

Predicting a suitable Neighborhood for a Hotel using Foursquare data

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Introduction

My client owns a successful Hotel in "Stuyvesant Town" in Manhattan, NY and now has the opportunity to grow their business and open a second Hotel in the city of Düsseldorf in Germany. Often the success of a Hotel is linked to its location since it is one of the most important criteria for most customers staying at a Hotel. Given the success of the Hotel in Manhattan, my client would like to open the 2nd Hotel in Düsseldorf city center. Before doing any further in depth analysis on any neighborhoods in Düsseldorf, my client would like to narrow down their options by focusing on neighborhoods that are comparable to "Stuyvesant Town" using data.

My task is to use and analyze the available online data to give location recommendations to my client based on their requirements.

The Data

There is plenty of data available online but we will be using the official data provided by the city's official website "<https://opendata.duesseldorf.de/>" for location and neighborhood information. We will also be exploring the venues in target neighborhoods using the Foursquare services. The client has also provided a reference venue data for "Stuyvesant Town" on which the analysis should be based.

Düsseldorf City Data:

As you can see on the below screenshot from <https://opendata.duesseldorf.de/> the city provides a number of Data that is open and available for every one. You can choose the topic of interest and then select the file type that you would like to work with.

 BEVÖLKERUNG 42 DATENSÄTZE	 BILDUNG UND WISSENSCHAFT 40 DATENSÄTZE	 GEO 31 DATENSÄTZE	 GESETZE UND JUSTIZ 20 DATENSÄTZE	 GESUNDHEIT 5 DATENSÄTZE	 INFRASTRUKTUR, BAUEN UND WOHNEN 44 DATENSÄTZE	 KULTUR, FREIZEIT, SPORT UND TOURISMUS 22 DATENSÄTZE
 POLITIK UND WAHLEN 41 DATENSÄTZE	 SOZIALES 52 DATENSÄTZE	 TRANSPORT UND VERKEHR 29 DATENSÄTZE	 UMWELT UND KLIMA 30 DATENSÄTZE	 VERWALTUNG, HAUSHALT UND STEUERN 17 DATENSÄTZE	 WIRTSCHAFT UND ARBEIT 8 DATENSÄTZE	

For our purpose we will be using the data file „Stadtteile Düsseldorf 2017“ in .csv format. Stadtteile is the German word for Neighborhoods and using the built-in preview option on the website we could quickly verify if the data has the necessary information. In the Data we will find the name of

the Neighborhood „Stadtteil“, the Neighborhood's number Id „Stadtteilnummer“ and the District number Ids „Stadtbezirksnummer“

stadtteil	stadtteilnummer	stadtbezirksnummer
Carlstadt	012	1
Derendorf	015	1
Düsseltal	023	2
Eller	082	8
Flehe	038	3
Flingern Nord	022	2
Flingern Süd	021	2
Friedrichstadt	031	3
Garath	101	10

Foursquare Data:

The Foursquare data will be in .json filr formate and when visualized it looks a bit messy. However when undersstood and wrangled properly in could be transformed into a comprehensive dataframe containing all the information we need about venues in any given neighborhood.

Example Raw .json Data

```
{'type': 'FeatureCollection',
'totalFeatures': 306,
'features': [{'type': 'Feature',
'id': 'nyu_2451_34572.1',
'geometry': {'type': 'Point',
'coordinates': [-73.84720052054902, 40.894705176
'geometry_name': 'geom',
'properties': {'name': 'Wakefield',
'stacked': 1,
'annoline1': 'Wakefield',
'annoline2': None,
'annoline3': None,
'annoangle': 0.0,
'borough': 'Bronx',
'bbox': [-73.84720052054902,
40.89470517661,
-73.84720052054902,
40.89470517661]}},
{'type': 'Feature',
```

Example Data after wrangling

	name	categories	lat	lng
0	Bikram Yoga	Yoga Studio	40.876844	-73.906204
1	Arturo's	Pizza Place	40.874412	-73.910271
2	Tibbett Diner	Diner	40.880404	-73.908937
3	Starbucks	Coffee Shop	40.877531	-73.905582
4	Dunkin'	Donut Shop	40.877136	-73.906666

Client reference Data:

The most popular venues in Stuyvesant Town are as following:

1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
Park	Harbor / Marina	Cocktail Bar	Baseball Field	Bar
6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
Gym / Fitness Center	Heliport	Bistro	Farmers Market	Boat or Ferry