MOVIE RECOMMENDATION SYSTEM

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RESEARCH QUESTIONS

HOW CAN WE LEVERAGE MOVIE RATINGS TO MAKE ACCURATE MOVIE RECOMMENDATIONS USING VARIOUS MODEL-BUILDING TECHNIQUES?

OBJECTIVES

USING DATA ANALYTICS TO GATHER INSIGHTS INTO USER BEHAVIOUR AND MOVIE CHARACTERISTICS.

CREATE A MODEL THAT CAN PROVIDE ACCURATE MOVIE RECOMMENDATIONS.

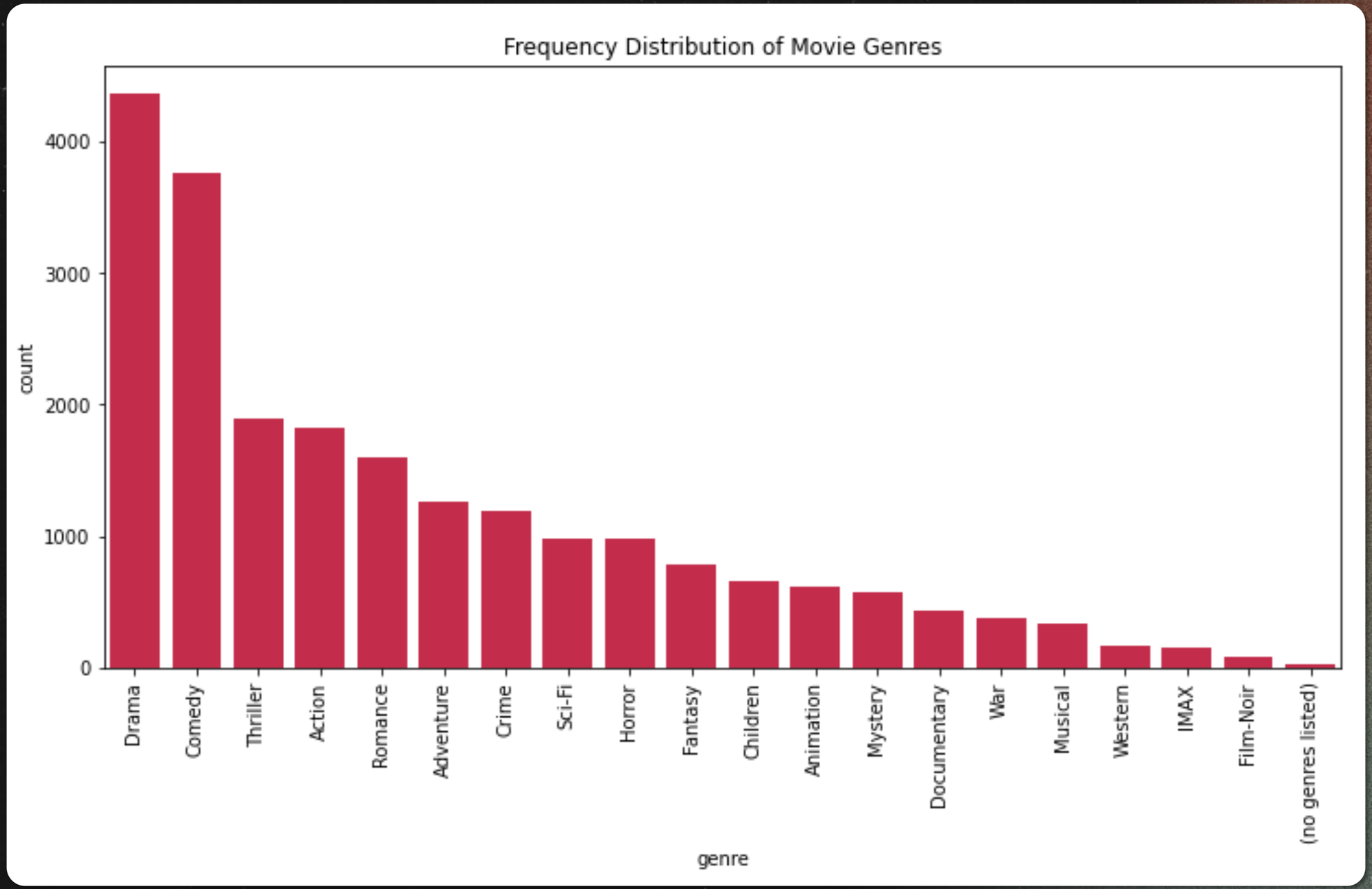
DATA UNDERSTANDING

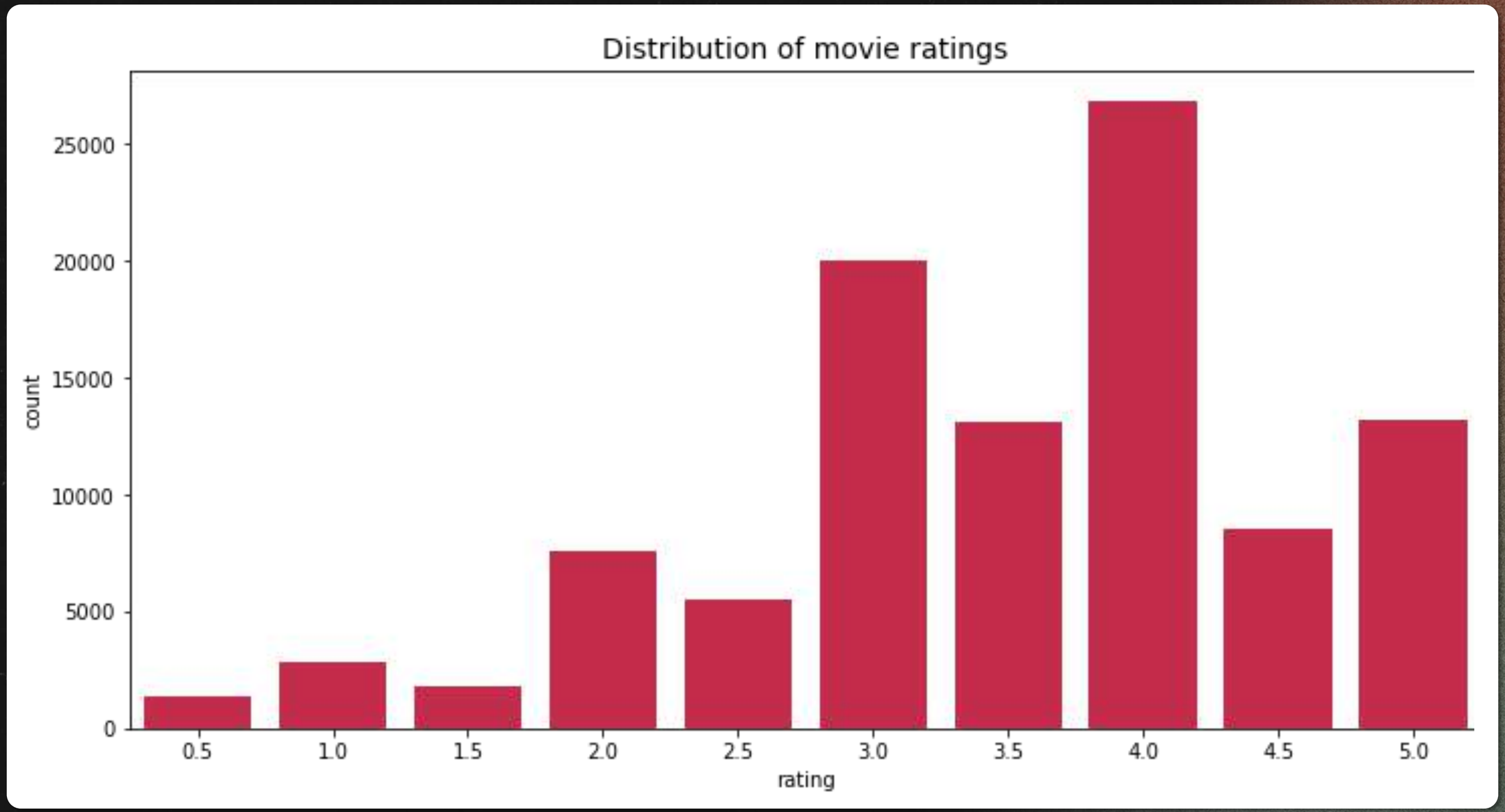
TITLES OF OUR DATA: MOVIES.CSV, RATINGS.CSV.

SOURCE: MOVIELENS

NUMBER OF MOVIES: 9742

NUMBER OF RATINGS: 100836


Frequency Distribution of Movie Genres
count
4000
3000
2000
1000
0
Drama
Comedy
Thriller
Action
Romance
Adventure
Crime
Sci-Fi
Horror
Fantasy
Children
Animation
Mystery
Documentary
War
Musical
Western
IMAX
Film-Noir
(no genres listed)
genre


Distribution of movie ratings
count
25000
20000
15000
10000
5000
0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
rating

RECOMMENDATION SYSTEM

WE CHOSE TO USE A RECOMMENDATION SYSTEM TO MAKE A MACHINE-LEARNING SYSTEM THAT CAN SUGGEST MOVIES THAT A USER MAY BE INTERESTED IN BASED ON OUR DATA.

MODELLING

WE CHOSE TO USE TWO DIFFERENT MACHINE-LEARNING TECHNIQUES TO CREATE OUR RECOMMENDATION SYSTEM:

COLLABORATIVE FILTERING

CONTENT-BASED FILTERING

HYBRID RECOMMENDATION SYSTEM

MODEL RESULTS

CONTENT-BASED FILTERING

THE OUTPUT OF CHECKING HOW MUCH TWO THINGS ARE ALIKE IN TERMS OF DIRECTION, FORMING RECOMMENDATIONS BASED ON SIMILAR CHARACTERISTICS:

```
recommend_movies('cinderella')
```

```
['Princess and the Frog, The (2009)',
 'Aladdin and the King of Thieves (1996)',
 'Nightmare Before Christmas, The (1993)',
 'Pinocchio (1940)',
 'Sword in the Stone, The (1963)']
```

```
recommend_movies('musketeers')
```

```
['Jewel of the Nile, The (1985)',
 'Romancing the Stone (1984)',
 'Four Musketeers, The (1974)',
 'Mr. & Mrs. Smith (2005)',
 "Fool's Gold (2008)"]
```

```
recommend_movies('Aladdin')
```

```
['Oliver & Company (1988)',
 'Hercules (1997)',
 'Robin Hood (1973)',
 'Land Before Time III: The Time of the Great Giving (1995)',
 "Pete's Dragon (1977)"]
```

COLLABORATIVE FILTERING

USING SINGULAR VALUE DECOMPOSITION USED TO HELP US FIND THE MOVIES WE COULD ENJOY BY BREAKING OUR INFORMATION INTO SMALLER PIECES:

```
# fit SVD model on training set
svd = SVD(**best_params)
svd.fit(train)
predictions = svd.test(test)
print(accuracy.rmse(predictions))
```

```
RMSE: 0.8765
0.8765276961511976
```

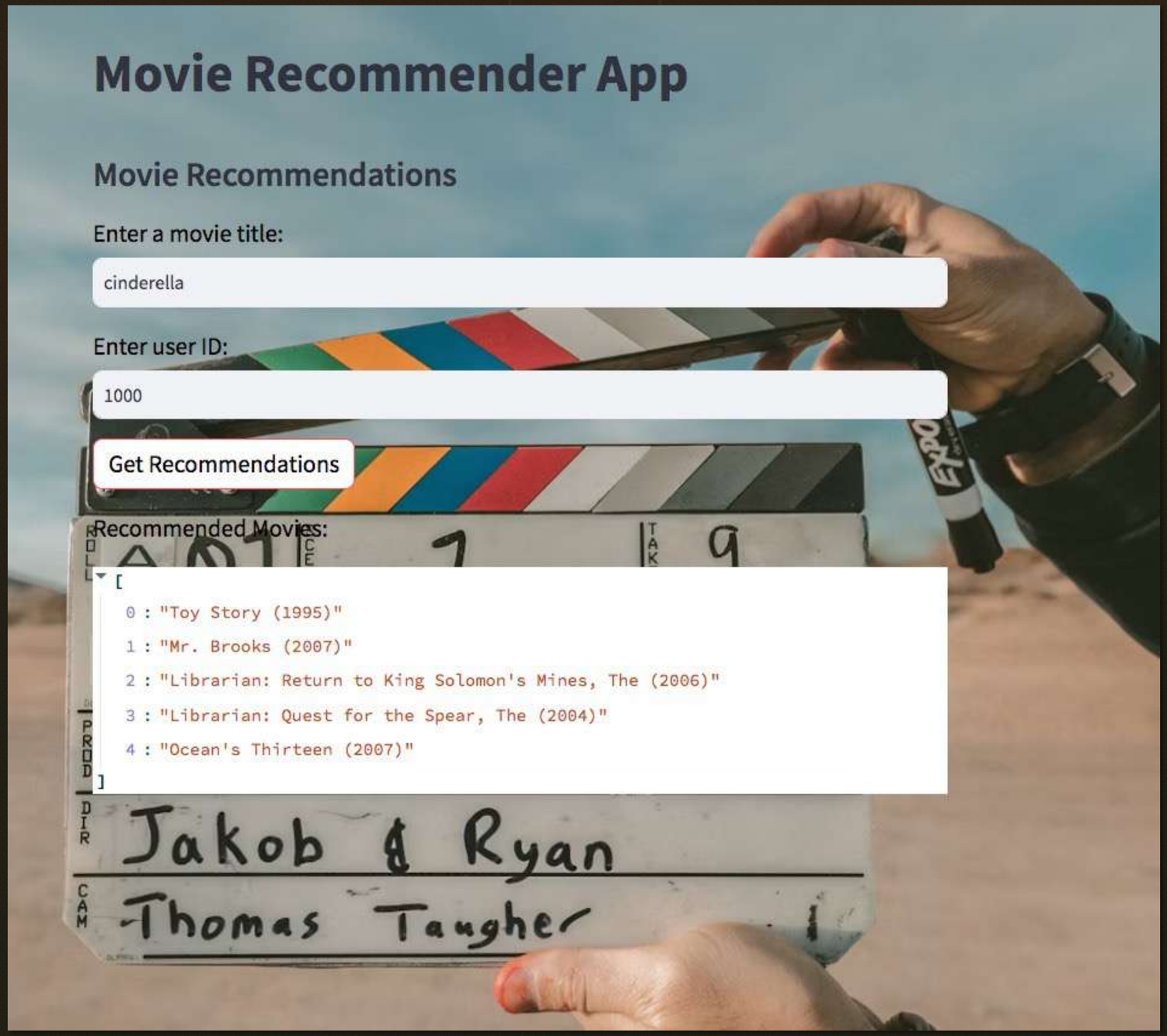
HYBRID APPROACH

OUTPUT FROM USING CONTENT-BASED AND COLLABORATIVE FILTERING GIVES RECOMMENDATIONS ORDERED BY ASCENDING:

```
hybrid_recommendations(300,'Toy Story')
```

```
['Monsters, Inc. (2001)',
 'Toy Story 2 (1999)',
 'Flipper (1996)',
 'Losing Isaiah (1995)',
 'Babysitter, The (1995)',
 "Emperor's New Groove, The (2000)",
 'Baby-Sitters Club, The (1995)',
 'Adventures of Rocky and Bullwinkle, The (2000)',
 'Antz (1998)',
 'All Dogs Go to Heaven 2 (1996)']
```

FOR EASE OF USE BY USERS WHO WOULD LIKE TO GET RECOMMENDATIONS ON MOVIES, WE BUILT AN APP THAT ALLOWS THEM TO INPUT A MOVIE THEY LIKE AND ACQUIRE RECOMMENDATIONS FUELED BY OUR RECOMMENDATION SYSTEM.



LIMITATIONS

01. NEED TO DIVERSIFY OUR TECHNIQUE THROUGH EXPLORING OTHER RECOMMENDATION ALGORITHMS.

02. NEED FOR MORE COMPREHENSIVE DATA PROCESSING BEFORE MODEL BUILDING.

RECOMMENDATIONS

01. CONTINUE EXPLORING AND IMPROVING THE HYBRID MODEL TO DIVERSIFY AND IMPROVE THE ACCURACY OF RECOMMENDATIONS MADE.

02. ENGAGE WITH MORE FEATURES LIKE ACTORS AND PLOT SUMMARIES TO ENHANCE OUR RECOMMENDATION ACCURACY.

03. EXPLORE OTHER RECOMMENDATION ALGORITHMS AND TECHNIQUES TO IMPROVE THE ACCURACY OF OUR RECOMMENDATION SYSTEM.

CONCLUSION

THROUGH COMBINING COLLABORATIVE AND CONTENT-BASED FILTERING INTO A HYBRID SYSTEM FOR MORE PERSONALIZED MOVIE RECOMMENDATIONS, WE WERE ABLE TO LEVERAGE ON MOVIE METADATA AND USER RATINGS TO DEVELOP A RHOMBUST RECOMMENDATION SYSTEM.