

# Capstone Project - Battle of the Neighborhoods - Paris, France



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## 0. Introduction

*Setting up a business is about the same as in any country. You must either be a resident or an EU citizen. The French government will ask for qualifications and they must be approved. A business proposal is a must containing financials, market research, budgeting and how the business will be funded. France is a good place to open a business it has many tax incentives and financial support. It takes approximately two weeks after all the initial work is done and a bank account is established. Types of restaurants in France are: Bistro - Bistros are intimate, usually family-owned restaurants that serve traditional fare and French wine. You'll find casual menu items that also show up in brasseries, as well as tarts, braises and stews. Bouchon - Specific to Lyon, bouchons are independent, casual dining spots that typically serve decadently high-fat items like pâtés, offals and roasts. Boulangerie - A bread shop. Dedicated boulangeries usually don't dabble in pastries or cakes. Brasserie - The name translates to "brewery," so a brasserie is a French version of a pub: beer and cider are usually served in a loud, bustling space. Typical brasserie meals include steak frites or mussels (also with frites, please!). Cafe - In France, a cafe is where you go for your coffee, and perhaps a light snack or lunch in the form of a croque monsieur or a meal-sized salad. Patisserie - A bakery specializing in cakes and sweets. This is where you'll find your éclairs, macarons and petit fours. These are the typical French restaurants....but an Italian restaurant?*

*Just like in the United States, restaurants are struggling due to Covid-19.*

*The target audience for this study is anyone interested in opening an Italian restaurant in any of the 20 boroughs of Paris and caring about whether or not there is potential for growth in these areas*

*According to a New York Times article. Italian food might be the best city for Italian food outside of Italy*

## 1. Problem

*The client wants to open an Italian Restaurant in Paris. Some of the problems we will look at - Who are the competitors, and what neighborhood will be the most challenging in getting prospective clients making sure there is room for another Italian Restaurant in order to attract customers. But although we will focus on restaurants we will also look at other Italian food venues. ¶*

## 2. Data

*There are 80 neighborhoods contained within 20 boroughs (arrondissements). I will gather data for each neighborhood, along with Italian restaurants that reside within each of the boroughs. Some of our data will come from the FourSquare API to explore the neighborhoods, Google Maps geocoding and various websites for data about restaurants in Paris France. The data will tell us where we can be most successful in starting an Italian restaurant. I did find a site in France that contained the neighborhood and longitude and latitude. It also allowed for the download of the data and I didn't need to webscrape this data. I downloaded the data and it is stored on my computer cloud.*

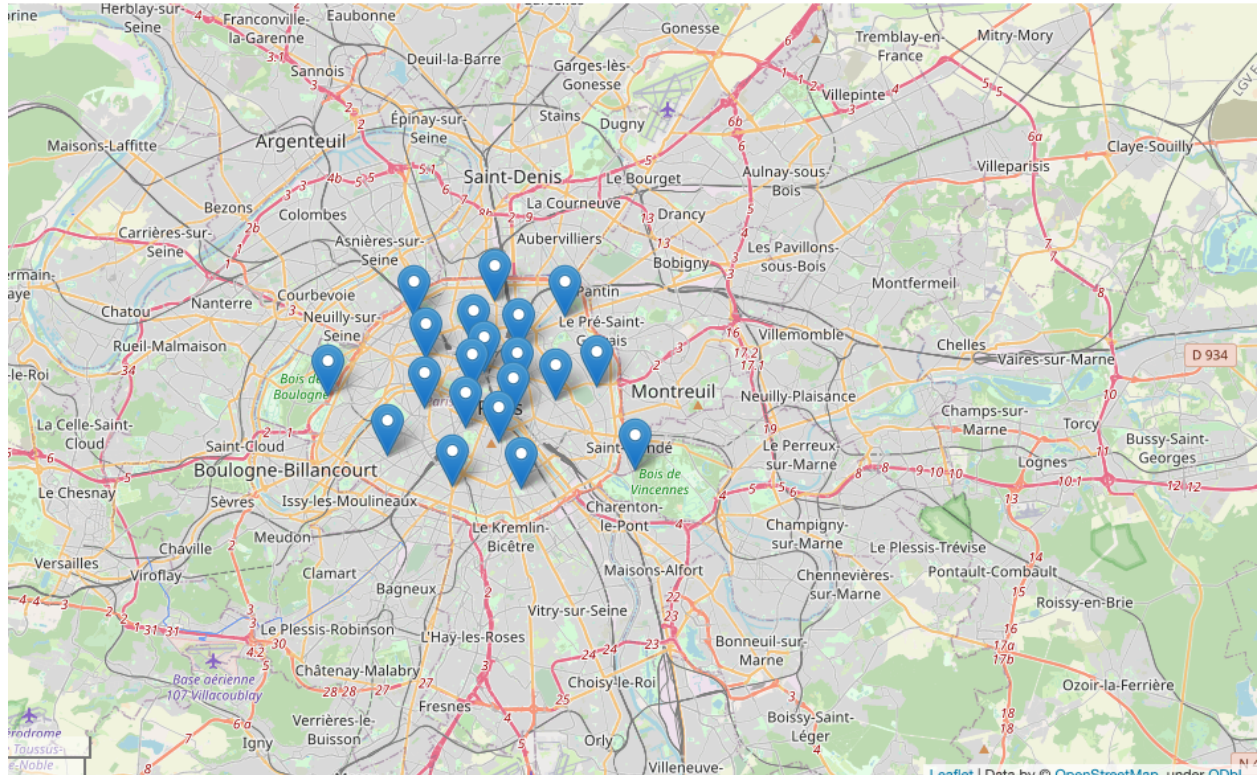
*Examples of features can be extracted from this data are ratings, locations, tips, photos, consumer users and popular hours of operations.*

The Foursquare API allows us to explore the 20 boroughs of Paris using the longitude and latitude. We will look for Italian restaurants in each of the 20 boroughs. Next K means certain to each of those cluster will let us find where the Italian restaurants are located information that will

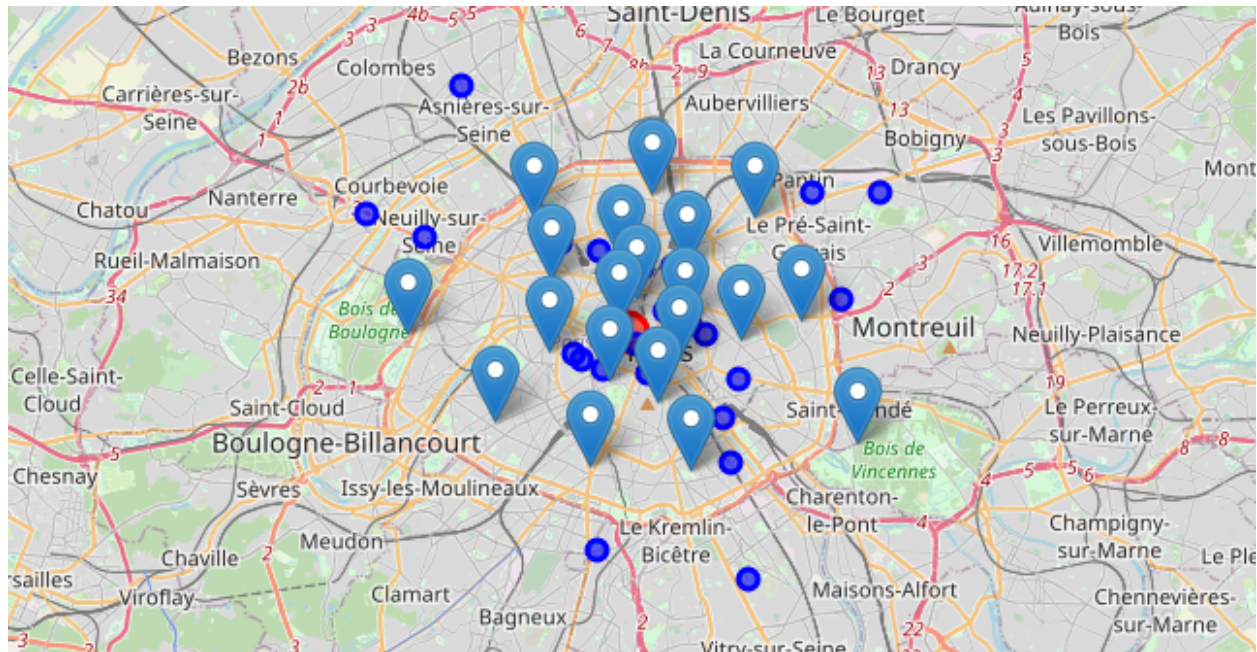
|    | Nom officiel de l'arrondissement | Geometry X Y                |
|----|----------------------------------|-----------------------------|
| 0  | Louvre                           | 48.8625627018,2.33644336205 |
| 1  | Palais-Bourbon                   | 48.8561744288,2.31218769148 |
| 2  | Élysée                           | 48.8727208374,2.3125540224  |
| 3  | Temple                           | 48.86287238,2.3600009859    |
| 4  | Popincourt                       | 48.8590592213,2.3800583082  |
| 5  | Observatoire                     | 48.8292445005,2.3265420442  |
| 6  | Luxembourg                       | 48.8491303586,2.33289799905 |
| 7  | Opéra                            | 48.8771635173,2.33745754348 |
| 8  | Ménilmontant                     | 48.8634605789,2.40118812928 |
| 9  | Passy                            | 48.8603921054,2.26197078836 |
| 10 | Buttes-Chaumont                  | 48.8870759966,2.38482096015 |
| 11 | Reuilly                          | 48.8349743815,2.42132490078 |
| 12 | Hôtel-de-Ville                   | 48.8543414263,2.35762962032 |
| 13 | Bourse                           | 48.8682792225,2.34280254689 |
| 14 | Entrepôt                         | 48.8761300365,2.36072848785 |
| 15 | Panthéon                         | 48.8444431505,2.35071460958 |
| 16 | Gobelins                         | 48.8283880317,2.36227244042 |
| 17 | Batignolles-Monceau              | 48.887326522,2.30677699057  |
| 18 | Buttes-Montmartre                | 48.892569268,2.34816051956  |
| 19 | Vaugirard                        | 48.8400853759,2.29282582242 |

LIST OF BOROUGHs IN PARIS, FRANCE



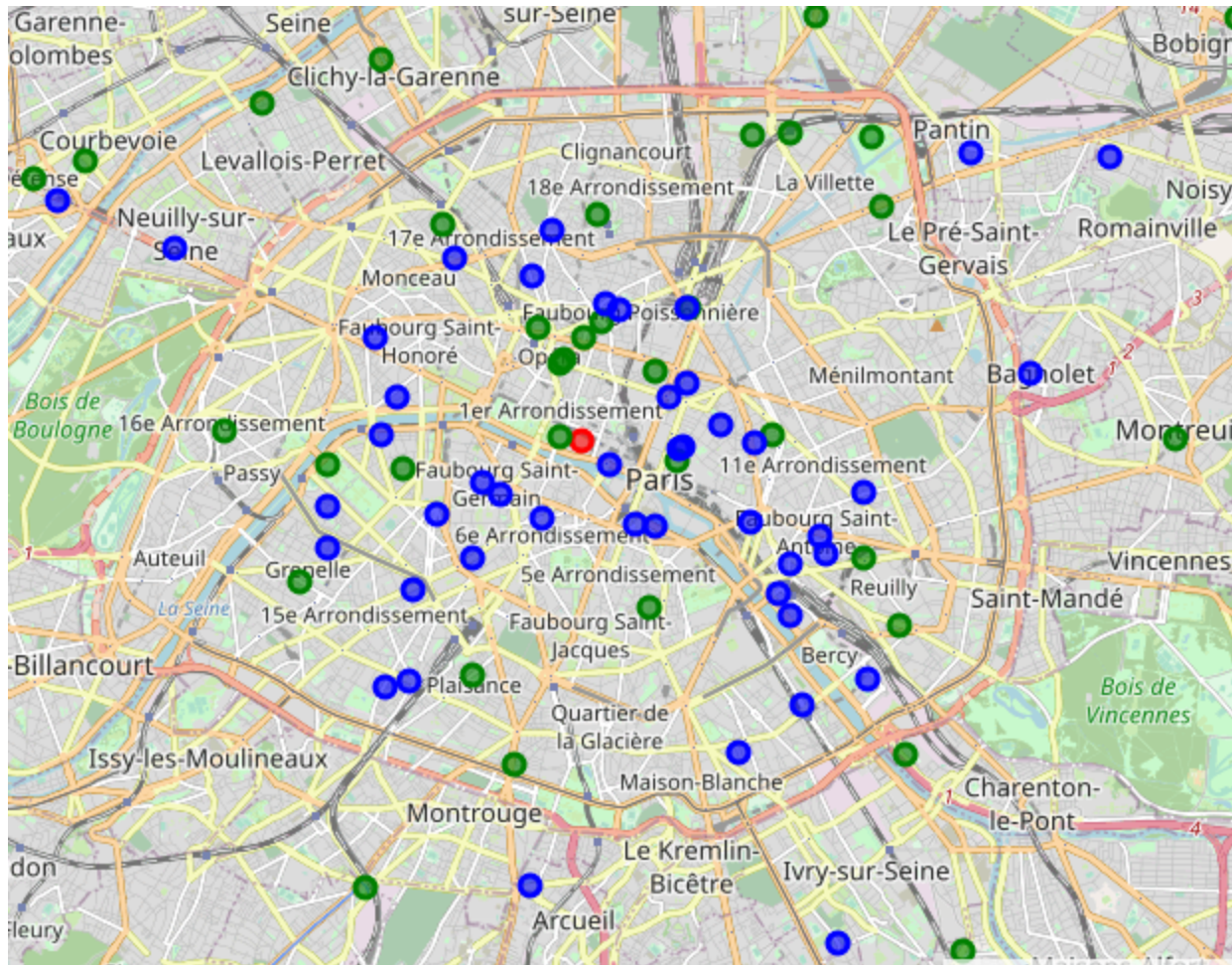


Map of Paris Boroughs



Map of Boroughs and Italian Restaurants in Paris borough area





Map of all Restaurants in Paris Blue(Italian) Green(other) Red(Louvre)

### 3. Methodology

We looked at the Italian restaurants within the Paris boroughs. We have collected the data for that area using Foursquare API. The zipcodes represent the neighborhoods of Paris that are contained within. Also listing of other restaurants within the same area. Second we collected information on the trending restaurants in the Paris area. We will focus on Italian restaurants in each neighborhood. I will then use the k means clustering to find the best places to build an Italian restaurants

In [ ]:

We have information for 20 boroughs, which is provide by Foursquare  
Using one hot coding we have information for all 20 boroughs and 41 venues

|    | zipcode | Asian Restaurant | Auditorium | Bar | Bistro | Brewery | Burger Joint | Business Service | Cafeteria | Café | ... | Pizza Place | Restaurant | Sandwich Place | Snack Place | Syrian Restaurant | Szechuan Restaurant |
|----|---------|------------------|------------|-----|--------|---------|--------------|------------------|-----------|------|-----|-------------|------------|----------------|-------------|-------------------|---------------------|
| 0  | 75001   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 1  | 75002   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 1          | 0              | 0           | 0                 | 0                   |
| 2  | 75002   | 0                | 0          | 0   | 0      | 0       | 0            | 1                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 3  | 75002   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 4  | 75009   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 1                   |
| 5  | 75007   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 6  | 75009   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 7  | 75009   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 8  | NaN     | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 9  | 75010   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 1          | 0              | 0           | 0                 | 0                   |
| 10 | 75007   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 11 | 75004   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 12 | 75017   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 13 | 75019   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 14 | 75014   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 15 | NaN     | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 16 | 92110   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 1          | 0              | 0           | 0                 | 0                   |
| 17 | 75012   | 0                | 0          | 0   | 0      | 1       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 18 | 75015   | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |
| 19 | NaN     | 0                | 0          | 0   | 0      | 0       | 0            | 0                | 0         | 0    | ... | 0           | 0          | 0              | 0           | 0                 | 0                   |

We group each of the venues by borough(zipcode) and looking at the frequency of each of the venues in that neighborhood

----75001----

|   | venue               | freq |
|---|---------------------|------|
| 0 | Food Court          | 1.0  |
| 1 | Asian Restaurant    | 0.0  |
| 2 | Indian Restaurant   | 0.0  |
| 3 | Japanese Restaurant | 0.0  |
| 4 | Kebab Restaurant    | 0.0  |

----75002----

|   | venue               | freq |
|---|---------------------|------|
| 0 | Restaurant          | 0.33 |
| 1 | Japanese Restaurant | 0.33 |
| 2 | Business Service    | 0.33 |
| 3 | Pizza Place         | 0.00 |
| 4 | Kebab Restaurant    | 0.00 |

----75003----

|   | venue               | freq |
|---|---------------------|------|
| 0 | Italian Restaurant  | 1.0  |
| 1 | Asian Restaurant    | 0.0  |
| 2 | Auditorium          | 0.0  |
| 3 | Japanese Restaurant | 0.0  |
| 4 | Kebab Restaurant    | 0.0  |

----75004----

|   | venue               | freq |
|---|---------------------|------|
| 0 | Gourmet Shop        | 0.5  |
| 1 | Japanese Restaurant | 0.5  |
| 2 | Auditorium          | 0.0  |
| 3 | Italian Restaurant  | 0.0  |
| 4 | Kebab Restaurant    | 0.0  |

----75005----

|   | venue               | freq |
|---|---------------------|------|
| 0 | Italian Restaurant  | 0.5  |
| 1 | Syrian Restaurant   | 0.5  |
| 2 | Asian Restaurant    | 0.0  |
| 3 | Optical Shop        | 0.0  |
| 4 | Japanese Restaurant | 0.0  |

----75006----

|   | venue               | freq |
|---|---------------------|------|
| 0 | Men's Store         | 1.0  |
| 1 | Asian Restaurant    | 0.0  |
| 2 | Auditorium          | 0.0  |
| 3 | Italian Restaurant  | 0.0  |
| 4 | Japanese Restaurant | 0.0  |

## 4. Analysis

Next we cluster the neighborhoods (zipcodes) k means cluster the data and returns each cluster. The cluster show the 10 most common venues in the neighborhood

### Cluster 1

| categories         | cc | id                       | 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 | Co   |
|--------------------|----|--------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------|
| Italian Restaurant | FR | 612be59c5c75d00fa2d4c9a3 | 0.0            | Sandwich Place        | Italian Restaurant    | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |
| Sandwich Place     | FR | 5e1122271dff6c0008ffb6b6 | 0.0            | Café                  | Italian Restaurant    | Sandwich Place        | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |
| Sandwich Place     | FR | 5e112023fc2c4b00083e4064 | 0.0            | Sandwich Place        | Italian Restaurant    | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |
| Sandwich Place     | FR | 5840ad57668af751c2f0d20e | 0.0            | Sandwich Place        | Italian Restaurant    | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |
| Sandwich Place     | FR | 50a630b3e4b0c753d69a133c | 0.0            | Italian Restaurant    | Sandwich Place        | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |
| Café               | FR | 4bfa23a98d30d13ab2410318 | 0.0            | Café                  | Italian Restaurant    | Sandwich Place        | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |
| Italian Restaurant | FR | 60ab6a73ab6ad13aa136614f | 0.0            | Italian Restaurant    | Sandwich Place        | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |
| Italian Restaurant | FR | 5acf67fff62f2b0f1615188a | 0.0            | Café                  | Italian Restaurant    | Sandwich Place        | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |

### Cluster 2

| categories  | cc | id                       | 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 | Co   |
|-------------|----|--------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------|
| Restaurant  | FR | 5b64524fb6eedb002c7652a4 | 1.0            | Restaurant            | Pizza Place           | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |
| Restaurant  | FR | 4d8737afd5fab60c2bd3199c | 1.0            | Restaurant            | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     | C Ca |
| Restaurant  | FR | 4f79801ce4b05c37fd507436 | 1.0            | Restaurant            | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     | C Ca |
| Pizza Place | FR | 4f9eda9fe4b033ffd5b24feb | 1.0            | Restaurant            | Pizza Place           | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | C Ca |



## Cluster 3

|    | categories          | cc | id                       | 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 |
|----|---------------------|----|--------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 0  | Food Court          | FR | 5496102a498ed65f031aba1c | 2.0            | Food Court            | Vietnamese Restaurant | Turkish Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |
| 1  | Restaurant          | FR | 50320cb5e4b0b5d01e5ccaf0 | 2.0            | Japanese Restaurant   | Business Service      | Restaurant            | Vietnamese Restaurant | Church                | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               |
| 2  | Business Service    | FR | 5f1025aa076bd258d2a8922c | 2.0            | Japanese Restaurant   | Business Service      | Restaurant            | Vietnamese Restaurant | Church                | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               |
| 3  | Japanese Restaurant | FR | 4c78048e81bca09323a5f814 | 2.0            | Japanese Restaurant   | Business Service      | Restaurant            | Vietnamese Restaurant | Church                | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               |
| 4  | Szechuan Restaurant | FR | 5a22ae7c8b2fb5c6278c5c2  | 2.0            | Turkish Restaurant    | Chinese Restaurant    | Szechuan Restaurant   | Italian Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |
| 5  | French Restaurant   | FR | 4e078807e4cdefcf6dce4f6  | 2.0            | Auditorium            | TV Station            | Italian Restaurant    | French Restaurant     | Vietnamese Restaurant | Church                | Fast Food Restaurant  | Diner                 | Deli / Bodega         |
| 6  | Turkish Restaurant  | FR | 5079be34e4b0109f35960edb | 2.0            | Turkish Restaurant    | Chinese Restaurant    | Szechuan Restaurant   | Italian Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |
| 7  | Chinese Restaurant  | FR | 5299003211d2904f2d623729 | 2.0            | Turkish Restaurant    | Chinese Restaurant    | Szechuan Restaurant   | Italian Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |
| 10 | None                | FR | 4adcda14f964a520523721e3 | 2.0            | Auditorium            | TV Station            | Italian Restaurant    | French Restaurant     | Vietnamese Restaurant | Church                | Fast Food Restaurant  | Diner                 | Deli / Bodega         |
| 11 | Japanese Restaurant | FR | 4bc0bfba920eb7131178192c | 2.0            | Gourmet Shop          | Japanese Restaurant   | Vietnamese Restaurant | Church                | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |
| 14 | Kebab Restaurant    | FR | 4c02a8999a7920a1f1c0ce79 | 2.0            | Kebab Restaurant      | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |
| 20 | None                | FR | 4b8d050af964a52092e432e3 | 2.0            | Vietnamese Restaurant | Turkish Restaurant    | Food Court            | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |
| 24 | Snack Place         | FR | 4cdeeb9e98ab6a31293560e1 | 2.0            | Snack Place           | Cafeteria             | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |

## Cluster 4

|    | categories         | cc | id                       | 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 | C |
|----|--------------------|----|--------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|
| 12 | Italian Restaurant | FR | 521f8f0711d227dcaef18221 | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 17 | Brewery            | FR | 4fd9bc03e4b01007e9cf1d1c | 3.0            | Italian Restaurant    | Gas Station           | Brewery               | Church                | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |   |
| 18 | French Restaurant  | FR | 4b50ea59f964a520803827e3 | 3.0            | Italian Restaurant    | French Restaurant     | Deli / Bodega         | Vietnamese Restaurant | Fast Food Restaurant  | Diner                 | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 38 | Syrian Restaurant  | FR | 5cba2ab1f870fd002c06ffce | 3.0            | Italian Restaurant    | Syrian Restaurant     | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |   |
| 1  | Italian Restaurant | FR | 536a15c8498e093e6a786c35 | 3.0            | Italian Restaurant    | Pizza Place           | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |   |
| 3  | Italian Restaurant | FR | 601e8d12e852b707c9d2e3e1 | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 5  | Italian Restaurant | FR | 4be4292e910020a1144bd114 | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 8  | Italian Restaurant | FR | 60dafc4b94df8a3d5bacfe37 | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 9  | Italian Restaurant | FR | 579b3443498e32737fc39639 | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 13 | Italian Restaurant | FR | 4e17630114957dc705ccf623 | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 17 | Italian Restaurant | FR | 59e26e23c97f284618e9120e | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 18 | Italian Restaurant | FR | 58b6b48e06f1a321016e25a5 | 3.0            | Italian Restaurant    | Gas Station           | Brewery               | Church                | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |   |
| 20 | Italian Restaurant | FR | 58ee0bd3790bea6d1effa8aa | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 25 | Pizza Place        | FR | 51430960e4b0455b2d070f45 | 3.0            | Italian Restaurant    | Pizza Place           | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   |   |
| 26 | Italian Restaurant | FR | 5e2c5fcb17ff6400084d1b22 | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |
| 35 | Italian Restaurant | FR | 4c1b676e8b3aa5932a14975f | 3.0            | Italian Restaurant    | Vietnamese Restaurant | French Restaurant     | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     |   |

## Cluster 5

|    | categories     | cc | id                       | 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 |
|----|----------------|----|--------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 39 | Sandwich Place | FR | 56d4a2afcd10ac3ebe9e701a | 4.0            | Sandwich Place        | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     | Church                 |
| 46 | Sandwich Place | FR | 52270f7611d2913b130b1f70 | 4.0            | Sandwich Place        | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     | Church                 |
| 49 | Sandwich Place | FR | 526a405a11d22febb98275c7 | 4.0            | Sandwich Place        | Vietnamese Restaurant | Chinese Restaurant    | Fast Food Restaurant  | Diner                 | Deli / Bodega         | Daycare               | Corporate Cafeteria   | College Cafeteria     | Church                 |

## 5. Discussion

I will disgest on the results on this model and what I recommend based on the previous results.

The data was limited The results are based on just the Paris 20 boroughs. I included some of the other venues other than what restaurants were around in the same are so it contains venues that could len itself to people attending events then leaving the events for restaurants

More data could give a more accurate picture of the areas such as economy, transportation, and other types of venues.

Out of the 20 boroughs the Italian restaurants are 7 of the most favorite and 2 in the 2nd most favorite.

One area I suggest not putting a restaurant is the Louvre area since the number one most common venue is the Food Court. My suggestions for 75010, 75018, 75014

75010 - unless Restaurant is Italian I would add it here near corporate cafeteria and College Cafeteria More investigation is needed to find out what kind of restaurant is favored

75014 - There is no Italian restaurants in this location and it seems there are other restaurants being favored in this borough

75018 - Although the 3 and 4th favored is the fast food two restaurants are 1st and 2nd and there may be room for Italian in this borough.

## 6. Conclusion

*The purpose of this project was to find a suitable place for a restaurant in one or more of the Paris boroughs. Other characteristics need to be taken into the decision of where to place an Italian restaurant. Data was used from the Foursquare, Geoggy, Wikipedia and Wikiwand*

Analysis was performed using k means clustering. Maps of the locations of Italian restaurants are provided along with other types of restaurants and venues.

## 7. References

- Boroughs of Paris [https://www.wikiwand.com/en/Arrondissement\\_of\\_Paris](https://www.wikiwand.com/en/Arrondissement_of_Paris)
- Foursquare API <https://developer.foursquare.com>
- Paris <https://en.wikipedia.org/wiki/Paris>