**Restaurant Recommender System**

**Problem Statement**

* Craft a user-friendly restaurant recommendation system that understands individual preferences, resulting in delightful dining experiences and stronger customer loyalty.

**Value In Restaurants**

* The project's value lies in a personalized and user-friendly restaurant recommendation system that boosts customer satisfaction and promotes the exploration of new dining options. By tailoring suggestions, our users enjoy delightful dining experiences, potentially attracting new customers to restaurants.

**Data Collection**

* The data collection process involved sourcing the datasets from Kaggle, which were originally provided by Yelp, a prominent online platform for reviews and recommendations. Specifically, we will focus on leveraging the datasets related to Yelp's businesses, reviews, and users to develop a comprehensive and insightful study.

**Data Description**

* The business dataset offers details such as names, locations, ratings, categories, and other attributes.
* The user dataset provides unique user IDs, user first names, and average ratings enabling us to gain insight into user preferences.
* Lastly, the review dataset plays a role by offering valuable insights into user feedback and sentiments regarding various businesses.

**User-Based Information**

* Our primary goal is to enhance the user dining experience by offering tailored restaurant suggestions. To achieve this, we will leverage user ratings and interactions with restaurants as the key features in our modeling. The system's target is to recommend restaurants that align with a specific user's tastes based on their past interactions and dining preferences.

**Cleaning The Datasets**

* We removed all entries that were not restaurants during the data cleaning process. We handled missing values, eliminated duplicates, and standardized text format to ensure data quality and integrity. These steps lay the groundwork for further analysis and modeling in our project.

**Overview Of Datasets**

* The final dataset, comprising 5.5 million entries and 18 columns, underwent thresholding to streamline its size and focus on relevant data. We specifically considered restaurants with at least 100 reviews and users who contributed more than 50 reviews. This selection process ensures that we prioritize restaurants and users with substantial interactions, resulting in a more meaningful and insightful analysis for our recommendation system.

**Machine Learning Model**

* As of the current, a collaborative filtering recommendation system has been implemented as the primary model. Preliminary results indicate that the model successfully provides personalized restaurant suggestions based on user-item interactions.

**Case Example**

* I decided to run our recommender on a local Japanese restaurant in Vancouver, BC – Suika. The recommendations returned were: Kishimoto Japanese Kitchen, Hokkaido Ramen Santouka, Phnom Penh, and Kingyo. Three of the recommended restaurants are Japanese just like Suika, where Phnom Penh is Cambodian – all of which are Asian cuisines. More specifically, Kingyo is a sister restaurant to Suika. However, further analysis and evaluation will be required to fine-tune the model and enhance its accuracy and performance.

**Plan Of Action**

* We will conduct a thorough analysis and evaluation process to improve the accuracy and performance of the model. To tackle sparse data and handle missing values in the user-item matrix, we will leverage the capabilities of FunkSVD. Moreover, we will rely on the Scikit Surprise library to thoroughly assess and analyze the model's performance.