Introduction

Many people have ever had the idea of starting their own business. However, when it comes to determine what business to do and where to set it up, a lot of people don’t have a systematical way to make this decision. This project is designed to help the prospect business owner to determine potentially the most profitable business to do in a specific area.

The area to be studied in this project is the Queens Borough in the Great New York area. All the neighborhoods in Queens are studied. For each neighborhood, the types of business as well as their densities (frequencies) are studied. It is tentatively postulated that, given a business type exists in a neighborhood, a business type of low density in the neighborhood would be more profitable than the type of business with higher density. Therefore, the goal of this project is to analyze the density of types of business in the neighborhoods in Queens, cluster the neighborhood based on the types of business, and figure out the potentially more profitable business to be established in the neighborhood.

Data

The data set used for this project is a combination of the neighborhood data from website <https://geo.nyu.edu/catalog/nyu_2451_34572> and the location data of the neighborhood from Foursquare. To obtain the neighborhood data from the website, a json file can be downloaded directly using the website API and then read into the project as pandas dataframe. The neighborhood data set contains latitude and longitude information for all the neighborhoods names in the five boroughs in New York area. For the purpose of this project, only the rows of Queens Borough were selected, which contains 81 neighborhoods. Foursquare location data for the business in the 81 neighborhoods were downloaded from Foursquare as json file, and the information of business name, category, latitude and longitude was extracted into pandas dataframe. The business dataframe is the one used for the following analysis.

Methodology

The first step after obtaining the raw data is to clean the data sets. For the neighborhood data set, only the rows for Queens Borough are selected. A head of the resulting dataframe for Queens Borough is as below:



To use the location data from Foursquare, latitude and longitude information of Queens Borough was googled, and they are latitude = 40.7282 and longitude = -73.7949.

Using this location information, the locations of the first 500 business venues within a radius of 500 of each neighborhood were requested from Foursquare. This resulted in a json file, from which the information of name, category, latitude and longitude was extracted and assembled into a data frame. The data frame has a shape of 2121 rows and 7 columns, with a head like the following:



Foursquare found 266 unique venues categories within these neighborhoods of Queens.

In order to study in details, the venue categories in each neighborhood, another data frame was created with the categories as the columns and dummy code was applied to each category. The resulting data frame has 2121 rows (number of business) and 266 columns (business categories). The category of the specific row was indicated by the column with a value of 1. For instance, the first row in the example below indicates the business is a Brazilian restaurant.



Then the venue categories were grouped by neighborhoods and percentage of each category for each neighborhood were calculated. An example of the percentages data frame is as below:



Then, based on the percentage of the business categories in each neighborhood, the top 10 most dense businesses are extracted. This step is to give the audience a general idea as to what business is the the most popular and what business exist but are not that dense in each neighborhood. The head of the data frame is as below: 

After that, based on the business percentage data, the neighborhoods are clustered using unsupervised KMean me method. Number of clusters ranging from 4 to 9 were experimented, and the final model was fixed as k=9 based on the model score and visualization. The map of the neighborhoods in Queens with 5 clusters is as below: 

Results

The resulting clustering for the neighborhoods in Queens turned out not to be a typical clustering pattern, with most of the neighborhoods crowding in one cluster (cluster 6) and other clusters sparsely populated. However, this result does not impact the goal of the project, which is to find the neighborhoods outside Cluster 6 and look into the business types other than the first and second popular ones.

Below is a full list of the cluster label of each neighborhood and the type of businesses of top 10 densities. Take the neighborhood of Glendale as an example. Glendale was labeled as cluster 0, with food & drink shops and pizza place as its most two popular businesses. If a client is interested to start a new small business in Glendale, it is not suggested that he start a new food & drink shop or a pizza place because there are already enough such stores to feed the people nearby, even though it seems that Glendale residents love by buy packaged food and drink and eat pizza out of home. So, some suggestions for the client to be consider could be to start a business such as a craft store, a fish store or a fish & chip shop.

Borough Neighborhood Latitude Longitude Cluster Labels \

0 Queens Astoria 40.768509 -73.915654 6

1 Queens Woodside 40.746349 -73.901842 6

2 Queens Jackson Heights 40.751981 -73.882821 6

3 Queens Elmhurst 40.744049 -73.881656 6

4 Queens Howard Beach 40.654225 -73.838138 6

5 Queens Corona 40.742382 -73.856825 6

6 Queens Forest Hills 40.725264 -73.844475 6

7 Queens Kew Gardens 40.705179 -73.829819 6

8 Queens Richmond Hill 40.697947 -73.831833 6

9 Queens Flushing 40.764454 -73.831773 6

10 Queens Long Island City 40.750217 -73.939202 6

11 Queens Sunnyside 40.740176 -73.926916 6

12 Queens East Elmhurst 40.764073 -73.867041 6

13 Queens Maspeth 40.725427 -73.896217 6

14 Queens Ridgewood 40.708323 -73.901435 6

15 Queens Glendale 40.702762 -73.870742 0

16 Queens Rego Park 40.728974 -73.857827 6

17 Queens Woodhaven 40.689887 -73.858110 0

18 Queens Ozone Park 40.680708 -73.843203 6

19 Queens South Ozone Park 40.668550 -73.809865 0

20 Queens College Point 40.784903 -73.843045 6

21 Queens Whitestone 40.781291 -73.814202 0

22 Queens Bayside 40.766041 -73.774274 6

23 Queens Auburndale 40.761730 -73.791762 6

24 Queens Little Neck 40.770826 -73.738898 6

25 Queens Douglaston 40.766846 -73.742498 0

26 Queens Glen Oaks 40.749441 -73.715481 6

27 Queens Bellerose 40.728573 -73.720128 6

28 Queens Kew Gardens Hills 40.722578 -73.820878 6

29 Queens Fresh Meadows 40.734394 -73.782713 6

30 Queens Briarwood 40.710935 -73.811748 0

31 Queens Jamaica Center 40.704657 -73.796902 6

32 Queens Oakland Gardens 40.745619 -73.754950 6

33 Queens Queens Village 40.718893 -73.738715 6

34 Queens Hollis 40.711243 -73.759250 6

35 Queens South Jamaica 40.696911 -73.790426 6

36 Queens St. Albans 40.694445 -73.758676 0

37 Queens Rochdale 40.675211 -73.772588 6

38 Queens Springfield Gardens 40.666230 -73.760421 6

39 Queens Cambria Heights 40.692775 -73.735269 6

40 Queens Rosedale 40.659816 -73.735261 6

41 Queens Far Rockaway 40.603134 -73.754980 0

42 Queens Broad Channel 40.603027 -73.820055 0

43 Queens Breezy Point 40.557401 -73.925512 5

44 Queens Steinway 40.775923 -73.902290 0

45 Queens Beechhurst 40.792781 -73.804365 0

46 Queens Bay Terrace 40.782843 -73.776802 6

47 Queens Edgemere 40.595642 -73.776133 0

48 Queens Arverne 40.589144 -73.791992 6

49 Queens Rockaway Beach 40.582802 -73.822361 0

50 Queens Neponsit 40.572037 -73.857547 3

51 Queens Murray Hill 40.764126 -73.812763 6

52 Queens Floral Park 40.741378 -73.708847 6

53 Queens Holliswood 40.720957 -73.767142 6

54 Queens Jamaica Estates 40.716805 -73.787227 6

55 Queens Queensboro Hill 40.744572 -73.825809 6

56 Queens Hillcrest 40.723825 -73.797603 6

57 Queens Ravenswood 40.761705 -73.931575 6

58 Queens Lindenwood 40.663918 -73.849638 0

59 Queens Laurelton 40.667884 -73.740256 8

60 Queens Lefrak City 40.736075 -73.862525 6

61 Queens Belle Harbor 40.576156 -73.854018 0

62 Queens Rockaway Park 40.580343 -73.841534 0

63 Queens Somerville 40.597711 -73.796648 4

64 Queens Brookville 40.660003 -73.751753 1

65 Queens Bellaire 40.733014 -73.738892 0

66 Queens North Corona 40.754071 -73.857518 0

67 Queens Forest Hills Gardens 40.714611 -73.841022 6

68 Queens Jamaica Hills 40.711460 -73.796465 6

69 Queens Utopia 40.733500 -73.796717 0

70 Queens Pomonok 40.734936 -73.804861 6

71 Queens Astoria Heights 40.770317 -73.894680 6

72 Queens Hunters Point 40.743414 -73.953868 6

73 Queens Sunnyside Gardens 40.745652 -73.918193 6

74 Queens Blissville 40.737251 -73.932442 0

75 Queens Roxbury 40.567376 -73.892138 0

76 Queens Middle Village 40.716415 -73.881143 6

77 Queens Malba 40.790602 -73.826678 2

78 Queens Hammels 40.587338 -73.805530 0

79 Queens Bayswater 40.611322 -73.765968 7

80 Queens Queensbridge 40.756091 -73.945631 6

1st Most Common Venue 2nd Most Common Venue \

0 Bar Middle Eastern Restaurant

1 Grocery Store Thai Restaurant

2 Latin American Restaurant Peruvian Restaurant

3 Thai Restaurant Mexican Restaurant

4 Italian Restaurant Bank

5 Mexican Restaurant Playground

6 Gym / Fitness Center Gym

7 Chinese Restaurant Cosmetics Shop

8 Pizza Place Latin American Restaurant

9 Hotpot Restaurant Chinese Restaurant

10 Coffee Shop Hotel

11 Pizza Place Chinese Restaurant

12 Donut Shop Café

13 Pizza Place Deli / Bodega

14 Bakery Grocery Store

15 Food & Drink Shop Pizza Place

16 Bakery Pharmacy

17 Deli / Bodega Pizza Place

18 Pizza Place Diner

19 Park Deli / Bodega

20 Pizza Place Deli / Bodega

21 Bubble Tea Shop Dance Studio

22 Bar Chinese Restaurant

23 Hookah Bar Mobile Phone Shop

24 Chinese Restaurant Deli / Bodega

25 Deli / Bodega Bank

26 Pharmacy Donut Shop

27 Pizza Place Italian Restaurant

28 Bank Playground

29 Bus Station Pharmacy

30 Coffee Shop Mexican Restaurant

31 Mobile Phone Shop Clothing Store

32 Korean Restaurant Yoga Studio

33 Bus Stop Bank

34 Sandwich Place Baseball Field

35 Bus Station Supermarket

36 Caribbean Restaurant Fast Food Restaurant

37 Southern / Soul Food Restaurant Pizza Place

38 Fried Chicken Joint Bus Station

39 Cosmetics Shop Caribbean Restaurant

40 Cosmetics Shop Bus Station

41 Deli / Bodega Pizza Place

42 Dive Bar Deli / Bodega

43 Beach Monument / Landmark

44 Rental Car Location Italian Restaurant

45 Chinese Restaurant Yoga Studio

46 Clothing Store Women's Store

47 Metro Station Pizza Place

48 Surf Spot Sandwich Place

49 Beach Ice Cream Shop

50 Beach Women's Store

51 Korean Restaurant Bank

52 Indian Restaurant Chinese Restaurant

53 Mobile Phone Shop Playground

54 Indian Restaurant Dog Run

55 Chinese Restaurant Bank

56 Donut Shop Fast Food Restaurant

57 Chinese Restaurant Grocery Store

58 Bakery Pizza Place

59 Caribbean Restaurant Park

60 Cosmetics Shop Bakery

61 Beach Deli / Bodega

62 Beach Pizza Place

63 Park Dumpling Restaurant

64 Deli / Bodega Women's Store

65 Greek Restaurant Diner

66 Deli / Bodega Bakery

67 Bakery Playground

68 Pharmacy Fast Food Restaurant

69 Deli / Bodega Playground

70 Bus Station Scenic Lookout

71 Playground Italian Restaurant

72 Café Italian Restaurant

73 Bar Grocery Store

74 Hotel Deli / Bodega

75 Beach Pub

76 Cosmetics Shop Diner

77 Rest Area Bus Line

78 Beach Bus Stop

79 Park Playground

80 Hotel Sandwich Place

3rd Most Common Venue 4th Most Common Venue \

0 Greek Restaurant Hookah Bar

1 Latin American Restaurant Bakery

2 South American Restaurant Bakery

3 South American Restaurant Chinese Restaurant

4 Pharmacy Fast Food Restaurant

5 Italian Restaurant Empanada Restaurant

6 Yoga Studio Convenience Store

7 Bank Donut Shop

8 Lounge Bank

9 Bubble Tea Shop Bakery

10 Gym / Fitness Center Pizza Place

11 Italian Restaurant Discount Store

12 Hotel Bar Gas Station

13 Mobile Phone Shop Grocery Store

14 Café Mobile Phone Shop

15 Brewery Bus Station

16 Grocery Store Sandwich Place

17 Pharmacy Bank

18 Pharmacy Spanish Restaurant

19 Fast Food Restaurant Hotel

20 Asian Restaurant Bakery

21 Deli / Bodega Candy Store

22 Pizza Place American Restaurant

23 Korean Restaurant Furniture / Home Store

24 Pizza Place Italian Restaurant

25 Bakery Shanghai Restaurant

26 Fast Food Restaurant Bakery

27 Mobile Phone Shop Diner

28 Middle Eastern Restaurant Pizza Place

29 Chinese Restaurant Cosmetics Shop

30 Deli / Bodega Plaza

31 Mexican Restaurant Coffee Shop

32 Donut Shop Chinese Restaurant

33 Sandwich Place Pedestrian Plaza

34 Shopping Mall Chinese Restaurant

35 Shop & Service Bakery

36 Chinese Restaurant Donut Shop

37 Pharmacy Market

38 Business Service Donut Shop

39 Gym / Fitness Center Pharmacy

40 Sandwich Place Jewelry Store

41 Chinese Restaurant Pharmacy

42 Pizza Place Other Nightlife

43 Board Shop Bus Stop

44 Deli / Bodega Sushi Restaurant

45 Supermarket Italian Restaurant

46 Cosmetics Shop Mobile Phone Shop

47 Skate Park Gift Shop

48 Metro Station Donut Shop

49 Food Truck Bus Station

50 Eastern European Restaurant Flower Shop

51 Bar Coffee Shop

52 Wine Shop Grocery Store

53 Donut Shop Supermarket

54 Intersection Bus Station

55 Bakery Cosmetics Shop

56 Grocery Store College Cafeteria

57 Brazilian Restaurant Bagel Shop

58 Bank Donut Shop

59 Train Station Women's Store

60 Department Store Mexican Restaurant

61 Spa Boutique

62 Donut Shop Bank

63 Flower Shop Flea Market

64 Farmers Market Egyptian Restaurant

65 Coffee Shop Chinese Restaurant

66 Pizza Place Gym / Fitness Center

67 Park Mexican Restaurant

68 Fried Chicken Joint Donut Shop

69 Automotive Shop South American Restaurant

70 Grocery Store Bar

71 Plaza Bus Line

72 Coffee Shop Japanese Restaurant

73 Pizza Place Mexican Restaurant

74 Donut Shop Mattress Store

75 Fast Food Restaurant Trail

76 Sports Bar Sushi Restaurant

77 Tennis Court Falafel Restaurant

78 Southern / Soul Food Restaurant Deli / Bodega

79 Farm Eastern European Restaurant

80 Hotel Pool Athletics & Sports

5th Most Common Venue 6th Most Common Venue \

0 Mediterranean Restaurant Seafood Restaurant

1 Filipino Restaurant Pizza Place

2 Mobile Phone Shop Diner

3 Bubble Tea Shop Indonesian Restaurant

4 Bagel Shop Sandwich Place

5 Supermarket Donut Shop

6 Park Pharmacy

7 Indian Restaurant Bus Stop

8 Metro Station Spanish Restaurant

9 Asian Restaurant Hotel Bar

10 Bar Mexican Restaurant

11 Hotel Mexican Restaurant

12 American Restaurant Bus Station

13 Diner Bank

14 Greek Restaurant Pizza Place

15 Arts & Crafts Store Deli / Bodega

16 Sushi Restaurant Restaurant

17 Hookah Bar Restaurant

18 Bank Gym

19 Donut Shop Sandwich Place

20 Pharmacy Latin American Restaurant

21 Women's Store Farmers Market

22 Indian Restaurant Sushi Restaurant

23 Noodle House Bar

24 Bus Station Coffee Shop

25 Supermarket Frozen Yogurt Shop

26 Bagel Shop Grocery Store

27 Liquor Store Bank

28 Bagel Shop Bus Station

29 Liquor Store Moving Target

30 Convenience Store Indian Restaurant

31 Performing Arts Venue Caribbean Restaurant

32 Bus Stop Pizza Place

33 Fish Market Mobile Phone Shop

34 Bakery Grocery Store

35 Grocery Store Pizza Place

36 Motorcycle Shop Shopping Mall

37 Bank Bus Stop

38 Gym Laundromat

39 Restaurant Chinese Restaurant

40 Accessories Store Deli / Bodega

41 Fried Chicken Joint Grocery Store

42 Women's Store Egyptian Restaurant

43 Trail Women's Store

44 Women's Store Pizza Place

45 Gym Donut Shop

46 Lingerie Store Kids Store

47 Seafood Restaurant Park

48 Wine Shop Pizza Place

49 BBQ Joint Latin American Restaurant

50 Flea Market Fish Market

51 Supermarket Breakfast Spot

52 Dosa Place Pizza Place

53 Women's Store Farm

54 Women's Store Farm

55 Auto Dealership Pizza Place

56 Food Food Court

57 Café Food & Drink Shop

58 Gym Japanese Restaurant

59 Eastern European Restaurant Egyptian Restaurant

60 Spa Liquor Store

61 Chinese Restaurant Mexican Restaurant

62 Seafood Restaurant Board Shop

63 Fish Market Fish & Chips Shop

64 Electronics Store Empanada Restaurant

65 Italian Restaurant Bus Station

66 Spanish Restaurant Gym

67 Plaza Food & Drink Shop

68 Indian Restaurant Shopping Mall

69 Spa Chinese Restaurant

70 Playground Pizza Place

71 Bowling Alley Bus Station

72 Burger Joint Scenic Lookout

73 Thai Restaurant Coffee Shop

74 Rental Service Clothing Store

75 Bar Irish Pub

76 Sandwich Place Bank

77 Eastern European Restaurant Egyptian Restaurant

78 Food Truck Diner

79 Egyptian Restaurant Electronics Store

80 Platform Performing Arts Venue

7th Most Common Venue 8th Most Common Venue \

0 Food Truck Bakery

1 Pub American Restaurant

2 Mexican Restaurant Thai Restaurant

3 Vietnamese Restaurant Sushi Restaurant

4 Clothing Store Fried Chicken Joint

5 Sandwich Place Bakery

6 Thai Restaurant Pizza Place

7 Pizza Place Park

8 Caribbean Restaurant Moving Target

9 Karaoke Bar Gym

10 Café Donut Shop

11 Coffee Shop South American Restaurant

12 Ice Cream Shop Lake

13 Donut Shop Japanese Restaurant

14 Bank Supplement Shop

15 Fish Market Fish & Chips Shop

16 Donut Shop Chinese Restaurant

17 Flower Shop Sporting Goods Shop

18 Sandwich Place Restaurant

19 Bar Empanada Restaurant

20 Chinese Restaurant Supermarket

21 Empanada Restaurant Event Space

22 Mexican Restaurant Pub

23 Italian Restaurant Athletics & Sports

24 Korean Restaurant Spa

25 Lounge Fast Food Restaurant

26 Park Gift Shop

27 Donut Shop Grocery Store

28 Supermarket Sushi Restaurant

29 Grocery Store Food Truck

30 Playground Arts & Crafts Store

31 Sandwich Place Department Store

32 Sandwich Place Supermarket

33 Martial Arts Dojo Fried Chicken Joint

34 Park Lounge

35 Caribbean Restaurant Electronics Store

36 Market Café

37 Sandwich Place Candy Store

38 Chinese Restaurant Liquor Store

39 Nightclub Moving Target

40 Baseball Field Caribbean Restaurant

41 Bus Station Bank

42 Electronics Store Empanada Restaurant

43 Empanada Restaurant Event Space

44 Brewery Café

45 Dessert Shop Pizza Place

46 Donut Shop Shoe Store

47 Asian Restaurant Farm

48 Playground Bed & Breakfast

49 Seafood Restaurant Pizza Place

50 Fish & Chips Shop Filipino Restaurant

51 Japanese Restaurant Bath House

52 Basketball Court Event Space

53 Electronics Store Empanada Restaurant

54 Electronics Store Empanada Restaurant

55 Park Dumpling Restaurant

56 Market Shipping Store

57 Food Truck Fried Chicken Joint

58 Fruit & Vegetable Store Deli / Bodega

59 Electronics Store Empanada Restaurant

60 Bistro Fried Chicken Joint

61 Bakery Bagel Shop

62 Bagel Shop Bar

63 Filipino Restaurant Fast Food Restaurant

64 Event Space Falafel Restaurant

65 Bus Stop Moving Target

66 Mobile Phone Shop Fast Food Restaurant

67 Donut Shop Sushi Restaurant

68 Sandwich Place Chinese Restaurant

69 Basketball Court Grocery Store

70 Bowling Alley Supermarket

71 Shopping Mall Supermarket

72 Brewery Deli / Bodega

73 Pharmacy Turkish Restaurant

74 Bar Restaurant

75 Baseball Field Deli / Bodega

76 Bakery Park

77 Electronics Store Empanada Restaurant

78 Fast Food Restaurant Bus Station

79 Empanada Restaurant Event Space

80 Park Roof Deck

9th Most Common Venue 10th Most Common Venue

0 Gym Latin American Restaurant

1 Bar Donut Shop

2 Supplement Shop Spanish Restaurant

3 Bar Bank

4 Sushi Restaurant Supermarket

5 Park Restaurant

6 Supermarket Italian Restaurant

7 Pet Store Bar

8 Sandwich Place Clothing Store

9 Gym / Fitness Center Construction & Landscaping

10 Food Truck Chinese Restaurant

11 Bakery Clothing Store

12 Rental Car Location School

13 Supermarket Chinese Restaurant

14 Sushi Restaurant Korean Restaurant

15 Flea Market Egyptian Restaurant

16 Pizza Place Diner

17 Fried Chicken Joint Supermarket

18 Latin American Restaurant Chinese Restaurant

19 Eastern European Restaurant Egyptian Restaurant

20 Karaoke Bar Café

21 Falafel Restaurant Farm

22 Bakery Greek Restaurant

23 Discount Store Train

24 Cantonese Restaurant Bank

25 Shipping Store Yoga Studio

26 Sandwich Place Mobile Phone Shop

27 Seafood Restaurant Chinese Restaurant

28 Chinese Restaurant Restaurant

29 Train Vegetarian / Vegan Restaurant

30 Bus Station Fast Food Restaurant

31 American Restaurant Pizza Place

32 Supplement Shop Sushi Restaurant

33 Bakery Salon / Barbershop

34 Asian Restaurant Fried Chicken Joint

35 Empanada Restaurant Event Space

36 Seafood Restaurant Grocery Store

37 Donut Shop Chinese Restaurant

38 Gas Station Park

39 Liquor Store Flower Shop

40 Pharmacy Fried Chicken Joint

41 Caribbean Restaurant Breakfast Spot

42 Event Space Falafel Restaurant

43 Falafel Restaurant Farm

44 Cosmetics Shop Donut Shop

45 Deli / Bodega Spa

46 American Restaurant Coffee Shop

47 Bus Station Deli / Bodega

48 Bus Stop Thai Restaurant

49 Bagel Shop Metro Station

50 Fast Food Restaurant Farmers Market

51 Karaoke Bar Cosmetics Shop

52 Eastern European Restaurant Egyptian Restaurant

53 Event Space Falafel Restaurant

54 Event Space Falafel Restaurant

55 Café Bus Station

56 Coffee Shop College Academic Building

57 Spanish Restaurant Market

58 Weight Loss Center Hotel

59 Event Space Falafel Restaurant

60 Steakhouse Frozen Yogurt Shop

61 Donut Shop Italian Restaurant

62 Smoke Shop French Restaurant

63 Farmers Market Farm

64 Farm Fast Food Restaurant

65 Convenience Store Deli / Bodega

66 Museum Caribbean Restaurant

67 Sandwich Place New American Restaurant

68 Thai Restaurant Coffee Shop

69 Bakery Donut Shop

70 Japanese Restaurant Moving Target

71 Bakery Burger Joint

72 Thai Restaurant Asian Restaurant

73 Food Truck American Restaurant

74 Movie Theater Thrift / Vintage Store

75 Filipino Restaurant Fish & Chips Shop

76 Italian Restaurant Discount Store

77 Event Space Women's Store

78 Café Dog Run

79 Falafel Restaurant Farmers Market

80 Scenic Lookout Baseball Field

Discussion

The suggestion for the client’s business type is based on data and the modeling of the data. However, in practice, a lot of other factors need to be considered for an attempt to start a new business. Such factors include, but not limited to, the amount of investment, availability of the business place and the personal interest of the client. While it is difficult to model these factor using data, they have to be considered in combination with what has been reflected from data.

Conclusion

This project use the neighborhood information and the location data to cluster the neighborhoods in Queens Borough based on their business features, with a goal to provide business suggestions to clients who plan to start new small business in one or more of the neighborhoods. Suggestions can be successfully provided to the clients based on data, however, the final decision on a business type has to be made combining what the data suggested and the practical factors.