Board Games Recommender

Phua Jia Qing,
GA DSI 30

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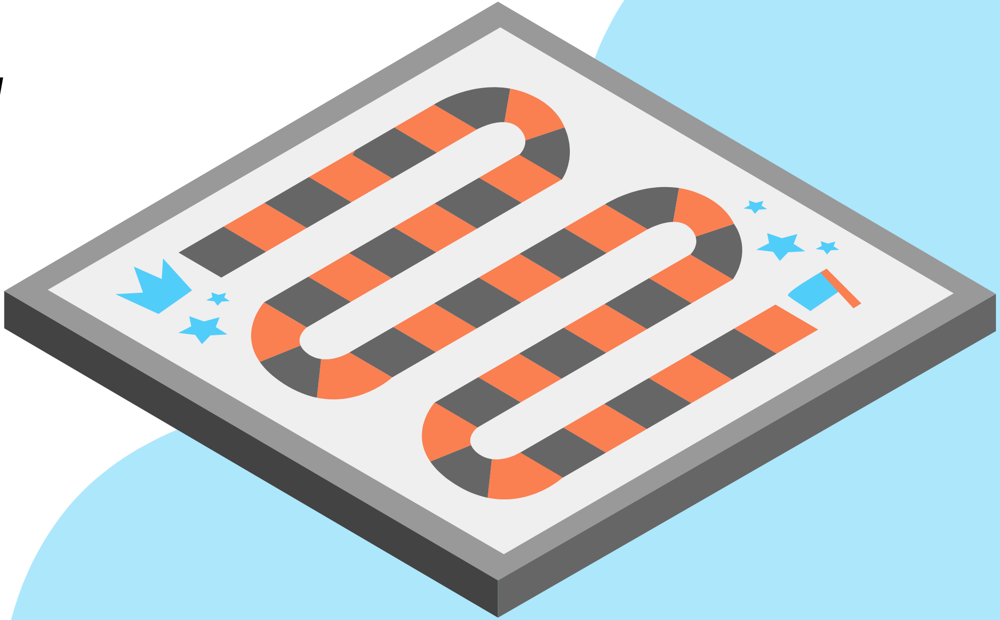
PROBLEM STATEMENT

Background on Board Games



HISTORY OF BOARD GAMES

3000 BC

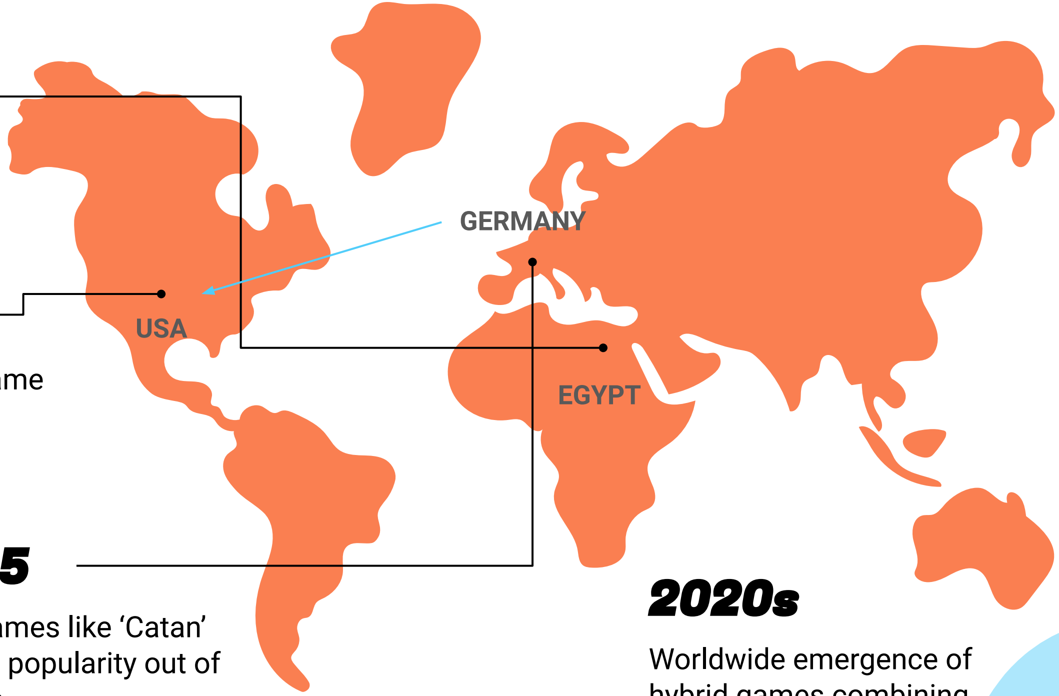
Senet was a very popular game in ancient Egypt

1900

First version of the game 'The Landlord's Game

1995

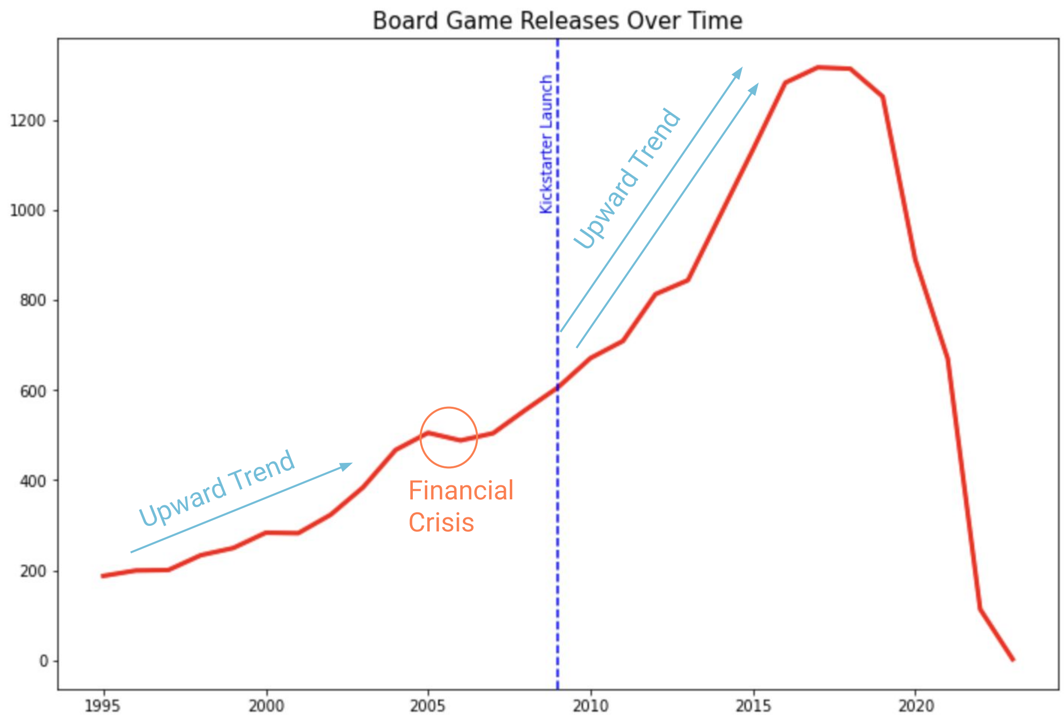
Eurogames like 'Catan' gained popularity out of Europe.



2020s

Worldwide emergence of hybrid games combining multiple genres.

BOARD GAME RELEASES



Financial Crisis

Upward Trend

EGYPT

Board game originated from

5,000 YEARS

Existed for

30 BILLIONS

Forecast market value in 2028

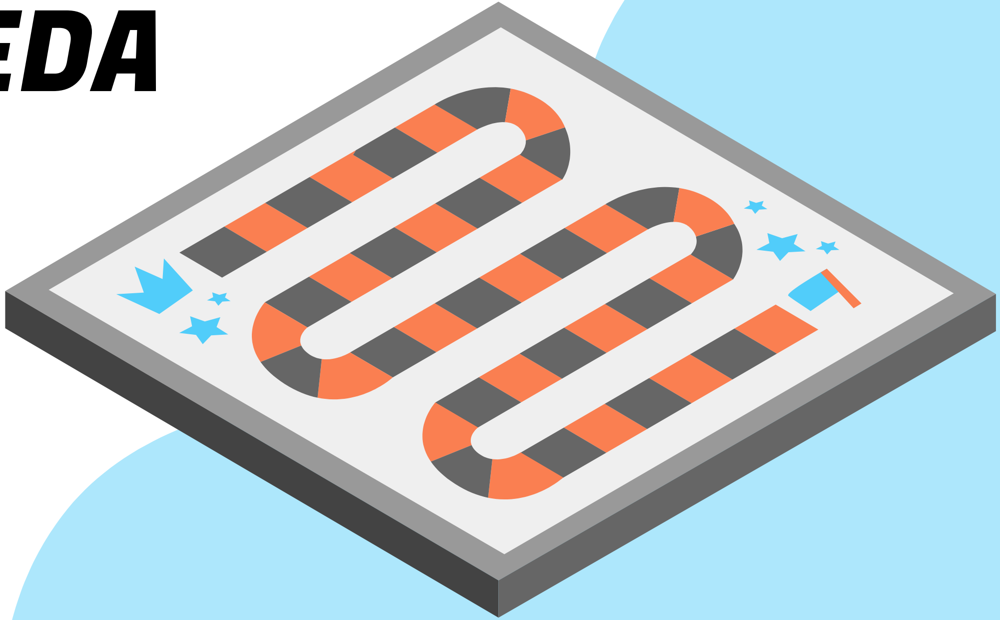
Problem Statement:

Build a good recommender system for board games

02

DATASET & EDA

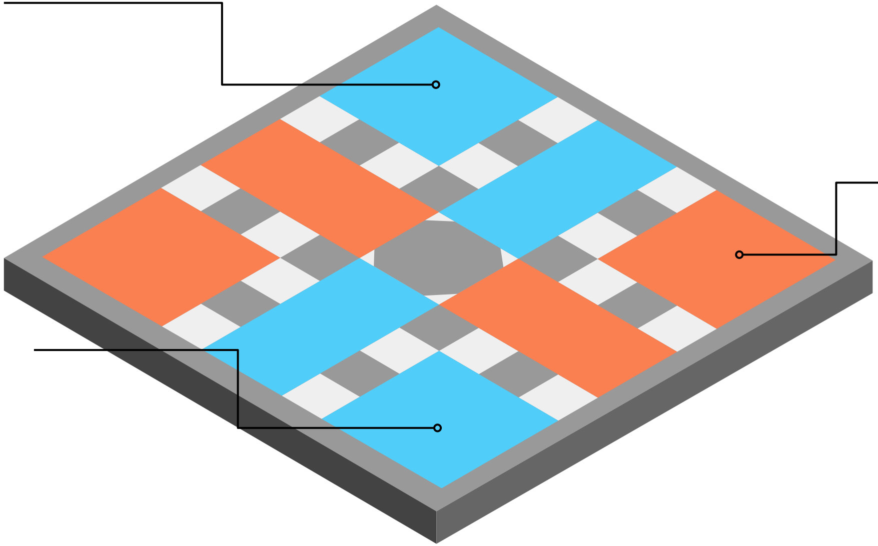
Cleaning the data



BOARDGAMEGEEK

BOARD GAME COMMUNITY

Online community with more than 2 million users



BOARD GAME RATING

Users leave rating and reviews

BOARD GAME INFORMATION

Updated on a real-time basis

CLEANING DATASETS

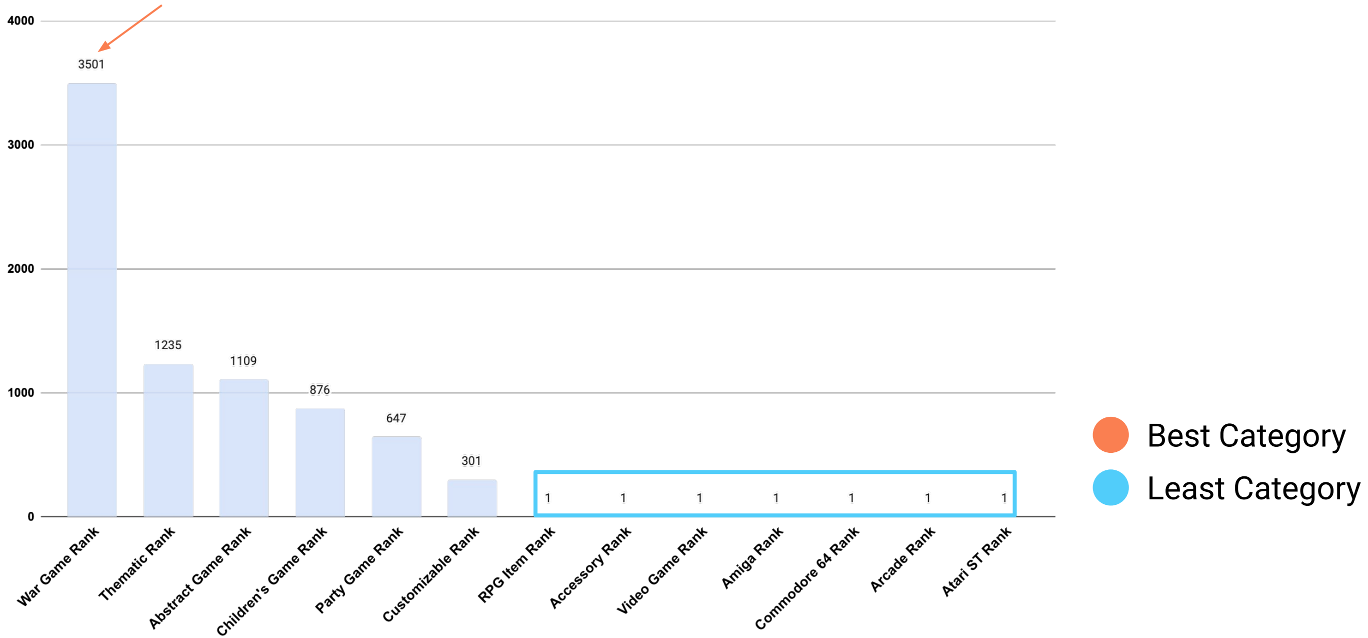
01: 'Games'

02: 'Games_info'

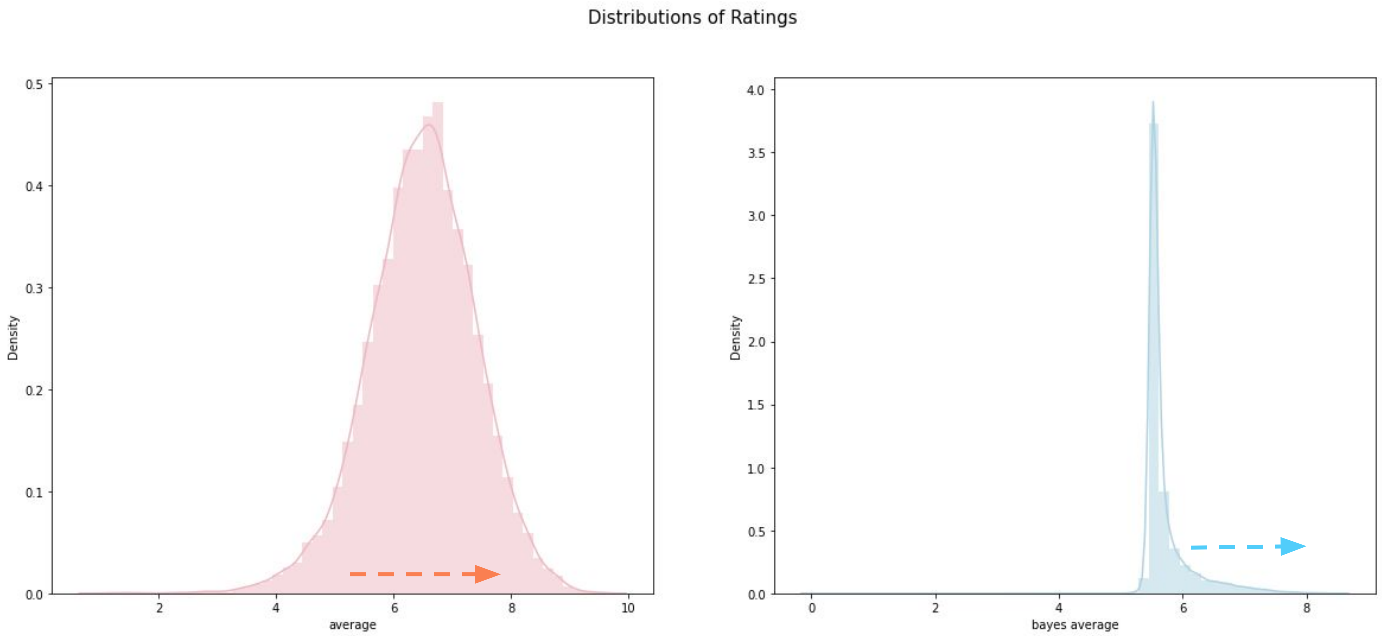
03: 'Reviews'

- Drop duplicates and some empty values.
- Feature engineering and scale down dataset
- Merge 'Games' & 'Games_info'

TOP CATEGORY



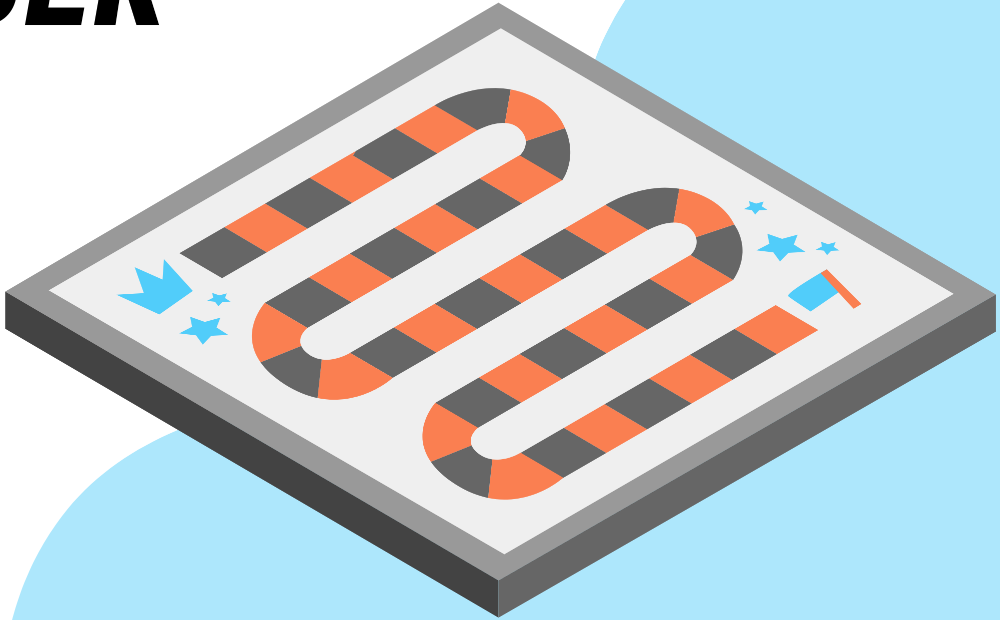
AVERAGE & BAYES AVERAGE



03

RECOMMENDER SYSTEM

Collaborative Filtering
Recommender System



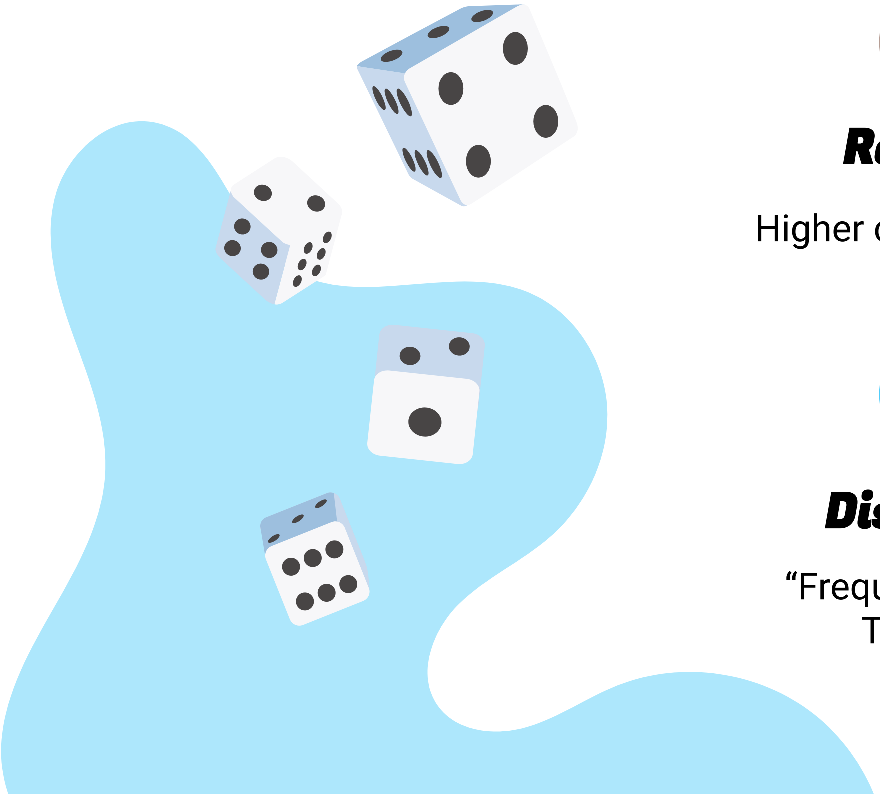
BENEFITS OF RECOMMENDER SYSTEM

Personalisation

User's preference

Customer Satisfaction

Efficient time spent



Revenue

Higher conversion rate

Discovery

"Frequently Bought Together"

Types of Recommender System

- Popularity-Based
- Collaborative Filtering
- Content-Based Filtering

POPULARITY RECOMMENDER

```
The list of recommendations for the user: 10

    user                     name  score  new_rank
13    10                 Citadels    313       1.0
0     10                7 Wonders    311       2.0
34    10                 Pandemic    310       3.0
31    10              Love Letter    309       4.0
47    10  The Castles of Burgundy    307       5.0
```

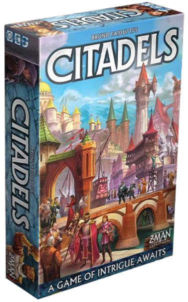
```
The list of recommendations for the user: 100

    user                     name  score  new_rank
13   100                 Citadels    313       1.0
0    100                7 Wonders    311       2.0
34   100                 Pandemic    310       3.0
31   100              Love Letter    309       4.0
47   100  The Castles of Burgundy    307       5.0
```

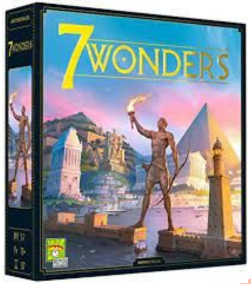
```
The list of recommendations for the user: 150

    user                     name  score  new_rank
13   150                 Citadels    313       1.0
0    150                7 Wonders    311       2.0
34   150                 Pandemic    310       3.0
31   150              Love Letter    309       4.0
47   150  The Castles of Burgundy    307       5.0
```

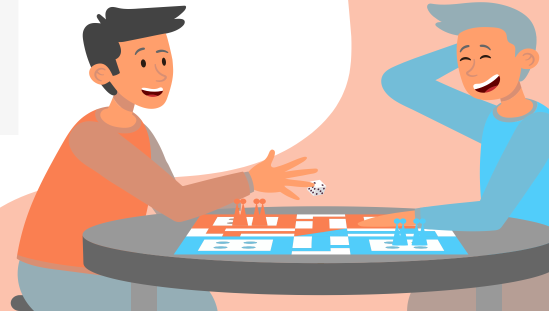
01: Citadels



02: 7 Wonders



03: Pandemic



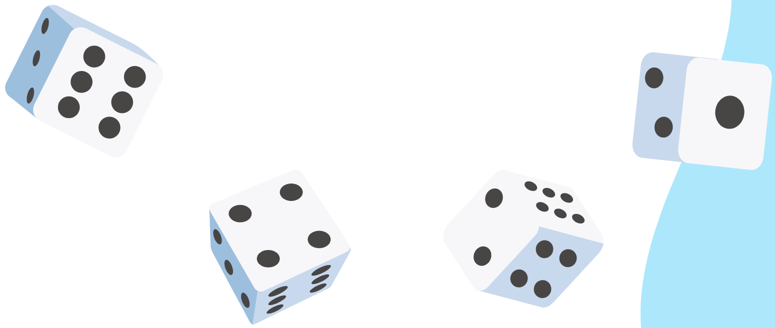
COLLABORATIVE FILTERING

USER-BASED

Similar Users

ITEM-BASED

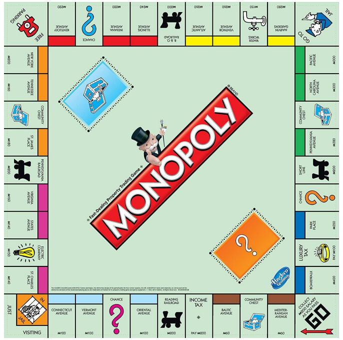
Similar Board Games



USER-BASED CF

1 2

3



Similar Users

1

3

User 1 loves exploding kittens

Predict User 3 will like it too

Target User: User 3

CONS OF USER-BASED CF

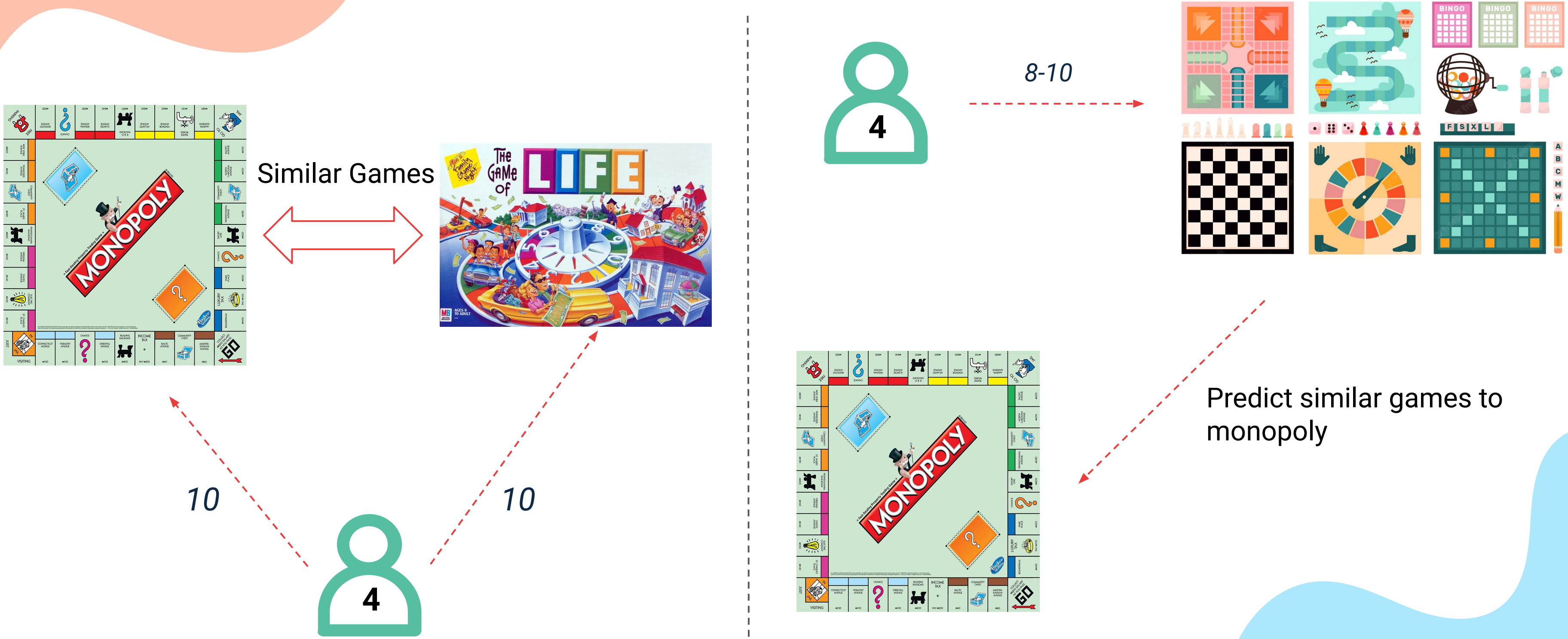
NEW USER

Difficult to find
similar user

LIMITED CHOICES

Small pool of games
left unplayed

ITEM-BASED CF



Target Item: Monopoly

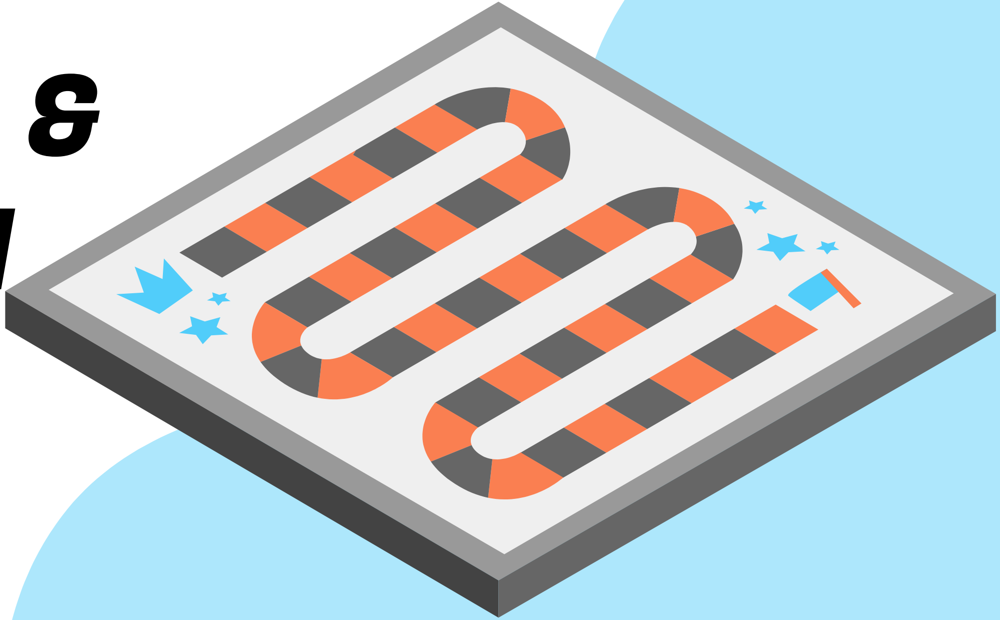
SUMMARY

A recommender system would be helpful in attending to every user's personal needs and attracting new users

04

MODEL EVALUATION & CONCLUSION

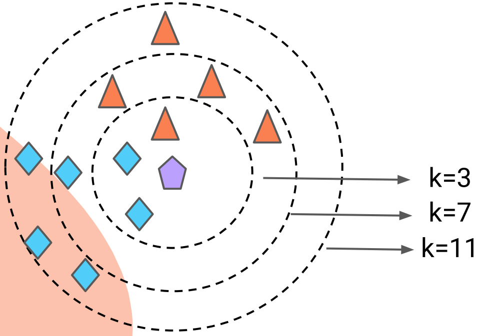
Best performing model



MODELS

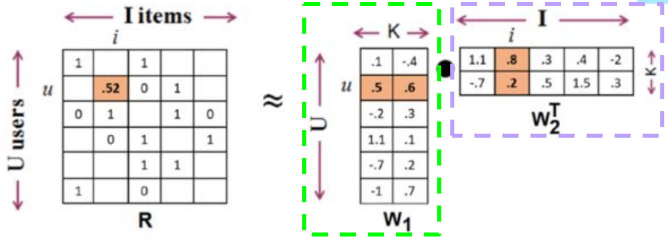
KNN

Make predictions using the average rating of top-k nearest neighbours



Matrix Factorization

Decomposing user-item interaction matrix into the product of 2 lower dimensionality rectangular matrices



Source

MODEL FLOW

Models

9 base models

GridSearchCV

ALS vs SGD

Best Model

With best parameters and best scores

BASE MODELS

	train_rmse	test_rmse
base_knn_baseline	0.1200	0.1500
base_knn_zscore	0.1171	0.1505
base_baseline_only	0.1475	0.1517
base_svdpp	0.1425	0.1518
base_slop	0.1484	0.1542
base_knn_basic	0.1262	0.1562
base_nmf	0.1563	0.1620
base_svd	0.137	0.1622
base_cluster	0.6338	0.6425

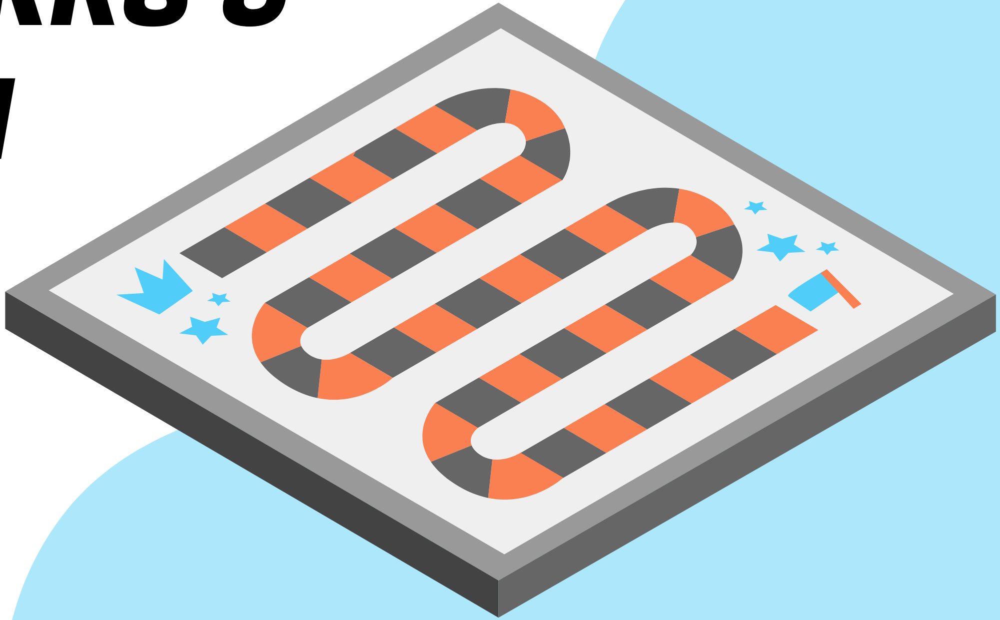
BEST MODEL

	train_rmse	test_rmse
base_knn_baseline	0.1200	0.1500
knn_als_1	0.1195	0.1497
knn_sgd_1	0.1149	0.1554

05

FUTURE WORKS & CONCLUSION

Hybrid Recommender System



FUTURE WORKS

Evaluation Metric

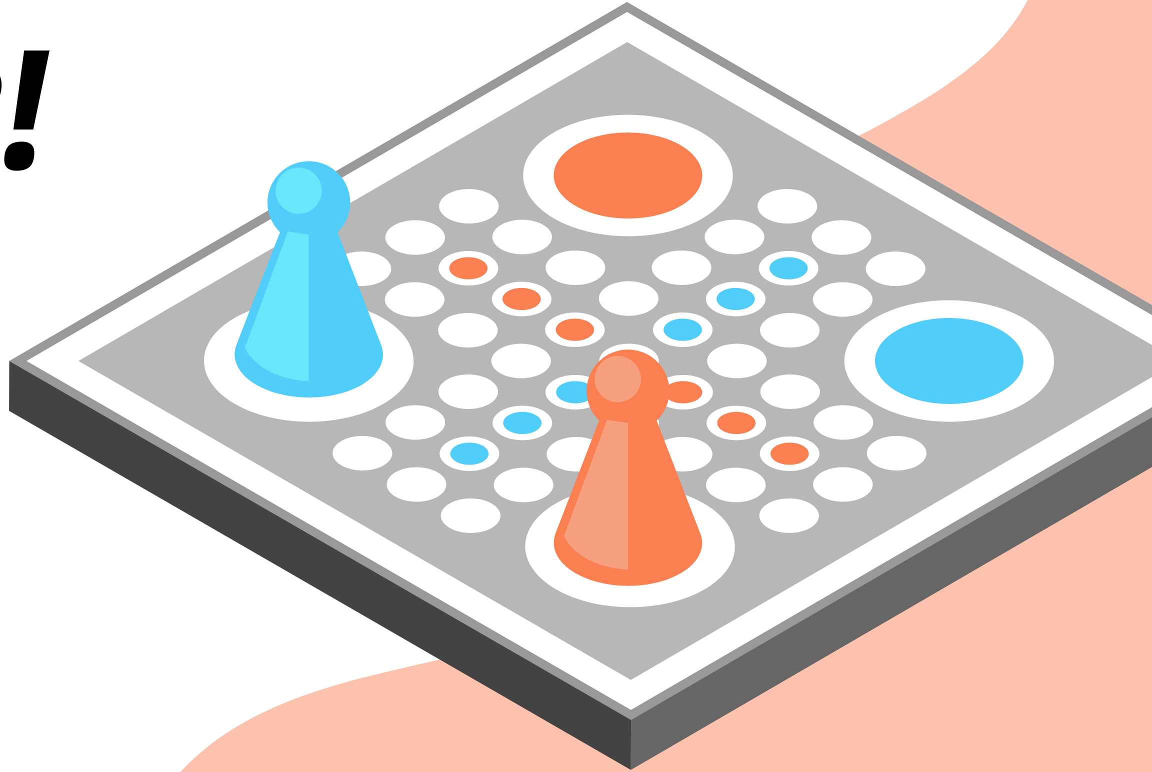
Try using other metric like precision@K, recall@K

Hybrid

Combine collaborative filtering and content-based filtering

THANKS!

Do you have any questions?



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