Finding Location for a Salon

CAPSTONE PROJECT FINAL

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1. Introduction

Suppose your friend decided to open her own beauty salon in Toronto. That is mostly a spontaneous decision, she doesn't have any business experience, but is very enthusiastic and open-minded person. Choosing a location for the salon is one of those important decisions she has to make in the early stages of establishing her new business, so she asked you to help her to find a location for her future salon.

Taking into account tips from 'Choose the Best Location for Your Hair Salon and Day Spa', and 'Choosing the perfect location for your salon', you came up with the following **criteria for the apartment**:

1. For a start she is looking for an apartment **for lease**.
2. Since now she doesn't have any hired workers, she would be satisfied with a small apartment **from 300 to 800 square feet**.
3. It should be **accessible by car, passersby and public transport** (e.g. close to bus stop, or free parking, at the main street).
4. For attracting new customers there should be **other retail businesses nearby** (small shops, city malls).
5. She is not ready for a direct competition with another beauty salon, thus there should be **no salons nearby**.
6. People around should be **interested in visiting salons**.

The goal is to choose the best available spot in accordance with the specified conditions. If there are more than one proper place, your friend will go with **the cheapest one**.

2. Data

For a list of available properties, we can use Spacelist service. The service allows specifying search criteria in get-request, and returns results in a table format, which is plenty good enough for parsing. So that criteria 1, and 2 would be satisfied at once.

To filter available spots, we will use the Foursquare API. Criteria from 3 to 5 could be satisfied by (not)finding proper venues within a specified radius (which also needs to be defined).

The most complicated criterion is no. 6. We are going to cluster neighborhoods according to venues inside them, and find those neighborhoods, which are more interested in salons, than others. So that apartments inside such neighborhoods will be considered as more perspective.

3. Methodology

The first step is web scraping from the Spacelist service. With the help of BeautifulSoup the process of scraping is not very complex. The only pitfall is the necessity for processing all pages with the results.

The second step is filtering the apartments according to their environment (see criteria from 3 to 5). To find apartment accessible, there must be both at least one bus or light rail station stop, and parking lot nearby. As for shopping, at least one shop or mall will be enough.

For finding bus stops, parking lots, and shopping centers bigger radius was used (600 m), but filtering salons with radius more than 200 m makes list of possible apartments empty. So, let's suppose that direct competition with other salons wouldn't be very serious with more than 150 m.

The most sophisticated criterion is number 6. How to determine, whether people inside a borough are ready to go to the salon? The first idea was to use trending venues from the Foursquare API. The problem is, that such venues depend on time of the request.

Another idea was to use results from the previous lab and to cluster borough according to their venues. Since, if there are almost no salons inside the neighborhood, opening a new one is a very high risk.

The problem is, that most of the venue's categories belong to food or restaurants in some way or another. Clustering neighborhoods in such way will not help at all. Thus, from all categories were selected only those, that are somehow close to 'Salon': ['Spa', 'Cosmetics Shop', 'Salon / Barbershop']. So, neighborhoods will be clustered into 2 groups, which will probably distinguish those, who go to salons from others.

Finally, if there would still be more than one place, the cheapest apartment will be chosen.

4. Results

The Spacelist service offers 42 apartments, which are for lease and has square from 300 to 800 square feet.

As a result of filtering on the second stage, it was found that:

- 36 apartments have bus stop nearby
- 33 apartments have parking nearby
- 27 apartments have shops or malls nearby
- 30 apartments have other salons nearby
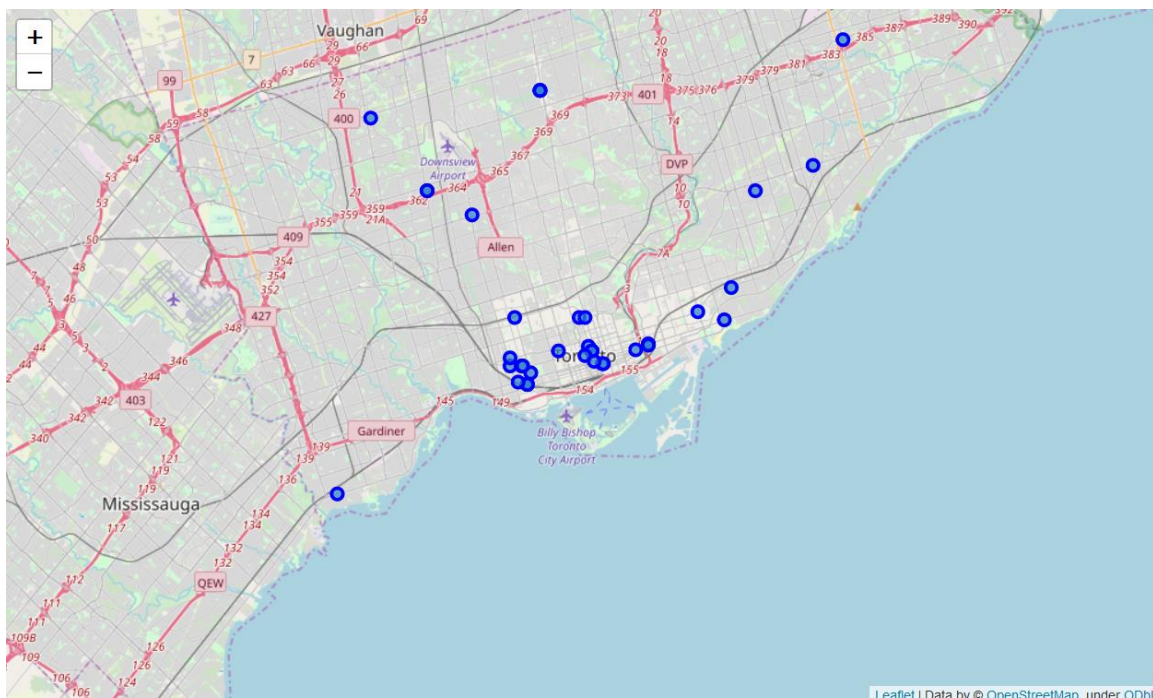
All apartments from the service, 42 in total

And only 5 apartments satisfy all criteria from 3 to 5, and 3 of them located in one building (different suits).

At the third step, inside quite a big radius 38 boroughs give us 1377 venues, belonging to 229 unique categories. Out of those 229 categories only 3 were used for clustering: ['Spa', 'Cosmetics Shop', 'Salon / Barbershop'], and only 11 Boroughs were grouped.

The results of clustering are very interesting. Neighborhoods from the first cluster prefer visiting Cosmetic Shop and Spa, while neighborhoods from the second cluster prefer visiting Salons and Spa.
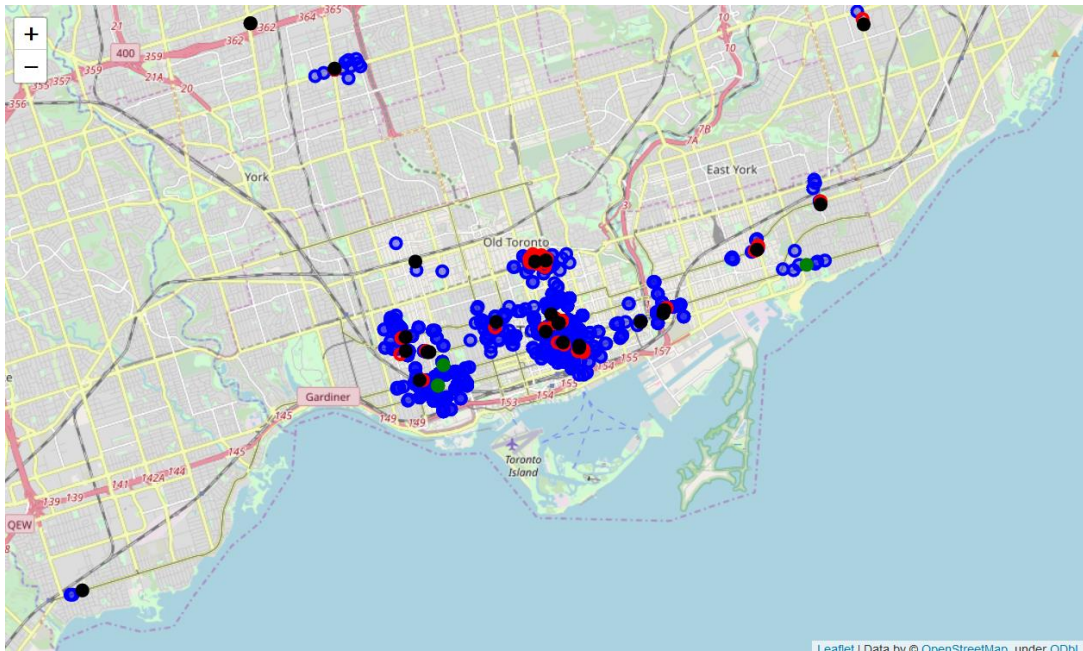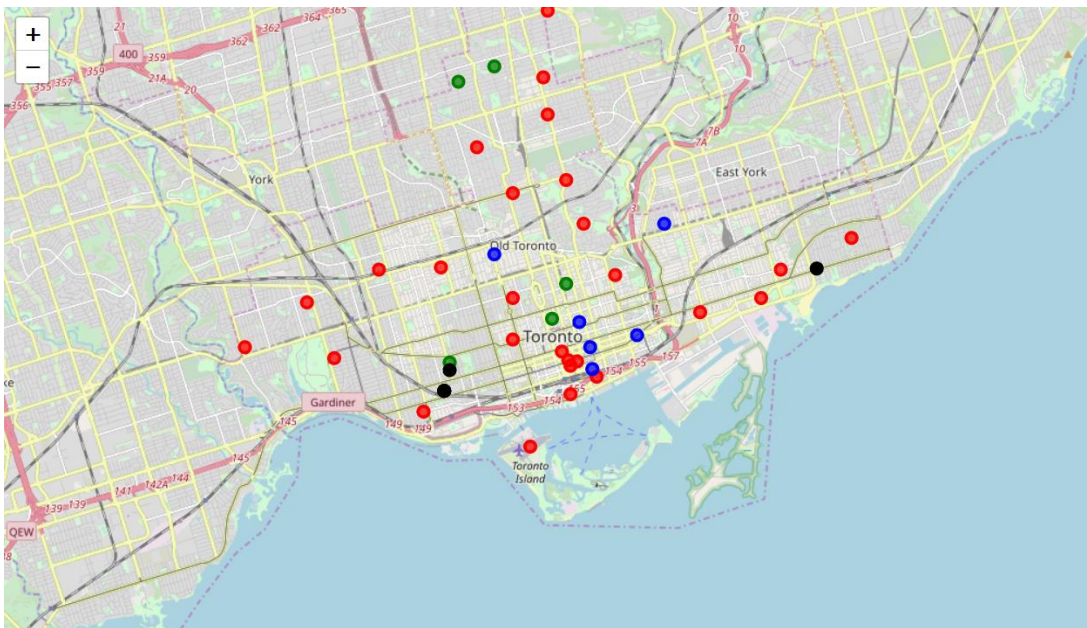
Three green points are those apartments, which satisfy all criteria so far.
Black are those, which did not.
Blue point are shops, parking lots – those spots, that can surround apartments.
Red are other salons, which should be as far, as we can afford.

Visualizing clusters gives us the following picture:

Red points are for those neighborhoods, which are not interested in cosmetic and salons.
Blue points are for those, who are interested in cosmetic.
Green points are for those, who are interested in salons.
Black points are for the apartments, which satisfy all the above criteria.

Since we are looking for a black point close to the green, and taking into account the lowest price, our winner is

98 Ossington Avenue with $2,800/mo

5. Discussion

The results in total can be found satisfying, but probably using trending requests during several days at different time will provide better understanding in how to cluster neighborhoods.

6. Conclusion

The selected problem of finding best apartment for a salon was successfully set resolved. With the help of the Foursquare API and k-means clustering, the proper apartment was found.