



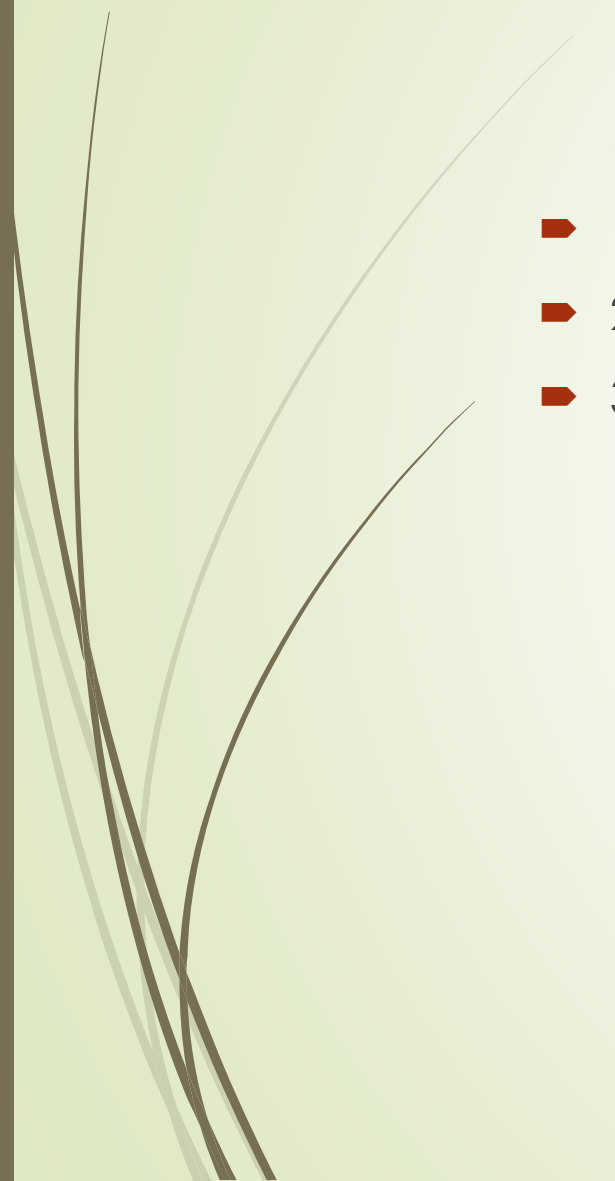
Defining the best area for an Italian restaurant

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Data acquisition and cleaning:

- 1. List of the districts of São Paulo;
 - 2. Geo-coordinates of the districts in São Paulo;
 - 3. Top venues of districts.
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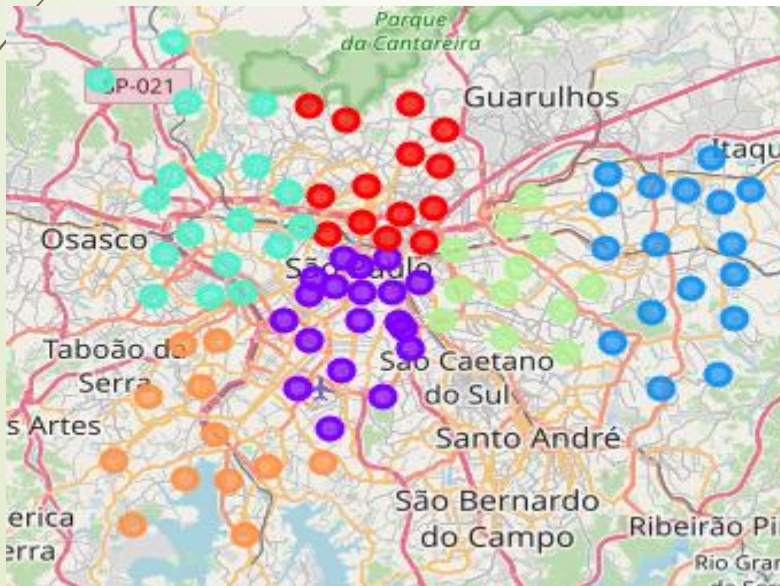


Methodology:

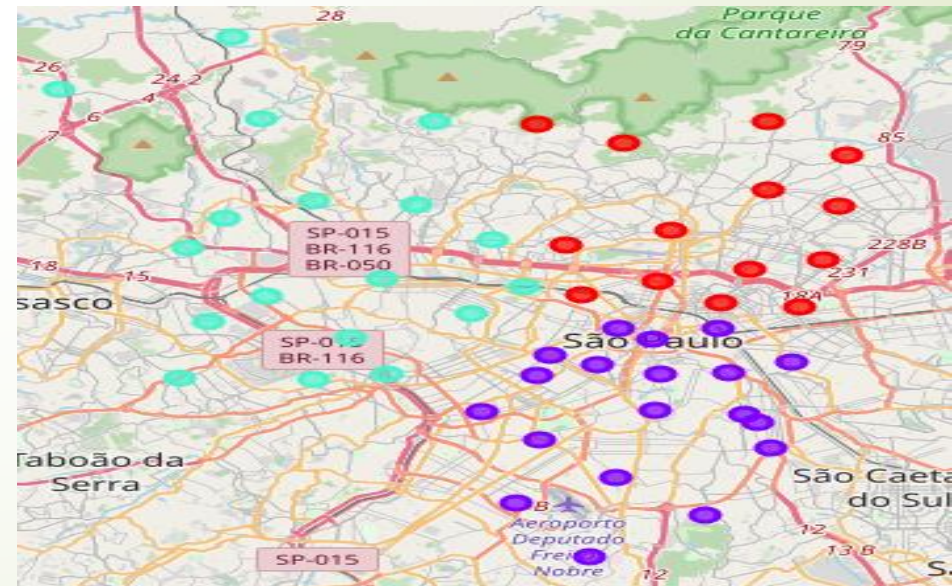
- K-means machine learning
 - 96 districts obtained after collecting the data. 4 district were excluded, resulting in 92 districts.
 - Venues from each districts: 100 venues withing a radius of 2000 meters.
 - Reduction of venues: Excluded venues that appeared only once.
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Methodology:

- Reducing number of districts: Considering that São Paulo is one of the biggest city in the world, it may be wiser to reduce the area to be analyze.
- The districts were clustered by área, than 3 out of 6 areas were selected.



➤ Clusters by location



➤ Selected districts

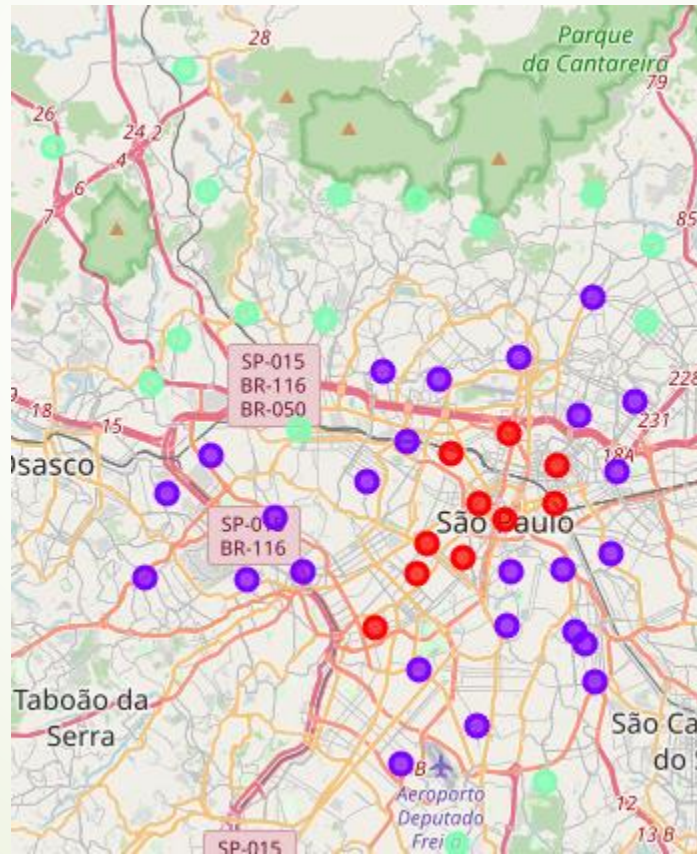
Methodology:

- One hot encoding: Dummy variables for categories so the data set could be used for machine learning.
- After performing manipulations with the dataset, we get the following table, which shows the top ten most common venues for each district

	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	Alto de Pinheiros	Restaurant	Plaza	Athletics & Sports	Gym / Fitness Center	Dog Run	Clothing Store	Cosmetics Shop	Brazilian Restaurant	Track	Health Food Store
1	Anhanguera	Bakery	Grocery Store	Convenience Store	Park	Food & Drink Shop	Gym / Fitness Center	Snack Place	Campground	Supermarket	Ice Cream Shop
4	Barra Funda	Pizza Place	Italian Restaurant	Motel	Pet Store	Dessert Shop	Restaurant	Hotel	Theater	Farmers Market	Café
5	Bela Vista	Ice Cream Shop	Theater	Italian Restaurant	Coffee Shop	Café	Hotel	Movie Theater	Cultural Center	Bakery	Bookstore
6	Belém	Pizza Place	Bar	Restaurant	Snack Place	Café	Chocolate Shop	Churrascaria	Ice Cream Shop	Pet Store	Bakery

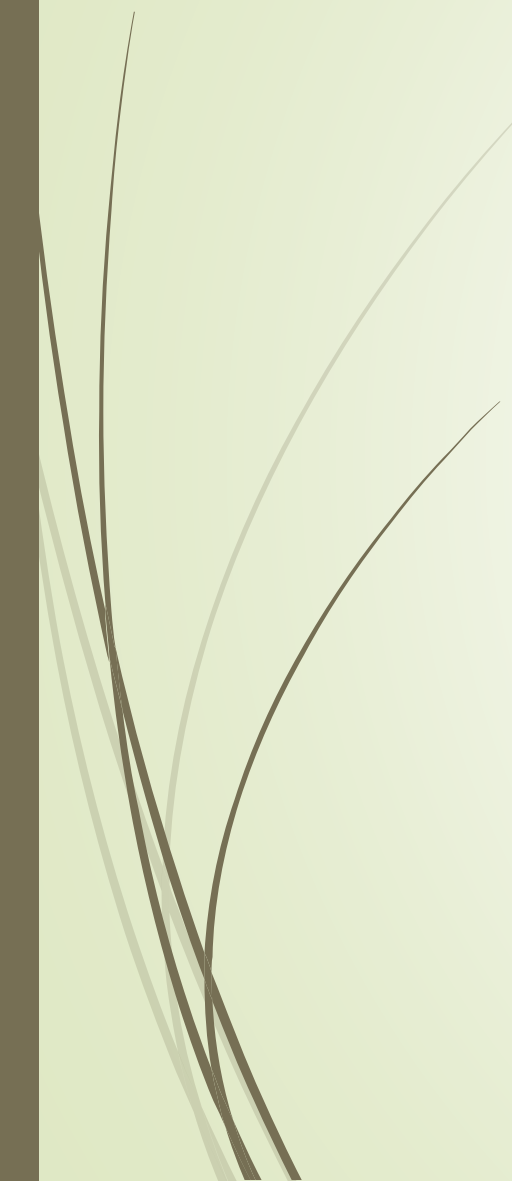
Methodology:

- Clustering: 3 clusters were selected based on silhouette score





Results:

- Cluster 2 is a district where top gastronomy is not really represented, it is more common fast food and regular restaurant.
 - Cluster 3 is an outer district and it seems to be residential areas, where are common to have bakeries.
 - Cluster 1 is where we see lots of gastronomy related venues (Italian Restaurant, Middle Eastern Restaurant and Pizza Place, for example). Also, cluster 2 presents the largest number of Italian restaurants as the most common options in the districts. Based on that, we can advise the restaurant owner to consider the districts from this cluster as the potential location for the new restaurant.
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Results:

Selected cluster:

	Distrito	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
56	Itaim Bibi	Italian Restaurant	Restaurant	Hotel	Ice Cream Shop	Argentinian Restaurant	Cycle Studio	Café	French Restaurant	Japanese Restaurant	Art Museum
60	Jardim Paulista	Ice Cream Shop	Italian Restaurant	Hotel	Brazilian Restaurant	Art Museum	Restaurant	Cosmetics Shop	Bookstore	Pizza Place	Bakery
64	Santa Cecília	Pizza Place	Italian Restaurant	Theater	Restaurant	Middle Eastern Restaurant	Café	Bakery	Women's Store	Brazilian Restaurant	Fruit & Vegetable Store
70	Bela Vista	Ice Cream Shop	Theater	Italian Restaurant	Coffee Shop	Café	Hotel	Movie Theater	Cultural Center	Bakery	Bookstore
78	Consolação	Bakery	Ice Cream Shop	Italian Restaurant	Hotel	Café	Theater	Pizza Place	Coffee Shop	Brazilian Restaurant	Bookstore
81	República	Theater	Italian Restaurant	Bakery	Sandwich Place	Cultural Center	Grocery Store	Middle Eastern Restaurant	Café	Brazilian Restaurant	Coffee Shop
89	Bom Retiro	Middle Eastern Restaurant	Korean Restaurant	Café	Women's Store	Dessert Shop	Restaurant	Brazilian Restaurant	Bar	Art Museum	Italian Restaurant
90	Brás	Middle Eastern Restaurant	Food & Drink Shop	Pizza Place	Restaurant	Italian Restaurant	Brazilian Restaurant	Bar	Market	Sandwich Place	Arts & Crafts Store
92	Sé	Grocery Store	Bakery	Market	Theater	Food & Drink Shop	Italian Restaurant	Cultural Center	Sandwich Place	Brazilian Restaurant	Middle Eastern Restaurant
93	Pari	Middle Eastern Restaurant	Clothing Store	Churrascaria	Food & Drink Shop	Pet Store	Restaurant	Italian Restaurant	Sandwich Place	Shopping Mall	Market