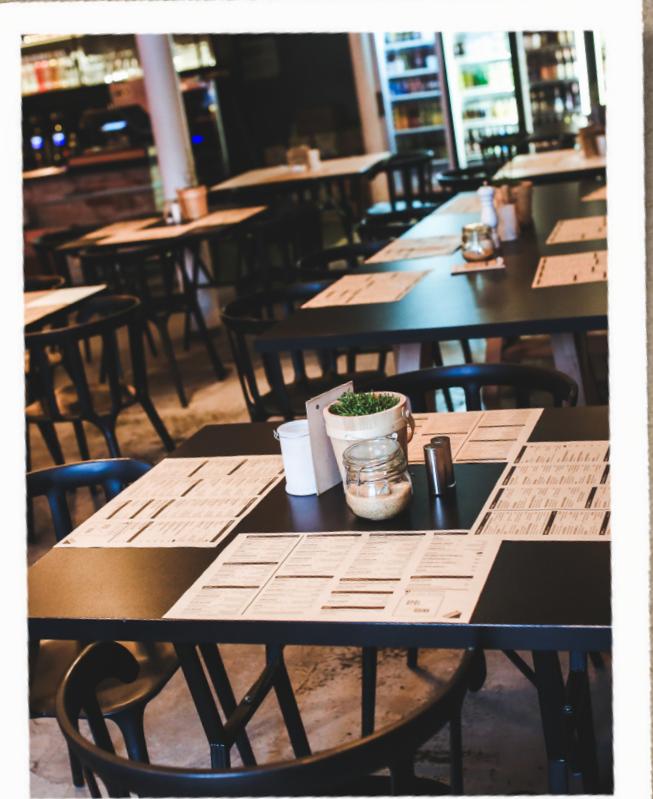


Building a Restaurant Recommendation System

By Flipping - A - Coin -
Devansh Shrestha
Lakshay Chawla
Rommel Jalasutram
Varnika Vatsyayan



The Problem.

The base model is to answer the question for the user - "give me more restaurants like this one" Create a database of item-item similarities. Build a CF-based Recommender system using Stochastic Gradient Descent.

The Dataset.

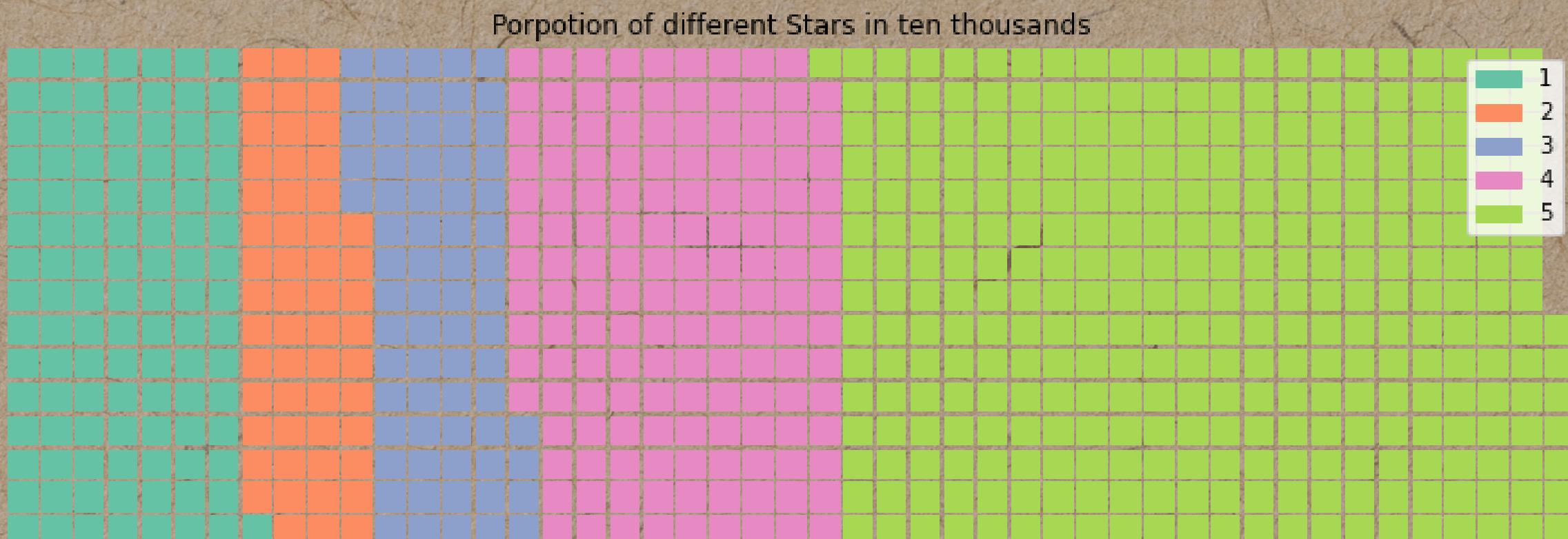
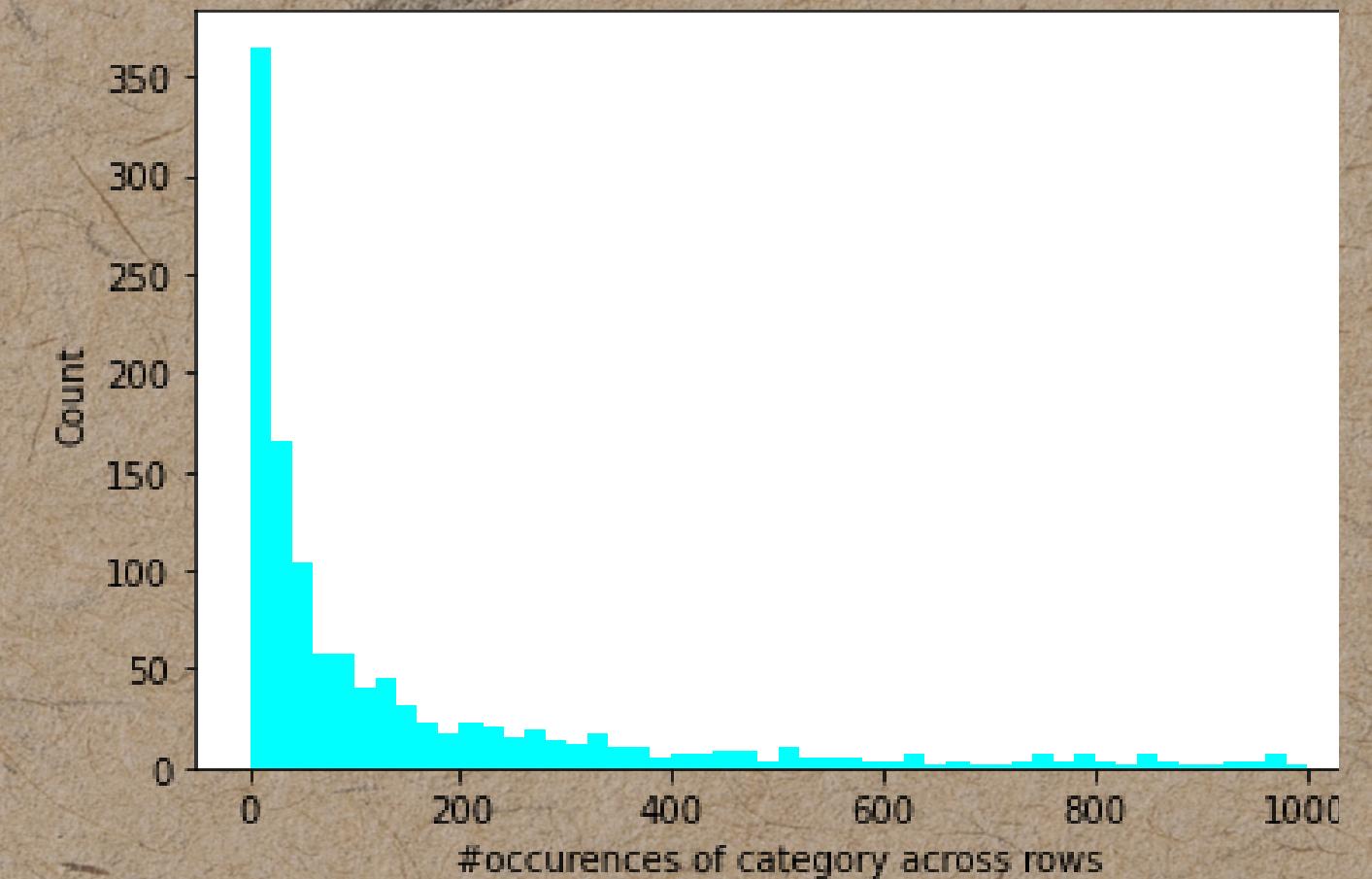
Yelp Dataset:

This dataset contained 5 tables -

- 1.User
- 2.Business
- 3.Checkin
- 4.Tip
- 5.Review

Exploratory Data Analysis

Table Name	Shape
Business	(150346, 14)
Checkin	(131930, 2)
Review	(6990280, 9)
Tip	(908915, 5)
User	(1987897, 22)





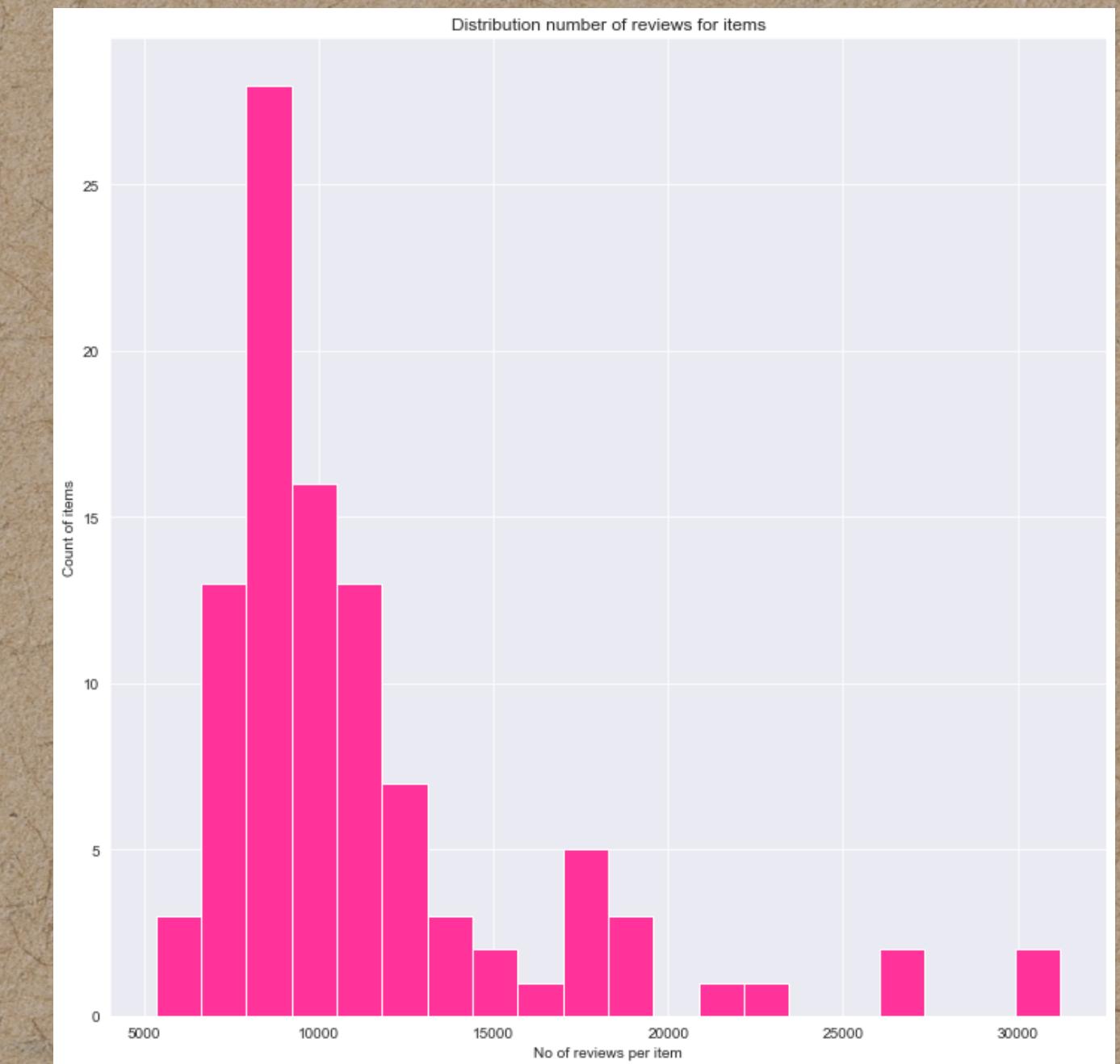
Methodologies Used



1. ITEM-ITEM
COLLABORATIVE
BASED FILTERING
- USING
SIMILARITY
MATRIX
2. COLLABORATIVE
FILTERING USING
SGD
3. HYBRID MODEL

Item-Item Collaborative Based Filtering - Using similarity matrix

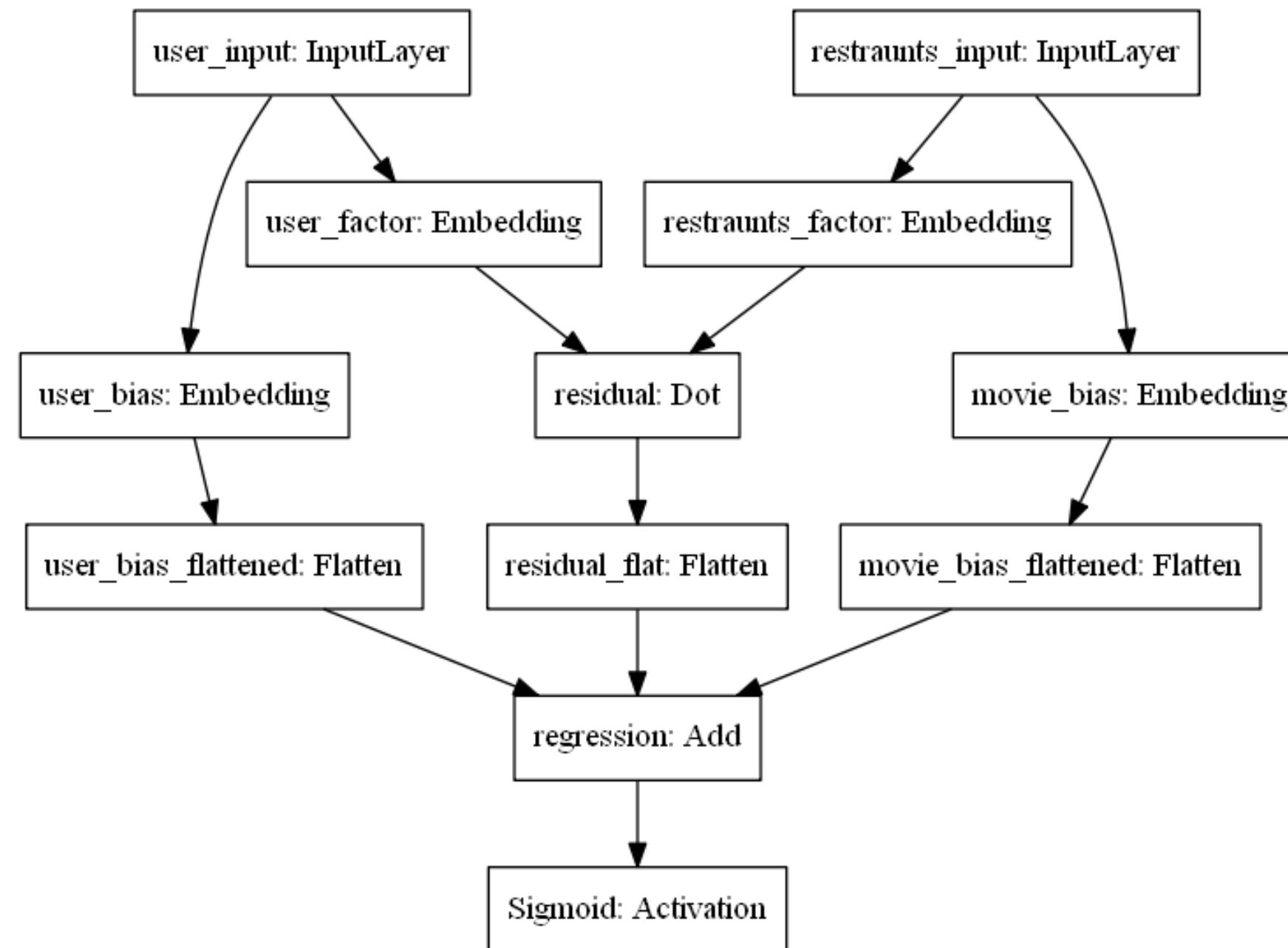
This was achieved by making a UI matrix i.e, User-Item matrix having rows as Users and columns as items.



Cosine Similarity

1. Created Item-Item similarity matrix
2. Calculated user-item score for every unrated item for a user.
3. Predicted top 5 similar restaurants for every user.

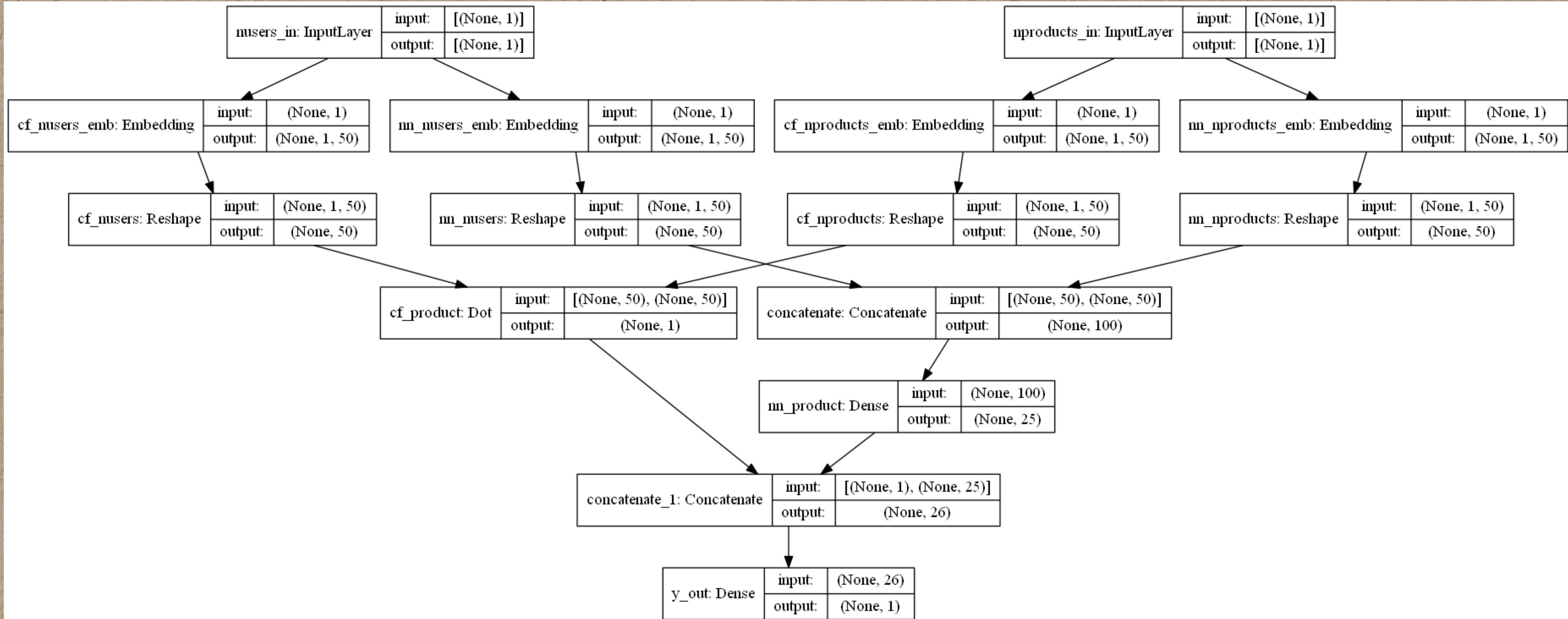
Collaborative Filtering Using SGD



1. Latent Factors - 45
2. Used embedding layer to create embeddings



Hybrid Model



Model Performance: Loss Plot

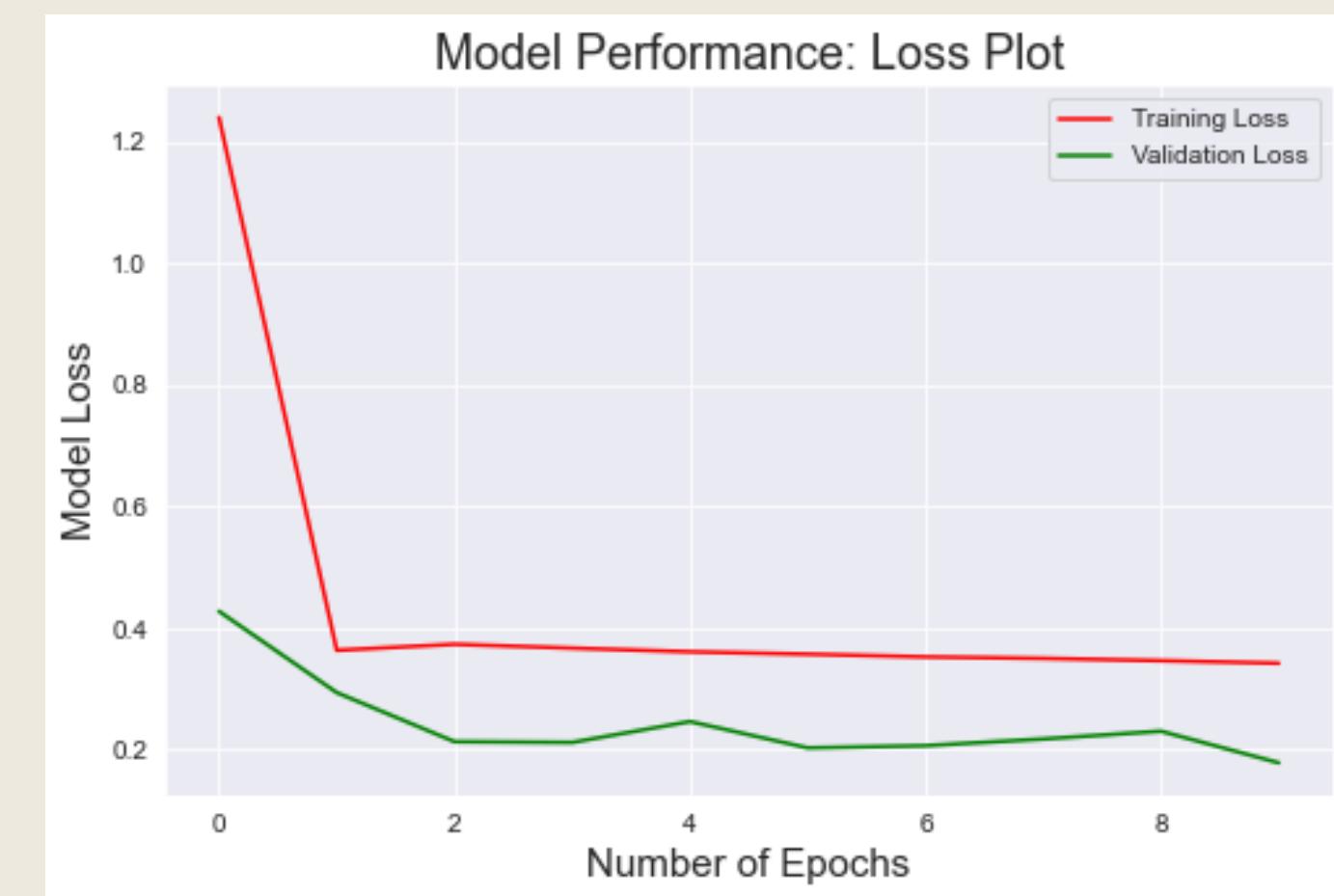


SGD MODEL

HYBRID MODEL



Model Performance: Loss Plot



LOSS PLOTS

Conclusion.

- Time complexity of cosine similarity based collaborative filtering technique was high.
- Amongst the 2 neural networks, the one with hybrid approach seems to perform way better than the other one.

Future Scope.

- Try content based filtering.
- Experiment with more complex models.

Thank you.

