Opening a Food Delivery Company in Paris

Presentation

Introduction & Business Problem

- The city of Paris is an international city with a population of 2,148,271 residents.

- The city of Paris is divided into twenty administrative districts, more simply referred to as **"arrondissements".**

- **A local food delivery company** with a limited startup budget is about to open in the city. In its early years of creation, the company's motivation is to partner up with the **biggest number of restaurants and supermarkets** while offering the top-notch customer service to their clients.

- Their business strategy for the next five years is to focus on only **two districts**- ideally next to each to other- and then expand from there once they become financially ready.

- This company wants to know which are the two best districts among the twenty that will **maximize their revenue for the first year while minimizing their operating costs.**

Data Description

- The data about all the districts of Paris was found on this website : https://fr.geneawiki.com/index.php/Liste_des_quartiers_de_Paris

- This data was combined with geospatial data from **Google Maps**.

- The location data that will be used in this analysis is the *Foursquare* data.

- We will be using API calls to their server to identify the location of venues that best match the company's objectives and business plan.

Methodology

- Data was cleaned and merged with the Geospatial Data to produce this data frame.

	Postal Code	District	Neighborhoods	Latitude	Longitude	Population Density ha/km²
0	75001	Le Louvre	01 - Saint-Germain-l'Auxerrois 02 - Les Halles...	48.8592	2.3417	9 041
1	75002	La Bourse	05 - Gaillon 06 - Vivienne 07 - Le Mail 08 - B...	48.8655	2.3426	21 006
2	75003	Le Temple	09 - Les Arts-et-Métiers 10 - Les Enfants-Roug...	48.8637	2.3615	29 956
3	75004	L'Hôtel-de-Ville	13 - Saint-Merri 14 - Saint-Gervais 15 - L'Ars...	48.8601	2.3507	16 966
4	75005	Le Panthéon	17 - Saint-Victor 18 - Le Jardin-des-Plantes 1...	48.8448	2.3471	23 359

- This data frame was used to produce a map describing the locations of all the districts of Paris with the help of the Folium library.
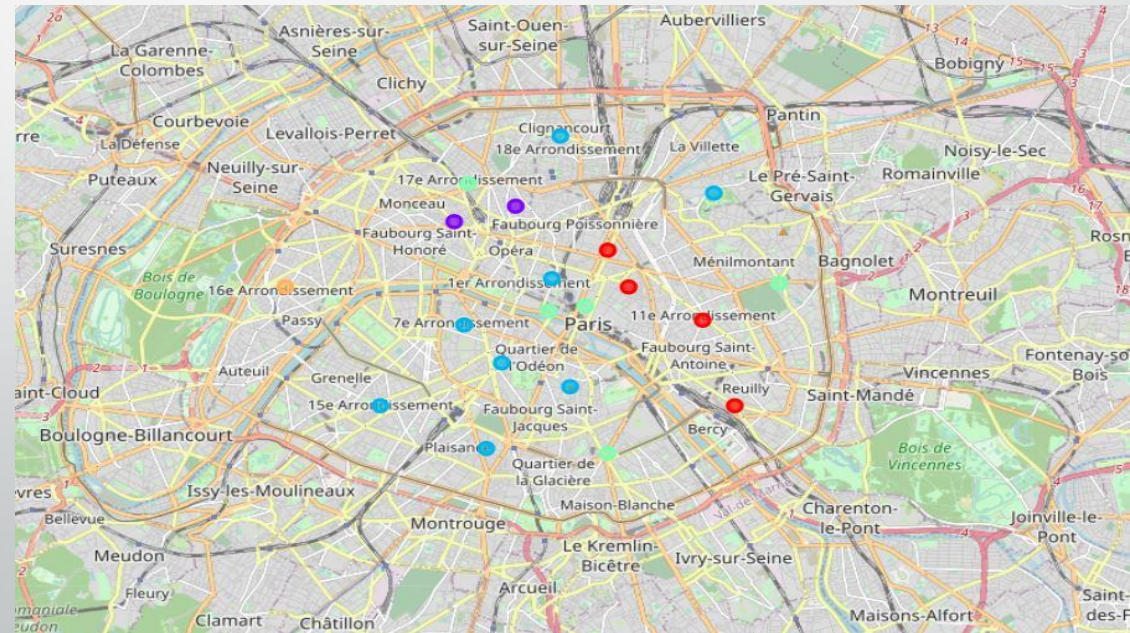
Methodology

- At the outset of the API calls to the Foursquare, **937 venues** were extracted and **162 unique categories.**

- The districts are then grouped by taking the mean frequency of occurrence of each category. Using this information, a data frame has been that has the 10 most common venues for each district.

- The machine learning algorithm that will be used for this project is Kmeans.

	District	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	L'Enclos-Saint-Laurent	Cocktail Bar	Hotel	French Restaurant	Seafood Restaurant	Bar	Breakfast Spot	Pizza Place	Bakery	Coffee Shop	Bistro
1	L'Hôtel-de-Ville	French Restaurant	Art Gallery	Ice Cream Shop	Bakery	Burger Joint	Pub	Bar	Plaza	Gay Bar	Park
2	L'Observatoire	French Restaurant	Hotel	Bar	Bakery	Italian Restaurant	Bistro	Garden	Bookstore	Brasserie	Southwestern French Restaurant
3	L'Opéra	French Restaurant	Hotel	Cocktail Bar	Italian Restaurant	Wine Bar	Lounge	Bistro	Café	Museum	Juice Bar
4	L'Élysée	Hotel	Italian Restaurant	Café	French Restaurant	Bar	Thai Restaurant	Theater	Bakery	Wine Shop	Modern European Restaurant

Results

The results of the KMeans analysis were very promising. The algorithm produced 5 clusters labeled from 0 to 4 shown on the map.

	Postal Code	District	Neighborhoods	Latitude	Longitude	Population Density ha/km²	Cluster Labels	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
0	75001	Le Louvre	01 - Saint-Germain-l'Auxerrois 02 - Les Halles...	48.8592	2.3417	9 041	3	Plaza	Hotel	French Restaurant	Bar	Tea Room	Theater	Wine Bar
1	75002	La Bourse	05 - Gaillon 06 - Vivienne 07 - Le Mail 08 - B...	48.8655	2.3426	21 006	2	French Restaurant	Hotel	Bistro	Italian Restaurant	Restaurant	Spa	Clothing Store
2	75003	Le Temple	09 - Les Arts-et-Métiers 10 - Les Enfants-Roug...	48.8637	2.3615	29 956	0	Japanese Restaurant	Italian Restaurant	Vietnamese Restaurant	Cocktail Bar	Sandwich Place	Art Gallery	Burger Joint
3	75004	L'Hôtel-de-Ville	13 - Saint-Merri 14 - Saint-Gervais 15 - L'Ars...	48.8601	2.3507	16 966	3	French Restaurant	Art Gallery	Ice Cream Shop	Bakery	Burger Joint	Pub	Bar
4	75005	Le Panthéon	17 - Saint-Victor 18 - Le Jardin-des-Plantes 1...	48.8448	2.3471	23 359	2	French Restaurant	Italian Restaurant	Pub	Wine Bar	Coffee Shop	Plaza	Bakery

Results

	District	Population Density ha/km²	Cluster Labels	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
2	Le Temple	29 956	0	Japanese Restaurant	Italian Restaurant	Vietnamese Restaurant	Cocktail Bar	Sandwich Place	Art Gallery	Burger Joint	Bistro	Café	Bookstore
9	L'Enclos-Saint-Laurent	31 754	0	Cocktail Bar	Hotel	French Restaurant	Seafood Restaurant	Bar	Breakfast Spot	Pizza Place	Bakery	Coffee Shop	Bistro
10	Popincourt	40 827	0	French Restaurant	Cocktail Bar	Italian Restaurant	Bistro	Café	Wine Bar	Pastry Shop	Bar	Gluten-free Restaurant	Pizza Place
11	Reuilly	22 345	0	Hotel	Bistro	Supermarket	Chinese Restaurant	French Restaurant	Japanese Restaurant	Bar	Cheese Shop	Middle Eastern Restaurant	Soup Place

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7	L'Élysée	9 457	1	Hotel	Italian Restaurant	Café	French Restaurant	Bar	Thai Restaurant	Theater	Bakery	Wine Shop	Modern European Restaurant
8	L'Opéra	27 251	1	French Restaurant	Hotel	Cocktail Bar	Italian Restaurant	Wine Bar	Lounge	Bistro	Café	Museum	Juice Bar

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1	La Bourse	21 006	2	French Restaurant	Hotel	Bistro	Italian Restaurant	Restaurant	Spa	Clothing Store	Bakery	Pizza Place	Plaza
4	Le Panthéon	23 359	2	French Restaurant	Italian Restaurant	Pub	Wine Bar	Coffee Shop	Plaza	Bakery	Bar	Creperie	Hotel
5	Le Luxembourg	19 734	2	French Restaurant	Bakery	Hotel	Wine Bar	Art Gallery	Chocolate Shop	Dessert Shop	Cocktail Bar	Coffee Shop	Cupcake Shop
6	Le Palais-Bourbon	13 235	2	French Restaurant	Hotel	Bistro	Italian Restaurant	Coffee Shop	Art Museum	Park	Chocolate Shop	Bakery	Pizza Place
13	L'Observatoire	24 821	2	French Restaurant	Hotel	Bar	Bakery	Italian Restaurant	Bistro	Garden	Bookstore	Brasserie	Southwestern French Restaurant
14	Vaugirard	27 712	2	French Restaurant	Hotel	Italian Restaurant	Coffee Shop	Japanese Restaurant	Supermarket	Korean Restaurant	Lebanese Restaurant	Bar	Ethiopian Restaurant
17	La Butte-Montmartre	32 875	2	French Restaurant	Bar	Pizza Place	Café	Wine Bar	Italian Restaurant	Gastropub	Restaurant	Deli / Bodega	Coffee Shop
18	Les Buttes-Chaumont	27 342	2	French Restaurant	Italian Restaurant	Bar	Pool	Restaurant	Beer Garden	Dessert Shop	Concert Hall	Park	Scenic Lookout

Results

	District	Population Density ha/km²	Cluster Labels	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	Le Louvre	9 041	3	Plaza	Hotel	French Restaurant	Bar	Tea Room	Theater	Wine Bar	Clothing Store	Restaurant	Church
3	L'Hôtel-de-Ville	16 966	3	French Restaurant	Art Gallery	Ice Cream Shop	Bakery	Burger Joint	Pub	Bar	Plaza	Gay Bar	Park
12	Les Gobelins	25 625	3	French Restaurant	Thai Restaurant	Hotel	Vietnamese Restaurant	Italian Restaurant	Asian Restaurant	Bakery	Indian Restaurant	Bar	Cambodian Restaurant
16	Les Batignolles-Monceau	29 724	3	Wine Bar	French Restaurant	Bar	Thai Restaurant	Coffee Shop	Italian Restaurant	Korean Restaurant	Pizza Place	Bookstore	Restaurant
19	Ménilmontant	32 702	3	French Restaurant	Bar	Bakery	Japanese Restaurant	Bistro	Plaza	Park	Food & Drink Shop	Italian Restaurant	Café

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15	Passy	20 921	4	French Restaurant	Bakery	Café	Grocery Store	Supermarket	Garden	Sandwich Place	Chinese Restaurant	Restaurant	Asian Restaurant

Discussion

- It appears that cluster 3 and cluster 4 are the best suited for the company's needs because they offer the biggest number of business opportunities. French restaurants and hotels are the most common venues in these clusters.

- **L'Observatoire** district with a population density of 24 821 and **Vaugirard** district with 27 712. **These two districts are the best match for the company's needs, because they have diversified venues, are close to each other and have a great population density.**

Conclusion

- The goal of the analysis that was done in this report is to determine the two best districts of Paris that have the most upside for our food deliver company. They want to find out which are the districts that offer the best business opportunities. Based on the data collected, and the machine learning approach used (KMeans) it was concluded that, **L'Observatoire district and Vaugirard district are the best match for the company**.