

Location-based Clustering for Business Analysis

Applied Data Science Capstone Project

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Abstract

Relying on Hotelling's Model of Spatial Competition and the concept of Nash Equilibrium from Game Theory as a starting point, this project aims to identify the cluster formation phenomenon of same-kind businesses and to analyze the customer-preferences statistics of the aforementioned clusters in order to identify business opportunities and help in the business decision-making process and market analysis.

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0.1 Introduction

Phenomena in different fields can often be abstracted, reduced and analyzed as situations governed by some rules, where one or multiple players make moves to try to achieve a particular objective, either cooperatively or in spite of the other players (which in this case would be opponents). This abstracted, simplified and formalized models is what Game Theory defines as games.

Focusing on a free-competence economic scenario, let us consider a model known as Hotelling's Model of Spatial Competition, or rather a variation of it. In Hotelling's original model, different businesses or retailers with identical products (these are the players) are fixed and located on a defined space (traditionally one dimensional, that is along a finite line that might represent a street, for instance), and compete by setting the prices of their products (these are the moves they can make) in order to maximize their profits (this would be their objective). There are some additional rules, though:

- The customers are uniformly distributed in the given space (i.e. there are no high and low customer concentration zones).
- For the customer, there's a cost proportional to the distance he/she has to travel to get the product. (i.e. distance to the retailer matters for the customer).
- Customers don't have a personal preference for a given retailer. They are driven just by the minimization of their cost to get the product.

The version of Hotelling's model that is considered in this work is exactly the same, but the location becomes the free variable and the prices are equal and fixed. That means that the moves the players can make are spatial movements in the defined space in order to maximize their profits.

Due to the conditions of the game, the retailers will move until an equilibrium is reached, where none of them can have a better position and the profit would be maximized for all of them. This situation in which each and every player simultaneously has run out of moves that can increase their profit is called the Nash Equilibrium. In our game, equilibrium is reached when the retailers end up in the center of the defined space, sharing customers equally.

This can be extended to a two-dimensional case as well, where the defined space may be a disk of a finite radius in which the customers are uniformly distributed. The Nash Equilibrium would be the same: all the retailers will move until they all converge to the center of the disk, dividing it in sectors of equal areas.

In reality, there are more factors involved in a competitive economy of a certain good or service, but this simplified model serves us to explain why we often see geographic clusters of businesses of the same kind.

0.2 Objective and scope of the project

Now we know that businesses have a natural tendency to form clusters and the reason for it. But, although this do happens in the real world, the game considered is a simplification. In reality, factors like marketing, product and/or service quality, added value, different prices and many more, are additional variables that allow businesses to compete for the customers and stand out.

Objective: Identify business clusters and extract consumer-preferences statistics in order to provide insight and useful information that aids in the business strategic decision-making, opportunity-detection and market analysis processes.

Scope: Although the code and methodology proposed here can be applied to many different locations and business types, the project focuses on clusters of coffee shops in the city of Paris. Every coffee shop the Data Base can return in a radius of 600 meters from the center of the city is considered. The statistics computed are the average rating and the standard deviation of the ratings for every identified cluster of coffee shops.

The idea is that one can look for the coffee shop clusters that perform poorly according to the customer reviews. In such a cluster there's a business opportunity, since the expectations of the customers are not being met, the competitors are not succeeding at doing so and therefore the competence may be weak in the zone. The average rating will provide a representative value for the quality of the coffee shops in a given cluster; while the standard deviation of the ratings will show how different the actual individual ratings are from the average and, therefore, give an idea of how representative the average rating is for the coffee shops in the cluster.

A natural, finer next step would be to analyze in detail the comments of the customers' reviews to take specific actions oriented to satisfy the customer's needs, but that is out of the scope of this project and remains as a future direction to explore.

0.3 Data Requirements and Acquisition

The first piece of information required are the geographic coordinates of the city of Paris: *latitude* and *longitude*. This is obtained through the **Geopy** library, using the *Photon* geocoder.

As stated in section 0.2, the project requires information from every coffee shop the chosen Data Base can return in a radius of 600 meters from the center of the Paris. Then a suitable Data Base that contains geographical and customer-preferences information about the coffee shops must be picked. The **Foursquare** API (RESTful) and Data Base are the employed tools to retrieve such information.

To request the coffee shops (or any venue category supported by Foursquare), a "Search for Venues" API call was used. The location, venue category, the radius and the number of results must be specified. It's worth noticing that in practice only 30 results have been observed at most, even when the limit is set to the maximum value (which is 50).

Also, since this approach can be used to analyze different kind of businesses, all the business categories and subcategories managed by Foursquare were also retrieved, to be aware of the categories of businesses that could be analyzed. The data retrieved consists of the category *Name* and its corresponding *ID* (datatype of both being *string*). This is done through a "Get Venue Categories" API call.

The specific data required from each coffee shop is:

- *Name*: the name of the coffee shop. Datatype: *string*
- *Unique ID*: the shop's unique identifier assigned by Foursquare. Datatype: *string*
- *Latitude*: the latitude coordinate of the coffee shop. Datatype: *float*
- *Longitude*: the longitude coordinate of the coffee shop. Datatype: *float*
- *Rating*: the average rating of the coffee shop given by the Foursquare users. Datatype: *float*

The previously mentioned "Search for Venues" API call already returns the *name*, *ID*, *latitude* and *longitude* information of each venue of the given category. To get the *rating* of each coffee shop, a "Get Details of a Venue" API call per individual coffee shop had to be made and then the data was extracted from the returned information. The only parameter needed for this API call is the *ID* of the coffee shop.

All the data obtained from the Foursquare API is in a **JSON** format.

Foursquare was chosen for simplicity and due to the suggestion of the corresponding course this project is associated with. It is possible that other APIs could provide more and more accurate data that may boost the quality and utility of the results, as well as enable a more refined analysis. This is a further development direction.

0.4 Data Manipulation and Analysis

Once the required data is retrieved using the API, it is integrated and converted into a **Python dictionary** format, and later to a **Pandas DataFrame** format for ease of manipulation, organization and presentation.

	id	name	rating	lat	lng
0	5618ca93498e8d9df7d0b582	Le Peloton Café	8.9	48.855505	2.356034
1	4bbb21a91261d13aa847eb98	La Caf��th��que de Paris	8.6	48.854197	2.355714
2	5933d8c0f2905e16619d0adf	La Mouette Reuse	8.5	48.856709	2.361316
3	57b0b2c6498e62eda148b41	A. Lacroix P��tissier & Glacier	8.3	48.851714	2.349406
4	59a1833193bd63511bd5629d	Terres de Caf��	8.0	48.860580	2.355482
5	59f48af7dee770670bd2bd9c	Nespresso	7.8	48.857316	2.361344
6	562a40c3498e425bd53baa85	Shakespeare & Company Caf��	7.5	48.852492	2.347197
7	4b73c62cf964a52073bb2de3	Starbucks Coffee	7.2	48.858902	2.348151
8	5831bcbf9398ab3e7c5f5f54	Unicorners	7.2	48.863291	2.354619
9	4d9da49ec97a236af68c199	Starbucks	7.1	48.856742	2.354907
10	58e6b9a20aac7515afa6686a	Cinq Fois Plus	6.9	48.861900	2.352130
11	58f29967588e300d808ba92b	Starbucks	6.8	48.861570	2.346730
12	58f214a51ffe973298e372e6	Starbucks	6.4	48.856930	2.353459
13	4bb0e4ff964a520b0673ce3	Au P��re Tranquille	6.2	48.862193	2.348360
14	4ba50a1ef964a5203ed438e3	Lapeyronie	6.1	48.861626	2.352668
15	595faf53c9a5176d6761a507	Marlette	5.7	48.857372	2.352702
16	50959204e4b0e52fa3dd4006	Caf�� Comptoir	NaN	48.858059	2.352887
17	5cd57eba6bdee6002c1e4e0d	Gagao Organic Coffee-Shop	NaN	48.861280	2.346694
18	5c7f0c33112c6c002ce99796	Terres de Caf�� Pop-up	NaN	48.860050	2.354404
19	5b1e3c392619ee002c435105	Aux Art Ect.	NaN	48.851902	2.348960

Figure 1: Dataframe of the coffee shops in the center of Paris (top 20)

Respecting the data cleaning and preprocessing, the only problem faced was that not every venue (coffee shop in this case) has a rating in the Foursquare Data Base. The special **Numpy** value *NaN* (Not a Number) was assigned in place of the missing rating values to simplify the upcoming calculations.

The resulting Dataframe can be observed in figure 1

For the location-based clusering, the algorithm chosen is the **DBSCAN** (Density-Based Spatial Clustering of Applications with Noise) algorithm. This is because the number of data-points observed is not very big (this algorithm visits each data-point one by one) and because this algorithm is capable of identifying irregular-shaped clusters, while other algorithms usually construct their clusters in a circular fashion (multiple coffee shops on a long street would form a strip-shaped cluster, for example).

The algorithm is implemented using the functions included in the **Scikit-Learn** library; and the hyper-parameters *eps* (corresponding to the maximum distance between two samples for one to be considered as in the neighborhood of the other) and *min_samples* (the number of samples in a neighborhood for a point to be considered as a core point, including the point itself) were tuned rather heuristically, although thinking about real life distances between shops in cities.

The metric used by the algorithm was not the Euclidean distance, which is the default choice, but rather the Geopy’s function *geodesic* was passed using a *lambda function*. This is because the clusters are being formed by passing the geographical coordinates of the coffee shops as features, and the geodesic function calculates the geodesic distance between two points in such coordinates. The units of the distances computed are meters (*geodesic(A,B).m*), and

therefore the units of the parameter *eps* are meters as well.

The DBSCAN algorithm uses the **cluster label -1** to classify 'noisy' samples, i.e. coffee shops that didn't meet the criteria to be grouped in a cluster.

Once the data-points have been classified, the average and the standard deviation of the ratings, as well as the average location (latitude and longitude) were computed for each cluster. This was done using **Pandas** *mean()* and *std()* functions, which ignore the *NaN* values by default. If a cluster has only one coffee shop that has been rated, the *std()* function for the rating will return *NaN*, indicating that there's not enough information to compute this statistic.

0.5 Results

In figure 2, the retrieved coffee shops prior to clustering are marked in the map. It can already be observed how some zones have a higher coffee shop density than others.

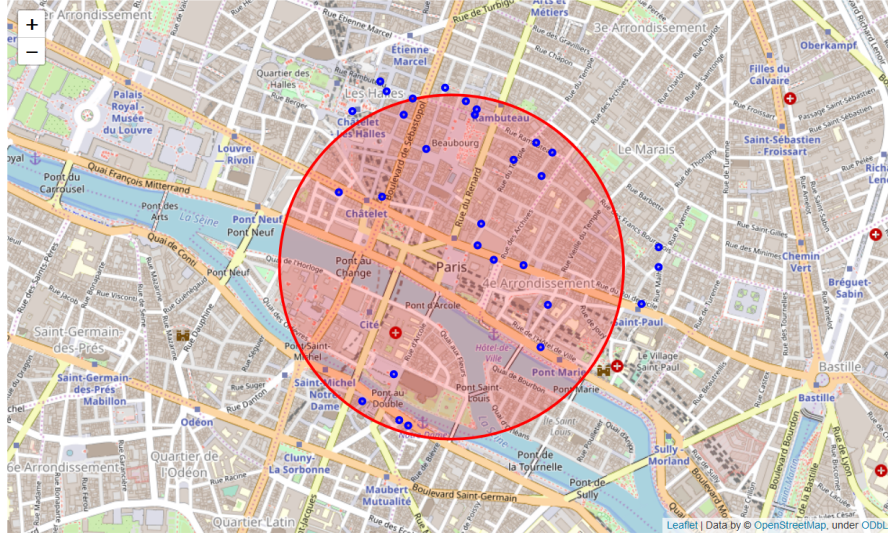


Figure 2: Coffee shops before clustering

After applying the DBSCAN algorithm to classify the coffee shops in clusters and computing the aforementioned statistics, the final results can be displayed on the map in figure 3.

The visualization of the data using interactive maps was done with the **Folium** library.

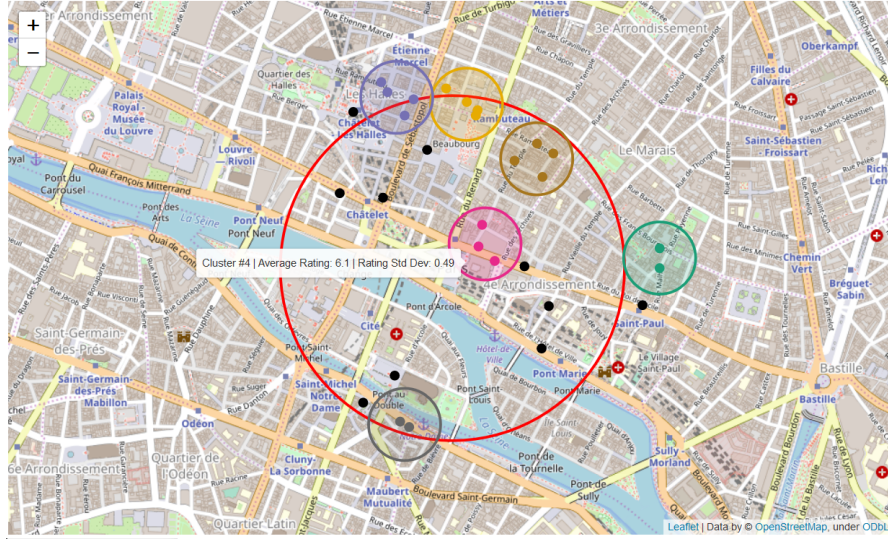


Figure 3: Coffee shop clusters

The average rating shows of course how good or bad the coffee shops of a given cluster have been rated on average by their customers.

The standard deviation shows how different the ratings of the coffee shops are from the cluster's average rating. A high standard deviation may indicate that the cluster consists on a mixed group of above average and below average quality coffee shops.

0.6 Conclusion

Using Foursquare's information and some Machine Learning techniques allowed us to perform a simple yet useful analysis on the geographical distribution and perceived quality of the coffee shops in the center of Paris, providing us with important insights that would definitely be helpful for the detection of business opportunities and decision-making process regarding a possible business venture on the coffee shop market in "The City of Lights".

This of course can be applied to all sort of different business categories, providing useful information that investors and businessmen would definitely value.

Perhaps a different choice of the API/Data-Base could enhance the results obtained here. A further direction to explore would be to retrieve and analyze the comments on the users' reviews to gain better and more specific information about the needs and complaints of the customers, something that would clarify the opportunities in the region and leverage the advantage over the competitors.

0.7 References

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0.8 Appendix: List of names of all the venue categories and subcategories available in Foursquare

+ Arts Entertainment	+++ Outdoor Sculpture
++ Amphitheater	+++ Street Art
++ Aquarium	++ Racecourse
++ Arcade	++ Racetrack
++ Art Gallery	++ Roller Rink
++ Bowling Alley	++ Salsa Club
++ Casino	++ Samba School
++ Circus	++ Stadium
++ Comedy Club	+++ Baseball Stadium
++ Concert Hall	+++ Basketball Stadium
++ Country Dance Club	+++ Cricket Ground
++ Disc Golf	+++ Football Stadium
++ Exhibit	+++ Hockey Arena
++ General Entertainment	+++ Rugby Stadium
++ Go Kart Track	+++ Soccer Stadium
++ Historic Site	+++ Tennis Stadium
++ Karaoke Box	+++ Track Stadium
++ Laser Tag	++ Theme Park
++ Memorial Site	+++ Theme Park Ride / Attraction
++ Mini Golf	++ Tour Provider
++ Movie Theater	++ Water Park
+++ Drive-in Theater	++ Zoo
+++ Indie Movie Theater	+++ Zoo Exhibit
+++ Multiplex	+ College University
++ Museum	++ College Academic Building
+++ Art Museum	+++ College Arts Building
+++ Erotic Museum	+++ College Communications Building
+++ History Museum	ing
+++ Planetarium	+++ College Engineering Building
+++ Science Museum	+++ College History Building
++ Music Venue	+++ College Math Building
+++ Jazz Club	+++ College Science Building
+++ Piano Bar	+++ College Technology Building
+++ Rock Club	++ College Administrative Building
++ Pachinko Parlor	++ College Auditorium
++ Performing Arts Venue	++ College Bookstore
+++ Dance Studio	++ College Cafeteria
+++ Indie Theater	++ College Classroom
+++ Opera House	++ College Gym
+++ Theater	++ College Lab
++ Pool Hall	++ College Library
++ Public Art	++ College Quad

++ College Rec Center	++++ Cantonese Restaurant
++ College Residence Hall	++++ Cha Chaan Teng
++ College Stadium	++++ Chinese Aristocrat Restaurant
+++ College Baseball Diamond	++++ Chinese Breakfast Place
+++ College Basketball Court	++++ Dim Sum Restaurant
+++ College Cricket Pitch	++++ Dongbei Restaurant
+++ College Football Field	++++ Fujian Restaurant
+++ College Hockey Rink	++++ Guizhou Restaurant
+++ College Soccer Field	++++ Hainan Restaurant
+++ College Tennis Court	++++ Hakka Restaurant
+++ College Track	++++ Henan Restaurant
++ College Theater	++++ Hong Kong Restaurant
++ Community College	++++ Huaiyang Restaurant
++ Fraternity House	++++ Hubei Restaurant
++ General College University	++++ Hunan Restaurant
++ Law School	++++ Imperial Restaurant
++ Medical School	++++ Jiangsu Restaurant
++ Sorority House	++++ Jiangxi Restaurant
++ Student Center	++++ Macanese Restaurant
++ Trade School	++++ Manchu Restaurant
++ University	++++ Peking Duck Restaurant
+ Event	++++ Shaanxi Restaurant
++ Christmas Market	++++ Shandong Restaurant
++ Conference	++++ Shanghai Restaurant
++ Convention	++++ Shanxi Restaurant
++ Festival	++++ Szechuan Restaurant
++ Line / Queue	++++ Taiwanese Restaurant
++ Music Festival	++++ Tianjin Restaurant
++ Other Event	++++ Xinjiang Restaurant
++ Parade	++++ Yunnan Restaurant
++ Sporting Event	++++ Zhejiang Restaurant
++ Stoop Sale	+++ Filipino Restaurant
++ Street Fair	+++ Himalayan Restaurant
++ Trade Fair	+++ Hotpot Restaurant
+ Food	+++ Indonesian Restaurant
++ Afghan Restaurant	++++ Acehnese Restaurant
++ African Restaurant	++++ Balinese Restaurant
+++ Ethiopian Restaurant	++++ Betawinese Restaurant
++ American Restaurant	++++ Indonesian Meatball Place
+++ New American Restaurant	++++ Javanese Restaurant
++ Asian Restaurant	++++ Manadonese Restaurant
+++ Burmese Restaurant	++++ Padangnese Restaurant
+++ Cambodian Restaurant	++++ Sundanese Restaurant
+++ Chinese Restaurant	+++ Japanese Restaurant
++++ Anhui Restaurant	++++ Donburi Restaurant
++++ Beijing Restaurant	++++ Japanese Curry Restaurant

++++ Kaiseki Restaurant	++ Cajun / Creole Restaurant
++++ Kushikatsu Restaurant	++ Caribbean Restaurant
++++ Monjayaki Restaurant	+++ Cuban Restaurant
++++ Nabe Restaurant	++ Caucasian Restaurant
++++ Okonomiyaki Restaurant	++ Coffee Shop
++++ Ramen Restaurant	++ Comfort Food Restaurant
++++ Shabu-Shabu Restaurant	++ Creperie
++++ Soba Restaurant	++ Czech Restaurant
++++ Sukiyaki Restaurant	++ Deli / Bodega
++++ Sushi Restaurant	++ Dessert Shop
++++ Takoyaki Place	+++ Cupcake Shop
++++ Tempura Restaurant	+++ Frozen Yogurt Shop
++++ Tonkatsu Restaurant	+++ Ice Cream Shop
++++ Udon Restaurant	+++ Pastry Shop
++++ Unagi Restaurant	+++ Pie Shop
++++ Wagashi Place	++ Diner
++++ Yakitori Restaurant	++ Donut Shop
++++ Yoshoku Restaurant	++ Dumpling Restaurant
+++ Korean Restaurant	++ Dutch Restaurant
++++ Bossam/Jokbal Restaurant	++ Eastern European Restaurant
++++ Bunsik Restaurant	+++ Belarusian Restaurant
++++ Gukbap Restaurant	+++ Bosnian Restaurant
++++ Jangjuh Restaurant	+++ Bulgarian Restaurant
++++ Samgyetang Restaurant	+++ Romanian Restaurant
+++ Malay Restaurant	+++ Tatar Restaurant
++++ Mamak Restaurant	++ English Restaurant
+++ Mongolian Restaurant	++ Falafel Restaurant
+++ Noodle House	++ Fast Food Restaurant
+++ Satay Restaurant	++ Fish Chips Shop
+++ Thai Restaurant	++ Fondue Restaurant
++++ Som Tum Restaurant	++ Food Court
+++ Tibetan Restaurant	++ Food Stand
+++ Vietnamese Restaurant	++ Food Truck
++ Australian Restaurant	++ French Restaurant
++ Austrian Restaurant	+++ Alsatian Restaurant
++ BBQ Joint	+++ Auvergne Restaurant
++ Bagel Shop	+++ Basque Restaurant
++ Bakery	+++ Brasserie
++ Belgian Restaurant	+++ Breton Restaurant
++ Bistro	+++ Burgundian Restaurant
++ Breakfast Spot	+++ Catalan Restaurant
++ Bubble Tea Shop	+++ Ch'ti Restaurant
++ Buffet	+++ Corsican Restaurant
++ Burger Joint	+++ Estaminet
++ Cafeteria	+++ Labour Canteen
++ Café	+++ Lyonese Bouchon

+++ Norman Restaurant	+++ Dosa Place
+++ Provençal Restaurant	+++ Goan Restaurant
+++ Savoyard Restaurant	+++ Gujarati Restaurant
+++ Southwestern French Restaurant	+++ Hyderabad Restaurant
++ Fried Chicken Joint	+++ Indian Chinese Restaurant
++ Friterie	+++ Indian Sweet Shop
++ Gastropub	+++ Irani Cafe
++ German Restaurant	+++ Jain Restaurant
+++ Apple Wine Pub	+++ Karnataka Restaurant
+++ Bavarian Restaurant	+++ Kerala Restaurant
+++ Bratwurst Joint	+++ Maharashtrian Restaurant
+++ Currywurst Joint	+++ Mughlai Restaurant
+++ Franconian Restaurant	+++ Multicuisine Indian Restaurant
+++ German Pop-Up Restaurant	+++ North Indian Restaurant
+++ Palatine Restaurant	+++ Northeast Indian Restaurant
+++ Rhenisch Restaurant	+++ Parsi Restaurant
+++ Schnitzel Restaurant	+++ Punjabi Restaurant
+++ Silesian Restaurant	+++ Rajasthani Restaurant
+++ Swabian Restaurant	+++ South Indian Restaurant
++ Gluten-free Restaurant	+++ Udupi Restaurant
++ Greek Restaurant	++ Irish Pub
+++ Bougatsa Shop	++ Italian Restaurant
+++ Cretan Restaurant	+++ Abruzzo Restaurant
+++ Fish Taverna	+++ Agriturismo
+++ Grilled Meat Restaurant	+++ Aosta Restaurant
+++ Kafenio	+++ Basilicata Restaurant
+++ Magirio	+++ Calabria Restaurant
+++ Meze Restaurant	+++ Campanian Restaurant
+++ Modern Greek Restaurant	+++ Emilia Restaurant
+++ Ouzeri	+++ Friuli Restaurant
+++ Patsa Restaurant	+++ Ligurian Restaurant
+++ Souvlaki Shop	+++ Lombard Restaurant
+++ Taverna	+++ Malga
+++ Tsipouro Restaurant	+++ Marche Restaurant
++ Halal Restaurant	+++ Molise Restaurant
++ Hawaiian Restaurant	+++ Padineria
+++ Poke Place	+++ Piedmontese Restaurant
++ Hot Dog Joint	+++ Puglia Restaurant
++ Hungarian Restaurant	+++ Romagna Restaurant
++ Indian Restaurant	+++ Roman Restaurant
+++ Andhra Restaurant	+++ Sardinian Restaurant
+++ Awadhi Restaurant	+++ Sicilian Restaurant
+++ Bengali Restaurant	+++ South Tyrolean Restaurant
+++ Chaat Place	+++ Trattoria/Osteria
+++ Chettinad Restaurant	+++ Trentino Restaurant
+++ Dhaba	+++ Tuscan Restaurant

+++ Umbrian Restaurant	+++ Kurdish Restaurant
+++ Veneto Restaurant	+++ Lebanese Restaurant
++ Jewish Restaurant	+++ Persian Restaurant
+++ Kosher Restaurant	+++++ Ash and Haleem Place
++ Juice Bar	+++++ Dizi Place
++ Kebab Restaurant	+++++ Gilaki Restaurant
++ Latin American Restaurant	+++++ Jegaraki
+++ Arepa Restaurant	+++++ Tabbakhi
+++ Empanada Restaurant	+++ Shawarma Place
+++ Salvadoran Restaurant	+++ Syrian Restaurant
+++ South American Restaurant	+++ Yemeni Restaurant
+++++ Argentinian Restaurant	++ Modern European Restaurant
+++++ Brazilian Restaurant	++ Molecular Gastronomy Restaurant
+++++ Acai House	++ Pakistani Restaurant
+++++ Baiano Restaurant	++ Pet Café
+++++ Central Brazilian Restaurant	++ Pizza Place
+++++ Churrascaria	++ Polish Restaurant
+++++ Empada House	++ Portuguese Restaurant
+++++ Goiano Restaurant	++ Poutine Place
+++++ Mineiro Restaurant	++ Restaurant
+++++ Northeastern Brazilian Restaurant	++ Russian Restaurant
+++++ Northern Brazilian Restaurant	+++ Blini House
+++++ Pastelaria	+++ Pelmeni House
+++++ Southeastern Brazilian Restaurant	++ Salad Place
+++++ Southern Brazilian Restaurant	++ Sandwich Place
+++++ Tapiocaria	++ Scandinavian Restaurant
+++++ Colombian Restaurant	++ Scottish Restaurant
+++++ Peruvian Restaurant	++ Seafood Restaurant
+++++ Venezuelan Restaurant	++ Slovak Restaurant
++ Mac Cheese Joint	++ Snack Place
++ Mediterranean Restaurant	++ Soup Place
++ Moroccan Restaurant	++ Southern / Soul Food Restaurant
++ Mexican Restaurant	++ Spanish Restaurant
+++ Botanero	+++ Paella Restaurant
+++ Burrito Place	+++ Tapas Restaurant
+++ Taco Place	++ Sri Lankan Restaurant
+++ Tex-Mex Restaurant	++ Steakhouse
+++ Yucatecan Restaurant	++ Swiss Restaurant
++ Middle Eastern Restaurant	++ Tea Room
+++ Egyptian Restaurant	++ Theme Restaurant
+++ Iraqi Restaurant	++ Truck Stop
+++ Israeli Restaurant	++ Turkish Restaurant
	+++ Borek Place
	+++ Cigkofte Place
	+++ Doner Restaurant
	+++ Gozleme Place

+++ Kofte Place	+++ Badminton Court
+++ Kokoreç Restaurant	+++ Baseball Field
+++ Kumpir Restaurant	+++ Basketball Court
+++ Kumru Restaurant	+++ Bowling Green
+++ Manti Place	+++ Curling Ice
+++ Meyhane	+++ Golf Course
+++ Pide Place	+++ Golf Driving Range
+++ Pilavcı	+++ Gym / Fitness Center
+++ Söğüş Place	+++++ Boxing Gym
+++ Tantuni Restaurant	+++++ Climbing Gym
+++ Turkish Coffeehouse	+++++ Cycle Studio
+++ Turkish Home Cooking Restaurant	+++++ Gym Pool
+++ Çöp Şiş Place	+++++ Gymnastics Gym
++ Ukrainian Restaurant	+++++ Gym
+++ Varenyky restaurant	+++++ Martial Arts Dojo
+++ West-Ukrainian Restaurant	+++++ Outdoor Gym
++ Vegetarian / Vegan Restaurant	+++++ Pilates Studio
++ Wings Joint	+++++ Track
+ Nightlife Spot	+++++ Weight Loss Center
++ Bar	+++++ Yoga Studio
+++ Beach Bar	+++ Hockey Field
+++ Beer Bar	+++ Hockey Rink
+++ Beer Garden	+++ Paintball Field
+++ Champagne Bar	+++ Rugby Pitch
+++ Cocktail Bar	+++ Skate Park
+++ Dive Bar	+++ Skating Rink
+++ Gay Bar	+++ Soccer Field
+++ Hookah Bar	+++ Sports Club
+++ Hotel Bar	+++ Squash Court
+++ Karaoke Bar	+++ Tennis Court
+++ Pub	+++ Volleyball Court
+++ Sake Bar	++ Bathing Area
+++ Speakeasy	++ Bay
+++ Sports Bar	++ Beach
+++ Tiki Bar	+++ Nudist Beach
+++ Whisky Bar	+++ Surf Spot
+++ Wine Bar	++ Bike Trail
++ Brewery	++ Botanical Garden
++ Lounge	++ Bridge
++ Night Market	++ Campground
++ Nightclub	++ Canal Lock
++ Other Nightlife	++ Canal
++ Strip Club	++ Castle
+ Outdoors Recreation	++ Cave
++ Athletics Sports	++ Cemetery
	++ Dive Spot

++ Dog Run	+++ Country
++ Farm	+++ Neighborhood
++ Field	+++ State
++ Fishing Spot	+++ Town
++ Forest	+++ Village
++ Fountain	++ Summer Camp
++ Garden	++ Trail
++ Gun Range	++ Tree
++ Harbor / Marina	++ Vineyard
++ Hill	++ Volcano
++ Hot Spring	++ Waterfall
++ Indoor Play Area	++ Waterfront
++ Island	++ Well
++ Lake	++ Windmill
++ Lighthouse	+ Professional Other Places
++ Mountain Hut	++ Animal Shelter
++ Mountain	++ Art Studio
++ National Park	++ Auditorium
++ Nature Preserve	++ Ballroom
++ Other Great Outdoors	++ Building
++ Palace	++ Business Center
++ Park	++ Club House
++ Pedestrian Plaza	++ Community Center
++ Playground	++ Convention Center
++ Plaza	+++ Meeting Room
++ Pool	++ Cultural Center
++ Rafting	++ Distillery
++ Recreation Center	++ Distribution Center
++ Reservoir	++ Event Space
++ River	+++ Outdoor Event Space
++ Rock Climbing Spot	++ Factory
++ Roof Deck	++ Fair
++ Scenic Lookout	++ Funeral Home
++ Sculpture Garden	++ Government Building
++ Ski Area	+++ Capitol Building
+++ Apres Ski Bar	+++ City Hall
+++ Ski Chairlift	+++ Courthouse
+++ Ski Chalet	+++ Embassy / Consulate
+++ Ski Lodge	+++ Fire Station
+++ Ski Trail	+++ Monument / Landmark
++ Skydiving Drop Zone	+++ Police Station
++ Stables	+++ Town Hall
++ State / Provincial Park	++ Industrial Estate
++ States Municipalities	++ Laboratory
+++ City	++ Library
+++ County	++ Medical Center

+++ Acupuncturist	+++ Music School
+++ Alternative Healer	+++ Nursery School
+++ Chiropractor	+++ Preschool
+++ Dentist's Office	+++ Private School
+++ Doctor's Office	+++ Religious School
+++ Emergency Room	+++ Swim School
+++ Eye Doctor	++ Social Club
+++ Hospital	++ Spiritual Center
++++ Hospital Ward	+++ Buddhist Temple
+++ Maternity Clinic	+++ Cemevi
+++ Medical Lab	+++ Church
+++ Mental Health Office	+++ Confucian Temple
+++ Nutritionist	+++ Hindu Temple
+++ Physical Therapist	+++ Kingdom Hall
+++ Rehab Center	+++ Monastery
+++ Urgent Care Center	+++ Mosque
+++ Veterinarian	+++ Prayer Room
++ Military Base	+++ Shrine
++ Non-Profit	+++ Sikh Temple
++ Observatory	+++ Synagogue
++ Office	+++ Temple
+++ Advertising Agency	+++ Terreiro
+++ Campaign Office	++ TV Station
+++ Conference Room	++ Voting Booth
+++ Corporate Amenity	++ Warehouse
+++ Corporate Cafeteria	++ Waste Facility
+++ Corporate Coffee Shop	++ Wedding Hall
+++ Coworking Space	++ Winery
+++ Tech Startup	+ Residence
++ Parking	++ Assisted Living
++ Post Office	++ Home (private)
++ Power Plant	++ Housing Development
++ Prison	++ Residential Building (Apartment / Condo)
++ Radio Station	++ Trailer Park
++ Recruiting Agency	+ Shop Service
++ Research Station	++ ATM
++ School	++ Adult Boutique
+++ Adult Education Center	++ Antique Shop
+++ Circus School	++ Arts Crafts Store
+++ Cooking School	++ Astrologer
+++ Driving School	++ Auto Dealership
+++ Elementary School	++ Auto Garage
+++ Flight School	++ Auto Workshop
+++ High School	++ Automotive Shop
+++ Language School	++ Baby Store
+++ Middle School	

++ Bank	++ Fireworks Store
++ Bath House	++ Fishing Store
++ Batik Shop	++ Flea Market
++ Betting Shop	++ Floating Market
++ Big Box Store	++ Flower Shop
++ Bike Shop	++ Food Drink Shop
++ Board Shop	+++ Beer Store
++ Bookstore	+++ Butcher
++ Bridal Shop	+++ Cheese Shop
++ Business Service	+++ Dairy Store
++ Camera Store	+++ Farmers Market
++ Candy Store	+++ Fish Market
++ Car Wash	+++ Food Service
++ Carpet Store	+++ Gourmet Shop
++ Check Cashing Service	+++ Grocery Store
++ Child Care Service	+++ Health Food Store
+++ Daycare	+++ Kuruyemişçi
++ Chocolate Shop	+++ Liquor Store
++ Clothing Store	+++ Organic Grocery
+++ Accessories Store	+++ Sausage Shop
+++ Boutique	+++ Street Food Gathering
+++ Kids Store	+++ Supermarket
+++ Lingerie Store	+++ Turşucu
+++ Men's Store	+++ Wine Shop
+++ Shoe Store	++ Frame Store
+++ Women's Store	++ Fruit Vegetable Store
++ Comic Shop	++ Furniture / Home Store
++ Construction Landscaping	+++ Lighting Store
++ Convenience Store	++ Gaming Cafe
++ Cosmetics Shop	++ Garden Center
++ Costume Shop	++ Gas Station
++ Credit Union	++ Gift Shop
++ Currency Exchange	++ Gun Shop
++ Department Store	++ Hardware Store
++ Design Studio	++ Health Beauty Service
++ Discount Store	++ Herbs Spices Store
++ Dive Shop	++ Hobby Shop
++ Drugstore	++ Home Service
++ Dry Cleaner	++ Hunting Supply
++ EV Charging Station	++ IT Services
++ Electronics Store	++ Insurance Office
++ Entertainment Service	++ Internet Cafe
++ Event Service	++ Jewelry Store
++ Fabric Shop	++ Kitchen Supply Store
++ Film Studio	++ Knitting Store
++ Financial or Legal Service	++ Laundromat

++ Laundry Service	++ Shopping Mall
++ Lawyer	++ Shopping Plaza
++ Leather Goods Store	++ Skate Shop
++ Locksmith	++ Ski Shop
++ Lottery Retailer	++ Smoke Shop
++ Luggage Store	++ Smoothie Shop
++ Marijuana Dispensary	++ Souvenir Shop
++ Market	++ Spa
++ Massage Studio	++ Sporting Goods Shop
++ Mattress Store	++ Stationery Store
++ Medical Supply Store	++ Storage Facility
++ Miscellaneous Shop	++ Supplement Shop
++ Mobile Phone Shop	++ Tailor Shop
++ Mobility Store	++ Tanning Salon
++ Motorcycle Shop	++ Tattoo Parlor
++ Motorsports Shop	++ Thrift / Vintage Store
++ Music Store	++ Toy / Game Store
++ Nail Salon	++ Travel Agency
++ Newsstand	++ Used Bookstore
++ Notary	++ Vape Store
++ Optical Shop	++ Video Game Store
++ Other Repair Shop	++ Video Store
++ Outdoor Supply Store	++ Warehouse Store
++ Outlet Mall	++ Watch Shop
++ Outlet Store	+ Travel Transport
++ Paper / Office Supplies Store	++ Airport
++ Pawn Shop	+++ Airport Food Court
++ Perfume Shop	+++ Airport Gate
++ Pet Service	+++ Airport Lounge
++ Pet Store	+++ Airport Service
++ Pharmacy	+++ Airport Terminal
++ Photography Lab	+++ Airport Tram
++ Photography Studio	+++ Baggage Claim
++ Piercing Parlor	+++ Plane
++ Pop-Up Shop	++ Baggage Locker
++ Print Shop	++ Bike Rental / Bike Share
++ Public Bathroom	++ Boat Rental
++ Real Estate Office	++ Boat or Ferry
++ Record Shop	++ Border Crossing
++ Recording Studio	++ Bus Station
++ Recycling Facility	+++ Bus Line
++ Rental Service	++ Bus Stop
++ Salon / Barbershop	++ Cable Car
++ Sauna / Steam Room	++ Cruise
++ Shipping Store	++ Duty-free Shop
++ Shoe Repair	++ General Travel

++ Heliport	++ RV Park
++ Hotel	++ Rental Car Location
+++ Bed Breakfast	++ Rest Area
+++ Boarding House	++ Road
+++ Hostel	++ Taxi Stand
+++ Hotel Pool	++ Taxi
+++ Inn	++ Toll Booth
+++ Motel	++ Toll Plaza
+++ Resort	++ Tourist Information Center
+++ Vacation Rental	++ Train Station
++ Intersection	+++ Platform
++ Light Rail Station	+++ Train
++ Metro Station	++ Tram Station
++ Moving Target	++ Transportation Service
++ Pier	++ Travel Lounge
++ Port	++ Tunnel