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Restaurant Recommendation System

The project is to build a recommendation system based on previous customer feedback. For that I used a dataset collected from Kaggle. the dataset is called Zomato. Zomato is an online platform where users can order food. This app can be compared to Uber Eat. https://www.kaggle.com/datasets/absin7/zomato-bangalore-dataset . So, data is collected every time a customer order food, reserve a table at a restaurant or leave a review on the app. Columns of the dataset are as followed:

1. URL: contains the URL of the restaurant on the Zomato website.
2. Address: Contains the address of the restaurant in Bangalore.
3. name: contains the name of the restaurant.
4. online order: whether online ordering is available in the restaurant or not.
5. book table: Table book option available or not.
6. Rate: contains the overall rating of the restaurant out of 5.
7. Votes: contains total number of ratings for the restaurant as of the above-mentioned date.
8. Phone: contains the phone number of the restaurant.
9. Location: contains the neighborhood in which the restaurant is located.
10. rest type: restaurant type.
11. dish_liked: dishes people liked in the restaurant.
12. Cuisines: food styles, separated by a comma.
13. approx_cost(for two people): contains the approximate cost for a meal for two people
14. reviews list list of tuples containing reviews for the restaurant, each tuple consists of two values.

To build the recommendation system based on previous customer restaurant preferences using the above dataset, I will apply collaborative filtering approach. I will use customer ratings or review to recommend restaurants similar customers liked.

Collaborative filtering is a technique used in recommender systems to predict what items a user might like based on the preferences of other similar users.

Data preprocessing:

- Handling Missing Data
- Removing Duplicates
- Converting Data Types
- Outlier Detection
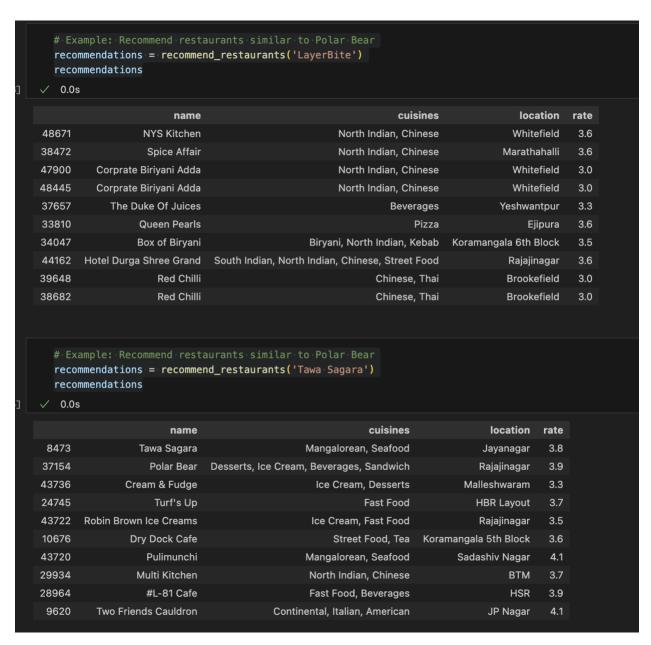- Normalize or scale numeric features for model compatibility.

Model: Content-Based Filtering Approach

I will compute similarities using TF-IDF. TF-IDF stands for term frequency-inverse document frequency, and it's a statistical measurement used to quantify the importance of words in a document:

- Term frequency (TF): The number of times a word appears in a document.
- Inverse document frequency (IDF): Weighs down frequent terms and increases the weight of rare terms.

Tokenize and vectorize "reviews_list "and use cosine similarity to compute restaurant similarities.

Recommendation system:

```python
# Example: Recommend restaurants similar to Polar Bear
recommendations = recommend_restaurants('LayerBite')
recommendations
```
✓ 0.0s

	name	cuisines	location	rate
48671	NYS Kitchen	North Indian, Chinese	Whitefield	3.6
38472	Spice Affair	North Indian, Chinese	Marathahalli	3.6
47900	Corprate Biriyani Adda	North Indian, Chinese	Whitefield	3.0
48445	Corprate Biriyani Adda	North Indian, Chinese	Whitefield	3.0
37657	The Duke Of Juices	Beverages	Yeshwantpur	3.3
33810	Queen Pearls	Pizza	Ejipura	3.6
34047	Box of Biryani	Biryani, North Indian, Kebab	Koramangala 6th Block	3.5
44162	Hotel Durga Shree Grand	South Indian, North Indian, Chinese, Street Food	Rajajinagar	3.6
39648	Red Chilli	Chinese, Thai	Brookefield	3.0
38682	Red Chilli	Chinese, Thai	Brookefield	3.0

```python
# Example: Recommend restaurants similar to Polar Bear
recommendations = recommend_restaurants('Tawa Sagara')
recommendations
```
✓ 0.0s

	name	cuisines	location	rate
8473	Tawa Sagara	Mangalorean, Seafood	Jayanagar	3.8
37154	Polar Bear	Desserts, Ice Cream, Beverages, Sandwich	Rajajinagar	3.9
43736	Cream & Fudge	Ice Cream, Desserts	Malleshwaram	3.3
24745	Turf's Up	Fast Food	HBR Layout	3.7
43722	Robin Brown Ice Creams	Ice Cream, Fast Food	Rajajinagar	3.5
10676	Dry Dock Cafe	Street Food, Tea	Koramangala 5th Block	3.6
43720	Pulimunchi	Mangalorean, Seafood	Sadashiv Nagar	4.1
29934	Multi Kitchen	North Indian, Chinese	BTM	3.7
28964	#L-81 Cafe	Fast Food, Beverages	HSR	3.9
9620	Two Friends Cauldron	Continental, Italian, American	JP Nagar	4.1

```
# Example: Recommend restaurants similar to Polar Bear
recommendations = recommend_restaurants('Udupi Thadka')
recommendations
```

[57] ✓ 0.0s

	name	cuisines	location	rate
9830	Flavour of China	Chinese	BTM	3.8
21391	Flavour of China	Chinese	BTM	3.8
8748	Flavour of China	Chinese	BTM	3.8
28376	Flavour of China	Chinese	BTM	3.8
31134	Flavour of China	Chinese	BTM	3.8
22236	Flavour of China	Chinese	BTM	3.8
1394	Flavour of China	Chinese	BTM	3.8
33676	Flavour of China	Chinese	BTM	3.8
16017	Cinnamon	North Indian, Chinese, Biryani	HSR	3.9
1850	Kabab Treat	North Indian, Chinese	Bannerghatta Road	2.8