Project Group 16

Team members:

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Yelp Recommendation System:

Recommend a restaurant to a user based on ratings using ensemble learning.

Approach:

-Since ratings matrix is sparse, we plan on using SVD and cosine/adjusted cosine similarity to estimate the unknown ratings that might be given to a restaurant by the user.
-To learn the latent features between users and restaurants, Alternating Least Square method will be used. Also, since there can be bias in the ratings given by a user to a particular restaurant (i.e. A user rates a restaurant higher than its usual ratings), we need to learn this bias and make sure that the prediction is free from such biases. For this purpose, we will be using Stochastic gradient descent and mean centering.
-After learning the latent features between users and restaurants this problem is then a regression or classification problem.
-For classification purposes, we will be using ensemble learning combining linear predictions from a simple 3 layer fully connected neural network and a random forest regressor.

-We will use different collaborative filtering techniques like item-based, used-based to predict the missing ratings.
-Using K- Nearest Neighbour algorithm, we will predict ratings of different restaurants and assign values based on weighted similarity instead of just taking average.
-We will extensively use “surprise” python library to perform these tasks.
-To calculate the correctness of our ratings, we will use various evaluation metrics.
-For Visualization, we will probably use “seaborn” or “matplotlib” libraries.

Dataset:

https://www.kaggle.com/yelp-dataset/yelp-dataset