Movie Recommender *App*

Built upon Deep Neural Network & Flask

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Why Movie Recommender?

- ★ Increasing entertainment market
- ★ Personalization on product marketing
- ★ Better engage customers on movie/tv products
- ★ Drive sales

Data Source & Properties

- ★ Amazon Movies/TV reviews from UCSD
- ★ Json.gz file with 19 years data (8,765,568 reviews)
- ★ Subsample to 2018 ratings/reviews
  - ○ reduce computational cost
- ★ Scrape review webpage link for each movie using BeautifulSoup
- ★ Drop unrelated variables
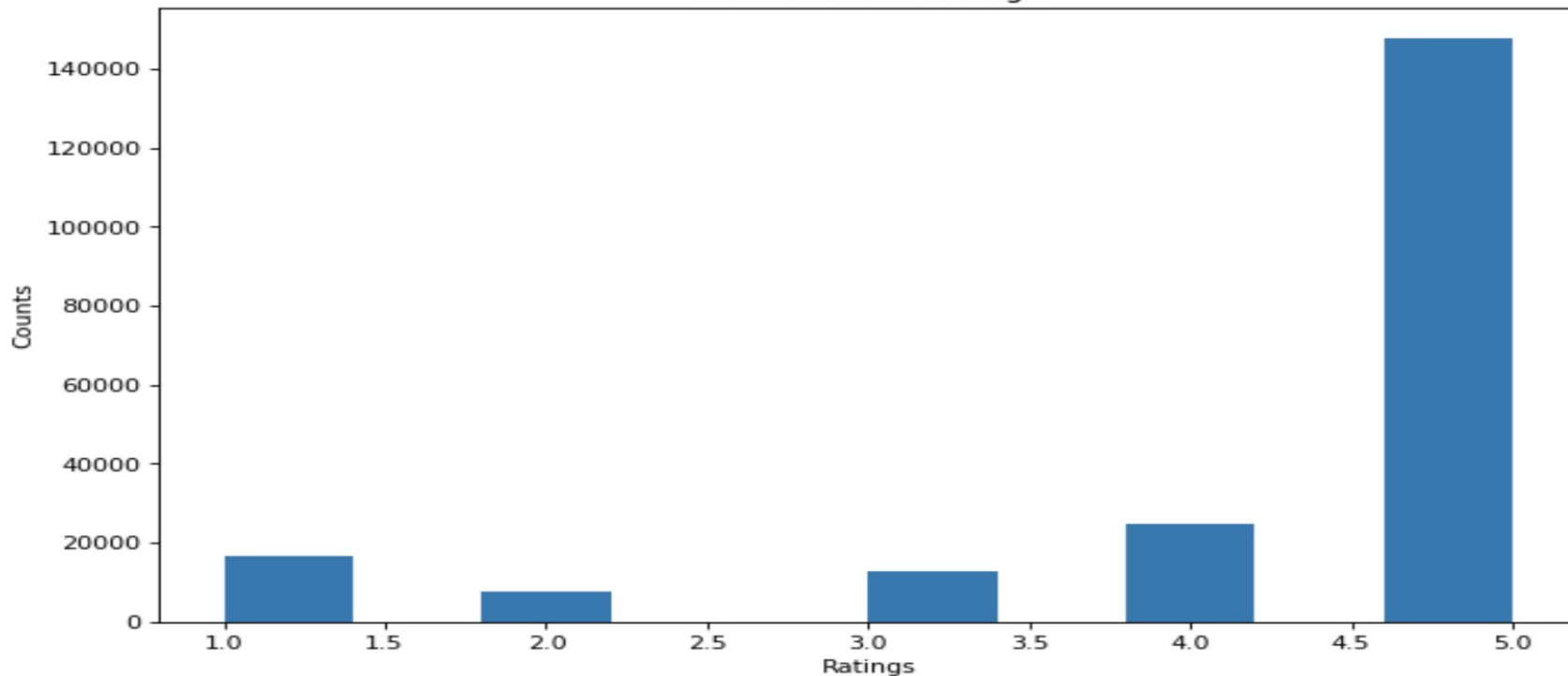
Data Exploration

N = 209,060

N= 38,864
Mean: 17.2
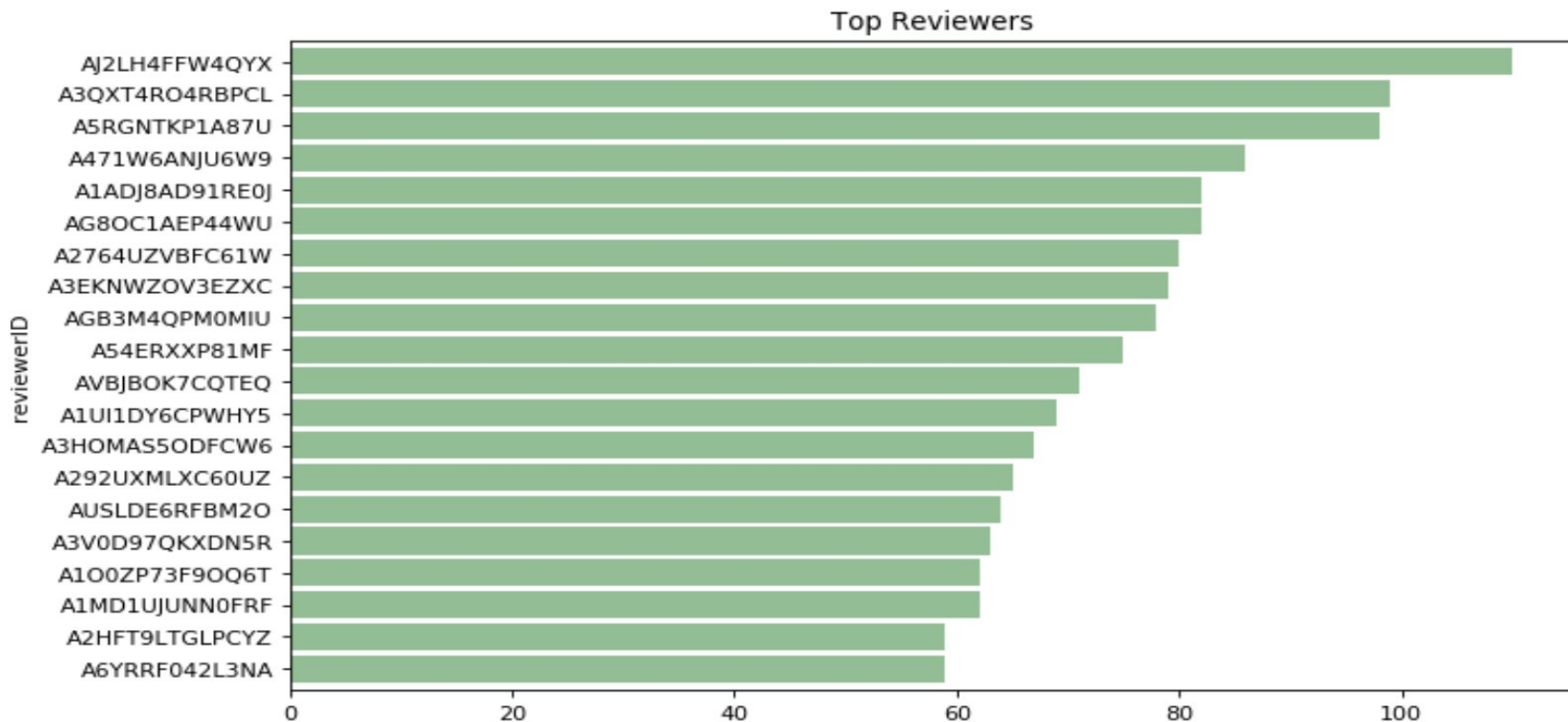Max: 959
25% : with 1 review

Users

N=119,945
Mean: 1.74
Max: 110
50%: with 1 review
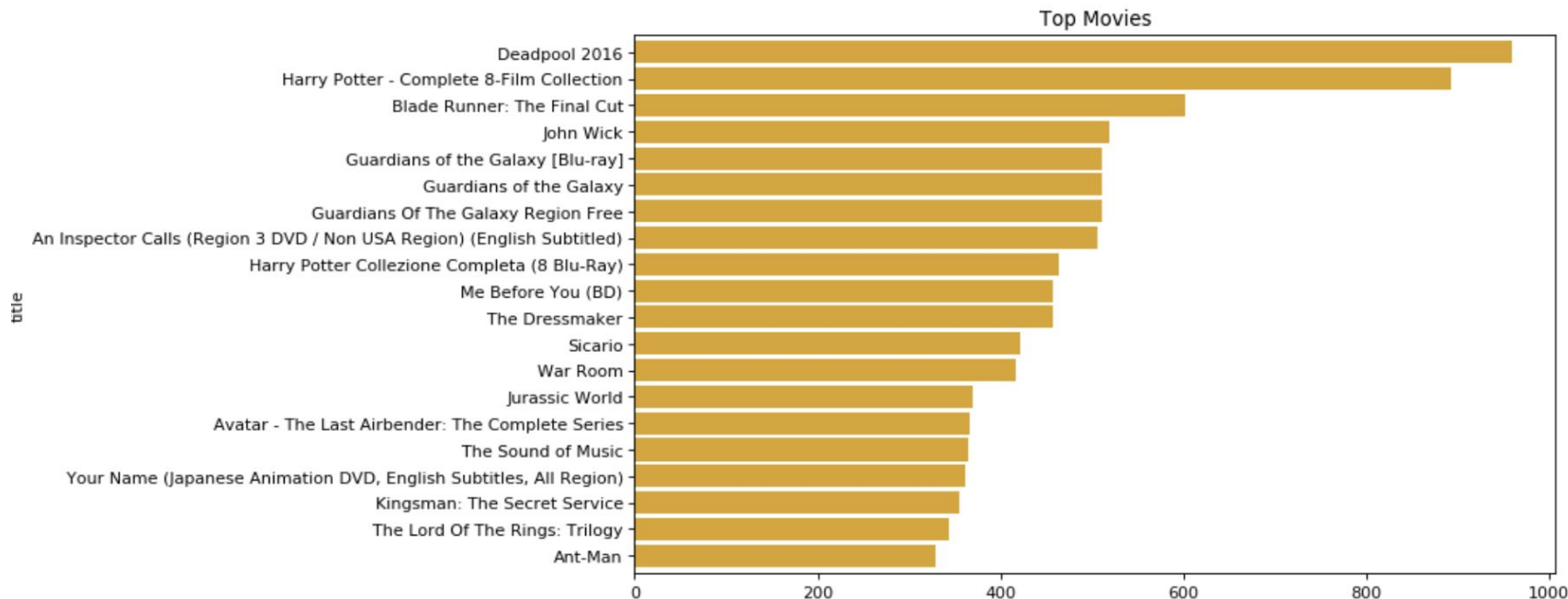
Data Exploration - Rating Distribution

Distribution of Ratings

Data Exploration - Top Reviewers by count of reviews

Data Exploration -Top Movies by Count of Reviews

Top Movies

Collaborative Filtering Using Neural Networks

★ Collaborative filtering
  ○ based on users' rates
  ○ recommend user A movies that users similar to A have watched & like
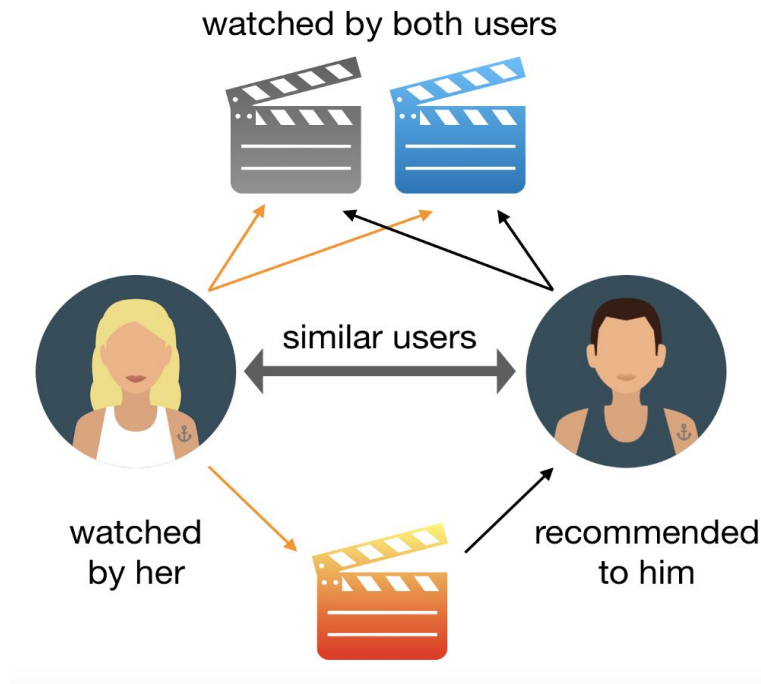
★ Keras embedding:
  ○ split one matrix into two smaller matrix
    ■ high dimension ⟹ low dimensions

★ Neural networks:
  ○ efficiently learn the underlying explanatory factors and useful representations

★ Evaluation metrics:
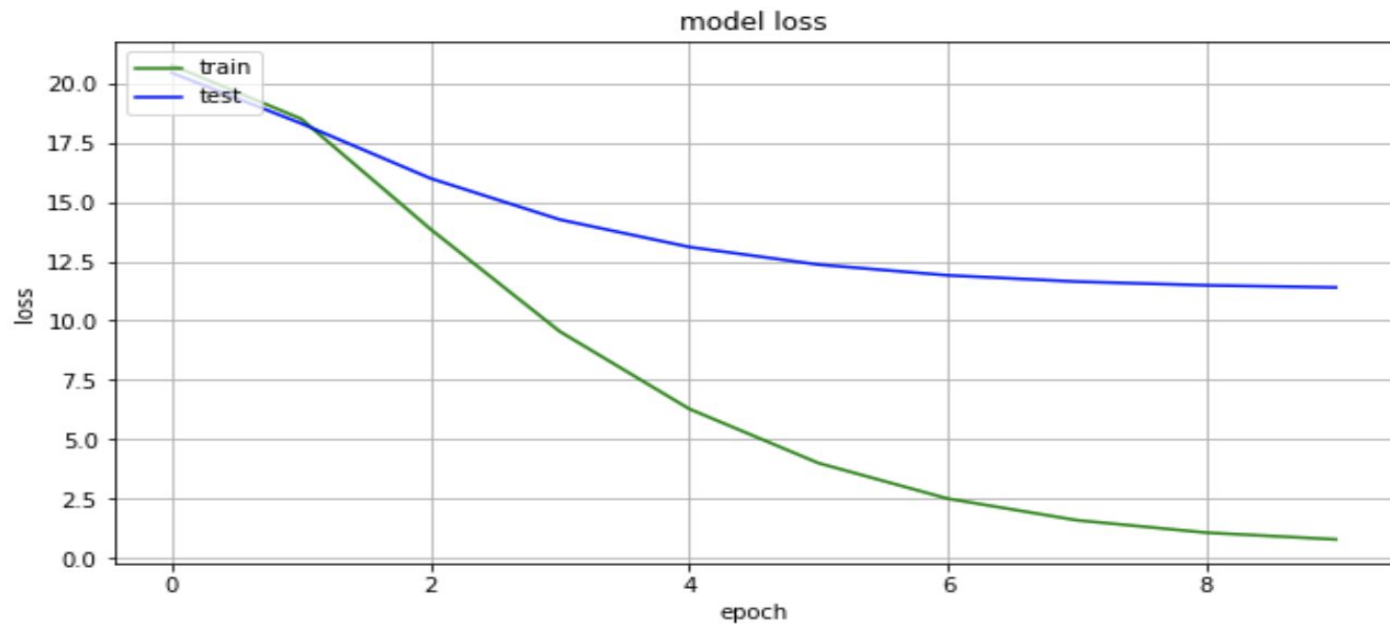 ○ Mean Absolute Error (MAE)

watched by both users

similar users

watched by her

recommended to him
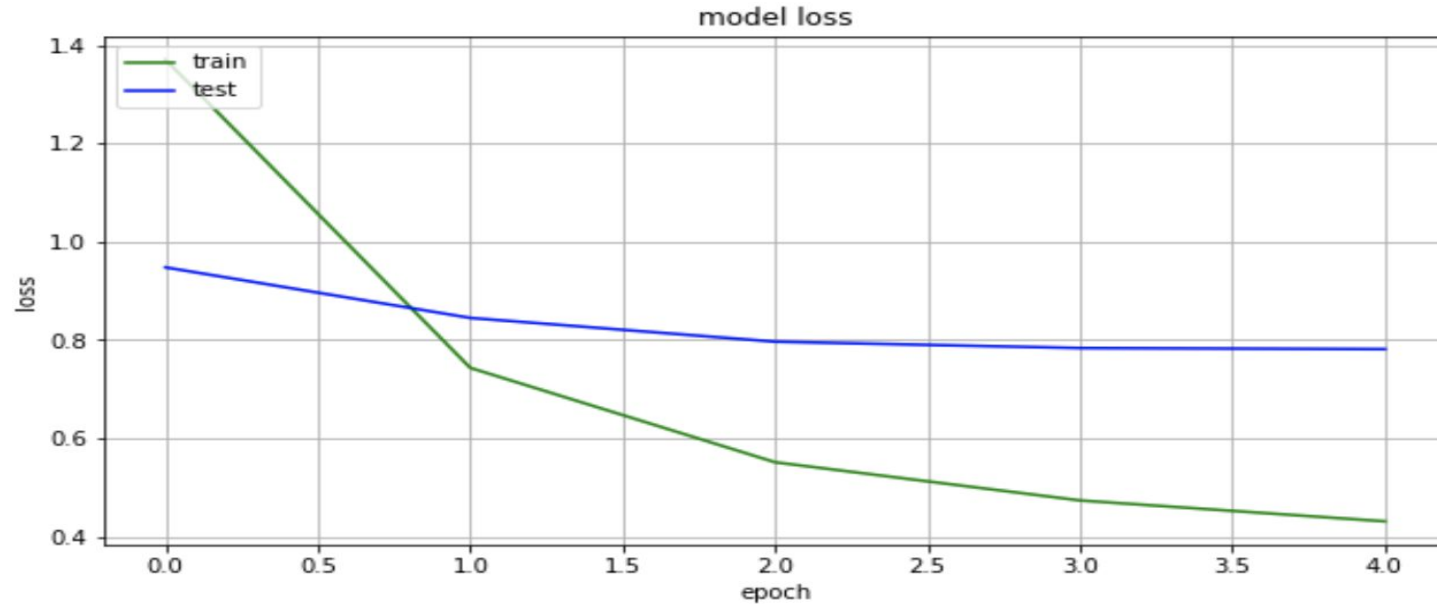
Base Model (input ⟹ output)

★ MAE = 2.4

Loss function: Mean squared error

Final Model (input ⟹ hidden layers/dropout ⟹ output)

★ MAE = 0.43

model loss

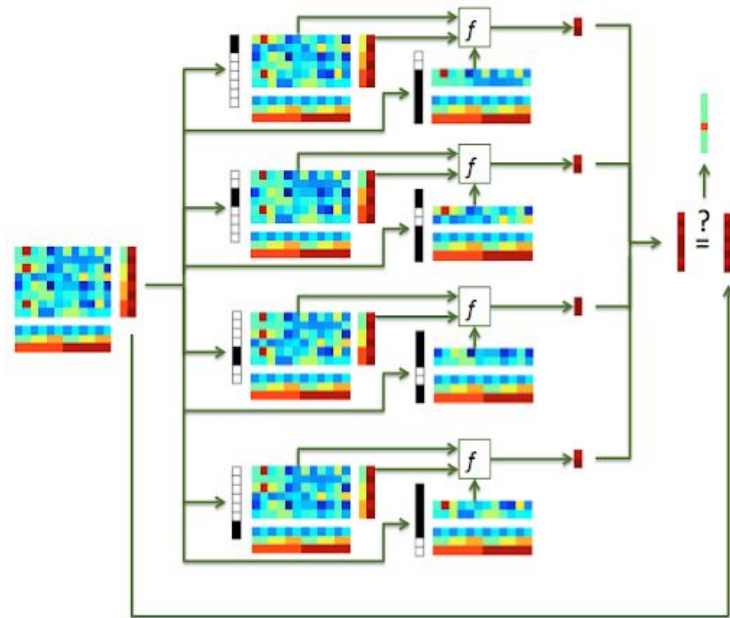Loss function: Mean squared error

Cross Validation on Final Model

Metrics: Mean Absolute Error (MAE)

StratifiedKFold, n_splits=5

★ Split 1: 0.41
★ Split 2: 0.40
★ Split 3: 0.38
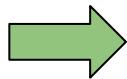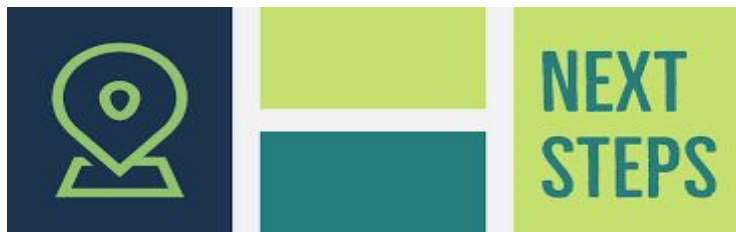★ Split 4: 0.37
★ Split 5: 0.38

Average of MAE: 0.39

Standard Deviation of MAE: 0.0124

Make Recommendation

GO!!!

NEXT STEPS

1. Cluster users & weight on rates
2. Build a recommendation system based on sentiment analysis on review texts
3. Compare two models & the combination of the two
4. Visualize keras embedding
5. Improve deployment
6. Build a new environment

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