Movie Recommender *App*

Built upon Deep Neural Network & Flask

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Why Movie Recommender?

Increasing & competitive online entertainment market

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Enable highly personalized marketing

⇩

Better engage customers

⇩

Drive sales

Data Source & Properties

- ★ Amazon Movies/TV reviews from UCSD
- ★ Json.gz files 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 to reduce the data size

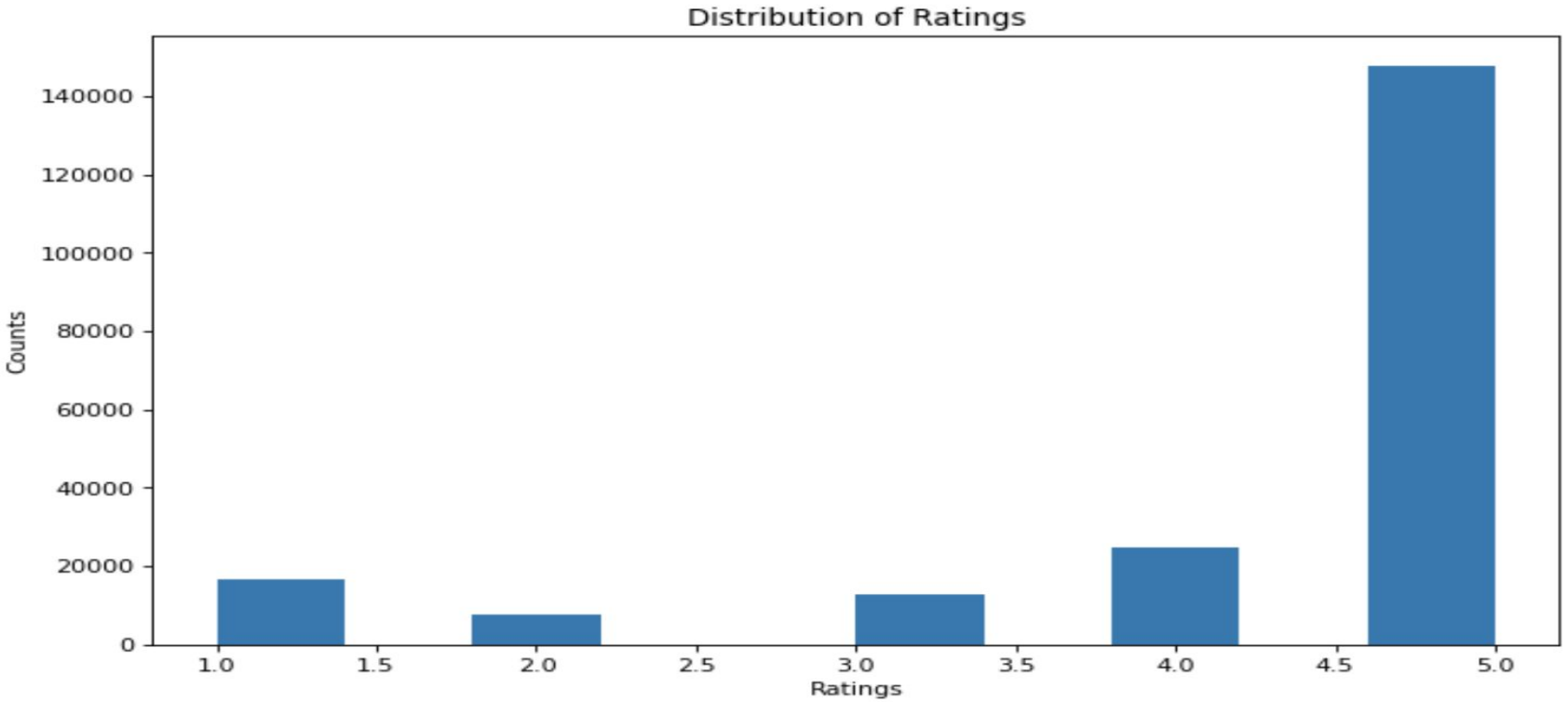
Data Exploration

N = 209,060

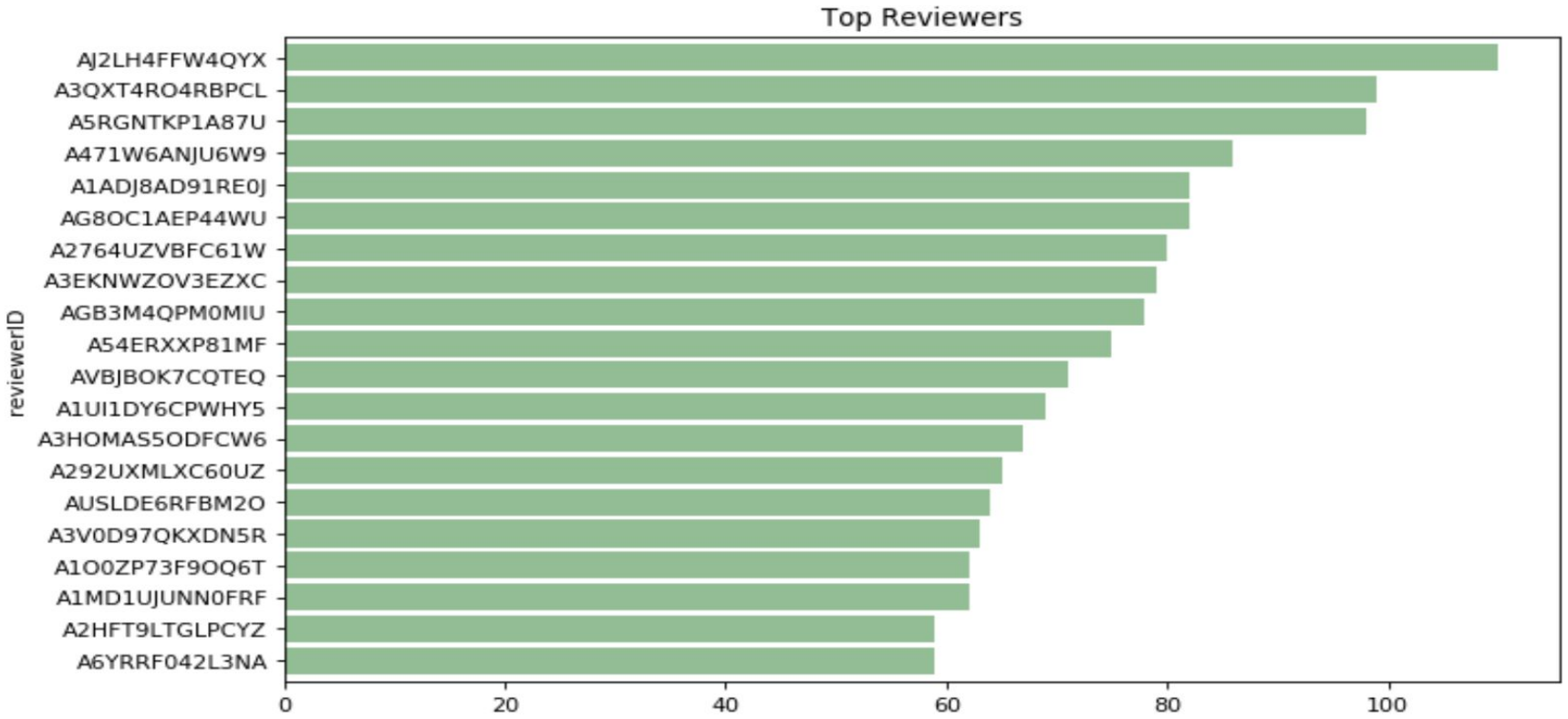
N= 38,864
Mean: 17.2
Max: 959
25% : with 1 review

N=119,945
Mean: 1.74
Max: 110
50%: with 1 review

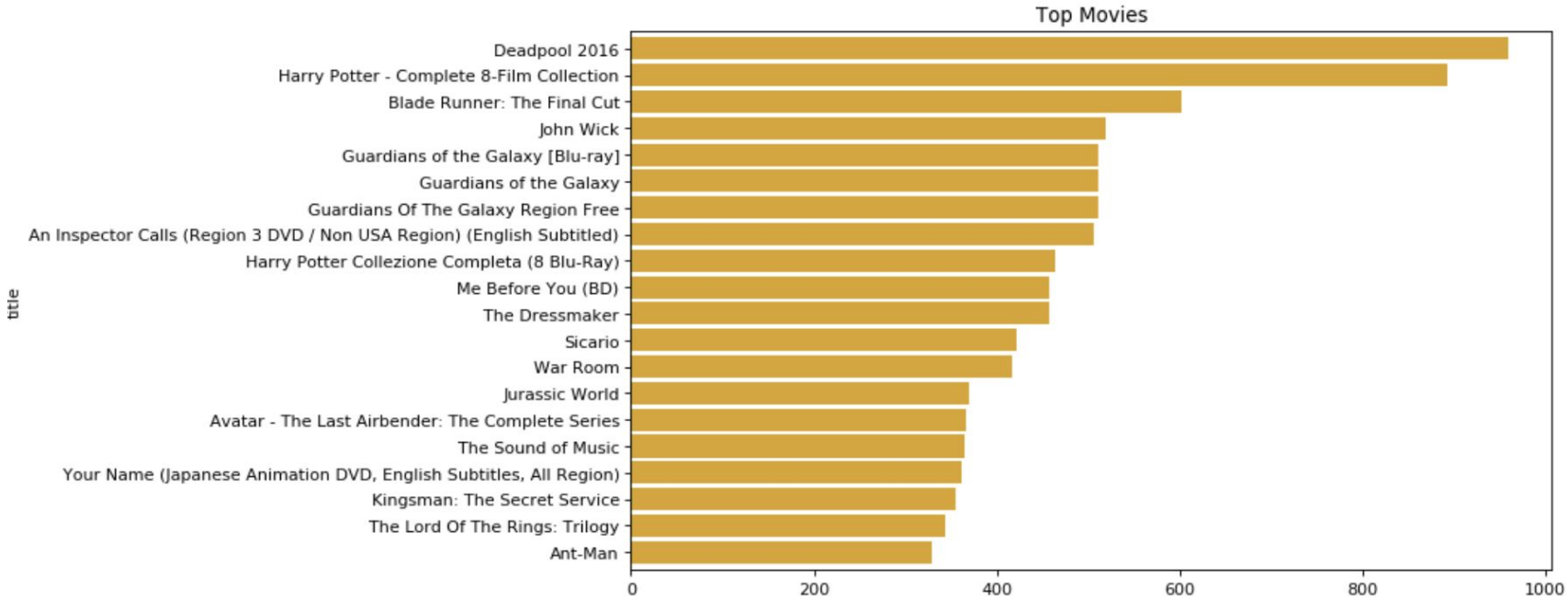
Data Exploration - Ratings Distribution



Data Exploration - Top Reviewers by Count of Reviews

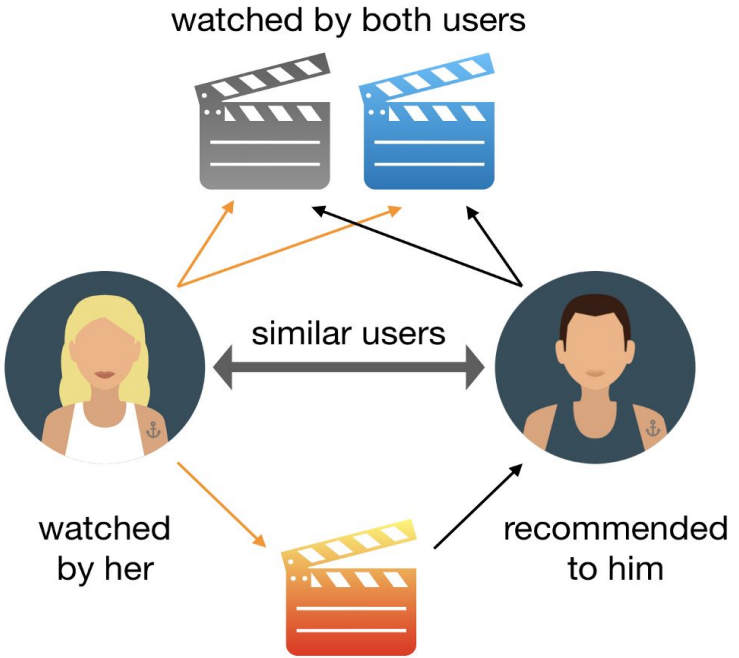


Data Exploration -Top Movies by Count of Reviews



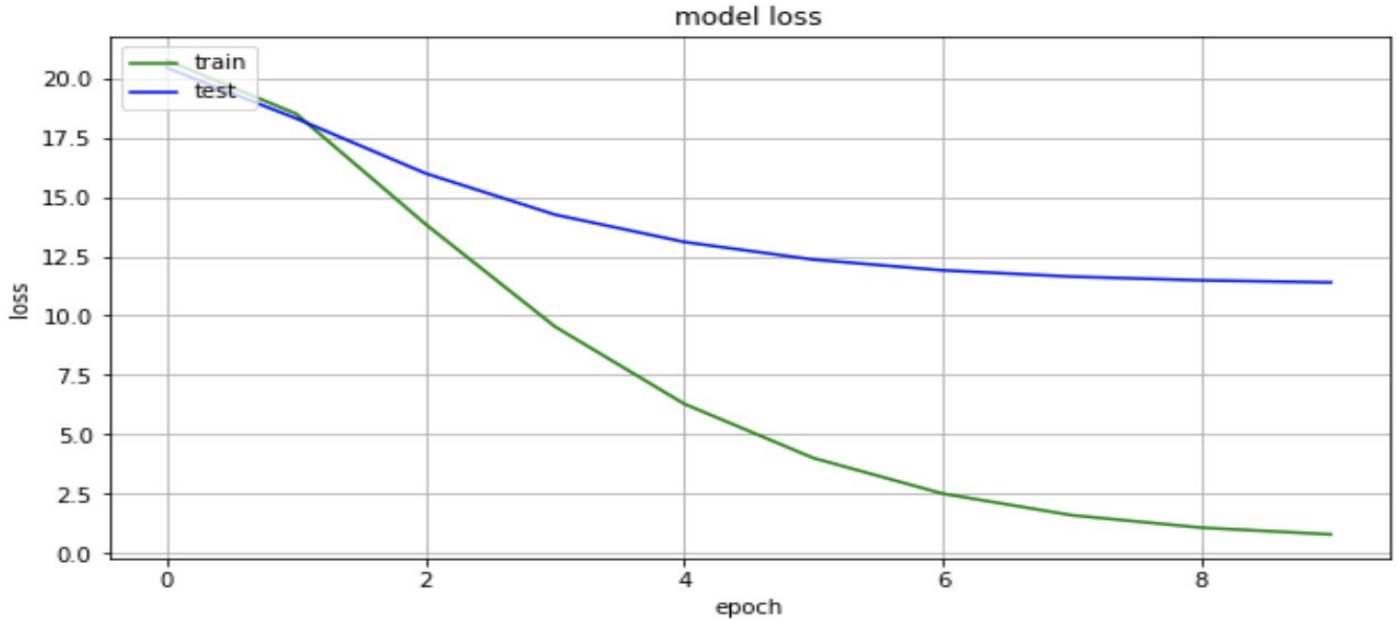
Collaborative Filtering Using Neural Networks

- ★ 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)



Base Model (input ⟹ output)

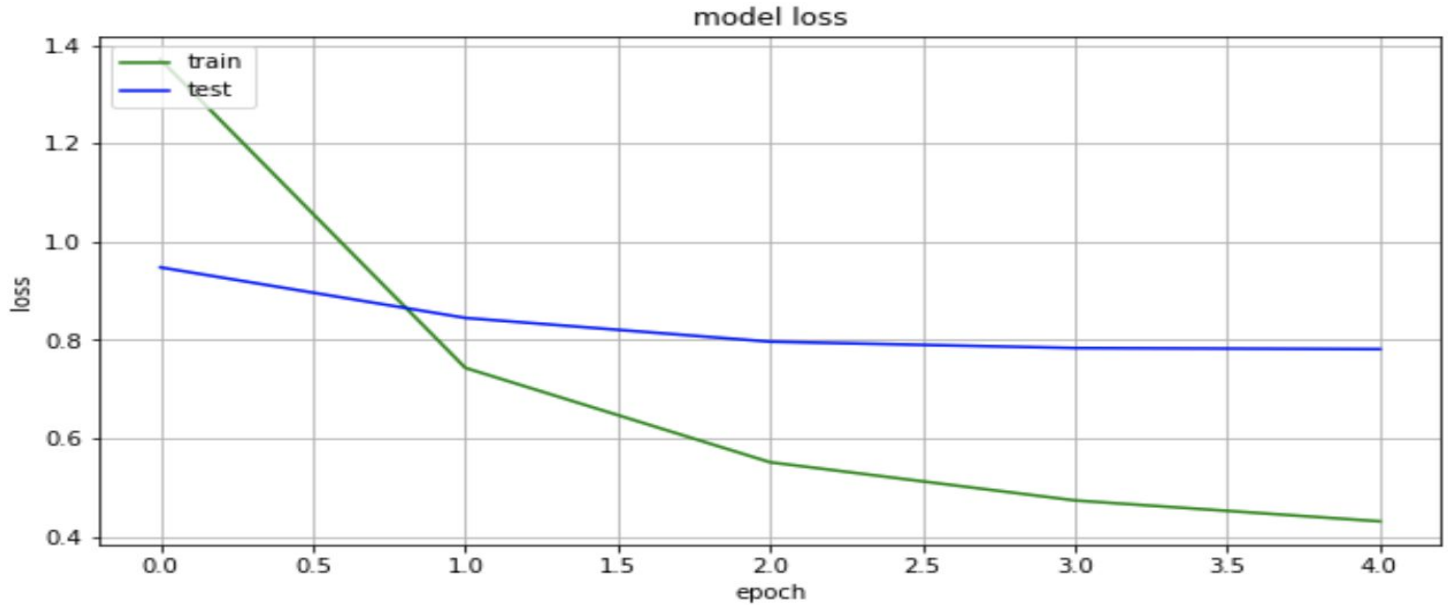
★ MAE = 2.4



Loss function: Mean squared error

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

★ MAE = 0.43



Loss function: Mean squared error

Cross Validation on Final Model

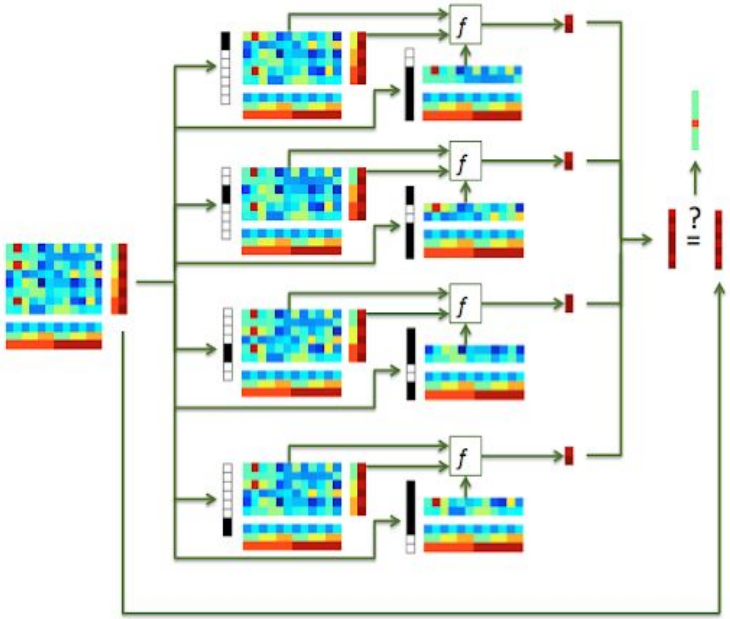
Metrics: Mean Absolute Error (MAE)

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!!!

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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