PROFITING RESTAURANTS VIA PERSONALIZED RECOMMENDATION

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Problem Statement

The outbreak of COVID-19 is impacting all businesses, including the hard-working owners, operators, farmers, delivery drivers, staff, and everyone in the food industry. Government and social responses are changing at a rapid pace and we believe it's more important than ever to monitor what's happening to rally support however we can. The restaurant owners are facing fear and are not able to make firm decisions due to these unpredictable times. Few operational restaurants are facing financial constraints and losses. We believe that these restaurants can improve their situation and become profitable if they manage their resources and energy efficiently. The restaurant owners should focus on a reduced menu size and optimize the energy spent on the supply chain i.e. acquiring the raw materials. Our team wants to help them manage their business by designing a system that could recommend which dishes to serve and a way to source raw materials for dishes efficiently and safely by optimizing supply chain management.

Scope/Importance

We are highly motivated to help the restaurant owners in these harsh times as they have made our life easier during our exams. This system can also be utilized by consumers, entrepreneurs as well as cooking enthusiasts who want to stay healthy and rely on organic and local raw materials. Our system can recommend recipes according to the user's choice and how to source organic ingredients for these recipes minimizing cost and energy.

Solution

Our solution consist of a Bi-Fold Recommendation system consisting of the following steps:

A) Recommend Dishes to solve user's purpose :

1. Discover the top selling dishes in the areas neighboring the restaurant .
2. Utilize the technique of user based content recommendation to find top-rated dishes by other restaurants serving the same cuisine.
3. Employing item based content recommendation to find dishes similar to the top dishes based on the ingredients used to make the dish.

B) Ingredient Supplier Recommendation/Supply Chain Path Recommendation

1. For any given recipe, we first check the ingredients required for that recipe from our dataset and then using the FoodMile metrics, calculate the cost of procuring the raw materials needed for the recipe.

2. Since our intention is to spend the least amount of money in the procurement of the ingredients in order to minimize the cost of our recipe, we'll develop a recommendation system based on top of something like the shortest path problem.
3. On the other hand, there would be cases where a restaurant/person already has most of the ingredients needed for the recipe in stock, in which case it would be prudent to make that recipe over the one where they have to get all the ingredients. Our system will take all these things into consideration and recommend them the recipe accordingly.