

Coursera Capstone Project

The Battle of Neighbourhoods

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Abstract

In this project, machine learning was used to estimate a good place for a new coffee business in centre of Helsinki.

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1. Introduction

In a city of Helsinki, if someone is looking to open a cafe restaurant, the question is, where would you recommend that they open it? The background of the problem is that in order for a cafe to be profitable, there must be enough customers, and in order to have enough customers, it is not worth setting up a cafe in the immediate proximity of existing ones.

Let's also make sure that audience is explicitly defined to be the local restaurant entrepreneurs in Helsinki and they should care about this problem because the location of the new café has a significant impact on the expected returns.

2. Data

A description of the data: the data used to solve this problem is geolocation data collected from Four Square. Adequate explanation and discussion, with examples, of the data is the following. Data is a single data frame, containing at least a location of the café.

Explanation of the location data is a standard tuple (lat, lng), where lat stands for latitude and lng for longitude. Some other metadata like name, postal code and so on is also collected, but let us discuss that they are not absolutely necessary for the analysis. Example of the data used in analysis is shown in table 1.

Identifier	Name	Shortname	Address	Postalcode	Latitude	Longitude
1	Patisserie Teemu & Markus	Bakery	Yrjönkatu 25	00100	60.167899	24.938190
2	Kaffecentralen	Coffee Shop	Fredrikinkatu 59	00100	60.167580	24.932526
3	La Torrefazione	Café	Mannerheimintie 22	00100	60.170721	24.936158
4	The Ounce	Tea Room	Fredrikinkatu 55	00100	60.167182	24.932993
5	La Torrefazione	Coffee Shop	Aleksanterinkatu 50	00100	60.168877	24.943845

Table 1: Five first rows of data used in the machine learning algorithm.

Data will be used in the following way: by knowing the locations of already existing cafes, it's possible to apply unsupervised learning technique like kernel density estimation (KDE) to determine the area of influence of the existing cafes, and start up new café which is not in the area of influence.

3. Methodology

Heatmap-based kernel density estimation was used. Heat map was already implemented as plugin for Folium, which was used to visualize data to map. Visualization is shown in figure.

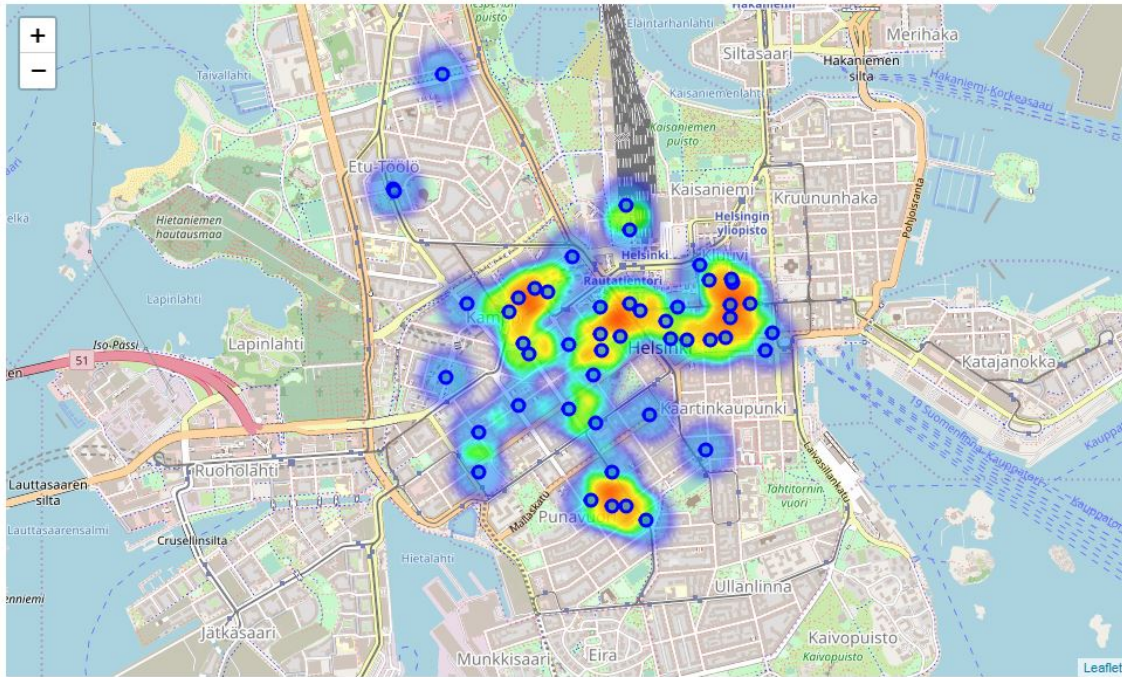


Figure 1: Data visualized to the map of Helsinki, including heatmap-based kernel density estimation.

4. Results

Based on the preliminary results, one possibly good location for new Cafe would be in crossroad of Aleksanterinkatu and Mikonkatu, shown in figure.

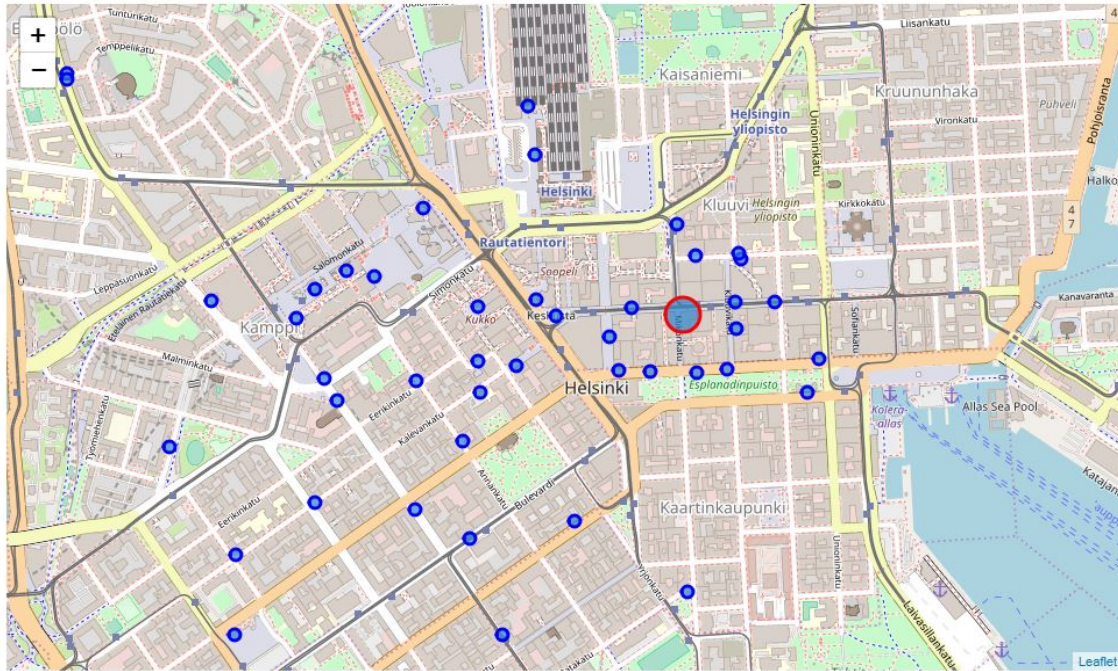


Figure 2: Proposed location for a new café restaurant.

5. Discussion

Before starting a business, some further data analysis of the optimal location of shop may be required.

6. Conclusions

Optimal location for a new coffee shop in center of Helsinki was estimated based on data from Four Square