**Applied Data Science Capstone Project**

**Introduction:**

This is the final assignment as part of Applied Data Science Capstone project. The problem we are trying to solve here is find a suitable area to start a new restaurant and also suggest the type of cuisine.

The people who would be interested in this work includes restaurant owners in the San Francisco area and also the enthusiasts of food business who wants to look at the geographical distribution of the restaurants and the popular cuisines across different neighborhoods of Bay area.

**Data:**

In order to accomplish the requirements above, we need to get some data related to the different types of cuisines in the Bay Area. For our purpose we are mainly focusing on three different types of cuisines:

1. Mexican cuisines
2. Italian cuisines
3. Indian cuisines

As part of the research we found that restaurant operated in a shopping Mall food courts could be more profitable for certain business models. These restaurants are low maintenance as compared to stand alone restaurants since the seating space and furniture are already provided to them. So, we are also gathering the data related to the malls in the Bay Area.

All the data about the venues we need is being consumed from Foursquare database by making some regular and premium calls.

**Methodology:**

We are using the clustering methodology to find the clusters of different types of cuisines in the bay area.

All the Mexican restaurants are denoted by the green circles, the Italian restaurants are denoted by blue circles, and the Indian restaurants are denoted by the red circles. The shopping malls are being denoted by big Yellow circles with zero opacity.

The idea is to generate a map using folium in order to see where the restaurants are located and draw conclusions based on the assumption below.

First assumption is that the restaurants in and around the shopping malls are more profitable than the ones away from the shopping malls as these areas are heavily crowded. The population flow to the restaurants in and around shopping malls is usually very high in the Bay area according to the latest surveys conducted by Yelp.

After finding the perfect area to start a restaurant, we need to fix the type of cuisine we need to establish. So, we are assuming that the chances of success are high, if the new restaurant is a different type of cuisine than the most cuisines in the given area. For examples, if the area has more Mexican and Indian cuisines and less Italian cuisines, it is better to start a new Italian restaurant so that we are automatically reducing some competition here. In order to satisfy the last statement, we need assume that the populations in the given area equally likes all types of cuisines.

**Results:**

Following are the images we generated using Folium.

Italian restaurants in the bay area:

A close up of a map

Description automatically generated

Indian restaurants in the bay area:

A close up of a map

Description automatically generated

Mexican restaurants in the bay area:

A close up of a map

Description automatically generated

Malls in the Bay Area:

A picture containing text, map

Description automatically generated

Combined Image:

**A close up of a map

Description automatically generated**

**Discussion:**

From the above pictures, we can say that the frequency of the types of cuisines vary from area to area. For instance, there are more Mexican cuisines in the concord area than the Italian and Indian cuisines combined. The San Francisco downtown has the highest density of different restaurants. In the Walnut Creek area, there are more Indian restaurants than the other types of cuisines. Similarly, in the Milpitas area, Italian restaurants are famous.

Also, if we consider the restaurants density in malls, there are plenty if malls where there are fewer number of restaurants. For example, the Richmond area mall has only two restaurants around it. It could be a potential area to start up a new restaurant.

**Results:**

Taking all the factors into account the following conclusions can be made about the location for a new restaurant.

For Mexican cuisines, Milpitas would be an ideal location. If a mall location is more appropriate for the business instead of standalone restaurant, Fremont mall would be an ideal location. For Indian restaurants, Livermore would be nice standalone location and Burlingame mall for food court location. For Italian place, San Leandro is good for standalone and Mountain View mall for food court location.