Restaurant Recommendation System Using CF

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Motivation and About the Project

The key reason why many people seem to care about recommender systems is money. For companies such as Amazon, Netflix, and Spotify, recommender systems drive significant engagement and revenue. But this is the more cynical view of things. The reason these companies (and others) see increased revenue is because they deliver actual value to their customers – recommender systems provide a scalable way of personalizing content for users in scenarios with many items. Recommendation systems help users find and select items (e.g., books, movies, restaurants) from the huge number available on the web or in other electronic information sources.

Data and Labels

The Yelp dataset is a subset of businesses, reviews, and user data. This dataset contains 150,346 businesses, 6,990,280 reviews and 200,100 pictures of 11 metropolitan areas. in which it has 908,915 tips by 1,987,897 users, Over 1.2 million business attributes like hours, parking, availability, and Aggregated check-ins over time for each of the 131,930 businesses

References

Rocha, F. P. P. (2021). Recommender System with Explanations.

Music Artist Recommender System

Model

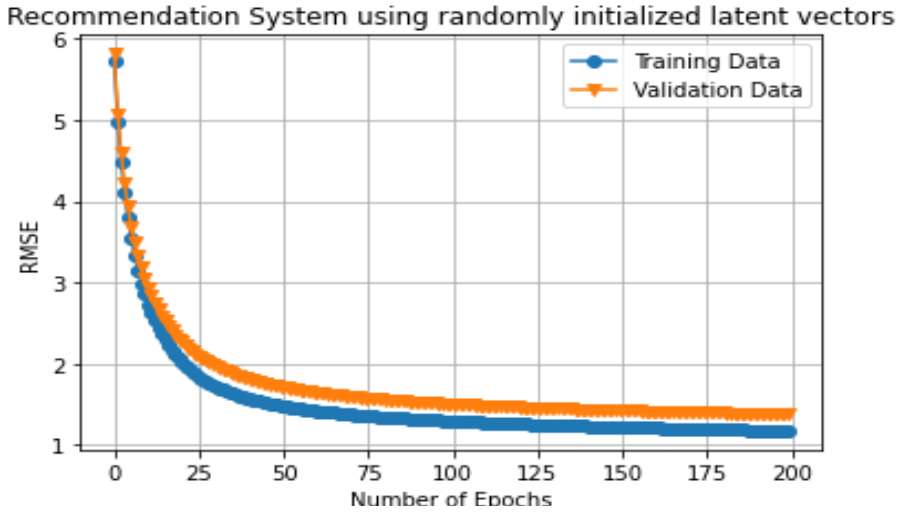
1. Recommendation System using randomly initialized latent vectors: Here we are randomly initializing the latent features and train them by stochastic gradient descent.

2. Recommendation System using Restaurant features: Here we used a static restaurant feature and use gradient descent to create user embeddings.

3. Using PCA on restaurant features: The restaurants have 141 features which would create a large sparse embedding; hence we will reduce it by using PCA on the features

Results

Sr. no.	CF Recommender type	RMSE
1	CF Recommender using randomly initialized latent vectors	1.38
2	CF Recommender using restaurant features	2.74
3	CF Recommender with PCA on restaurant features	3.51



Conclusion

According to our RMSE score, Recommendation System using randomly initialized latent vectors looks performing better with RMSE equal to 1.38 followed by Recommendation System using Restaurant features and Using PCA on restaurant features with RMSE 2.74 and 3.51 respectively.

Future work

We can make a Semantically Aware Explainable Recommender System using Asymmetric Matrix Factorization: The semantic data can be a source of knowledge for the system about both users and items, which can then be used to create meaningful explanations from the relations between both. If a semantic feature belongs to an item; in our case, a restaurant category such as serving vegetarian food or so like young, male are semantic features of the word boy which can be converted to binary. So, this way we can generate more features, or recommend specific restaurants to users.