CLUSTERINGIN NORTH SAN ANTONIO & SURROUNDING AREA

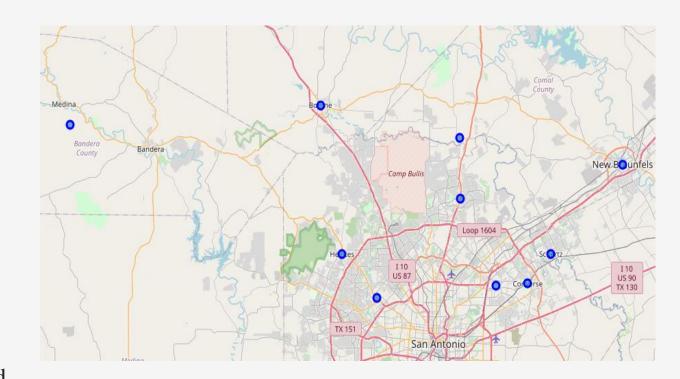
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Background & Objective

- San Antonio, TX is a diverse city that is seeing continued growth, and the surrounding areas are also experiencing an increase in development. It was recently ranked as one of the fastest growing cities in the United States.
- <u>Objective:</u> Find the ideal location for a restaurateur to open a new restaurant in north San Antonio or the surrounding area.

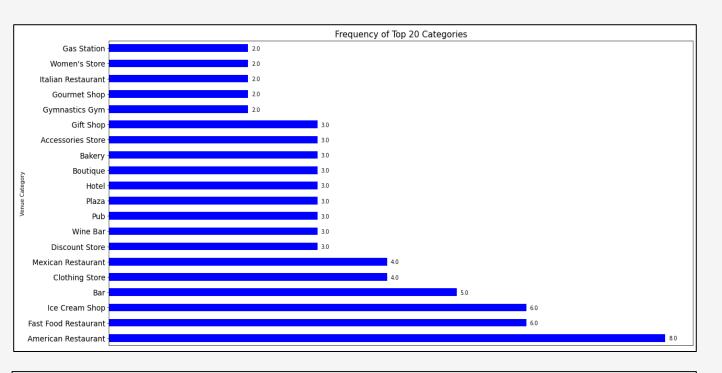
Visualizing Where to Begin

- The Folium package was first used to review the smaller cities within the north San Antonio area, and it was used again after selecting the top cities to review to visualize where they are located.
- The Geocoder package was used to obtain the latitude and longitude of surrounding areas



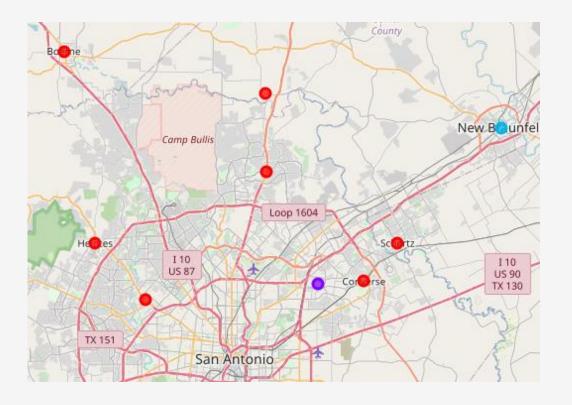
Review the Opportunities

 American Restaurants appear to be popular in this area, and we reviewed the top common venues by neighborhood.



	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Boerne, TX	Boutique	American Restaurant	Café	Burger Joint	Restaurant	Bistro	Hotel	Mexican Restaurant	Snack Place	Gourmet Shop
1	Bulverde, TX	Wine Bar	Gift Shop	Airport	American Restaurant	Discount Store	Cocktail Bar	Coffee Shop	Construction & Landscaping	Convenience Store	Cosmetics Shop
2	Converse, TX	Gas Station	BBQ Joint	Business Service	Construction & Landscaping	Convenience Store	Locksmith	Italian Restaurant	Dive Bar	Ice Cream Shop	Gymnastics Gym
3	Helotes, TX	Discount Store	Pharmacy	Smoke Shop	Fast Food Restaurant	Ice Cream Shop	Burger Joint	Bar	Gas Station	Video Store	American Restaurant
4	Leon Valley, TX	Fast Food Restaurant	Ice Cream Shop	Pawn Shop	Automotive Shop	Other Repair Shop	Pharmacy	Chinese Restaurant	Shoe Store	Mexican Restaurant	Mobile Phone Shop
5	New Braunfels, TX	Bar	Pub	German Restaurant	American Restaurant	Market	Hotel	Plaza	Cocktail Bar	Gourmet Shop	Clothing Store
6	Schertz, TX	Pizza Place	Baseball Field	Weight Loss Center	Gymnastics Gym	Bakery	Clothing Store	Cocktail Bar	Coffee Shop	Construction & Landscaping	Convenience Store
7	Stone Oak, TX	Accessories Store	Clothing Store	Women's Store	American Restaurant	Sandwich Place	Cosmetics Shop	Fast Food Restaurant	Gastropub	Massage Studio	Juice Bar
8	Windcrest, TX	Discount Store	Golf Course	Plaza	Frozen Yogurt Shop	Food Truck	Chinese Restaurant	Clothing Store	Cocktail Bar	Coffee Shop	Construction & Landscaping

Clustering



- K-means clustering (a machine learning technique) was used to divide the areas into three clusters.
- The dataframe with the restaurant venues was transformed using one-hot encoding. The process of one-hot is used for converting categorical variables into a form that can be used in a machine learning algorithm.
- Three clusters were created
 - Cluster 1 contains the most areas, and the neighborhoods in this group appear to have more restaurants in their top 10 common venues.
- Cluster 2 contains fewer restaurants, but it contains dessert and drink locations too.
- Cluster 3 appears to be somewhat similar to Cluster 3, in that it does not have many restaurants. However, it contains an American restaurant.

What's Next?

- Recommendation: Open an American food restaurant in cluster 2 (New Braunfels area).
- Cluster 1 has many restaurants already, and this might indicate that it could already be saturated with restaurants.
- Cluster 3 has fewer restaurants, but it already contains an American restaurant in its top venues.
- This leaves Cluster 2 (New Braunfels area) as the most desirable place to open an American food restaurant.