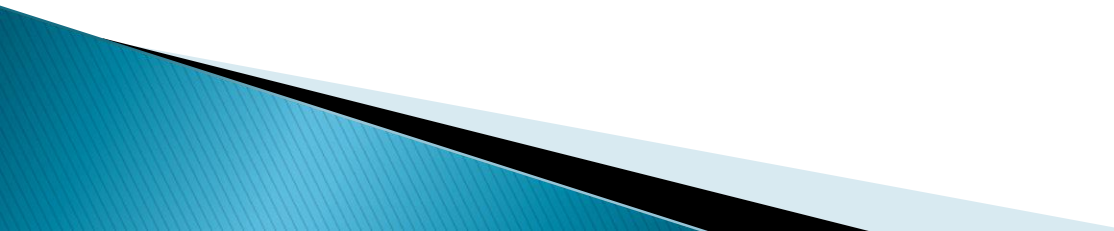# The Battle of Neighborhoods

Capstone Project

Introduction

- Paris is the capital and largest city of France. has 2 million inhabitants and is the fifth of the most populated cities in the world.
- The city is one of the most influential centers worldwide, as well as a very strong cultural, political and economic one.
- For that, Paris is so attractable to begin a new business, such as opining a restaurant.

Introduction

- **Objective**

- To get the appropriate places in Paris city to open new restaurant.
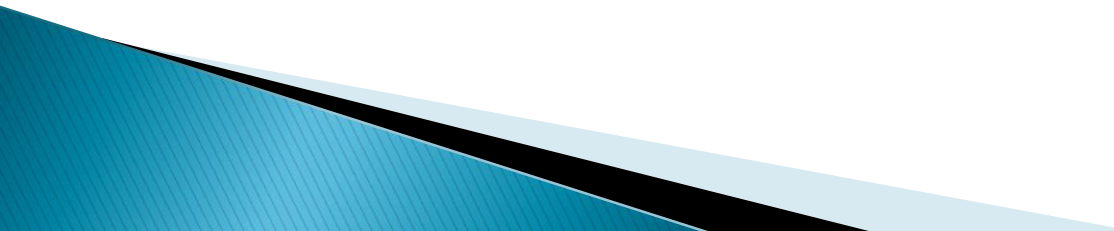
Data acquisition and cleaning

▸ **Data acquisition:**

✓ Dataset representing the list of borough in Paris this their longitude, latitude…

✓ https://raw.githubusercontent.com/AR-data-science/Coursera_Capstone/master/Arrondissements_.csv

Data acquisition and cleaning

	CAR	NAME	NSQAR	CAR.1	CARINSEE	LAR	NSQCO	SURFACE	PERIMETRE	Geometry_X	Geometry_Y
0	3	Temple	750000003	3	3	3eme Ardt	750001537	1170882828	4519264	48.862872	2.360001
1	19	Buttes-Chaumont	750000019	19	19	19eme Ardt	750001537	6792651129	11253182	48.887076	2.384821
2	14	Observatoire	750000014	14	14	14eme Ardt	750001537	5614877309	10317483	48.829245	2.326542
3	10	Entrepot	750000010	10	10	10eme Ardt	750001537	2891739442	6739375	48.876130	2.360728
4	12	Reuilly	750000012	12	12	12eme Ardt	750001537	16314782637	24089666	48.834974	2.421325
5	16	Passy	750000016	16	16	16eme Ardt	750001537	16372542129	17416110	48.860392	2.261971
6	11	Popincourt	750000011	11	11	11eme Ardt	750001537	3665441552	8282012	48.859059	2.380058
7	2	Bourse	750000002	2	2	2eme Ardt	750001537	991153745	4554104	48.868279	2.342803
8	4	Hotel-de-Ville	750000004	4	4	4eme Ardt	750001537	1600585632	5420908	48.854341	2.357630
9	17	Batignolles-Monceau	750000017	17	17	17eme Ardt	750001537	5668834504	10775580	48.887327	2.306777
10	18	Buttes-Montmartre	750000018	18	18	18eme Ardt	750001537	5996051308	9916464	48.892569	2.348161
11	1	Louvre	750000001	1	1	1er Ardt	750001537	1824612860	6054937	48.862563	2.336443
12	5	Pantheon	750000005	5	5	5eme Ardt	750001537	2539374623	6239195	48.844443	2.350715
13	7	Palais-Bourbon	750000007	7	7	7eme Ardt	750001537	4090057185	8099425	48.856174	2.312188
14	20	Menilmontant	750000020	20	20	20eme Ardt	750001537	5983446037	10704940	48.863461	2.401188
15	8	elysee	750000008	8	8	8eme Ardt	750001537	3880036397	7880533	48.872721	2.312554
16	9	Opera	750000009	9	9	9eme Ardt	750001537	2178303275	6471588	48.877164	2.337458

Figure1. Neighborhood list

Data acquisition and cleaning

▸ RESTful API calls to the Foursquare API to retrieve data about venues in Paris's borough

▸ One of the features of this API is to provide a list of venues within a specific location, based on the Lat/Lon coordinates and a radius. In order to obtain a list of venues within a specified area, we use the "explore" endpoint from the API.

Data acquisition and cleaning

```python
LIMIT = 100
radius = 500

url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&ll={},{}&radius={}&limit={}'.format(
    CLIENT_ID,
    CLIENT_SECRET,
    VERSION,
    borough_latitude,
    borough_longitude,
    radius,
    LIMIT)
```
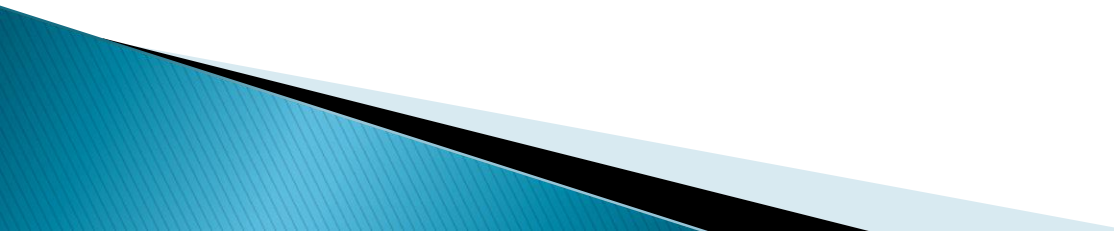
```python
# get the result
json_results = requests.get(url).json()
json_results
```

```
: {'meta': {'code': 200, 'requestId': '5e309b68c94979001b78c830'},
  'response': {'suggestedFilters': {'header': 'Tap to show:',
    'filters': [{'name': 'Open now', 'key': 'openNow'}]},
   'headerLocation': 'Palais-Royal',
   'headerFullLocation': 'Palais-Royal, Paris',
   'headerLocationGranularity': 'neighborhood',
   'totalResults': 142,
   'suggestedBounds': {'ne': {'lat': 48.86706270450001,
     'lng': 2.3432708805600218},
    'sw': {'lat': 48.8580626955, 'lng': 2.329615843439978}},
```

Figure2. Venues ist

Data acquisition and cleaning

▶ **Data cleaning:**

✓ Retrive the necessary informtaion

✓ Scraping web data and parsing HTML code.

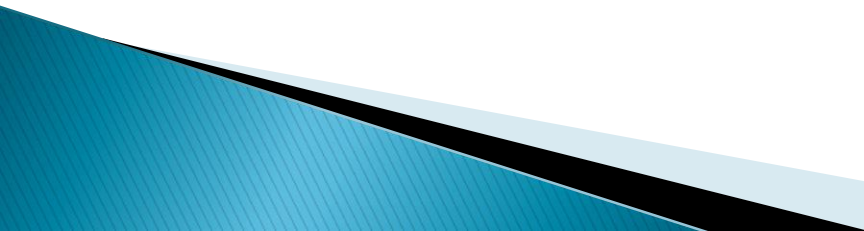✓ Utilize Python and its pandas library to manipulate data, in order to exploring and analyzing data

Data acquisition and cleaning

	borough_Num	borough	French_Name	Latitude	Longitude
0	3	Temple	3eme Ardt	48.862872	2.360001
1	19	Buttes-Chaumont	19eme Ardt	48.887076	2.384821
2	14	Observatoire	14eme Ardt	48.829245	2.326542
3	10	Entrepot	10eme Ardt	48.876130	2.360728
4	12	Reuilly	12eme Ardt	48.834974	2.421325
5	16	Passy	16eme Ardt	48.860392	2.261971
6	11	Popincourt	11eme Ardt	48.859059	2.380058
7	2	Bourse	2eme Ardt	48.868279	2.342803
8	4	Hotel-de-Ville	4eme Ardt	48.854341	2.357630
9	17	Batignolles-Monceau	17eme Ardt	48.887327	2.306777
10	18	Buttes-Montmartre	18eme Ardt	48.892569	2.348161
11	1	Louvre	1er Ardt	48.862563	2.336443
12	5	Pantheon	5eme Ardt	48.844443	2.350715
13	7	Palais-Bourbon	7eme Ardt	48.856174	2.312188
14	20	Menilmontant	20eme Ardt	48.863461	2.401188
15	8	elysee	8eme Ardt	48.872721	2.312554
16	9	Opera	9eme Ardt	48.877164	2.337458

Figure 3. Result after cleaning

Methodology

▸ Majorly relied on Foursquare API to

1. Retrieve all venues of each borough

2. Group venue by each borough

3. Count venues/borough

4. Filter top 10 most common venue types of each borough.

5. Select the suitable borough

Methodology

▸ To get the appropriate neighborhoods, we used the violon plot to facilitate the compression. As below the initial version:

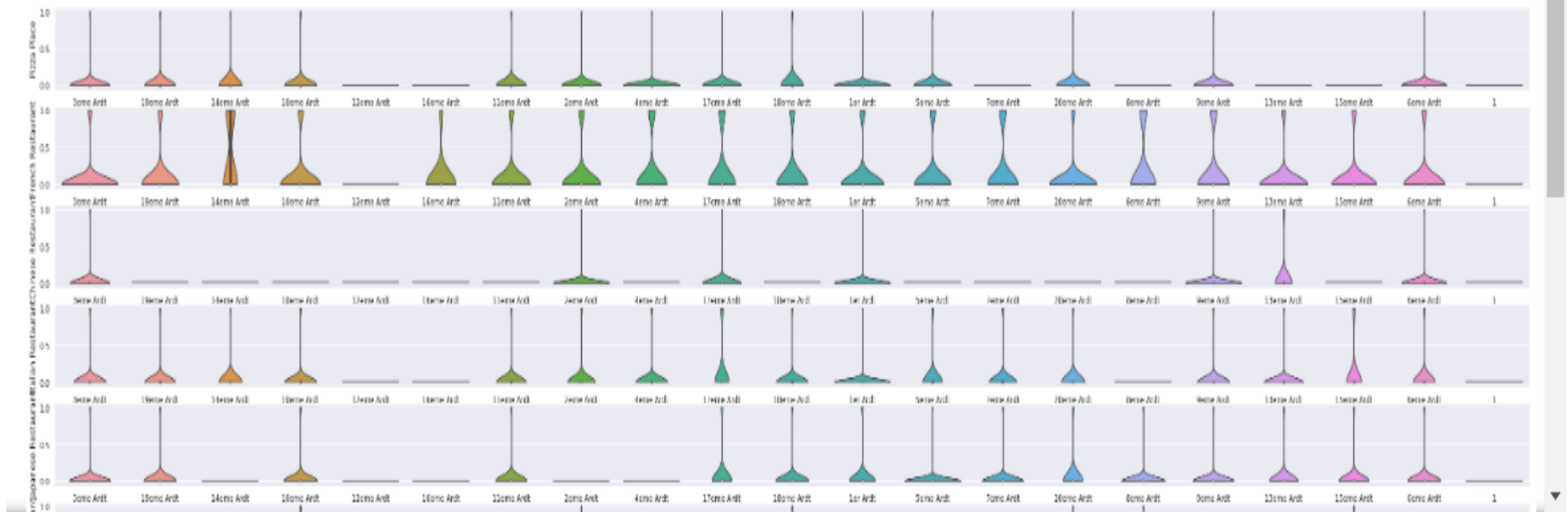|	borough	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	1	Supermarket	Sandwich Place	Zoo Exhibit	Electronics Store	Food & Drink Shop	Flower Shop	Fish & Chips Shop	Fast Food Restaurant	Farmers Market	Falafel Restaurant
1	10eme Ardt	French Restaurant	Bistro	Hotel	Coffee Shop	Café	Indian Restaurant	Pizza Place	Japanese Restaurant	Italian Restaurant	Bar
2	11eme Ardt	French Restaurant	Café	Pastry Shop	Wine Bar	Restaurant	Italian Restaurant	Cocktail Bar	Pizza Place	Theater	Grocery Store
3	12eme Ardt	Zoo Exhibit	Zoo	Monument / Landmark	Supermarket	Bike Rental / Bike Share	Park	Ethiopian Restaurant	Food & Drink Shop	Flower Shop	Fish & Chips Shop
4	13eme Ardt	Vietnamese Restaurant	Asian Restaurant	Thai Restaurant	Chinese Restaurant	French Restaurant	Juice Bar	Japanese Restaurant	Furniture / Home Store	Cambodian Restaurant	Fast Food Restaurant
5	14eme Ardt	French Restaurant	Hotel	Bistro	Supermarket	Bakery	Brasserie	Fast Food Restaurant	Sushi Restaurant	Tea Room	Food & Drink Shop
6	15eme Ardt	Hotel	Italian Restaurant	French Restaurant	Coffee Shop	Thai Restaurant	Park	Japanese Restaurant	Indian Restaurant	Lebanese Restaurant	Bakery
7	16eme Ardt	Lake	Plaza	Recording Studio	Park	Bus Stop	Bus Station	French Restaurant	Boat or Ferry	Pool	Art Museum
8	17eme Ardt	French Restaurant	Hotel	Italian Restaurant	Japanese Restaurant	Plaza	Bakery	Café	Bistro	Restaurant	Burger Joint

Methodology

Figure 5: Plot representation

Result

- **Condition:**
  - Find the borough with low number of restaurant
- **Result:**
  - The best borough to begin our business:

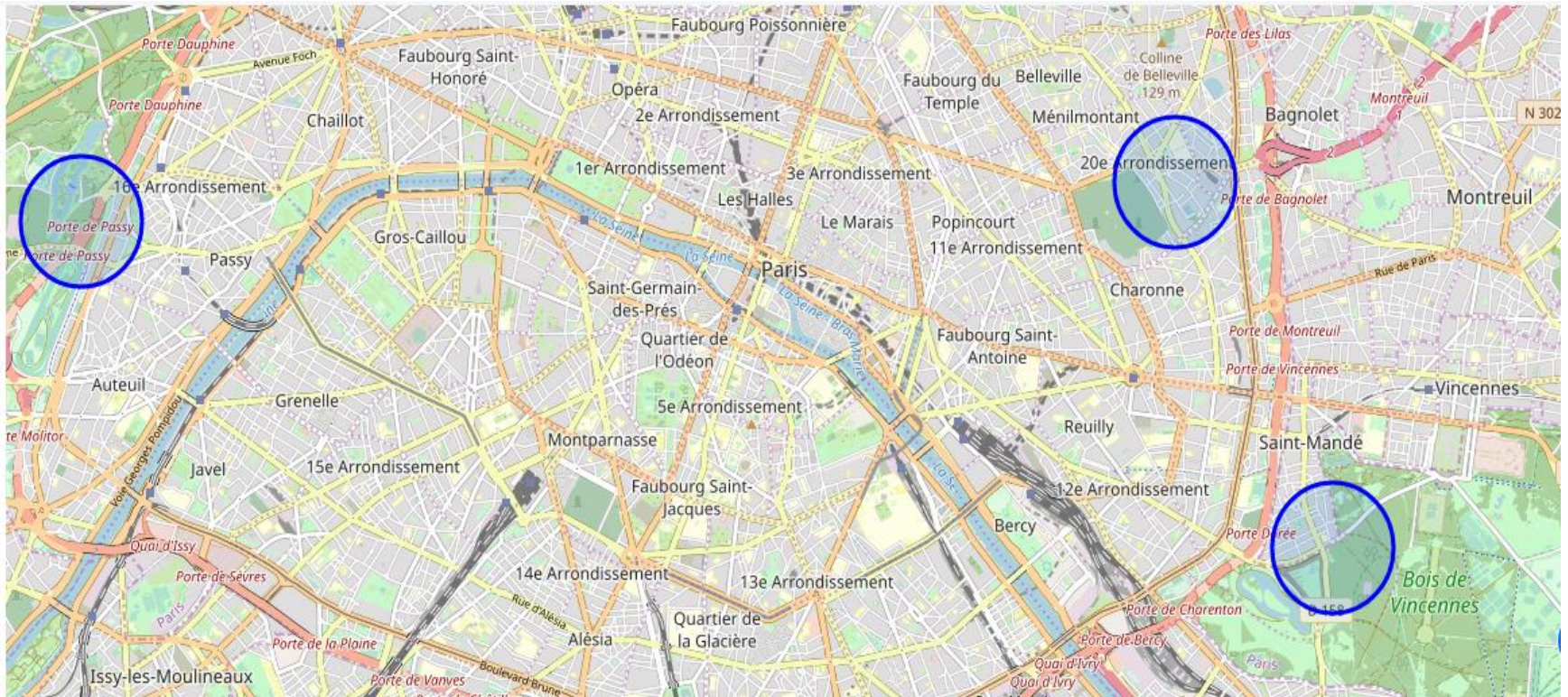|	Arrondissement_Num	Borough	French_name	Latitude	Longitude
0	12	Reuilly	12ème	48.835	2.42132
1	16	Passy	16ème	48.8604	2.26197
2	20	Menilmontant	20ème	48.8635	2.40119

Result

Figure 4. Map representation

Conclusion

- **The closer Boroughs to city center:**
  - Are more suitable to spend time and enjoy in various restaurant.

- **The further boroughs to city center:**
  - Are more suitable to visit Museum, Clothing Store…
  - They are the best places to open small business related to food and travel industry