

Battle of Neighborhoods

The Hague, Netherlands

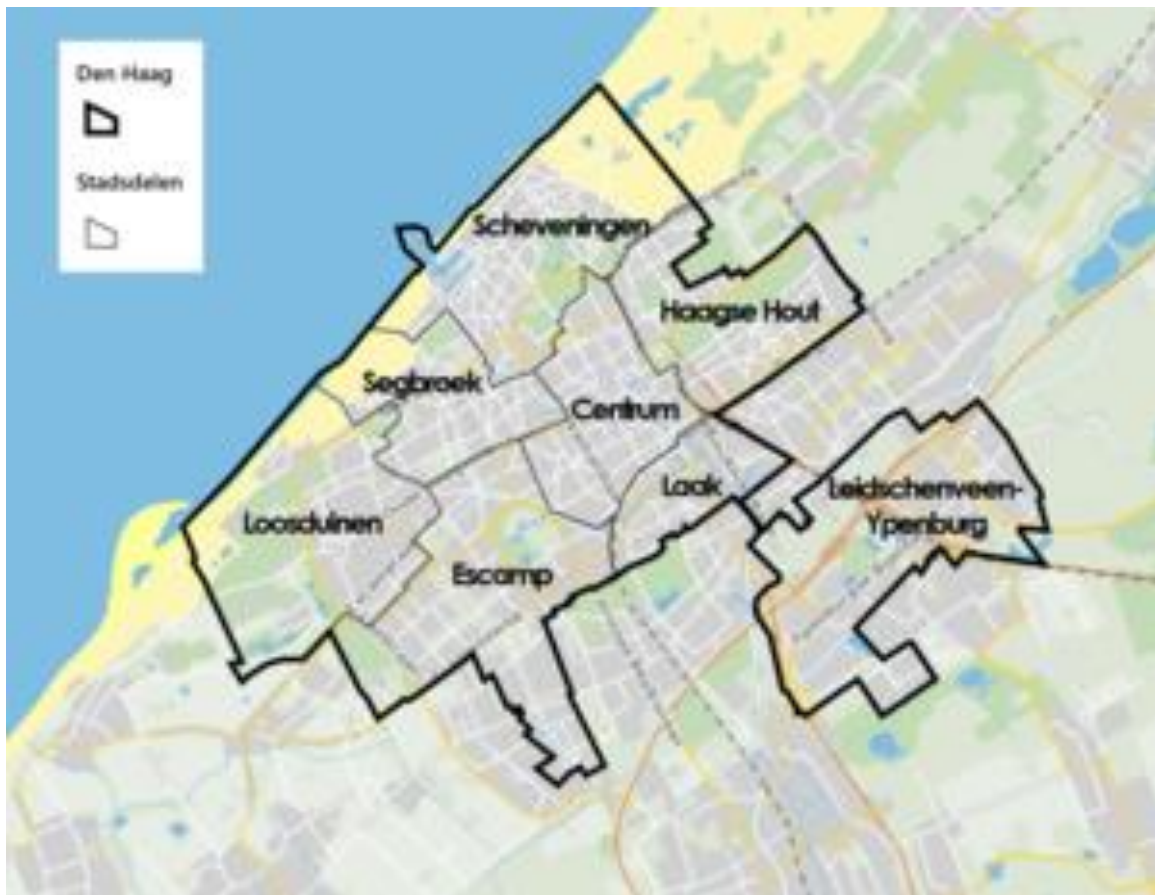


Image of all 8 Neighborhoods in The Hague, Netherlands

Date: 14 June 2019

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1. Introduction

Since I work in The Hague, I would like to reduce my travel time and move to The Hague. As I am not familiar with all Neighborhoods, my main problem/question is:

“Where to find a family friendly Neighborhood to settle and buy a new house”.

The Hague is also known as the International City of Peace and Justice. Therefore, crime rates are an important measurement for me. Because of that the following data will be needed:

1. Lowest crime rates in the Neighborhood
2. Number of venues within 1500 meters of the Neighborhood

2. Data

2.1 Sources

To extract the data needed several sources will be used. The general data of The Hague's Postal codes, District, Neighborhood, Borough will be imported from this URL:

https://ckan.dataplatform.nl/dataset/ed3fbd54-2e8b-4c7a-a9ab-5135db6a60f0/resource/7b8aeab2-ec73-4bdd-b0e1-7f892dd37b9b/download/postcode_bws_20171023.xlsx-postcodes.csv

from the URL <https://opendata.cbs.nl> a selection will be made and converted to csv of the crime rates of The Hague Districts/Neighborhoods. This site is an open data source of the Dutch Center of Statistics. This csv will be imported.

Foursquare API for venues in the surrounding of the Neighborhoods of The Hague.

2.2 Python libraries

The following python libraries will be used/installed to support the project:

- Pandas
- Requests
- BeautifulSoup
- NumPy
- Geopy
- Nominatim
- Matplotlib
- SKLearn
- Folium

3. Methodology

- First of all the number and names of Neighborhoods were determined.
- For each Neighborhood the Latitude and Longitude was collected through Nominatim.
- A Folium map of The Hague and its Neighborhoods is created to visualize the area.
- From the url <https://opendata.cbs.nl> a csv has been created with the number of crimes per Neighborhood.
- From Foursquare all venues within 1500 metres were selected for each centroid of the Neighborhood.
- The K-mean clustering machine learning has been used for the clustering and segmenting of Neighborhoods in The Hague.
- A new dataframe was created with the count of crimes and count of venues for each Neighborhood.
- The final result consists of a score to the count of crimes (-0.01) and the count of venues (1).

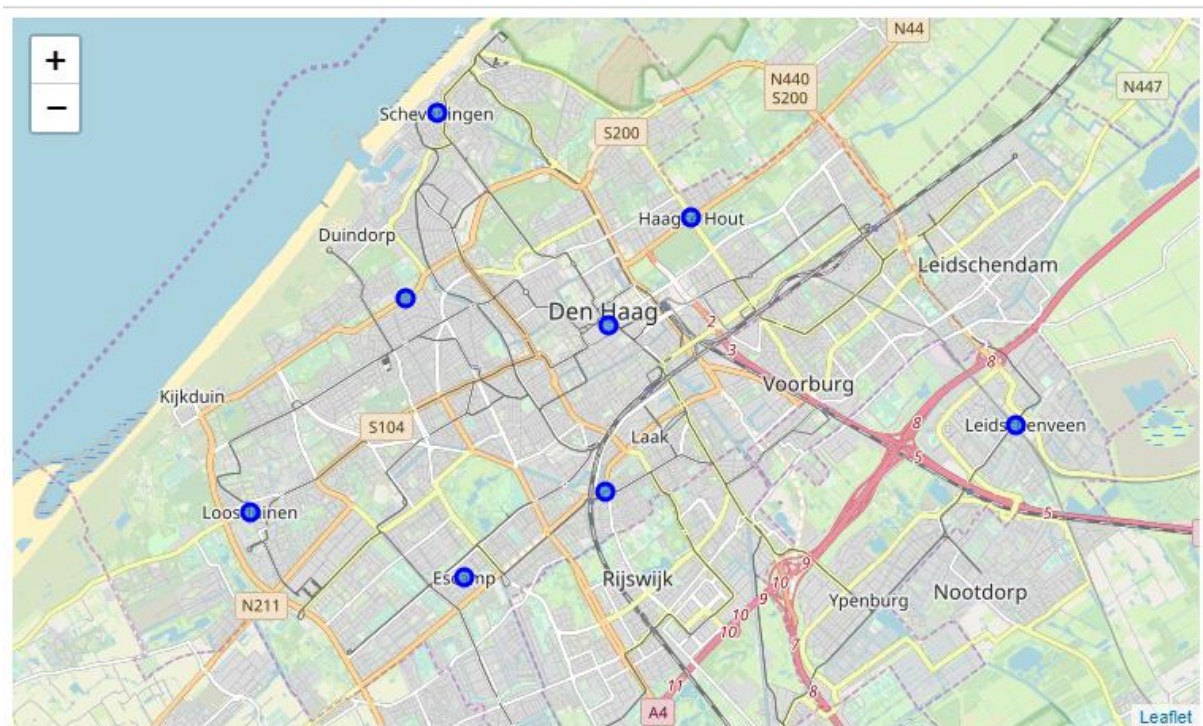
4. Results

4.1 Neighborhoods

The city of The Hague consists of 8 Neighborhoods. Underneath you will find the names, latitude, longitude and a map of The Hague and the Neighborhoods marked on it.

STADSDEEL			
Laak			
Loosduinen			
Segbroek			
Centrum			
Escamp			
Haagse Hout			
Scheveningen			
Leidschenveen-Ypenburg			

STADSDEEL	Latitude	Longitude
Laak	52.055940	4.311631
Loosduinen	52.053157	4.234828
Segbroek	52.081616	4.268620
Centrum	52.078080	4.312642
Escamp	52.044440	4.281246
Haagse Hout	52.092291	4.330432
Scheveningen	52.106207	4.275271
Leidschenveen-Ypenburg	52.064649	4.400574



4.2 Crimes per Neighborhood

The numbers of crime are selected on Neighborhoods. The data consists of the total number in the year 2017.

Stadsdeel	Totaal_criminaliteit_3
Leidschenveen-Ypenburg	1318
Loosduinen	1701
HaagseHout	1841
Segbroek	2284
Scheveningen	2420
Laak	2583
Escamp	5339
Centrum	9865

4.3 Venues per Neighborhood

Out of Foursquare API a selection has been made with the radius of 1500 metres to the centroid of each Neighborhood. A total outcome of 544 rows was listed in a .head version and a map of all venues.

(544, 7)

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Laak	52.05594	4.311631	Albert Heijn	52.055483	4.314541	Supermarket
1	Laak	52.05594	4.311631	Sportcity	52.063258	4.319482	Gym
2	Laak	52.05594	4.311631	De Haagse Markt	52.065038	4.299367	Market
3	Laak	52.05594	4.311631	Landgoed Te Werve	52.046806	4.321389	Park
4	Laak	52.05594	4.311631	Pasar Makan	52.055613	4.332216	Restaurant



For each Neighborhood a count of venues was created as well as the 10 most common venues per Neighborhood.

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Centrum	100	100	100	100	100	100
Escamp	59	59	59	59	59	59
Haagse Hout	86	86	86	86	86	86
Laak	40	40	40	40	40	40
Leidschenveen-Ypenburg	38	38	38	38	38	38
Loosduinen	52	52	52	52	52	52
Scheveningen	100	100	100	100	100	100
Segbroek	69	69	69	69	69	69

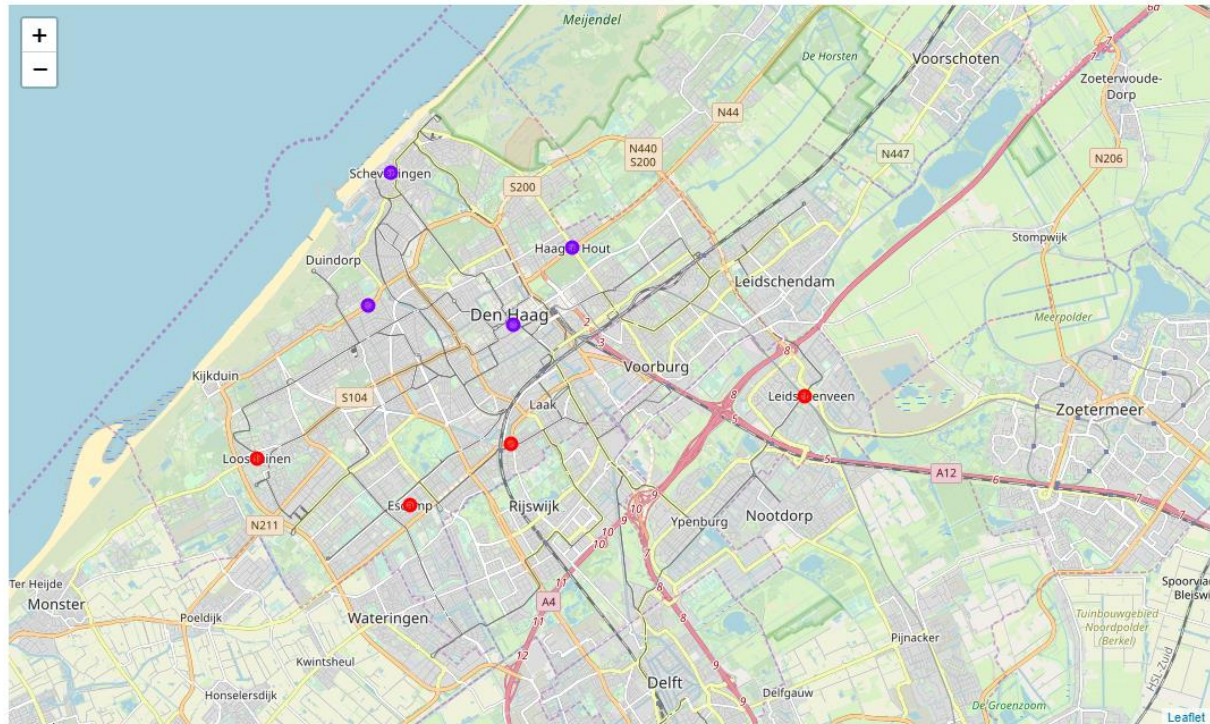
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Centrum	Coffee Shop	Italian Restaurant	Theater	Café	Restaurant	Hotel	Bar	Chinese Restaurant	Sandwich Place	Plaza
1	Escamp	Supermarket	Bus Stop	Gym	Soccer Field	Light Rail Station	Discount Store	Snack Place	Shopping Mall	Fast Food Restaurant	Gym / Fitness Center
2	Haagse Hout	Café	Restaurant	Italian Restaurant	Park	Asian Restaurant	Ice Cream Shop	Sandwich Place	Indonesian Restaurant	Soccer Field	Bar
3	Laak	Restaurant	Turkish Restaurant	Park	Supermarket	Fast Food Restaurant	Market	Café	Pizza Place	Farm	Mediterranean Restaurant
4	Leidschenveen-Ypenburg	Gym / Fitness Center	Restaurant	Supermarket	Gym	Sporting Goods Shop	Sandwich Place	Bus Stop	Farm	Platform	Martial Arts Dojo
5	Loosduinen	Supermarket	Park	Shopping Mall	Soccer Field	Pizza Place	Garden Center	Grocery Store	Snack Place	Light Rail Station	Café
6	Scheveningen	Beach Bar	Seafood Restaurant	Restaurant	Hotel	Italian Restaurant	Café	Beach	Mediterranean Restaurant	Bar	Park
7	Segbroek	Bar	Coffee Shop	Bakery	Thai Restaurant	Café	Gym / Fitness Center	Restaurant	Seafood Restaurant	Ice Cream Shop	Snack Place

4.4 Clustering

For the clustering of the venues the k-mean clustering was used.

Cluster Labels	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 Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	
0	1	Centrum	Coffee Shop	Italian Restaurant	Theater	Café	Restaurant	Hotel	Bar	Chinese Restaurant	Sandwich Place	Plaza
1	0	Escamp	Supermarket	Bus Stop	Gym	Soccer Field	Light Rail Station	Discount Store	Snack Place	Shopping Mall	Fast Food Restaurant	Gym / Fitness Center
2	1	Haagse Hout	Café	Restaurant	Italian Restaurant	Park	Asian Restaurant	Ice Cream Shop	Sandwich Place	Indonesian Restaurant	Soccer Field	Bar
3	0	Laak	Restaurant	Turkish Restaurant	Park	Supermarket	Fast Food Restaurant	Market	Café	Pizza Place	Farm	Mediterranean Restaurant
4	0	Leidschenveen-Ypenburg	Gym / Fitness Center	Restaurant	Supermarket	Gym	Sporting Goods Shop	Sandwich Place	Bus Stop	Farm	Platform	Martial Arts Dojo
5	0	Loosduinen	Supermarket	Park	Shopping Mall	Soccer Field	Pizza Place	Garden Center	Grocery Store	Snack Place	Light Rail Station	Café
6	1	Scheveningen	Beach Bar	Seafood Restaurant	Restaurant	Hotel	Italian Restaurant	Café	Beach	Mediterranean Restaurant	Bar	Park
7	1	Segbroek	Bar	Coffee Shop	Bakery	Thai Restaurant	Café	Gym / Fitness Center	Restaurant	Seafood Restaurant	Ice Cream Shop	Snack Place

The clusters are marked on the map and segmented in the table below.



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 Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	Latitude	Longitude
1	Escamp	Supermarket	Bus Stop	Gym	Soccer Field	Light Rail Station	Discount Store	Snack Place	Shopping Mall	Fast Food Restaurant	Gym / Fitness Center	52.044440	4.281246
3	Laak	Restaurant	Turkish Restaurant	Park	Supermarket	Fast Food Restaurant	Market	Café	Pizza Place	Farm	Mediterranean Restaurant	52.055940	4.311631
4	Leidschenveen-Ypenburg	Gym / Fitness Center	Restaurant	Supermarket	Gym	Sporting Goods Shop	Sandwich Place	Bus Stop	Farm	Platform	Martial Arts Dojo	52.064649	4.400574
5	Loosduinen	Supermarket	Park	Shopping Mall	Soccer Field	Pizza Place	Garden Center	Grocery Store	Snack Place	Light Rail Station	Café	52.053157	4.234828

	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 Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	Latitude	Longitude
0	Centrum	Coffee Shop	Italian Restaurant	Theater	Café	Restaurant	Hotel	Bar	Chinese Restaurant	Sandwich Place	Plaza	52.078080	4.312642
2	Haagse Hout	Café	Restaurant	Italian Restaurant	Park	Asian Restaurant	Ice Cream Shop	Sandwich Place	Indonesian Restaurant	Soccer Field	Bar	52.092291	4.330432
6	Scheveningen	Beach Bar	Seafood Restaurant	Restaurant	Hotel	Italian Restaurant	Café	Beach	Mediterranean Restaurant	Bar	Park	52.106207	4.275271
7	Segbroek	Bar	Coffee Shop	Bakery	Thai Restaurant	Café	Gym / Fitness	Restaurant	Seafood Restaurant	Ice Cream Shop	Snack Place	52.081616	4.268620

4.5 Results and score

To determine the best fitting Neighborhood we need to rate the Neighborhoods. For this rating we will need the number of crimes and the number of venues for each Neighborhood.

For the scalability a penalty factor of -0.01 will be given to the numbers of crime. For each venue a score of 1 will be given.

	Neighborhood	Totaal_criminaliteit_3
0	Centrum	9865.0
1	Escamp	5339.0
2	HaagseHout	1841.0
3	Laak	2583.0
4	Leidschenveen-Ypenburg	1318.0
5	Loosduinen	1701.0
6	Scheveningen	2420.0
7	Segbroek	2284.0

	Venue
Neighborhood	
Centrum	100.0
Escamp	59.0
Haagse Hout	86.0
Laak	40.0
Leidschenveen-Ypenburg	38.0
Loosduinen	52.0
Scheveningen	100.0
Segbroek	69.0

	Neighborhood	Totaal_criminaliteit_3	Venue
0	Centrum	9865.0	100.0
1	Escamp	5339.0	59.0
2	HaagseHout	1841.0	86.0
3	Laak	2583.0	40.0
4	Leidschenveen-Ypenburg	1318.0	38.0
5	Loosduinen	1701.0	52.0
6	Scheveningen	2420.0	100.0
7	Segbroek	2284.0	69.0

	Neighborhood	Totaal_criminaliteit_3	Venue	Score
6	Scheveningen	2420.0	100.0	75.80
2	HaagseHout	1841.0	86.0	67.59
7	Segbroek	2284.0	69.0	46.16
5	Loosduinen	1701.0	52.0	34.99
4	Leidschenveen-Ypenburg	1318.0	38.0	24.82
3	Laak	2583.0	40.0	14.17
1	Escamp	5339.0	59.0	5.61
0	Centrum	9865.0	100.0	1.35

5. Discussion

The data used was on a global level with the total count of crimes and total count of venues. During the extraction of data it was clear that every Neighborhood consists of boroughs. Together there are 44 boroughs in The Hague. These borough could help to give more insight and detailed data of each Neighborhood.

The crime rates are based on a total. These numbers could be more specified by category or as a percentage of total/number per 1000 residents.

Venues could be more clustered/segmented by category to give more detailed information or a better rating to the Neighborhoods.

6. Conclusion

The Neighborhood of Scheveningen is the best fit out of the data. With the high number of venues and a reasonable score on crimes Scheveningen scores the highest on the research. If crime is more important, HaagseHout is a very good number 2 with lots of venues and a lower number of crimes.