Sudha Vijayakumar |**SJSU.ID**: 014749488 | **RMSE**: 1.53463

Hybrid[Fastai + AutoSurprise]: Rating Prediction for Book Recommendation System

Learning Objective/ Goal

1) To predict book ratings for the given 'train.csv' using different approaches.

2) To use the book's metadata, learn and build a memory-based recommendation system listed in the article

Source code

https://github.com/sudha-vijayakumar/CMPE256-BOOK-RECOMMENDATION-SYSTEM.git

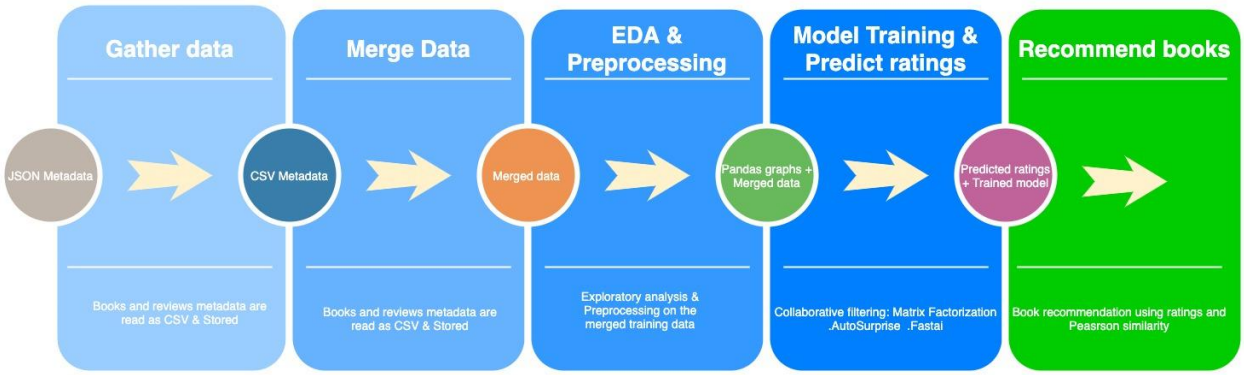
Input files (7)

- **input/metadata/**
  - goodreads_books_children.json.gz,
  - goodreads_reviews_children.json.gz
- **input/**
  - train.csv
  - test.csv
- **processed_data/**
  - books.csv
  - reviews.csv
  - books_with_review.csv (will be generated at step-1,2)

Output (5)

- **output/**
  - predictions-svd-75.csv
  - predictions_Fast_ai.csv
  - Final_submission.csv
  - Book_with_reviews.html
  - User_Ratings.html

ML Pipeline



Sudha Vijayakumar **SJSU.ID**: 014749488

HOW TO RUN (Run the notebooks in the below order)

No.	STEP	Filename
1	Read metadata as CSV	1_JSON_To_CSV.ipynb
2	Merge reviews with books (Preprocessing)	2_Merge_reviews_books_user_data.ipynb
3	EDA	3_EDA_using_Pandas.ipynb
4	**Model Training (Algorithms used)** 1) Identifying the best model for the train data a) AutoSurprise - SVD b) Fastai - Matrix Factorization 2) Train & make predictions for the test.csv using Surprise - SVD[Matrix Factorization]	4.0_Auto_Surprise_BestModel.ipynb **Run-time:** limited to 6hours 4.1_Surprise-SVD_Book_Rating_Prediction.ipynb **Run-time:** 1hour 4.2_Fastai_Book_Rating_Prediction.ipynb **Run-time:** 50mins **Submission**: [0.7 * 4.1_(prediction)] + [0.3 * 4.2_(prediction)] 6_submission.ipynb
5	**Recommendation System** Collaborative filter - Memory-based - PearsonR	5_Recommendation_using_Colab_Filtering.ipynb

Learning outcome

1) Experimented with different approaches on how to predict ratings for the given dataset.

2) Collaborative filtering + Matrix factorization: for 700k dataset,
   a) Surprise is slow and also did not scale well.
   b) fastai is faster and scales well comparatively.

3) Built basic recommendation systems using the practical approaches taught in this course(Collaborative filtering using Pearson similarity).

Future work

To try HGN baseline for sequential recommendation (**Rank_1) Source**