



Residential profiles of NYC

An analysis of every neighborhood in NYC based on the relative dominance of local building types.

Introduction

- ▶ NYC is one of the largest cities in the USA and a global center of finance and culture, as a result every neighborhood will have a different residential profile
- ▶ For prospective residents, tourists and businesses that are looking to expand, these profiles are an important insights to have when they consider where to go.

Residential profile

- ▶ The residential profile of a neighborhood often reflects the particular sector that influences it the most. For example, popular tourist sights will have many hotels in the neighborhood, while the normal residential neighborhood won't.
- ▶ Foursquare API has a lot of information of different residential venues that can be used to examine the residential profile of each neighborhood.

Data

- ▶ 2 Data sets will be used to examine the residential profile of each neighborhood. First is a data set that contains all boroughs and neighborhoods in NYC with their respective latitude and longitude
- ▶ The other dataset is the Foursquare API that contains information of the residential type of many of the venues in NYC

To get the profile of each neighborhood, the data sets will be loaded in a data frame.

The data will be cleaned so only residential buildings with an assigned neighborhood will be left.

Afterwards we count all the venues per neighborhood and get the mean values

The K-means machine learning technique will be used to cluster neighborhoods based on residential profile



Methodology

Results

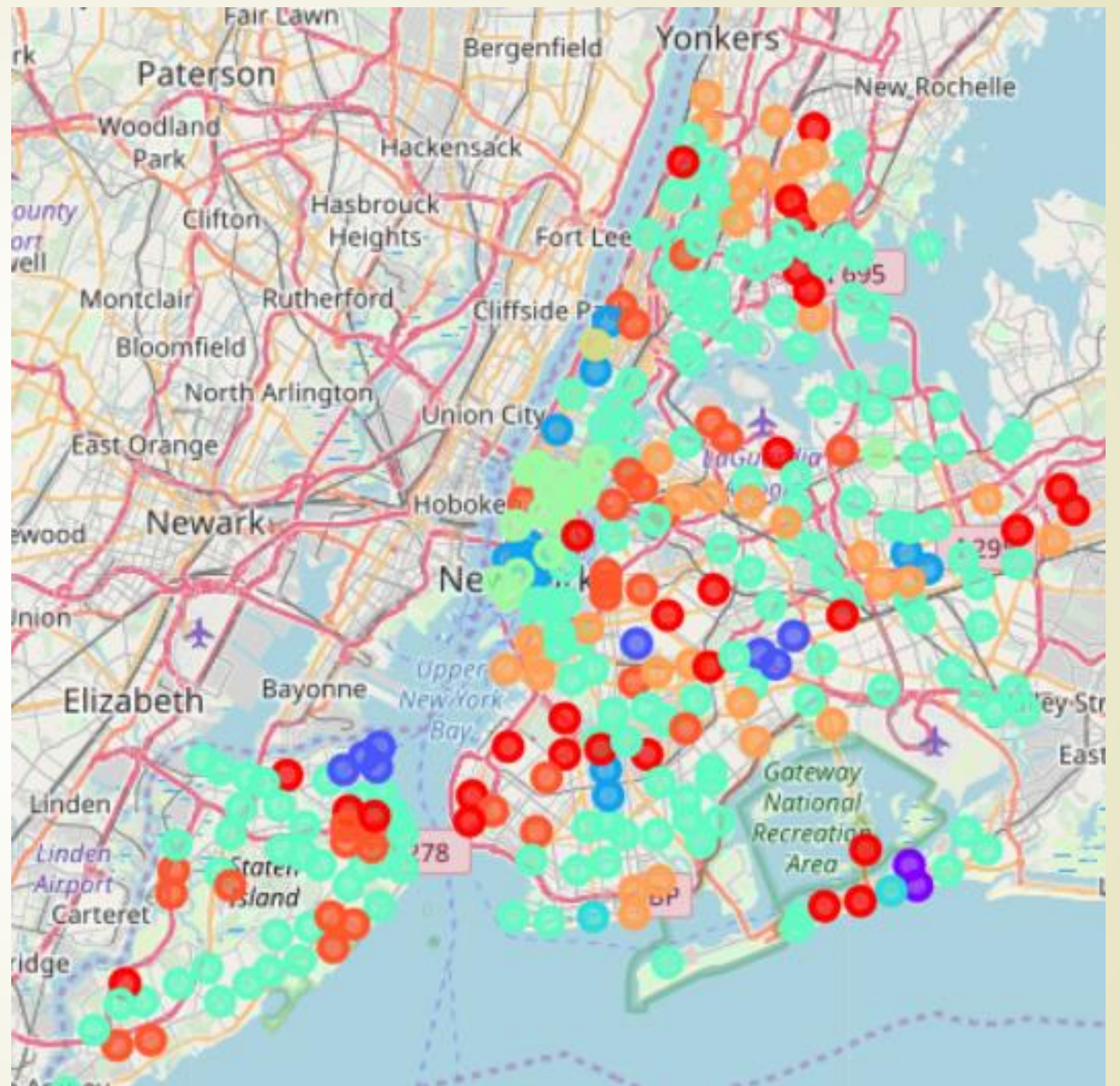
➤ The following tables show some results of the data analysis

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue Name	Venue Category	Venue Latitude	Venue Longitude	Venue City	Venue State
1	Wakefield	40.894705	-73.847201	Edenwald Houses - NYCHA	Housing Development	40.886606	-73.842116	Bronx	NY
2	Wakefield	40.894705	-73.847201	The Chamber	Bed & Breakfast	40.891560	-73.844467	Bronx	NY
3	Wakefield	40.894705	-73.847201	741 Hunts Point Avenue	Residential Building (Apartment / Condo)	40.889555	-73.843807	Bronx	NY
5	Wakefield	40.894705	-73.847201	Edenwald Community Center	Housing Development	40.886027	-73.845020	New York	NY
6	Wakefield	40.894705	-73.847201	E 226 St	Residential Building (Apartment / Condo)	40.885127	-73.849697	Bronx	NY

	Neighborhood	1st Top Venue Category	2nd Top Venue Category	3rd Top Venue Category	4th Top Venue Category	5th Top Venue Category
0	Allerton	Bed & Breakfast	Housing Development	Assisted Living	Motel	Residential Building (Apartment / Condo)
1	Arden Heights	Housing Development	Vacation Rental	Trailer Park	Residential Building (Apartment / Condo)	Motel
2	Arlington	Housing Development	Residential Building (Apartment / Condo)	Vacation Rental	Trailer Park	Motel
3	Arrochar	Residential Building (Apartment / Condo)	Hotel	Vacation Rental	Trailer Park	Motel
4	Arverne	Vacation Rental	Bed & Breakfast	Housing Development	Residential Building (Apartment / Condo)	Hotel

Results

- On the map we can see the distribution of every cluster
- For example, we can see a group of green clusters on mid to lower Manhattan, this is the hotel group!





Discussion



- ▶ The clusters are mostly based on the number 1 top category per neighborhood, cluster number 5 is the notable exception.
- ▶ Cluster 5 does not have a dominant residential type, which might be because it's an average residential neighborhood that is not defined by a particular sector.
- ▶ The distribution generally makes sense, e.g. hotels are on Manhattan, motels are along major highways and university halls are near universities.
- ▶ The clusters are based on relative occurrence of types, not absolute occurrence, otherwise apartments would always be number 1!

Conclusion



The residential profile of a neighborhood can often tell you something about the local dominant sector



The clustering makes sense and are often what is expected, e.g. hotels are near tourist sites



Clustering is based on relative occurrence, not on absolutes as apartments would always be the major residential type.