Assignment 2 Visualization

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For this assignment variant 1 is chosen.

1 Data sets

Three data-sets were used:

- 'Energie in beeld' from 2011 till 2015 for each neighborhood (https://data.overheid.nl/data/dataset/energieinbeeldstad-2015)
- 'Wijkgrenzen Den Haag' (https://data.overheid.nl/data/dataset/wijkgrenzen-den-haag)
- 'Stadsdeelgrens Den Haag' (https://data.overheid.nl/data/dataset/stadsdeelgrens-den-haag)

The actual data resides in the 'Energie in beeld' data-set. It contains the energy consumption and production for Den Haag measured per neighborhood.

It would be nice to show which trends in Den Haag are currently in effect with respect to the energy consumption, energy production and CO_2 emission. The data-set provides the columns as seen in Table 1. These columns are provided for all, only commercial and only private real estates. In addition 4 extra columns are also provided:

- real estates with solar energy
- solar energy production
- real estates with other power production
- total other power production

To compare all these values for all the 114 neighborhoods of Den Haag is quite the challenge.

1.1 Processing

Before the data could be visualized some artifacts had to be removed. The names of each neighborhood were denoted differently in each data-set. Also sometimes data was not available or protected, this was replaced by a negative number. The format that was provided was 'geojson', this is a very large format so I've decided to convert this first to 'topojson' which is much smaller. Also the hierarchy of each area in all data-sets was a bit hard to extract, to make it more convenient I added an reference to all parents to each neighborhood. This has all been done by using a simple python script. And finally the averages for the totals were missing, these could easily be calculated in real-time.

number of real estates	real estates with electricity	real estates with gas
total CO_2 emissions	total power consumption	total gas consumption
average CO_2 production per real estate	average power consumption	average gas consumption

Table 1: Columns of the data-set

2 Design

The design is split up by an selection part at the top and an more detailed part at the bottom, as seen in Figure 1. For a good analysis three things are important. Firstly a exploration fase must enable the user to focus on a certain area, otherwise all these neighborhoods names do not tell you much about how big it is or what is lays next to. For this reason a small map is chosen to visualize all neighborhoods. It might also be the case that the user already knows which district it wants to search, therefor an extra list is added to make sure that the user could quickly find a neighborhood by name if they are not familiar with Den Haag. Finally if a certain area is selected more detailed information about that area should be displayed. Therefor a chart is chosen with variable axis, that can be changed in real time.

2.1 Improvements

One of the improvements I was considering was to compare the trends to see if it might be bound to a specific area or not. The idea was to search through the city until a certain trend is found, for example such as in Figure 2. Then you could choose to store this information by s simple click on an button. After which the color encoding of the map will correspond to how correlated the trends are. However this turned out to be a bit to complex to implement.

Another improvement would be to compare multiple area's. At this point the entire design only makes use of a single hue. Multiple hues could be used to compare different parts of the city. However the different areas differ alot in the number of real estates that are located on them. A more clever scaling should be applied to make a good comparison for this. Or a data-set with a much higher resolution to let the user select an area by coordinates instead of predefined area's could solve this problem.

3 Implementation

The program is written using d3.js and and a simple npm hosting. The program can be executed locally with execution of the commands 'npm install' and 'npm start' in the 'app' folder. The styling of all the basic components makes use of bootstrap, in addition with jQuery.

3.1 Known issues

The list is not properly linked to the map. The intention was to simultaneously hover and select parts on the map and in the list. However it was hard to link these properly, so in the demo only the list is changed and the list items have no functionality.

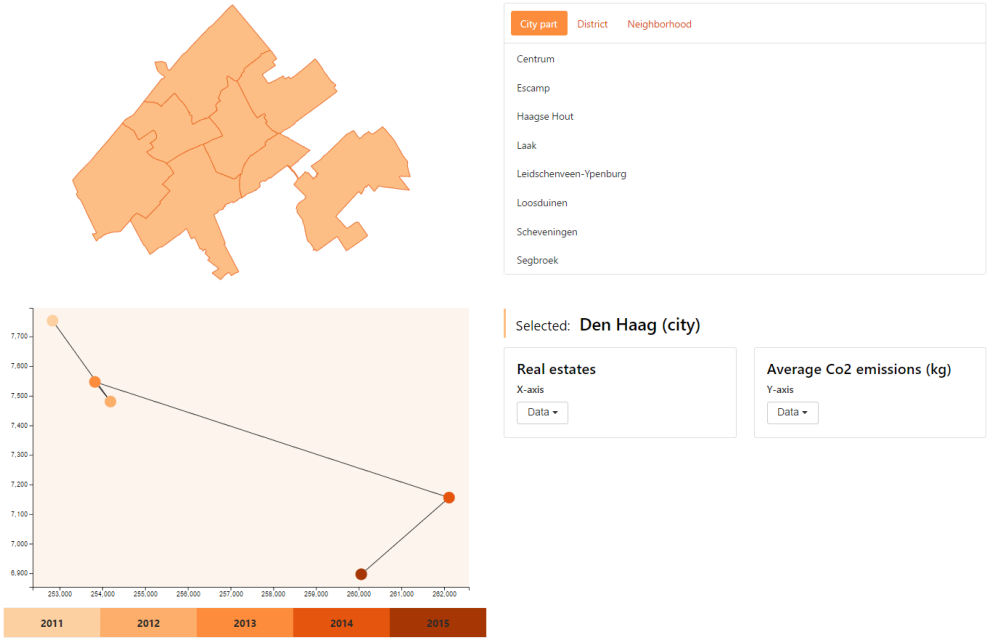

Figure 1: Overview

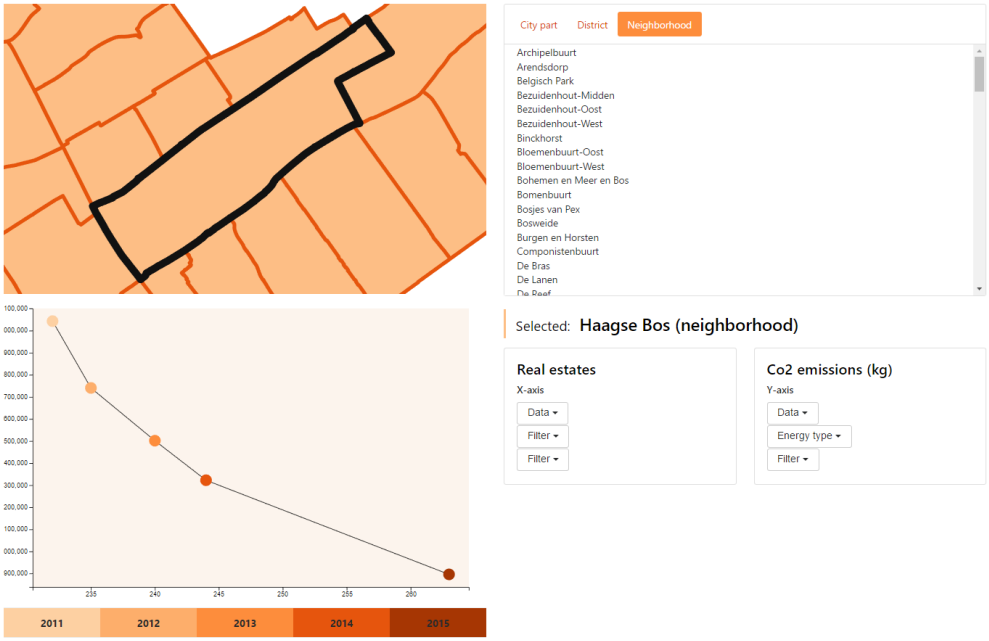

Figure 2: Detail