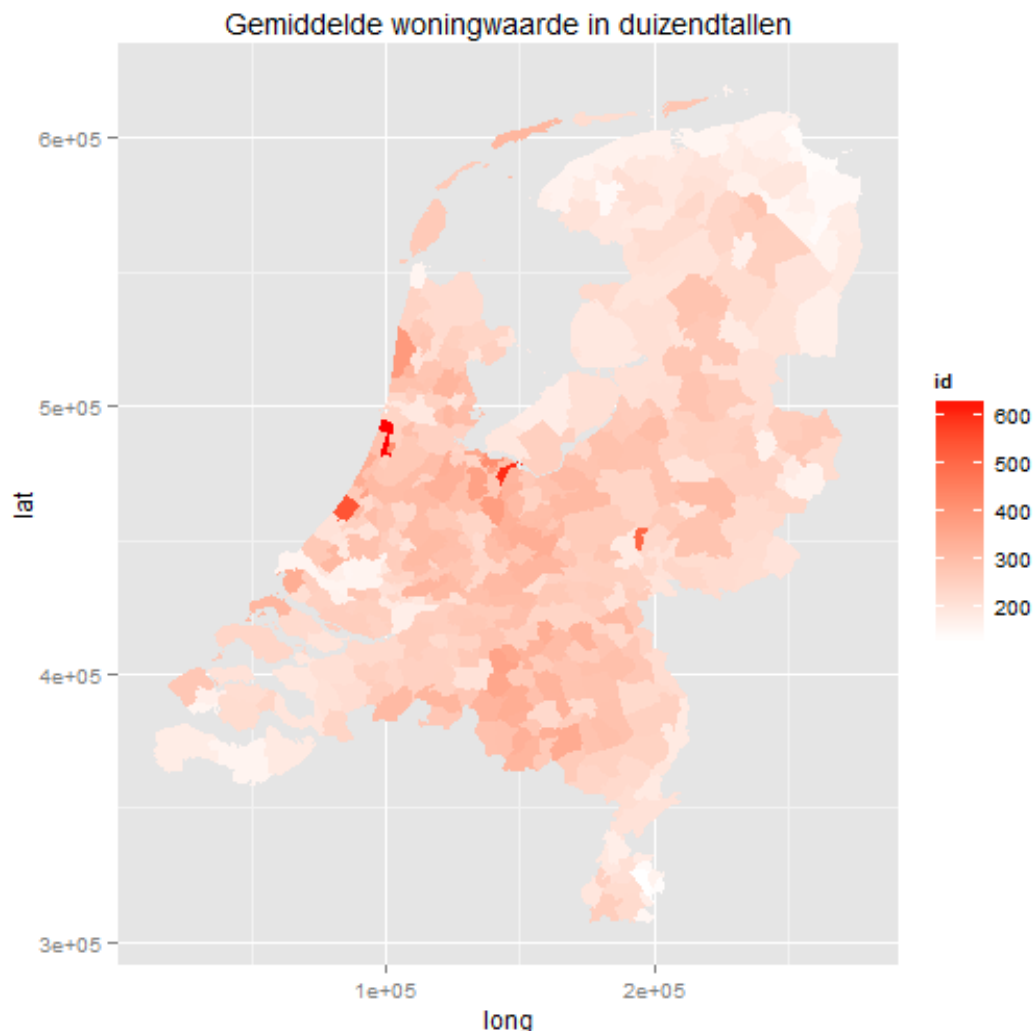# Geoscripting final assignment

Adding data to a map and make a standardized plot

Average value for houses in a municipality

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Abstract

When an time series analysis is done for data of municipalities in the Netherlands an complication is the municipal reformations. Comparisons between certain years cannot be made if a municipality has had a reformation. In this research it is attempted for all the municipalities in the Netherlands to compare old data with new data, and plot maps of this data after municipalities have reformed. Unfortunately this is not succeeded and thus this research has resulted in a part of this bigger picture. A script is made that can add data to the municipality map of the Netherlands where after with a function a plot is made that has a standardized lay out.

Introduction

When an time series analysis is done for data of municipalities in the Netherlands an complication is the municipal reformations. Every year there are municipalities that are merged with another municipality or are split up and merged to multiple other municipalities. It is documented what municipal reformations have been executed in the last 17 years. These reformations could be scripted and thus the data of the last 17 years could be reformed to the data of the current year. Using this script all data could be plotted on a map showing the current geographical locations of all the municipalities of the Netherlands. By being able of converting data of 1995 to the municipalities in 2012 time series analysis can be executed. The results of this time series analysis can be shown on a map of the Netherlands. In this way data like amount of citizens over time can easily be visualized.

Objective

For all the municipalities in the Netherlands, how do you compare old data with new data and plot maps of this data after municipalities have reformed and thus made the data not compatible over a certain time period?

Methodology

Steps in scripting

1. Get the shape file of the municipalities of the Netherlands in a reproducible way in the script
2. Clean the shape file from features that do not contain values (water areas)
3. Add a CSV file containing all municipal reformations in the last 17 years
4. Create functions converting data following municipality reformations year by year
5. Load in CBS data of municipalities in the 17 years before 2013
6. Run the functions on the data in order to make the data compatible to municipalities of 2013
7. Join the compatible data to the shape file of municipalities in 2013
8. Create a nice plotting function with a standardized lay out

Steps explained

As a first step the Dutch map with all the municipalities of the Netherlands is loaded in. This map contains water areas which do not contain demographic data. These have to be deleted. Afterwards all municipal reformations are loaded in. A function is created which splits the municipalities of the map in two data frames. One consisting of the municipalities without reformations since the year of the dataset that is about to be joined and one containing the municipalities with reformations. For all of these municipalities the values are copied or calculated and afterwards joined to the map. Then, using a function, a map is plotted with a standardized lay out.

Inputs

Description	Filename	Name in script
Map of the Netherlands	gem_2012_v1.shp	mun_neth
Municipal reformations	Gemeentelijke_herindelingen.csv	gem_her
Average values of houses in municipality	woningwaardegemeenten.csv	ww_gem_2012

Results

The overall result of this assignment is a script which adds data to a map from another dataset and creates a nice plot of this map showing the added data. Besides this main result there are also some intermediate results. These are given underneath as functions. Unfortunately some functions are not finished that have as an effect that the aimed result has not been reached. The splittingdata function is not even used in the resulting script.

Splittingdata.r   ->   A function which splits municipalities dependent on municipal reformations since a year that can be adjusted in the calling of the function. The minimum year Is 1995

Plottingmap.r   ->   A function that creates a plot of the map of the municipalities of the Netherlands in 2012 using ggplot.

The resulting image contains the standardized plot and an example dataset used and is shown on the front page of this document.

Recommendations

To come to the originally aimed for result functions have to be finalized.

Addingoldmuns.r ->   Recalculate the reformed municipalities based on the old municipalities that together form the new municipality

Differenceintime.r ->   Create a new column showing the difference in values between the joined data and the data of 2012

When the full code would be finished it can be expected that the different ways of writing a municipalities name will cause problems. For example the municipality of ' s Hertogenbosch is often also called Den Bosch. Also reformations can vary from merging two entire municipalities to one or to splitting one municipality up and merge this area to two different municipalities. In the second case an extra functionality has to be added in the script.

Conclusion

* From the created map it can be concluded that municipalities in the centre of the Netherlands ('Randstad') have an higher average price for an house than in the municipalities that are located at the edge of the Netherlands. In the top right corner and the bottom left corner it is shown that the values are the lowest. There are four municipalities with a high value (red) and it stands out that they have a relative small size compared to other municipalities.

*Unfortunately after this research it can be concluded that my goal was to ambitious to finalize within the given time for this assignment.

*Another conclusion is that stackoverflow.com is a wonderful website which gives me the opportunity to improve my programming in the future without having to take courses. I have frequently and interactively made use of it in this exercise.