Recommending Neighborhoods

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Coursera Capstone

Introduction

- The problem:
  - Relocate neighborhoods within a city or borough.
  - Replicate current situation as closely as possible.
- Example case:
  - A business seeking to relocate or open a second location that is satisfied with its current neighborhood and thus would like to replicate it as closely as possible.

Data

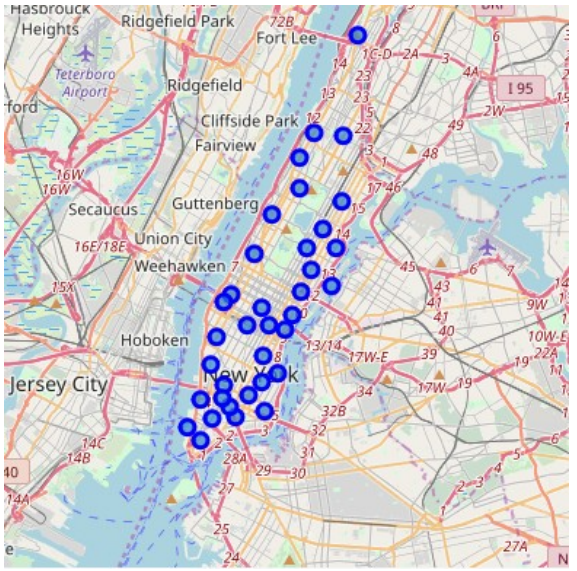
- Foursquare
  - Venues in each neighborhood are explored.
  - This provides an indication of the business landscape of each location
- Rent Cafe
  - A table with rent information for each neighborhood is scraped and added to base data.

Methodology

- Tables and maps are generated to show progress in data processing.
- K-means clustering groups comparable neighborhoods.

Selection of Results

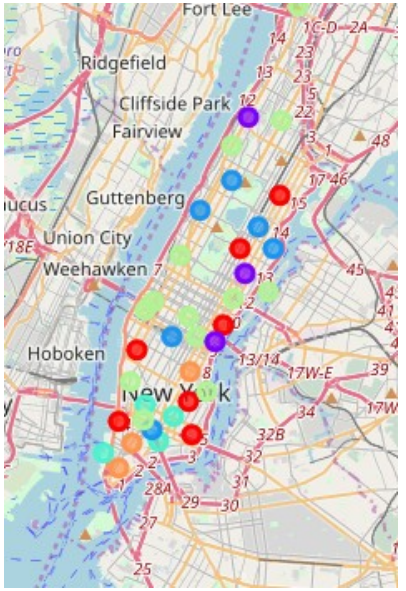
- To the right, we have the basic geographic data plotted out on map.
- Below, it is in a table, with rent information.



	Neighborhood	Borough	Latitude	Longitude	Average Rent
0	Chinatown	Manhattan	40.715618	-73.994279	$4,864
1	Washington Heights	Manhattan	40.851903	-73.936900	$2,170
2	Manhattanville	Manhattan	40.816934	-73.957385	$4,553
3	Central Harlem	Manhattan	40.815976	-73.943211	$2,783
4	East Harlem	Manhattan	40.792249	-73.944182	$2,528
5	Upper East Side	Manhattan	40.775639	-73.960508	$4,173
6	Yorkville	Manhattan	40.775930	-73.947118	$4,130

Selection of Results

	Neighborhood	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 M Com Ve
0	Battery Park City	Park	Coffee Shop	Sandwich Place	Fountain	Plaza	Cupcake Shop	BBQ
1	Carnegie Hill	Spa	Bookstore	Pizza Place	Yoga Studio	Bakery	Café	Coffee S
2	Central Harlem	African Restaurant	Seafood Restaurant	Pizza Place	American Restaurant	Chinese Restaurant	French Restaurant	Gym / Fitr Ce
3	Chelsea	Ice Cream Shop	Hotel	Nightclub	Asian Restaurant	Coffee Shop	Seafood Restaurant	The
4	Chinatown	Chinese Restaurant	Ice Cream Shop	American Restaurant	Sandwich Place	Bar	Salon / Barbershop	Cocktai
5	Civic Center	Gym / Fitness Center	Bakery	Cocktail Bar	Italian Restaurant	Coffee Shop	Sandwich Place	
6	Clinton	Theater	American Restaurant	Gym / Fitness Center	Hotel	Wine Shop	Gym	Lou
7	East Harlem	Mexican Restaurant	Bakery	Deli / Bodega	Latin American Restaurant	Thai Restaurant	Pharmacy	Cu Restau



- A table with most common venues by neighbourhood.
- A map with the neighborhoods clustered by venue and rent

Selection of Results

```
            if new_distance < distance:
                distance = new_distance
                best_index = i
    recommended_name = manhattan_merged.loc[best_index, 'Neighborhood']
    recommended_distance = distance
    recommended_rent = manhattan_merged.loc[best_index, 'Average Rent']
    output_string = "The recommended neighborhood is "+str(recommended_name)+", it is "+str(recommended_distance)+" kilometers from the desired locat
    print(output_string)
```

The function is all set and ready to be called!

```
: neighborhood_recommender('Yorkville', 40.5, -74 )
```

```
The recommended neighborhood is Little Italy, it is 24.388754508902256 kilometers from the desired location, and the average rent is 5690.
```

- Above is the function that comprises our end result.

Discussion

- The results could easily be tweaked according to need
- The model could be easily extended.
- Greater refinement of the model might also be advisable in later iterations.

Conclusion

- This project aimed to provide an aid to anyone seeking to switch neighborhoods within the borough of Manhattan.
- It produced Python functions that utilize machine learning in order to make recommendations based on some combination of relevant paramaters.
- The basic findings are also readily extensible in a variety of directions.