#### Optimizing a New Food Truck Business in San Diego, CA

#### Introduction

The Food Truck industry has always been popular in San Diego. There are currently at least 50 different food trucks that park all over San Diego to offer their varied comestibles, and the wide range of choices representing all kinds of cuisines from these different vendors is impressive. Food trucks can provide catering services for private or public events, they can add variety to an already booming restaurant industry in San Diego, or they can simply offer an alternative to more traditional fast food options. For these reasons, starting a food truck in San Diego could be a lucrative business opportunity for someone looking to break into the restaurant industry, especially since this could be a less expensive alternative to a more traditional brick-and-mortar restaurant which would have higher overhead costs.

The questions for a potential entrepreneur that arise would be the type of cuisine to offer and the best place or places to park the food truck for maximum profit. The type of cuisine to offer could be a highly personal decision for the business owner, but looking at data for existing restaurants could provide some insight about the areas of San Diego where the competition would be higher or lower by looking at the types of restaurants that are already established in the various neighborhoods. The question of where to park it has several components for consideration. The business owner could simply look for a spot with lots of restaurants but with different cuisines than would be offered on their food truck. They could also look for more industrial or commercial areas with less restaurant density and offer a convenient way for people in these areas to have access to better food options. Another option would be to only offer catering services for private or public events and market themselves as a less expensive alternative to cater food for larger events.

With these questions in mind, the main analysis will be to look at the different regions and neighborhoods in San Diego and analyze the existing businesses and restaurants and make a determination about the optimal way to start a food truck in San Diego.

#### Data

To begin the data analysis, the entirety of San Diego county will need to be broken down into regions. For people who live in this area, the regions of the county are already commonly known as North, South, East, and Central (which includes downtown San Diego and the western coastal region). The next step would be to tie all of the postal codes in San Diego county to these different regions. The best source for this data is the zip code data provided by the San Diego county court system. The website for zip code data provided by the court system shows the zip code, the region, and the city or neighborhood.

Once this data is obtained, the zip codes can be used to query the Foursquare database to retrieve the types of venues associated with these different regions and neighborhoods. These venues can be further analyzed to make a decision about the best place to park a food truck for highest profit potential.

### Methodology

The methodology for this project began with scraping the data from the website <a href="http://www.sdcourt.ca.gov/portal/page?\_pageid=55,1524259&\_dad=portal&\_schema=PORTAL">http://www.sdcourt.ca.gov/portal/page?\_pageid=55,1524259&\_dad=portal&\_schema=PORTAL</a> in order to get the list of San Diego County zip codes with their corresponding neighborhoods and regions. Once this data was transferred to a csv file, it was imported into a Jupyter notebook as a dataframe using pandas. The first 5 rows of this dataframe are shown below.

	Zip Code	City	Region
0	91901	Alpine	EAST
1	91902	Bonita	SOUTH
2	91903	Alpine	EAST
3	91905	Boulevard	EAST
4	91906	Campo	EAST

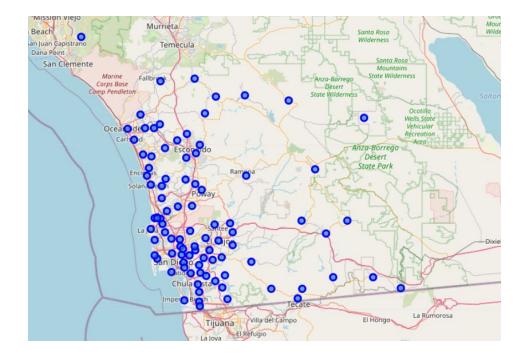
The zip codes column was extracted from this dataframe as a list and used to retrieve the latitude and longitude for each zip code using the pandas geocoders library. These latitudes and longitudes were then added back to the dataframe, as shown below.

	Zip Code	City	Region	Latitude	Longitude
0	91901	Alpine	EAST	48.409197	17.493948
1	91902	Bonita	SOUTH	32.666379	-117.022725
2	91903	Alpine	EAST	48.905857	24.713281
3	91905	Boulevard	EAST	32.662786	-116.312998
4	91906	Campo	EAST	32.662691	-116.481502

Once the latitudes and longitudes were retrieved and added to the dataframe, the zip code column was no longer needed so it was dropped from the dataframe.

	City	Region	Latitude	Longitude
0	Alpine	EAST	48.409197	17.493948
1	Bonita	SOUTH	32.666379	-117.022725
2	Alpine	EAST	48.905857	24.713281
3	Boulevard	EAST	32.662786	-116.312998
4	Campo	EAST	32.662691	-116.481 <mark>50</mark> 2

Now the data was in a usable format to generate a map of San Diego county with the labels on the map formatted as 'City, Region'. The folium library in python was used to generate the map.



The next step in the analysis was to use the city, latitude, and longitude data to retrieve the associated venue information from Foursquare. The resulting information was put into a new dataframe as shown below. Note that the column 'City' was renamed to 'Neighborhood'. Only the first five rows of the dataframe are shown.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Alpine	48.409197	17.493948	Restaurant & Pizza ŠRÁMEK	48.409530	17.495751	Gastropub
1	Alpine	48.409197	17.493948	Piváreň Zákruta	48.408316	17.492037	Bar
2	Bonita	32.666379	-117.022725	Starbucks	32.669177	-117.022423	Coffee Shop
3	Bonita	32.666379	-117.022725	Hans & Harry Bakery	32.670406	-117.021200	Bakery
4	Bonita	32.666379	-117.022725	Club Caribe	32.670370	-117.021281	Nightclub

This dataframe was then grouped by neighborhood and a count of unique categories of venues was determined.

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Alpine	18	18	18	18	18	18
Bonita	12	12	12	12	12	12
Borrego Springs/Ocotillo Wells	1	1	1	1	1	1
Camp Pendleton	46	46	46	46	46	46
Cardiff By The Sea	4	4	4	4	4	4
	2700		2277	***	191110	
Santee	49	49	49	49	49	49
Solana Beach	32	32	32	32	32	32
Spring Valley	10	10	10	10	10	10
Tecate	4	4	4	4	4	4
Vista	77	77	77	77	77	77

There are 258 uniques categories.

Next, one-hot encoding was applied to determine the frequency of each type of venue in each neighborhood. The top five rows of data are shown below, with the 258 columns corresponding to the 258 unique categories.

	АТМ	Accessories Store	American Restaurant	Antique Shop	Apres Ski Bar	Arcade	Art Gallery	Arts & Crafts Store	Arts & Entertainment	Asian Restaurant	Video Store	Vietnamese Restaurant	Warehouse Store	Water Park	Wine Bar	Wine	Winery	Wings Joint	Women's Store	Yoga Studio
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 ro	ws × 2	58 columns																		

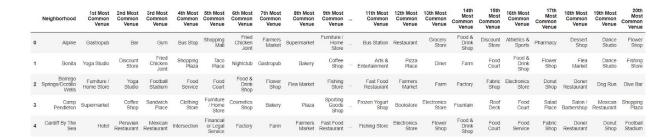
The total number of rows for this dataframe was 1376 which was determined using the shape() method in pandas.

This dataframe was then grouped by 'Neighborhood' to get an average frequency of each type of venue as shown below.

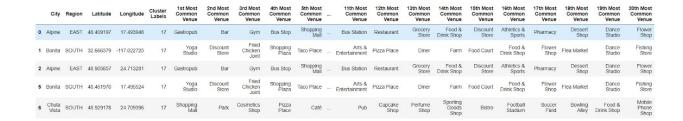
	Neighborhood	ATM	Accessories Store	American Restaurant	Antique Shop	Apres Ski Bar	Arcade	Art Gallery	Arts & Crafts Store	Arts & Entertainment	 Video Store	Vietnamese Restaurant	Warehouse Store	Water Park	Wine	Wine Shop	Winery	Wings Joint	Women's Store	Yoga Studio
0	Alpine	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.000000	0.000000	 0.000000	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.000000
1	Bonita	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.000000	0.083333	0.000000	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.083333
2	Borrego Springs/Ocotillo Wells	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.000000
3	Camp Pendleton	0.000000	0.021739	0.0	0.0	0.0	0.0	0.000000	0.000000	0.000000	 0.000000	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.000000
4	Cardiff By The Sea	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.000000
62	Santee	0.000000	0.000000	0.0	0.0	0.0	0.0	0.020408	0.020408	0.000000	0.020408	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.020408
63	Solana Beach	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.031250	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.000000
64	Spring Valley	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.000000
65	Tecate	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0	0.000000
66	Vista	0.012987	0.000000	0.0	0.0	0.0	0.0	0.000000	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.0	0.012987	0.0	0.012987	0.0	0.000000

67 rows × 258 columns

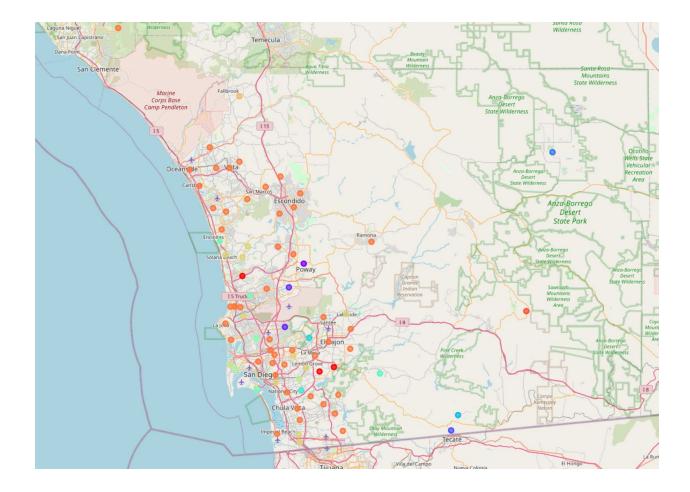
Now that the frequencies were assigned, the resulting frequencies could be sorted in descending order to see the top N most common venues. In this case, N was selected to be 20 to show the top 20 most common venues per neighborhood. This number was selected after some trial and error to show the best possible representation of venue frequencies in San Diego county. The first five rows of the dataframe are shown below.



At this point, the data was ready to be analyzed via K-Means Clustering to break up the different neighborhoods and corresponding venues into statistically related clusters. The number of clusters was chosen to be 20, also after some trial and error to show the optimal number of clusters for the data in San Diego county. A column for cluster labels was added to the dataframe with the first five rows shown below.



A new map with the cluster labels was generated using folium.



The specific data generated for each of these clusters will be discussed further in the results section.

### Results

With the KMeans Cluster analysis complete, the different clusters that were generated can now be examined. The data for each of the clusters is shown below.

### Cluster #1

	City	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	 11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
31	Spring Valley	Pool	Home Service	Seafood Restaurant	Massage Studio	Park	Discount Store	Electronics Store	Fabric Shop	Factory	Hobby Shop	Donut Shop	Fast Food Restaurant	Financial or Legal Service	Fishing Store	Flea Market	Flower Shop	Food & Drink Shop	Farmers Market	
32	Spring Valley	Pool	Home Service	Seafood Restaurant	Massage Studio	Park	Discount Store	Electronics Store	Fabric Shop	Factory	Hobby Shop	Donut Shop		Financial or Legal Service	Fishing Store	Flea Market	Flower Shop	Food & Drink Shop	Farmers Market	
33	Spring Valley	Pool	Home Service	Seafood Restaurant	Massage Studio	Park	Discount Store	Electronics Store	Fabric Shop	Factory	Hobby Shop	Donut Shop	Fast Food Restaurant	Financial or Legal Service	Fishing Store	Flea Market	Flower Shop	Food & Drink Shop	Farmers Market	Doner Restaurant
124	San Diego, Carmel Valley	Park	Pool	American Restaurant	Dog Run	Financial or Legal Service	Fabric Shop	Factory	Farm	Farmers Market	Yoga Studio	Electronics Store	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Fishing Store	Doner Restaurant	Donut Shop

### Cluster #2

	City Con								9th Most Common Venue		12th Most Common Venue			15th Most Common Venue		17th Most Common Venue		Common	
74 Po	Constru way Landsc	ction & aping	Electronics Store	Food Truck	Food Service	Food Court	Food & Drink Shop	Flower Shop	Flea Market	Financial or Legal Service	Fast Food Restaurant	Farmers Market	Farm	Factory	Fabric Shop	Donut Shop	Cultural Center	Doner Restaurant	Dog Run

	City	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	 11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
44	Del Mar	Bar	Beach	Business Service	Italian Restaurant	Shopping Mall	Fishing Store	Farm	Farmers Market	Fast Food Restaurant	Yoga Studio	Factory	Flower Shop	Food & Drink Shop	Food Court	Food Service	Flea Market	Fabric Shop	Football Stadium	Electronics Store
119	San Diego, Tierrasanta	Park	Baseball Field	Trail	Basketball Court	Yoga Studio	Electronics Store	Factory	Farm	Farmers Market	Financial or Legal Service	Fishing Store	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Donut Shop	Football Stadium
125	San Diego, Scripps Ranch	Park	Home Service	Financial or Legal Service	Nightlife Spot	Yoga Studio	Food Court	Food & Drink Shop	Flower Shop	Flea Market	Fast Food Restaurant	Farmers Market	Farm	Factory	Fabric Shop	Electronics Store	Donut Shop	Food Truck	Doner Restaurant	Dog Run
135	San Diego, Tierrasanta	Park	Baseball Field	Trail	Basketball Court	Yoga Studio	Electronics Store	Factory	Farm	Farmers Market	Financial or Legal Service	Fishing Store	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Donut Shop	Football Stadium

# Cluster #4

	City	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		12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
34	Tecate	Café	Beach	Resort	Financial or Legal Service	Factory	Farm	Farmers Market	Fast Food Restaurant	Yoga Studio ···	Fishing Store	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Donut Shop	Football Stadium	Doner Restaurant
35	Tecate	Café	Beach	Resort	Financial or Legal Service	Factory	Farm	Farmers Market	Fast Food Restaurant	Yoga Studio ···	Fishing Store	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Donut Shop	Football Stadium	Doner Restaurant

# Cluster #5

City	1st Most Common Venue	Common	Common	Common	Common	Common	Common	Common	9th Most Common Venue	Common	Common	Common	Common	Common	Common	Common	18th Most Common Venue	Common	20th Most Common Venue
Borrego 37 Springs/Ocotillo Wells	Furniture / Home Store	Yoga Studio	Football Stadium	Food Service	Food Court	Food & Drink Shop	Flower	Flea Market	Fishing Store	Fast Food Restaurant	Farmers Market	Farm	Factory	Fabric Shop	Electronics Store	Donut Shop	Doner Restaurant	Dog Run	Dive Bar

# Cluster #6

	City	1st Most Common Venue								9th Most Common Venue			13th Most Common Venue		15th Most Common Venue	16th Most Common Venue		18th Most Common Venue	Common	20th Most Common Venue
168	San Diego, Polando	Grocery Store	Department Store	Yoga Studio	Financial or Legal Service	Fabric Shop	Factory	Farm	Farmers Market	Fast Food Restaurant	Donut Shop	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Electronics Store	Doner Restaurant	Football Stadium	Dog Run

# Cluster #7

City		2nd Most Common Venue			Common				9th Most Common Venue		12th Most Common Venue			15th Most Common Venue		17th Most Common Venue	18th Most Common Venue		
30 Potrero	RV Park	Café	Yoga Studio	Electronics Store	Food Service	Food Court	Food & Drink Shop	Flower Shop	Flea Market ···	Financial or Legal Service	Fast Food Restaurant	Farmers Market	Farm	Factory	Fabric Shop	Donut Shop	Football Stadium	Doner Restaurant	Dog Run

### Cluster #8

City	1st Most	2nd Most	3rd Most	4th Most	5th Most	6th Most	7th Most	8th Most	9th Most	11th Most	12th Most	13th Most	14th Most	15th Most	16th Most	17th Most	18th Most	19th Most	20th Most
	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common	Common
	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue	Venue
San 114 Diego, Navajo	Smoke Shop	Liquor Store	Yoga Studio	Electronics Store	Food Service	Food Court	Food & Drink Shop	Flower Shop	Flea Market ···	Financial or Legal Service	Fast Food Restaurant	Farmers Market	Farm	Factory	Fabric Shop	Donut Shop	Football Stadium	Doner Restaurant	Dog Run

# Cluster #9

	City	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
133	San Diego, Paradise Hills	Baby Store	High School	Business Service	Night Market	Yoga Studio	Fishing Store	Farm	Farmers Market	Fast Food Restaurant	Flea Market	Fabric Shop	Flower Shop	Food & Drink Shop	Food Court	Food Service	Factory	Donut Shop	Electronics Store	Football Stadium

City	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	Common Venue	19th Most Common Venue	Common Venue
20 Jamul	Business Service	Yoga Studio	Cultural Center	Food Truck	Food Service	Food Court	Food & Drink Shop	Flower Shop	Flea Market ···	Financial or Legal Service	Fast Food Restaurant	Farmers Market	Farm	Factory	Fabric Shop	Electronics Store	Donut Shop	Doner Restaurant	Dog Run

# Cluster #11

	City	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	 11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
38	Cardiff By The Sea	Hotel	Peruvian Restaurant	Mexican Restaurant	Intersection	Financial or Legal Service	Factory	Farm	Farmers Market	Fast Food Restaurant	Fishing Store	Electronics Store	Flower	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Doner Restaurant	Donut Shop	Football Stadium
79	Santa Ysabel	Hotel	Bakery	Food Truck	Bus Station	Fast Food Restaurant	Food Service	Food Court	Food & Drink Shop	Flower	Fishing Store	Financial or Legal Service	Farmers Market	Farm	Factory	Fabric Shop	Electronics Store	Fountain	Donut Shop	Doner Restaurant
113	Coronado	Hotel	Harbor / Marina	Mexican Restaurant	Seafood Restaurant	Beach	Gift Shop	Factory	Farm	Farmers Market	Financial or Legal Service	Fishing Store	Flea Market	Flower	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Electronics Store	Football Stadium
116	San Diego, Sorrento Valley	Hotel	Tex-Mex Restaurant	Sushi Restaurant	Playground	Deli / Bodega	Mexican Restaurant	Restaurant	Café	Factory	Farmers Market	Yoga Studio	Fast Food Restaurant	Financial or Legal Service	Fabric Shop	Flea Market	Flower Shop	Food & Drink Shop	Fishing Store	Doner Restaurant
159	Coronado	Hotel	Harbor / Marina	Mexican Restaurant	Seafood Restaurant	Beach	Gift Shop	Factory	Farm	Farmers Market	Financial or Legal Service	Fishing Store	Flea Market	Flower	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Electronics Store	Football Stadium
164	San Diego, Sorrento Valley	Hotel	Tex-Mex Restaurant	Sushi Restaurant	Playground	Deli / Bodega	Mexican Restaurant	Restaurant	Café	Factory	Farmers Market	Yoga Studio	Fast Food Restaurant	Financial or Legal Service	Fabric Shop	Flea Market	Flower Shop	Food & Drink Shop	Fishing Store	Doner Restaurant

# Cluster #12

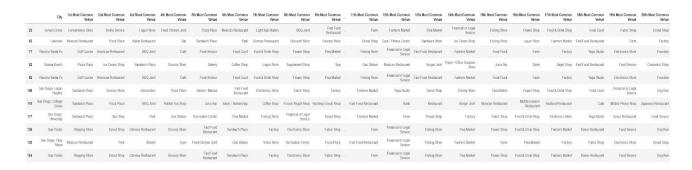
	City	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	th Most common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
10	San Diego, Linda Vista	Japanese Restaurant	Dog Run	Fishing Store	Factory	Farm	Farmers Market	Fast Food Restaurant	Financial or Legal Service	Yoga Studio ···	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Food Truck	Fabric Shop	Donut Shop	Fountain	Doner Restaurant
15	San Diego, Linda Vista	Japanese Restaurant	Dog Run	Fishing Store	Factory	Farm	Farmers Market	Fast Food Restaurant	Financial or Legal Service	Yoga Studio	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Food Truck	Fabric Shop	Donut Shop	Fountain	Doner Restaurant

# Cluster #13

	City	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	 11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
101	San Diego, Point Loma	Coffee Shop	Supermarket	Mexican Restaurant	Yoga Studio	Financial or Legal Service	Factory	Farm	Farmers Market	Fast Food Restaurant	 Fishing Store	Electronics Store	Flower Shop	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Donut Shop	Football Stadium	Doner Restaurant
149	San Diego, Point	Coffee Shop	Supermarket	Mexican Restaurant	Yoga Studio	Financial or Legal Service	Factory	Farm	Farmers Market	Fast Food Restaurant	Fishing Store	Electronics Store	Flower	Food & Drink Shop	Food Court	Food Service	Fabric Shop	Donut Shop	Football Stadium	Doner Restaurant

# Cluster #14

	City	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
102	San Diego, Ocean Beach	Park	Botanical Garden	Construction & Landscaping	Fishing Store	Factory	Farm	Farmers Market	Fast Food Restaurant	Financial or Legal Service	Flea Market	Electronics Store	Food & Drink Shop	Food Court	Food Service	Food Truck	Fabric Shop	Yoga Studio	Fountain	Donut Shop
109	San Diego, Encanto	Park	Construction & Landscaping	Bakery	Financial or Legal Service	Fabric Shop	Factory	Farm	Farmers Market	Fast Food Restaurant	Fishing Store	Flower	Food & Drink Shop	Food Court	Food Service	Food Truck	Electronics Store	Yoga Studio	Fountain	Donut Shop
155	San Diego, Encanto	Park	Construction & Landscaping	Bakery	Financial or Legal Service	Fabric Shop	Factory	Farm	Farmers Market	Fast Food Restaurant	Fishing Store	Flower Shop	Food & Drink Shop	Food Court	Food Service	Food Truck	Electronics Store	Yoga Studio	Fountain	Donut Shop



#### Cluster #16



### Cluster #17

	City	Common		Common Venue		Common Venue				Common Venue			Common	Common			Common Venue		Common Venue	
141	San Diego, Nestor	Fast Food Restaurant	Seafood Restaurant	Harbor / Marina	Yoga Studio	Fabric Shop	Factory	Farm	Farmers Market	Financial or Legal Service	Fishing	Flea Market	Flower Shop	Food & Drink Shop	Food Court	Food Service	Electronics Store	Doner Restaurant	Football Stadium	Dog Run

#### Cluster #18

\*Note: Only the first few rows of this data frame are shown due to the size of this particular cluster. The entirety of this cluster can be viewed in the associated Jupyter Notebook on Github. This cluster has a total of 105 rows of data.

	City	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	11th Most Coennion Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	19th Most Common Venue	16th Most Common Venue	17th Most Common Venue	18th Most Common Venue	19th Most Common Venue	20th Most Common Venue
0	Alpre	Gestropub	Bar	Gym	Bus Stop	Shopping Mall	Fried Chicken Joint	Farmers Market	Supermarket	Familiare / Home Stora	Bus Station	Restaurant	Grocery Store	Food & Drink Shop	Discount Store	Athletics & Sports	Pharmacy	Dessert Shop	Dance Studio	Flower Shop
1	Bonita	Yoga Studio	Discount Store	Fried Chicken Joint	Shopping Plaza	Taco Place	Nightclub	Gastropub	Bakery	Coffee Shop	Arts & Entertainment	Pizza Place	Diner	Fam	Food Court	Food & Drink Shop	Flower Shop	Floa Market	Dance Studio	Fishing Store
2	Algine	Gastropub	Bar	Gyn	Bus Stop	Shopping Mail	Fried Chicken Joint	Farmers Market	Supermarket	Furniture / Home Store	Bus Station	Restaurant	Grocery Store	Food & Drink Shop	Discount Store	Athletics & Sports	Pharmacy	Dessert Shop	Dance Studio	Flower Shop
5	Bonita	Yoga Studio	Discount Store	Fried Chicken Joint	Shopping Plaza	Taco Place	Nightclub	Gastropub	Bakery	Coffee Shop	Arts & Entertainment	Pizza Place	Diner	Farm	Food Court	Food & Drink Shop	Flower Shop	Flea Market	Dance Studio	Fishing Store
6	Chula Vista	Shopping Mail	Park	Cosmotics Shop	Pizza Place	Cate	Clothing Store	Furniture / Home Store	Electronics Store	Supermarket	Pub	Cupcake Shop	Perfume Shop	Sporting Goods Shop	Bistro	Foobal Stedum	Soccer Field	Bowing Alley	Food & Drink Shop	Mobile Phone Shop
7	Chula Vista	Shopping Mail	Park	Cosmetics Shop	Pizza Place	Cate	Clothing Store	Furniture / Home Store	Electronics Store	Supermarket	Pub	Capcake Shop	Perfume Shop	Sporting Goods Shop	Bistro	Football Stadium	Soccer Field	Bowing Alley	Food & Drink Shop	Mobile Phone Shop
8	Chula Vista	Shopping Mall	Park	Cosmetics Shop	Pizza Place	Caté	Clothing Store	Furniture / Home Store	Electronics Store	Supermarket .	Pub	Cupcake Shop	Perfume Shop	Sporting Goods Shop	Bistro	Football Stadium	Soccer Field	Bowing Alley	Food & Drink Shop	Mobile Phone Shop
9	Chula Vista	Shopping Mall	Park	Cosmetics Shop	Pizza Place	Calli	Clothing Store	Furnture / Home Store	Electronics Store	Supermarket	Pub	Cupcake Shop	Perlume Shop	Sporting Goods Shop	Bsto	Football Stadium	Soccer Field	Bowing Alley	Food & Drink Shop	Mobile Phone Shop
10	Chala Vista	Shopping Mail	Park	Cosmetics Shop	Pizza Place	Calli	Clothing Store	Furniture / Home Store	Electronics Store	Supermarket .	Pub	Cupcake Shop	Perfume Shop	Sporting Goods Shop	Bsto	Football Stadium	Soccer Field	Bowing Alloy	Food & Drink Shop	Mobile Phone Shop
-11	Chala Vista	Shopping Mail	Park	Cosmetics Shop	Puzza Place	Cath	Cletting Store	Furniture / Home Store	Electronics Store	Supermarket	Pub	Cupcake Shop	Perfume Shop	Sporting Goods Shop	Bstro	Footbal Stadium	Soccer Field	Bowing Alley	Food & Drink Shop	Mobile Phone Shop
12	Chala Vista	Shopping Mail	Park	Cosmotics Shop	Puza Place	Cato	Clething Store	Furniture / Home Store	Electronics Store	Supermarket	Pub	Cupcako Shop	Perfume Shop	Sporting Goods Shop	Bistro	Football Stadium	Soccer Field	Bowing Alloy	Food & Drink Shop	Mobile Phone Shop
15	Chula Vista	Shopping Mail	Park	Cosmotics Shop	Pizza Place	Caté	Clothing Store	Furniture / Home Store	Electronics Store	Supermarket	Pub	Cupcake Shop	Parlume Shop	Sporting Goods Shop	Bistro	Football Stadium	Soccer Field	Bowing Alley	Food & Drink Shop	Mobile Phone Shop
17	Imperial Beach	Playground	Food & Drink Shop	Intersection	Bus Stop	Fast Food Restaurant	Pharmacy	Yoga Studio	Financial or Legal Service	Factory	Farmers Market	Flea Market	Fishing Store	Electronics Store	Flower Shop	Food Court	Food Service	Fabric Shop	Doner Restaurant	Donat Shop
18	Imperial Beach	Playground	Food & Drink Shop	Intersection	Bus Stop	Fast Food Restaurant	Pharmacy	Yoga Stido	Financial or Legal Service	Fectory	Farmers Market	Flea Market	Fishing Store	Electronics Store	Flower Stop	Feed Court	Food Service	Fabric Shop	Doner Restaurant	Donat Shop
21	La Mesa	Home Service	Toy / Game Store	Plaza	Bus Station	Mexican Restaurant	Pool	Health & Beauty Service	Hawaian Restaurant	Dog Run .	Fies Market	Fishing Store	Financial or Legal Service	Fast Food Restaurant	Farmers Market	Fam	Factory	Fabric Shop	Electronics Store	Donal Shop
22	La Mesa	Home Service	Toy / Game Stone	Plaza	Bus Station	Mexican Restaurant	Pool	Health & Beauty Service	Hawaian Restaurant	Dog Run	Flee Market	Fishing Store	Financial or Legal Service	Fast Food Restaurant	Farmers Market	Farm	Factory	Fabric Shop	Electronics Store	Donal Shop
23	La Mesa	Home Service	Toy / Game Store	Plaza	Bus Station	Mexican Restaurant	Pool	Health & Beauty Service	Hawaien Restaurant	Dog Run	Floa Market	Fishing Store	Financial or Legal Service	Fast Food Restaurant	Farmers Market	Fam	Factory	Fabric Shop	Electronics Store	Donat Shop

	City					Common	Common	Common		9th Most Common Venue							17th Most Common Venue		19th Most Common Venue	
26	Mount Laguna	Park	Breakfast Spot	Inn	Financial or Legal Service	Fabric Shop	Factory	Farm	Farmers Market	Fast Food Restaurant	Electronics Store	Flea Market	Flower	Food & Drink Shop	Food Court	Food Service	Food Truck	Fishing Store	Donut Shop	Doner Restaurant

#### Cluster #20

City			Common	Common	Common	Common	Common	Common	9th Most Common Venue			Common		Common		Common		Common	
16 Guatay	Bus	Café	Yoga	Football	Food	Food	Food &	Flower	Flea Market ···	Financial or Legal	Fast Food Restaurant	Farmers Market	Farm	Factory	Fabric	Electronics	Donut Shop	Doner	Dog Run

#### Discussion

At first, this data seems very unbalanced given that one of the clusters is much larger than the others. But knowing the way that the population is distributed in San Diego county, it actually makes sense. The vast majority of the population is located closer to the coast and away from the desert, and so this is where the majority of the venues would be located as well. Therefore, what we are seeing is one very large cluster and several smaller ones.

As far as the best location for a food truck, there are many options here to consider. The first one would be to examine the smaller clusters and see if there is an opportunity there to capitalize on the fact that there aren't as many restaurants in these regions. Looking at the first 3 clusters, we can see that the most common venue is not a restaurant, so there is opportunity here to add a new dining option in these areas. The next few clusters, through cluster #10, represent some of the communities on the outskirts of San Diego county where there is less population due to the proximity to the desert. Although there may be a good opportunity for a new restaurant business here, the locations of these communities are not very

convenient to travel to for a food truck. However, looking at cluster #11, we see that the most common venue for these areas is a hotel. This could be a prime opportunity for a food truck to offer a less expensive and more convenient dining option for tourists who may want to grab some food quickly to go. The remaining clusters, with the exception of cluster #18, show areas that have several restaurant options available but could still have some opportunity for a food truck if the particular type of cuisine was chosen carefully so as not to clash with any existing businesses.

Looking at the largest cluster from the analysis, cluster #18, we can see that restaurants are quite common in these areas. However, if we look closely, we can see that there are some areas where there are opportunities for new restaurants. For example, Chula Vista and San Marcos both have a shopping mall or plaza as their most common venues. These areas would not only be a good location for a food truck, the large parking lots would provide a convenient place to park one. There are other areas such as Imperial Beach and Santee that list a park or playground as the most common venue. Once again, this is a prime opportunity for a food truck given the ease of parking a food truck here and the lack of other dining options for patrons of these parks. Other areas of note are La Mesa and El Cajon that list other retail businesses as being more common than restaurants. The lower restaurant density here could be a good opportunity for a food truck to start a business.

#### Conclusion

In summary, there are many potential business opportunities in San Diego for someone looking to start a food truck business, especially if a potential entrepreneur is flexible and adaptable to available opportunities. The analysis of this data shows that there are specific neighborhoods around the county that could potentially be very profitable for a food truck, particularly given that the mobile nature of a food truck would allow for trying out several different areas to find the most profitable one.

#### References

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