**Recommending Location for Opening a Restaurant in Dallas, Texas**

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1. **Introduction**
   1. **Problem Statement**

Not every available space is right for a restaurant. A good restaurant location is harder to find than some people think. What may look like the perfect spot- say a bustling pedestrian street in the heart of downtown- may turn out to be a dud.

Other times a spot that you would never think to put a restaurant - like in an old shoe shop in a run-down mill town - is a success. Of course, food and service are important to the success of a restaurant, but the location can be just as crucial, especially in the early years. Read on for ten things you should know about selecting a restaurant location

* 1. **Factors Affecting Choices**

**Parking:** Ideally, a new restaurant location should have its own parking lot. If that isn’t an option—for example, in a major city—consider partnering with a hotel in the area that has its own parking options. Many famous restaurants are housed in hotels, and for a good reason. Not only is there parking, but the benefit of foot traffic that is staying right upstairs is incalculable.

**Accessibility:** There’s a reason that major restaurant chains are often located near highway exits: It makes them accessible for customers. Certain restaurants can get away with food or service that isn't the best simply because their locations are so accessible, like restaurants near the Eiffel Tower or Collisseum. There is plenty of foot traffic in urbanized areas, and restaurants only need to attract customers from the street into their business. Most successful restaurants—other than the truly elite—are easy to find, and you will find them in city centers or unique locations throughout the world.

**Visibility:** This goes along with accessibility and is very important for new restaurant locations. People have to know the restaurant is there, either in person or on their mobile devices. It is why property prices in downtown districts and developed strips are higher than in other areas. They offer a level of visibility that can bring in a great deal of walk-in business. Consider advertising in search engines and social media to enhance your presence across all forms of media. Make sure to register your restaurant in search engines as the type of food you offer and your price point, as it will be easier to attract the clientele you want when they go to search.

**Population Base:** Are there enough people in the area to support your business? There need to be enough people who live in or pass through the area regularly to keep you busy. To determine a particular area's population base, you could do a site study. However, these can cost up to $25,000. Most people looking at their first restaurant don’t have enough money in their budget for a professional survey. A less expensive method to determine the population base of a certain area is to use a pie chart, as well as asking the local chamber of commerce and town office for more information. If you would rather pound the pavement, simply walk around the area where you plan to build. Intuition can place a big role in choosing your site.

**Competitors:** When looking for a restaurant location, consider who else is doing business in the neighborhood. Are there already half a dozen restaurants with the same concept as yours? Is the area busy or full of empty storefronts? Successful businesses attract other successful businesses

1. **Targeted audience**

people interested in opening a restaurant in the state of Texas in the united states may need some help in determining the best location to start their business this would require analysis keeping in mind the points discussed above. We can help them decide the most suitable place for their business using location information available at foursquare.

1. **Data Acquisition and Cleaning**
   1. **Data Source**

The data used in this recommendation system was acquired by the following website

<https://public.opendatasoft.com/explore/dataset/us-zip-code-latitude-and-longitude/download/?format=csv&timezone=Asia/Karachi&lang=en&use_labels_for_header=true&csv_separator=%3B>

this dataset has all the information about the zipcode and longitude latitudes of different neighborhoods in the United States.

To get the names of the respective neighborhoods we will use reverse geolocator API to retrieve the names from longitude and latitudes.

The venues at each respective neighborhoods will be retrieved by the foursquare API.

* 1. **Data Cleaning**

The data retrieved consisted of all the zip codes in the United States we required only those of Dallas Texas. So, we searched the keyword Dallas in city and TX in States to and stored them in a data frame. Then we removed any rows with null values in longitude and latitude.

* 1. **Retrieving Names of Neighborhoods**

Our dataframe consisted of the zip code and their longitude and latitudes but not the names so we used the reverse geolocator to get the names from longitude and latitudes this allowed us to have an address to each longitude and latitude. And made our analysis easy.

A close up of text on a white background

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* 1. **Plotting the neighborhoods on the map for visualization**

Once the data was prepared the points were plotted on the map to get a better visualization of the are and the location of the neighborhoods

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* 1. **Searching for all type of venues in each neighborhood**

Next an API call was made to the foursquare API and a list of venues their location and their category was returned by the API this would help us look at the places in each neighborhood and let the investor decide what type of restaurant she may want to open and at what place

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* 1. **Applying one hot encoding to our data**

One hot encoding is a process by which categorical variables are converted into a form that could be provided to ML algorithms to do a better job in prediction

The venue categories were converted in to columns and the rows were neighborhoods with 0 or 1 as values. With 1 representing that certain type of venue is in this neighborhood.

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* 1. **Retrieving Top Five Venues at Each Neighborhood**

Now we will retrieve the top five revenues of each neighborhood and look for places where the restaurants will be successful and where the competition is a lot less. We can see where the people have most interactions.

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1. **K-Mean Clustering**

We would like to make clusters of neighborhoods to see where there is saturation and where there are opportunities available similar neighborhoods would be clustered together and we can easily make our analysis seeing the clusters.

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After our clustering we can see the different colors represent different clusters and the red dot represent a single cluster and represent places.

1. **Conclusion**

After our analysis we can conclude that the following neighborhoods have plenty of opportunity for a restaurant they have customer available and there is not much competition as they only have only popular fast foods and not proper restaurants there is potential in these neighborhoods

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