ONLINE BOOK RECOMMENDATION SYSTEM

EXPLORATORY DATA ANALYSIS

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OBJECTIVES

- INTRODUCTION
- ABSTRACT
- LITERATURE SURVEY
- MODULUS OF PROPOSED SYSTEM
- MACHINE LEARNING ALGORITHM
- UML DIAGRAM
- IMPLEMENTATION
- RESULT AND DISCUSSION
- FUTURE WORKS
- CONCLUSION

ABSTRACT

- Recommendation system is one of most popular applications which attracts many researches all over the global and help to navigate quickly and receive necessary information. There are many machine learning techniques which can be used to realize the recommendation system.
- Our project to proposes a quick and intuitive book recommendation systems that helps the readers to find appropriate book to read and predict buyers interest and recommend books to them accordingly. The work will help the researchers in exploring new dimension for recommendation technology in general and book recommendation in particular.

INTRODUCTION

- Growth of the internet and advancement in computing technologies has touched every aspect of human being. Nowadays computers are being implemented in almost every domain of life to replicate the manual system and to reduce the workload of humans.

- Recommender are a type of intelligent systems which are implemented to replicate human experts

CONTINUATION

- a book recommender applied in e-commerce domain suggest the merchants about the different books and help him to manage his inventory. It also helps the user in purchasing the most appropriate book for him considering various criteria like his preferences, cost and other features of Book.

- Machine learning (ML) is one of the fascinating and fastest growing field of this era. ML techniques are being implemented in almost every domain of computing. They have been implemented to improve the predictive and recommendation accuracy of the system

- After finding sentiments, choices, browsing history, and features of books similarity is calculated and recommendations are generated.

LITERATURE SURVEY

Literature survey

Title and Year	Algorithm Technique	Advantages	Disadvantages
TITLE **Book Recommendation System Based on Collaborative Filtering and Association Rule Mining.[1]** **YEAR : 2018**	. **Classification Technique.** . **Association rule mining.** . **Collaborative Filtering**	**They considered user based collaborative filtering which helped in getting the books of good quality.** **Its helped in Filtering the transaction to find stronger recommendation and classification technique.**	**It does not have a exact accuracy of recommendation book with the past mining techniques.**
TITLE : **Book Recommendation System with Tensor Flow.[2]** **YEAR : 2021**	. **Collaborative Filtering** . **Deep learning** . **Tenser flow**	**Tensor flow techniques to make a recommendation system stable and recommend the relevant kind of books to the user in the efficient and simple manner.** **The accuracy and effectiveness of this project from obtained results and visualization models.**	**In this techniques they doesn't focus on the security system.** **They use the old technique for the recommendation need to add a new techniques for better accuracy.**

TITLE **Book Recommendation Using Machine Learning Methods Based on Library Loan Records and Bibliographic Information.[5]** **YEAR: 2020**	• **Support Vector Machine (SVM)** • **Random Forest.** • **Ada boost.**	**This recommendation system works in offline mode, so it does not have any performance problem.**	**They have a problem with the effectiveness of incorporating into recommendation methods information.**

MODULUS OF PROPOSED SYSTEM

- The association mining, collaborative filtering and content filtering are the three widely employed methods for strong impact using search engines.
- The content based filtering system is one in which the recommendation to the buyers are provided based on the items they have searched for.
- The collaborative filtering involves the analysis of the opinions in which the recommendation is provided based on the ratings provided by the users
- The association rule mining in which association and correlation relationship is mined for the best outcome.

MODULUS

COLLECTING THE DATASET

- **Collecting Dataset for the book recommendation system from kaggle. This data will taken in e-commerce Amazon website dataset. Its contains user data, book data and rating book data.**

USERS:

- **Contains the users. Note that user IDs (User-ID) have been anonym zed and map to integers. Demographic data is provided (Location, Age) if available. Otherwise, these fields contain NULL values.**

BOOKS:

- **Books are identified by their respective ISBN. Invalid ISBNs have already been removed from the dataset. Moreover, some content-based information is given (Book-Title, Book-Author, Year-Of-Publication, Publisher), obtained from Amazon Web Services**

Building the Machine learning algorithm :

Collaborative Filtering :

Collaborative recommendation is probably the most familiar, most widely implemented and most mature of the technologies. Collaborative recommender systems aggregate ratings of objects, recognize commonalities between users on the basis of their ratings, and generate new recommendations

K-Nearest Neighbors algorithm:

Recommendation Systems and learn how to build a book Recommendation System using collaborative filtering by implementing the K-Nearest Neighbors algorithm. We will also predict the rating of the given movie based on its neighbors and compare it with the actual rating.

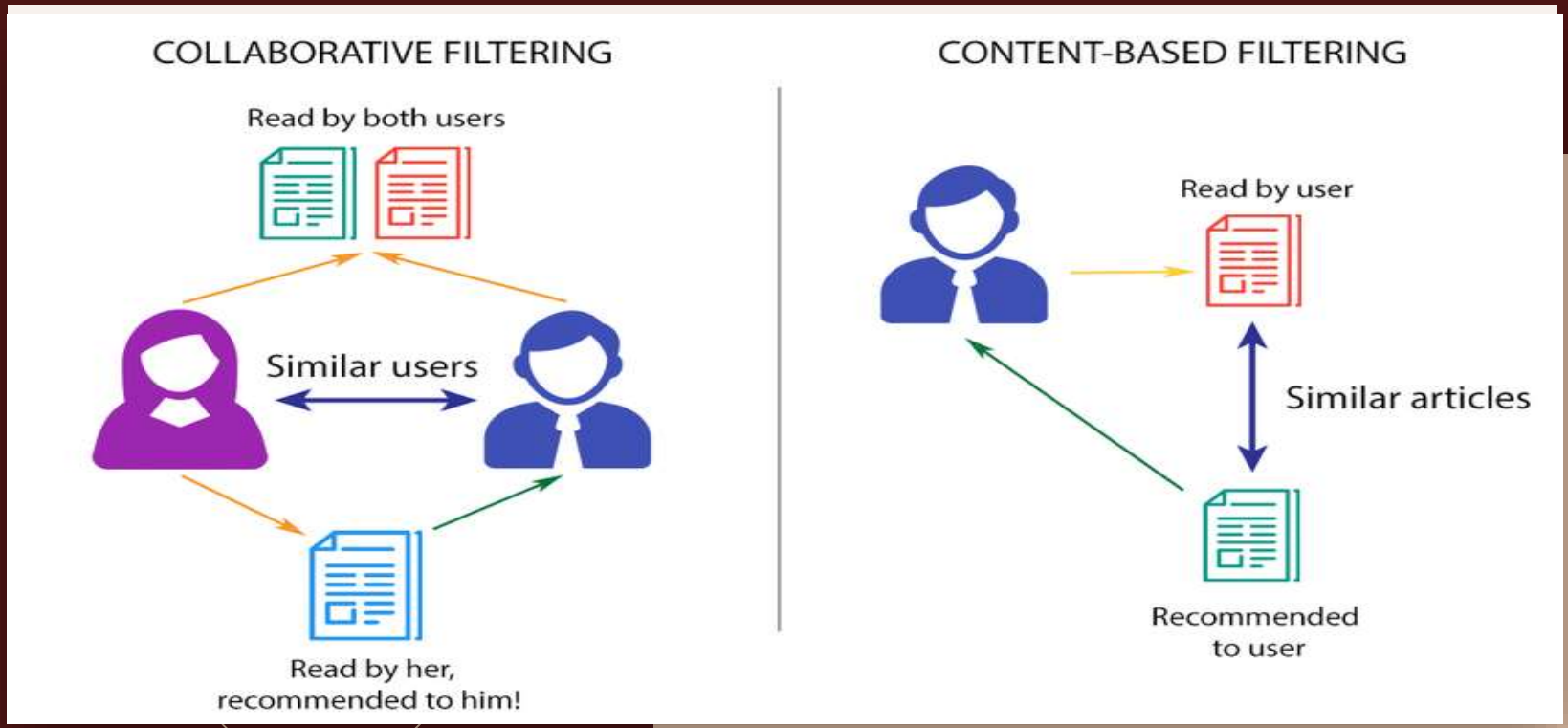
CONTINUATION

Content-based filtering

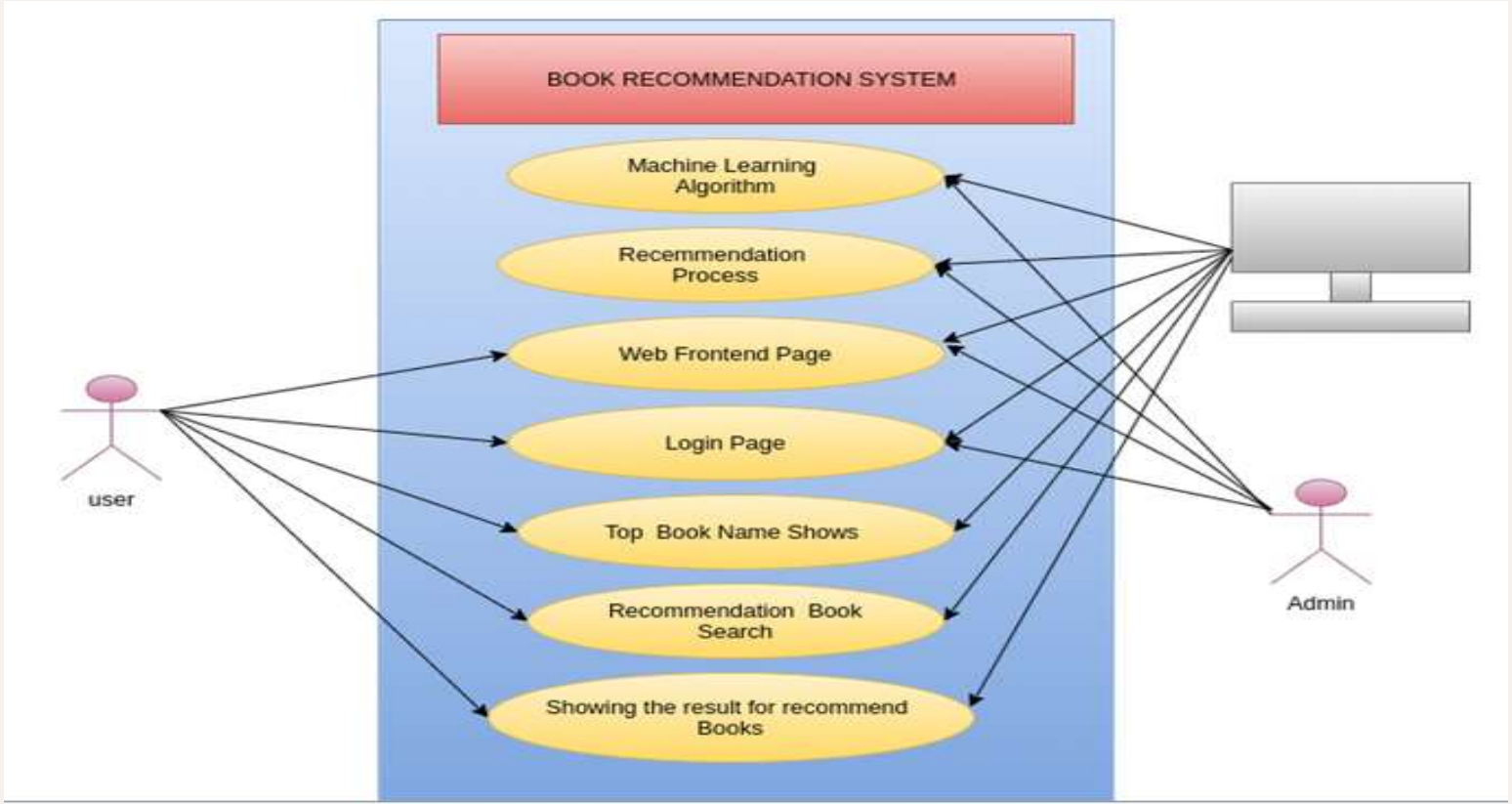
- These filtering methods are based on the description of an item and a profile of the user's preferred choices. In a content-based recommendation system, keywords are used to describe the items, besides, a user profile is built to state the type of item this user likes. In other words, the algorithms try to recommend products that are similar to the ones that a user has liked in the past.

products that are similar to the ones that a user has liked in the past.

Collaborative & content-based filtering



UML DAIGRAM FOR BOOK RECOMMENDATION SYSTEM :



This system that predicts the items a user would like based on the ratings provided to that item by other users that have similar tastes to the target user

For example: based on the users wish it will recommend the books of their taste ,in this users wised for fantasy it will recommend books like stranger things,etc..

IMPLEMENTATION:

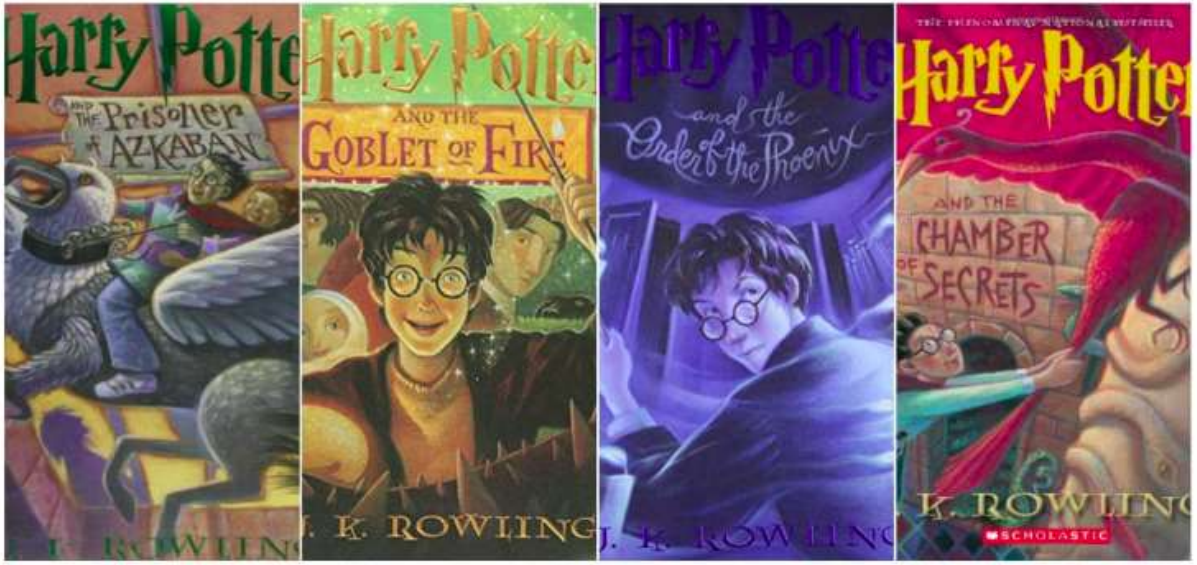
```
#Importing modules
import pandas as pd
import sys
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import random
# This is to supress the warning messages (if any) generated in our code

import os
import re
import nltk
import requests
import warnings
```

```
books.head()
```

	ISBN	Book-Title	Book-Author	Year-Of-Publication	Publisher	Image-URL-S	Image-URL
0	0195153448	Classical Mythology	Mark P. O. Morford	2002	Oxford University Press	http://images.amazon.com/images/P/0195153448.0...	http://images.amazon.com/images/P/0195153448.
1	0002005018	Clara Callan	Richard Bruce Wright	2001	HarperFlamingo Canada	http://images.amazon.com/images/P/0002005018.0...	http://images.amazon.com/images/P/0002005018.
2	0060973129	Decision in Normandy	Carlo D'Este	1991	HarperPerennial	http://images.amazon.com/images/P/0060973129.0...	http://images.amazon.com/images/P/0060973129.
3	0374157065	Flu: The Story of the Great Influenza Pandemic...	Gina Bari Kolata	1999	Farrar Straus Giroux	http://images.amazon.com/images/P/0374157065.0...	http://images.amazon.com/images/P/0374157065.
4	0393045218	The Mummies of Urumchi	E. J. W. Barber	1999	W. W. Norton & Company	http://images.amazon.com/images/P/0393045218.0...	http://images.amazon.com/images/P/0393045218.

```
corr_coffey_hands  = corr[coffey_hands]
```

```
list(us_canada_book_title[(corr_coffey_hands<1.0) & (corr_coffey_hands>0.9)])
```



Collaborative Filtering Based Recommender System

```
x = ratings_with_name.groupby('User-ID').count()['Book-Rating'] > 200
padhe_likhe_users = x[x].index
```

```
filtered_rating = ratings_with_name[ratings_with_name['User-ID'].isin(padhe_likhe_users)]
```

```
y = filtered_rating.groupby('Book-Title').count()['Book-Rating']>=50
famous_books = y[y].index
```

```
final_ratings = filtered_rating[filtered_rating['Book-Title'].isin(famous_books)]
```

```
pt = final_ratings.pivot_table(index='Book-Title',columns='User-ID',values='Book-Rating')
```

```
pt.fillna(0,inplace=True)
```

```
pt
```

User-ID / Book-Title	254	2276	2766	2977	3363	4017	4385	6251	6323	6543	...	271705	273979	274004	274061	274301	274308	276970	277427	277639	2
1984	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1st to Die: A Novel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2nd Chance	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4 Blondes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
A Bend in the Road	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Year of Wonders	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
You Belong To Me	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Zen and the Art of Motorcycle Maintenance: An Inquiry Into Values	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Zoya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
\"O\" Is for Outlaw"	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	

706 rows × 810 columns

```
from sklearn.metrics.pairwise import cosine_similarity
```

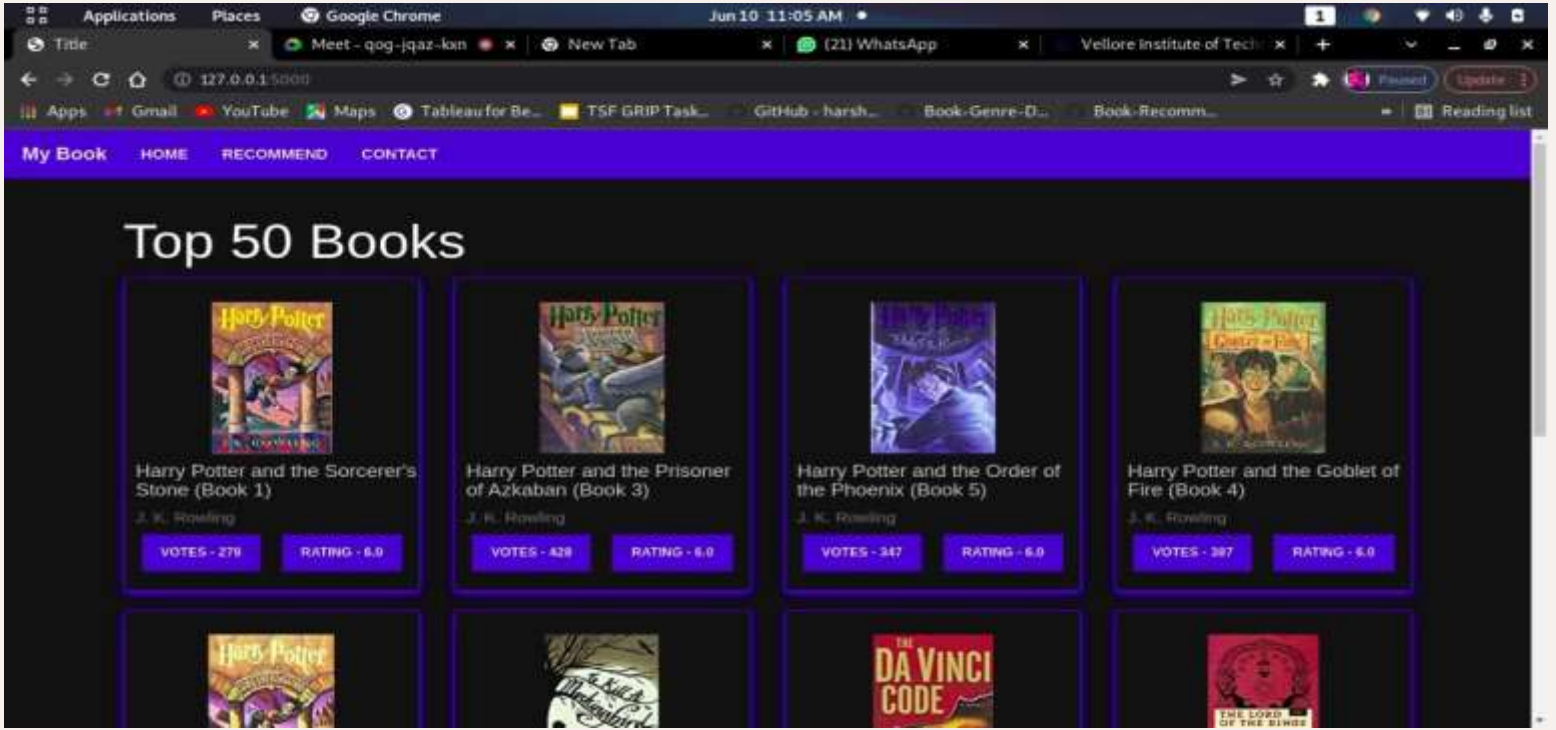
```
similarity_scores = cosine_similarity(pt)
```

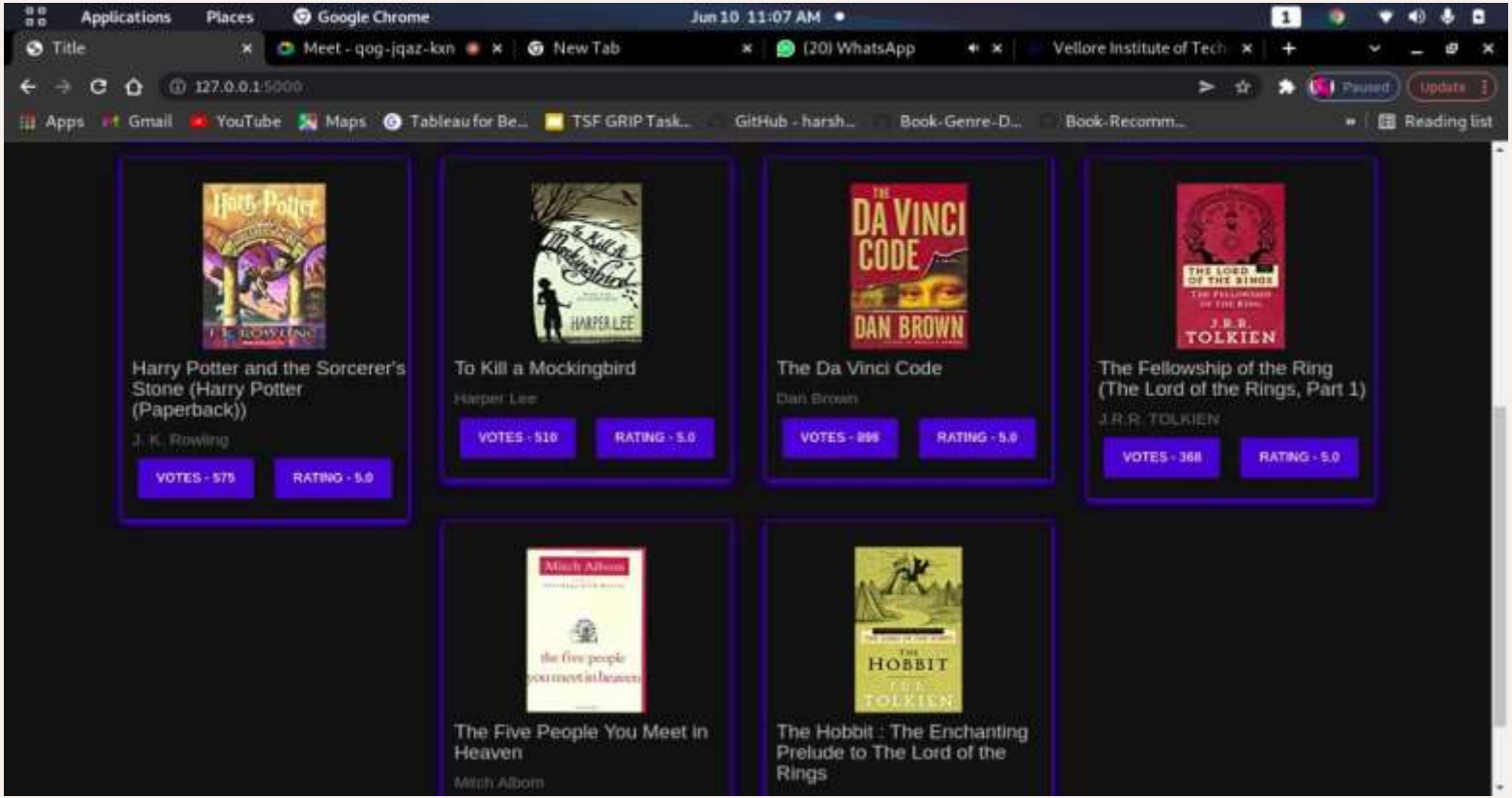
SAMPLE PHYTON CODE:

FRONTEND CODE USING FLASK:

```
from flask import Flask, render_template,request
import pickle
import numpy as np

popular_df = pickle.load(open('popular.pkl','rb'))
pt  = pickle.load(open('pt.pkl','rb'))
books  = pickle.load(open('books.pkl','rb'))
similarity_scores  = pickle.load(open('similarity_scores.pkl','rb'))

app = Flask(__name__)
@app.route('/')
def index():
    return render_template("sample.html",
                           book_name= list(popular_df['Book-Title'].values),
                           author = list(popular_df['Book-Author'].values),
```

RESULT AND DISCUSSIONS




Applications
Places
Google Chrome
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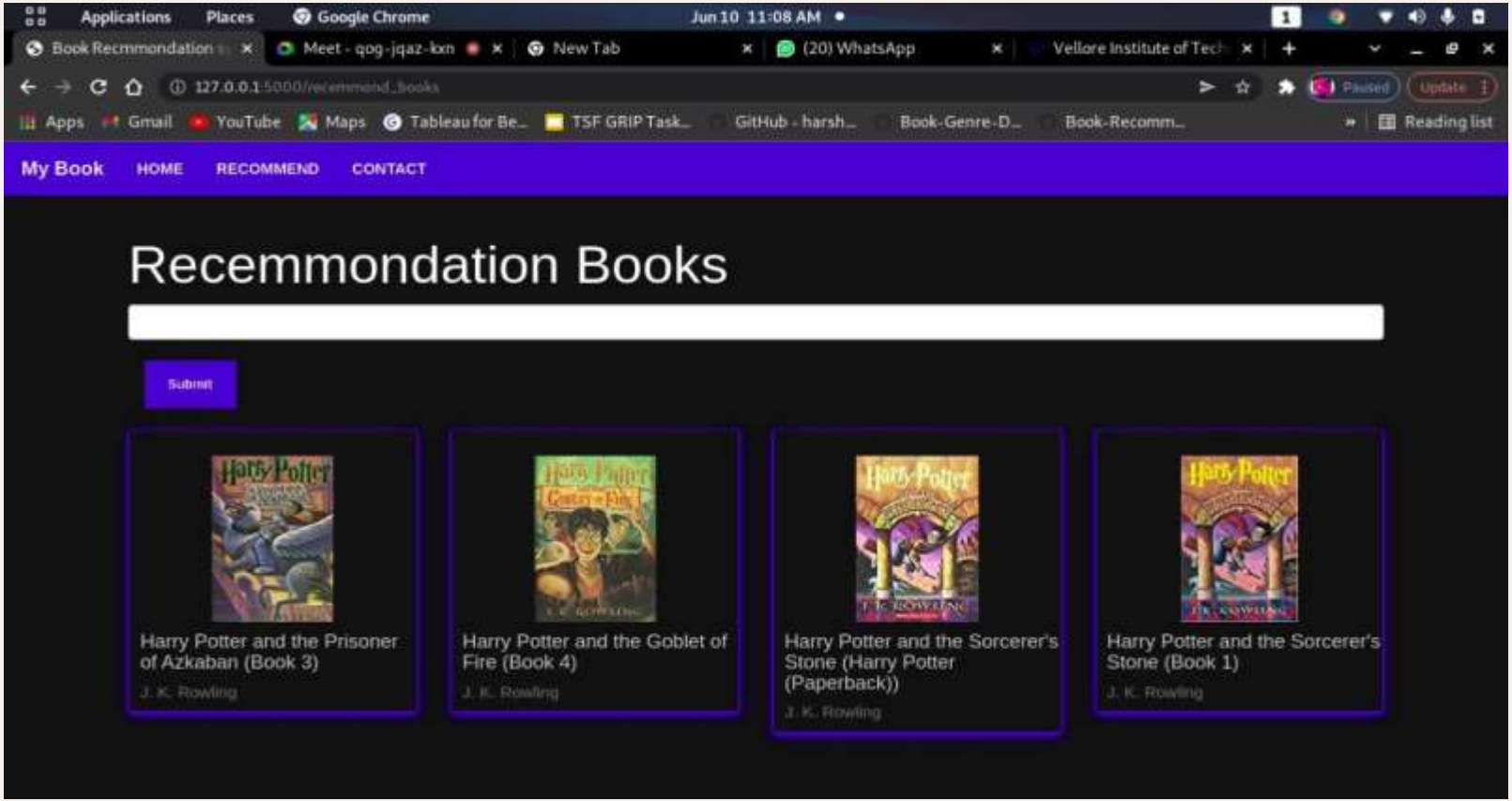
Title
Meet - qog-jqaz-kxn
New Tab
(20) WhatsApp
Vellore Institute of Tech
127.0.0.1:5000
Paused
Update
Apps
Gmail
YouTube
Maps
Tableau for Be...
TSF GRIP Task...
GitHub - harsh...
Book-Genre-D...
Book-Recomm...
Reading list
Harry Potter and the Sorcerer's Stone (Harry Potter (Paperback))
J. K. Rowling
VOTES - 575
RATING - 5.0
To Kill a Mockingbird
Harper Lee
VOTES - 510
RATING - 5.0
The Da Vinci Code
Dan Brown
VOTES - 899
RATING - 5.0
The Fellowship of the Ring (The Lord of the Rings, Part 1)
J.R.R. TOLKIEN
VOTES - 368
RATING - 5.0
The Five People You Meet in Heaven
Mitch Albom
The Hobbit : The Enchanting Prelude to The Lord of the Rings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Update
Apps
Gmail
YouTube
Maps
Tableau for Be...
TSF GRIP Task...
GitHub - harsh...
Book-Genre-D...
Book-Recomm...
Reading list
My Book
HOME
RECOMMEND
CONTACT
Recmmondation Books
Submit
Harry Potter and the Prisoner of Azkaban (Book 3)
J. K. Rowling
Harry Potter and the Goblet of Fire (Book 4)
J. K. Rowling
Harry Potter and the Sorcerer's Stone (Harry Potter (Paperback))
J. K. Rowling
Harry Potter and the Sorcerer's Stone (Book 1)
J. K. Rowling

CONCLUSION:

- To conclude about our project, we have made analysis of different research papers and algorithm implemented in it about recommendation systems. In our project we have improvised and modified the recommendation systems. This Book Recommendation System has considered many parameters like ratings, book name, book cover images, author etc..

- We successfully implemented and found the similar books from Amazon and Flip kart using cosine similarity. Also, the recommendation system was implemented using book covers dataset and Collaborative Filtering algorithm to display most similar book covers based on the input book cover

ADVANTAGES OF PROJECT:

- This Book Recommendation System upon its implementation, No Need for Feature Engineering: Feature engineering is the process of extracting features from raw data to better describe the underlying problem.

- It is a fundamental job in machine learning as it improves model accuracy. The process can sometimes require domain knowledge about a given problem.

FUTURE WORK:

- In the future work, there are many different methods which are used in mining the data and can be used for recommendation process. One of the algorithm which can be used in the future work is K-Means clustering, Sparks ALS (Alternating Least Squares) Algorithm.

- In our future work, we shall propose a suggestion system for recommending online courses , system for recommending movies using the convolutional neural network (CNN).

- The proposed work can be used to suggest items such as music, and other products in other domains.

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