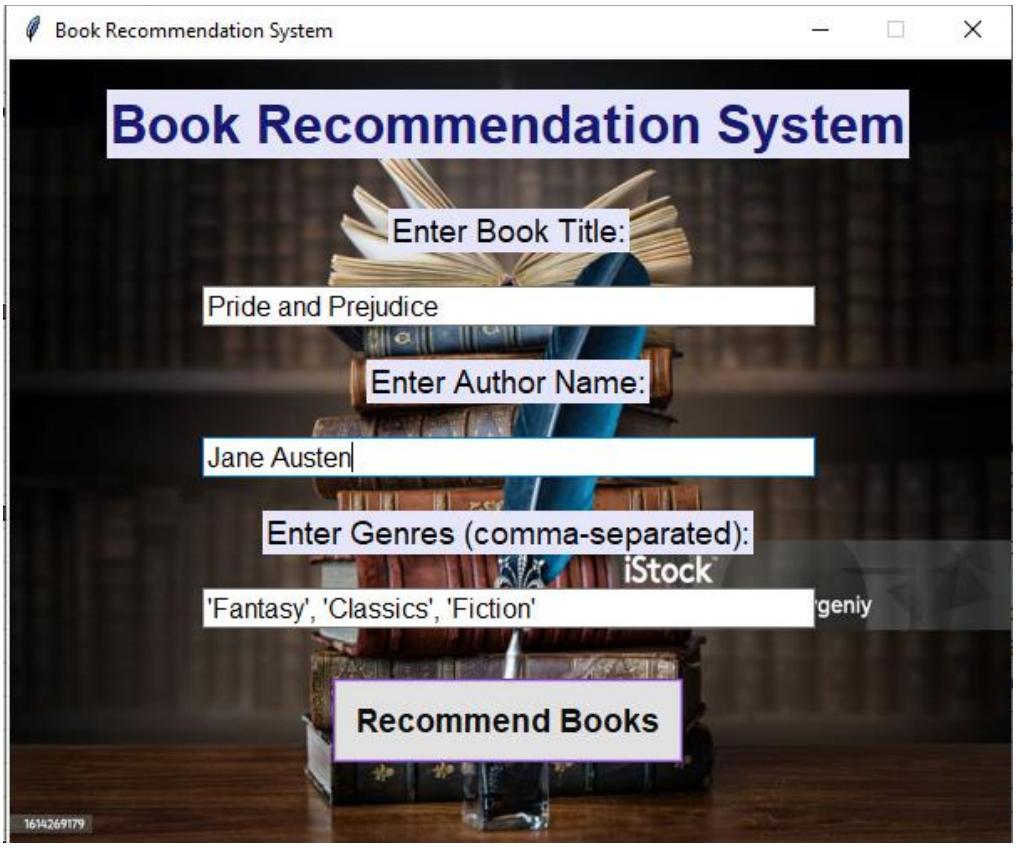
Figure 7.2: Sample System Flow Diagram

8. USER GUIDE

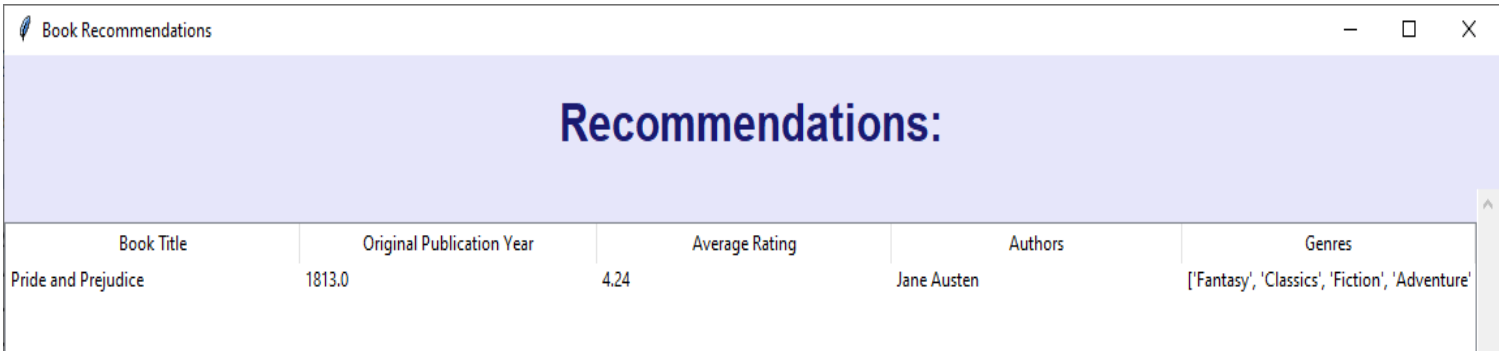
When you run the project , a window will pop up titled “Book Recommendation System” . It asks you to fill in the empty fields so that it can start recommending books to you



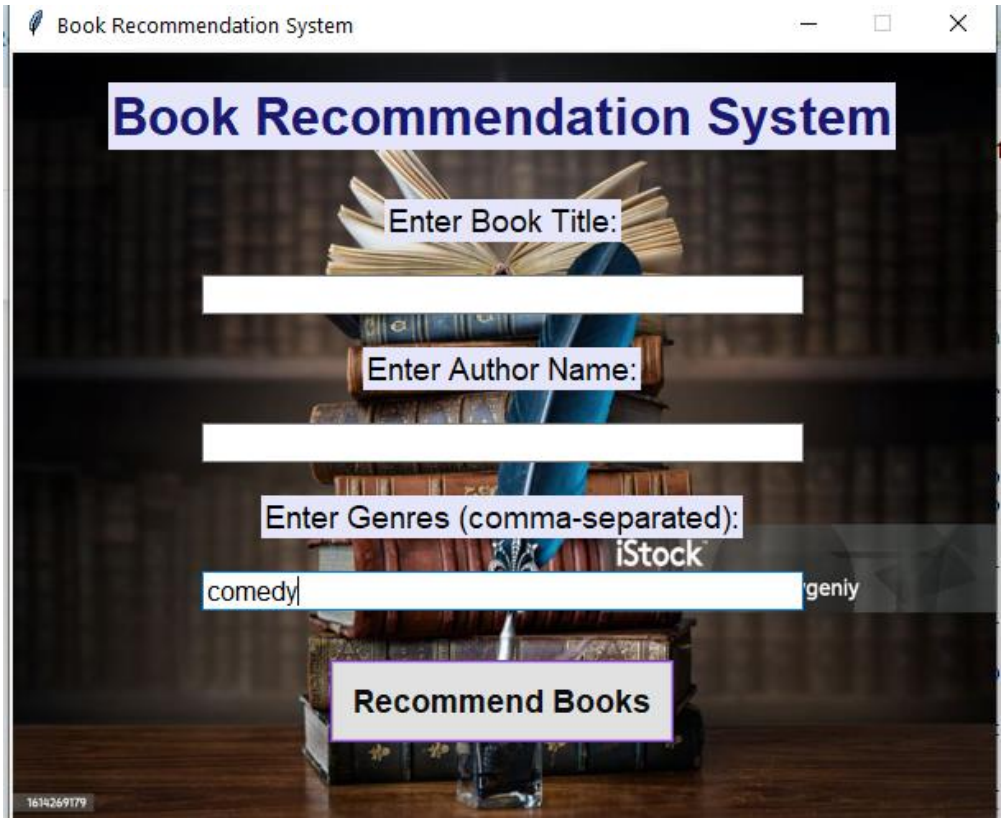
The fields contain book title, author name and genres. The user can fill the fields according to their preferred genres, favorite authors and the book title they may be looking for. Then click the Recommend Books button so that the system can start making your desired suggestions.



As soon as u click the Recommend Books button, the system takes into account various factors such as genre, author, and title preferences to offer a list of books tailored to each user's unique tastes and interests.The system also provides the publication year and average rating of the book.



You can also enter only one of the fields and the system will give personalized suggestion based on your preference making it both practical and simpler to use .Here is an example of the genre field.



The comedy books are listed below

Book Title	Original Publication Year	Average Rating	Authors	Genres
The Other Woman	2004.0	3.68	Jane Green	['Fantasy', 'Fiction', 'Humor', 'Comedy', 'Science Fiction Fantasy', 'Audiobook', 'Magic']
Twilight (Warriors: The New Prop	2006.0	4.3	Erin Hunter	['Science Fiction', 'Fiction', 'Humor', 'Fantasy', 'Comedy', 'Science Fiction Fantasy', 'Classics']
Mitosis (The Reckoners, #1.5)	2013.0	3.87	Brandon Sanderson	['Science Fiction', 'Fiction', 'Humor', 'Fantasy', 'Comedy', 'Science Fiction Fantasy', 'Classics']
The Alchemist	1988.0	3.82	Paulo Coelho, Alan R. Clarke	['Science Fiction', 'Fiction', 'Humor', 'Classics', 'Fantasy', 'Comedy', 'Science Fiction Fantasy']
Triptych (Will Trent, #1)	2006.0	4.14	Karin Slaughter	['Science Fiction', 'Fiction', 'Humor', 'Fantasy', 'Classics', 'Comedy', 'Science Fiction Fantasy']
Written in My Own Heart's Blood	2014.0	4.5	Diana Gabaldon	['Fiction', 'Fantasy', 'Science Fiction', 'Humor', 'Mystery', 'Comedy', 'Science Fiction Fantasy']
Freedom	2010.0	3.73	Jonathan Franzen	['Fantasy', 'Fiction', 'Humor', 'Comedy', 'Science Fiction Fantasy', 'Religion', 'Audiobook']
Everything's Eventual: 14 Dark Tal	2002.0	3.94	Stephen King	['Fantasy', 'Fiction', 'Humor', 'Comedy', 'Dragons', 'Science Fiction Fantasy', 'Audiobook']
Sick Puppy	2000.0	3.88	Carl Hiaasen	['Fantasy', 'Fiction', 'Humor', 'Comedy', 'Audiobook', 'Mystery', 'Science Fiction Fantasy']
The Paper Bag Princess	1980.0	4.32	Robert Munsch, Michael Martchenko	['Science Fiction', 'Fiction', 'Humor', 'Fantasy', 'Comedy', 'Science Fiction Fantasy', 'Classics']