CSE4077- Recommender Systems

J Component – Review 1 Project Report

Book Recommendation System

By

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August 2022

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FALL SEM 22-23

Worklet details

Programme	M.Tech CSE with Specialization in business analytics	
Course Name / Code	Recommender Systems / CSE4077	
Slot	E1	
Faculty Name	Dr.A.Bhuvaneswari	
Component	J – Component	
J Component Title	Book Recommendation System	
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Team Members(s) Contributions – Tentatively planned for implementation:

Worklet Tasks	Contributor's Names
Database connection and integration using Pymongo	Saurav Kumar & Arnav Saha
Preprocessing	Nikhil Kumar Rana& Arnav Saha
Model building	Nikhil Kumar Rana, Saurav Kumar & Arnav Saha
Visualization	Saurav Kumar & Nikhil Kumar Rana
Technical Report writing	Nikhil Kumar Rana, Saurav Kumar & Arnav Saha
Presentation preparation	Nikhil Kumar Rana, Saurav Kumar & Arnav Saha

ABSTRACT

Today the amount of information in the internet grows very rapidly and people need some instruments to find and access appropriate information. One of such tools is called recommendation system. Recommendation systems help to navigate quickly and receive necessary information. Generally they are used in Internet shops to increase the profit. This project proposes a quick and intuitive book recommendation system that helps readers to find appropriate book to read next. This project proposes the books that belongs to similar genre, author or publisher, buyer's interest. This project's result will increase in rate of purchase, these may also include unplanned purchases driven by surprise factor from the recommendations made.

1. Introduction

Nowadays the amount of information especially in Internet growth very rapidly. Finding necessary information becomes more difficult. Recommendation systems aim to solve this kind of problems. With the help of them one can quickly access relevant information without searching the web manually. As such many web sites today benefit from recommendation systems to promote and sell their products. There is a wide range of products like music, movies, articles and etc. that can be recommended to the customer based on their profiles in internet shops or even social networks, browsing history such as visited links, browsing activity like number and time of visits and other online behavior.

Online shops are increasing their sales using such technologies. In this project we propose using recommendation systems for recommending books. We have done four recommendation systems which are Simple Recommender, Content Based Recommender, Collaborative Filtering (user-based and item-based) and Hybrid Engine.

2. Literature Survey (sample)

SI NO.	**Title**	**Author/Journal Name/ Year**	**Technique**	**Result**
1	An Improved Online Book Recommender System using Collaborative Filtering Algorithm	Okon 2018	Enhanced CF algorithm, a quick sort algorithm and Object Oriented Analysis and Design Methodology (OOADM)	This system performed well on the evaluation metrics.
2	Online Book Recommendation System	Kurmashov 2015	Pearson correlation coefficient based CF	Evaluated the system through an online survey.
3	Book Recommendation System through content based and collaborative filtering method	Mathew 2016	Hybrid algorithm using collaborative filtering, content-based filtering and association rule	Proposed a system that saves details of books purchased by the user
4	Online book recommendation system by using collaborative	Parvatikar 2015	Similarity between different users was computed through	Better recommendations were obtained as through this method data

	filtering and association mining		Adjusted Cosine Vector Similarity function	sparsity problem was removed.
5	Online Book Recommendation System using Collaborative Filtering (With Jaccard Similarity)	Ayub 2018	Proposed a similarity function similar to Jaccard Similarity to locate alike items and users for the enquiring item and user in nearest neighbour based collaborative filtering.	Absolute value of ratings should be taken as against the ratio of co-rated items taken in Jaccard Similarity
6	Latent factor models for collaborative filtering	Gogna and Majumdar 2017	Latent Factor Model (LFM) was used.	The outcome of this system was used to suggest unrated and other items to new buyers
7	Online book recommendation systems	Chatti 2013	Suggested tag-based and rating based CF recommendation in technology enhanced learning (TEL)	Memory and model oriented 16 varied tag-based Collaborative filtering algorithms were evaluated for buyer satisfaction and accuracy of recommendations in Personal Learning Environments.

3. Dataset and Tool to be used (Details)

This dataset contains ratings for ten thousand popular books. the ratings were found on the internet. Generally, there are 100 reviews for each book, although some have less - fewer - ratings. Ratings go from one to five. Both book IDs and user IDs are contiguous. For books, they are 1-10000. For users it is 1-53424. All users have made at least two ratings. Median number of ratings per user is 8. There are also books marked to read by the users, book metadata (author, year, etc.) and tags. ratings.csv contains ratings. toread.csv provides IDs of the books marked ”to read” by each user, as userid,book.id pairs. books.csv has metadata for each book (goodreads IDs, authors, title, average rating, etc.) book.tags.csv contains tags/shelves/genres assigned by users to books. Tags in this file are represented by their IDs. tags.csv translates tag IDs to names.

4. Algorithms / Techniques description

Simple Recommender

The Simple Recommender offers generalized recommnendations to every user based on book popularity and (sometimes) genre. The basic idea behind this recommender is that books that are more popular and more critically acclaimed will have a higher probability of being liked by the average audience. This model does not give personalized recommendations based on the user.

Content Based Recommender

To personalise our recommendations more, We are going to build an engine that computes similarity between movies based on certain metrics and suggests books that are most similar to a particular book that a user liked. Since we will be using book metadata

(or content) to build this engine, this also known as Content Based Filtering. We will build this recommender based on book's Title, Authors and Genres.

Popularity and ratings- One thing that we notice about our recommendation system is that it recommends books regardless of ratings and popularity. Therefore, we will add a mechanism to remove bad books and return books which are popular and have had a good critical response.

Collaborative Filtering

Collaborative filtering systems collect and evaluate users' behavioral information in the form of feedback, ratings, preferences. Based on this information, they try to use similarities among users and items for predicting missing ratings and make suitable recommendations. We built two Collaborative Filters; one that uses the powerful Surprise Library to build an user-based filter based on single value decomposition, since the RMSE obtained was less than 1, and the engine gave estimated ratings for a given user and book. And the other (item-based) which built a pivot table for users ratings corresponding to each book, and the engine gave similar books for a given book.

Hybrid Recommender

We brought together ideas from content and collaborative filterting to build an engine that gave book suggestions to a particular user based on the estimated ratings that it had internally calculated for that user

5. **Github Repository Link**

https://github.com/shivanignaidu/Book-Recommendation-System

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