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## BookBarn: Web Based Book Recommendation and E-Commerce System

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**Abstract**—In the current scenario websites or apps allow users to buy new books, sell old books or rent books but none of them provides all of these features on the same platform. There are many websites that are now focusing on E-books as they are easy to maintain and can be read anytime and anywhere the user wants. The proposed system allows user to buy new books, sell old books, rent old books all at the same place. The web-based application would have a recommendation system that would recommend books to users based on various parameters. The recommendation system here would be designed using Machine Learning thus making it almost close to real life recommendations. The system would also have E-commerce features like Product filter, product search option, responsive User Interface etc.

**Keywords**—Books, Recommendation system, Machine learning, Product Filters.

### I. INTRODUCTION

Books have been our source for gaining information or learning new things since a long time but recently we have seen a fall in the number of book readers. People have shifted their attention to E-books which are available easily and can be read anytime a user wants whereas a physical book is available in a Library or it needs to be purchased. But a study suggests that a physical book helps the reader to absorb more information than an E-book. It is a need to make books easily available to people or to bring the library online. A physical book helps the reader to stay focused and is easier on the eyes. However, these benefits didn't stop the rise of E-books. To solve this many E-commerce companies like Amazon, Flipkart tried to sell books online and allowed users to sell used books. Amazon provides an extra option to buy E-books. Sites like Padhega India offered a chance to rent books or buy/sell used books. But none of them offered all the services together at a same place. We have tried to improve this by building a platform where a user can do all the above services at the same place and thus provide users with features like Shopping Cart, Product recommendations. The objective is to design a web-based application which would provide users with a variety of books and allow users to buy, sell, rent books

with all other services including shopping cart, a recommendation system to recommend books to the user, payment, a responsive user interface and other features that a regular E-commerce website has. Thus, reducing user's efforts to buy a book and saving their time by bringing books to their phones. This would not only allow users to buy books but at the same time boost the sale of physical books.

### II. LITERATURE SURVEY

In paper [1] Nayana Vaidya and Prof. A.R Khachane describe recommender system as an information filtering system which recommends the products or items to the user. They further describe Content based recommender system as the system that compares the already purchased or searched items by the user and recommends similar items to the user and Collaborative Filtering as a method where prediction for the active user is done by calculating the weighted average of all ratings of similar users.

In paper [2] Aayush Jain, Shweta Rajeev, Mayank Katiyar, Shreya Sreenivasan, Mr. Mohammed Zabeeulla aimed to build a Web Based Product recommendation and shopping website named OYE, the application made use of MEAN Stack i.e Mongo DB, Express, Angular, NodeJs. The recommendation system for their application was built using KNN algorithm. OYE was an e-commerce website, developed to use Recommender Systems, it compared the costs of books and eradicated fake reviews while shopping online. It helped the end-users to completely rely on the website while shopping. This project focused on making use of content-based approach in addition to Collaborative Filtering approach to endorse quality content to its users. The project also aimed at using soft computing technologies to create an automated process and develop an intelligent web application.

In paper [3] Kaivan Shah aims to build a Book Recommendation System using Item Based Collaborative Filtering, He studies different approaches for recommendation as well as different approaches in Collaborative Filtering. He uses the goodbooks10K data set for performing Collaborative filtering. The paper contains the implementation of Item Based Collaborative Filtering with Python.

In paper [4] E. Uko Okon, B. O. Eke and P. O. Asagba aim to build a Book recommendation system using Collaborative Filtering. They describe a recommender system as a type of information filtering system that predicts the preference of a user. They have further listed the type of recommender systems as Personalized and Non-Personalized Recommendation. They take reference of MovieLens dataset where the best week and best strong generalization results are compared. They use Firebase as a database here.

In paper [5] Wei, Fan & Zhang, Qian propose to build a Online Shopping System based on Browser/Server model which is described as a hidden client mode after web development. This kind of network structure uses browser as the client-side in order to integrate the core part of system function to the server. The reason for using B/S model is that it simplifies system development, maintenance, and usage. The client needs a browser which would interact data with database through Web Server. In order to do this their system uses Java Server Page and Spring Architecture which is an Model-View-Controller architecture.

In paper [6] Khalid Anwar and Jamshed Siddiqui survey machine learning based book recommender system, their main focus is on Collaborative Filtering, Content Based Recommendation system and Hybrid Recommendation System. The paper further gives a brief idea about existing book recommendation systems built till date and the technology used for the same a further gives detailed information about the each of them.

### III. PROPOSED SYSTEM

When the user first visits BookBarn he will be displayed all the available books on the homepage with a navigation bar that would navigate the user to different sections of the website, if the user wants to buy a book, he would have to create an account to begin shopping on our website. If he already has an account, he could simply login/Sign-in to the website. After which the user would be taken to the Account page and the user can now carry out all the activities like Selling books, buying books, renting books. The user can edit his account details, at the same time view different products and add them to shopping cart for checking out later. The user can search for books using the search feature provided in the website, they would display searched products as well as recommendations to user. He can further add reviews to the book. If an old version of the same book is available then the user would be able to buy/rent the book as per the seller has specified.

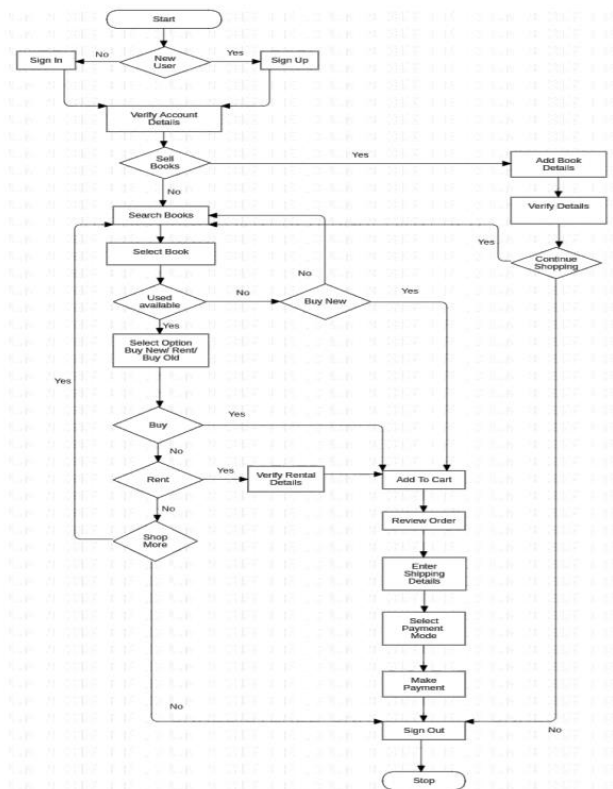


Fig 3.1 Flowchart

Algorithm to be used:

For Recommending books to the user, we would use Collaborative Filtering and content-based Recommendation both of them would use the KNN (K Nearest Neighbor) algorithm which works as follows:

- Step-1: We select the number 'K' of the neighbours (Other users in our case)
- Step-2: We calculate the Euclidean distance of 'K' neighbours.
- Step-3: We consider the 'K' nearest neighbours as per the calculated distance.
- Step-4: Then we count the number of the data points in each category.
- Step-5: We assign the new data points to the category with maximum neighbours

### IV. METHODOLOGY

The web-based application would consist of a huge variety of books sorted by categories like Fiction, Self Help etc. The Books could be new or used and would be made available by sellers, users. In case of used books, the condition of book would be verified by the staff. The website would also have features like Shopping Cart, Payment Checkouts, Reviews etc. The website would have attractive UI and would be responsive so that users can access it from their phones too.

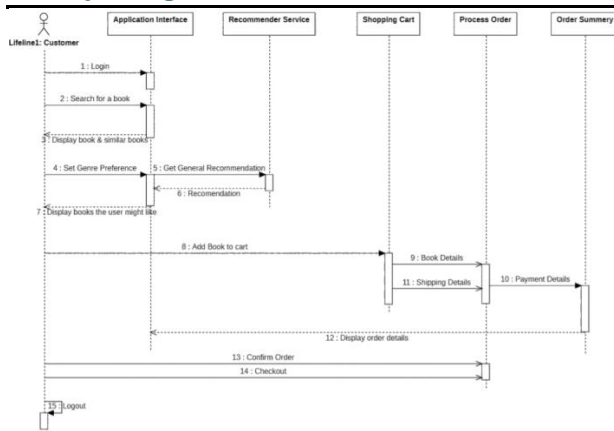


Fig 4.1 Sequence Diagram

The application would recommend books to users in two ways

1. Based on their previous actions or explicit feedback by the user. (Content Based Filtering)
2. Based on users who have similar interests. (Collaborative Filtering) Both the methods would be implemented using KNN (K Nearest Neighbor) Algorithm. KNN algorithm assumes the similarity between new data and available data then it adds the new data into the category that is most similar to available categories. The algorithm classifies a new data point for the data based on similarity. Thus KNN algorithm classifies the data into a well suited category.

## CONCLUSION AND FUTURE SCOPE

Recommender systems have become an important tool on many websites like Netflix, Amazon, FlipKart, Spotify. These websites use it for recommending movies, music, products etc. We propose to use this recommendation system to recommend books to users according to their search history and based on other similar user's experiences. This would thus reduce user's searching time and at the same user could explore more books from our website. This website would further allow users to buy, rent, sell books on the website thus reducing efforts of the user. Thus the application would be beneficial to user in terms of efforts and at the same time it would save the user's money as a user can rent a book instead of paying full cost. Some features that could be added in the future includes

- The website could be available in multiple languages
- The website can have a Chat Bot to answer user queries
- A point-based system, where a user gets points for reading books could be added to increase user's engagement.
- The website can have a separate section for buying E-Books.
- An Android app could be developed for the same.

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