



## Machine Learning Course-end Project

## Book Rental Recommendation



## Objectives

- To improve the user experience by personalizing the user needs.
- To create a recommendation engine so that users get recommendations for books based on the behavior of similar users. This will ensure that users are renting the books based on their tastes and traits.





## Prerequisites

- Python
- Data preprocessing
- Exploratory data analysis
- Machine learning algorithms
- Recommendation System



## Industry Relevance



- **Python:** It is widely used to implement data analysis and machine learning.
- **Data preprocessing:** It includes various steps like treating missing values or removing duplicate values before using the data.
- **Exploratory data analysis:** It is used to find trends and patterns or to check assumptions by analyzing data with visual tools.
- **Machine Learning Algorithm:** Various machine learning algorithms are used to predict the outcome based on historical data.
- **Recommendation system:** It helps the websites to interact with users and enable businesses to maximize their ROI based on the knowledge gathered about each customer's preferences and purchases.

## Problem Statement



Book Rent is the largest online and offline book rental chain in India. They provide books of various genres such as thriller, mystery, romance, and science fiction. The company charges a fixed rental fee for a book per month. Lately, the company has been losing its user base. The main reason for this is that users are not able to choose the right books for themselves. The company wants to solve this problem and increase its revenue and profit.

**Note:** You must perform user-based collaborative filtering and item-based collaborative filtering.

## Dataset



Three datasets are available to complete the project:

1. BX-Books.csv
2. BX-Users.csv
3. BX-Book-Ratings.csv



## Dataset Description



BX-Books: It contains the information of books.

Variable	-	Description
Isbn	-	Books are identified by their respective ISBN. Invalid ISBNs have already been removed from the dataset.
book_title	-	Title of the book
book_author	-	Writer of the book
Publisher	-	Name of the publishing house for the book
year_of_publication	-	Year of a book released



## Dataset Description



BX-Users: It contains the information of users.

Variable	-	Description
User_id	-	These have been anonymized and mapped to integers.
Location	-	Demographic data is provided.
Age	-	Demographic data is provided.

**Note:** If available; otherwise, these fields contain NULL values.

## Dataset Description



BX-Book-Ratings: Contains the book rating information

Variable	-	Description
Isbn	-	Books are identified by their respective ISBN.
user_id	-	These have been anonymized and mapped to integers.
Rating	-	Ratings are either explicit, expressed on a scale from 1-10 (higher values denoting higher appreciation), or implicit, expressed by 0.

## Tasks to Perform



Perform the following tasks on the dataset

1. Read the books dataset and explore it
2. Clean up NaN values
3. Read the data where ratings are given by users
4. Take a quick look at the number of unique users and books
5. Convert ISBN to numeric numbers in the correct order
6. Do the same for user\_id. Convert it into numeric order
7. Convert both user\_id and ISBN to the ordered list i.e., from 0...n-1



## Tasks to Perform



Perform the following tasks on the dataset

8. Re-index columns to build matrix later on
9. Split your data into two sets (training and testing)
10. Make predictions based on user and items
11. Use RSME to evaluate the predictions

## Project Outcome



- This project is designed to understand how to perform data preprocessing including treating null values and removing duplicate values.
- The machine learning model recommends appropriate books to users based on reader interest and popularity.
- This project also involves building a recommendation model.

## Submission Process



1. Complete the project in the Simplilearn lab
2. Complete each task listed in the problem statement
3. Take screenshots of the results for each question and the corresponding code
4. Save it as a document and submit using the assessment tab
5. Tap the "Submit" button (this will present you with three choices)
6. Attach three files and then click "Submit"

**Note:** Be sure to include screenshots of the output



**Thank You**