On the move...

...or how to find the right place in a new city?

Introduction

The world is on the move! In these times people have become quite flexible. It is common to go to a different country to start a new job.

But how do you find the right neighbourhood in a city you do not know?

Solution: You can use your current neighbourhood as **point of reference!**

For illustration purposes:

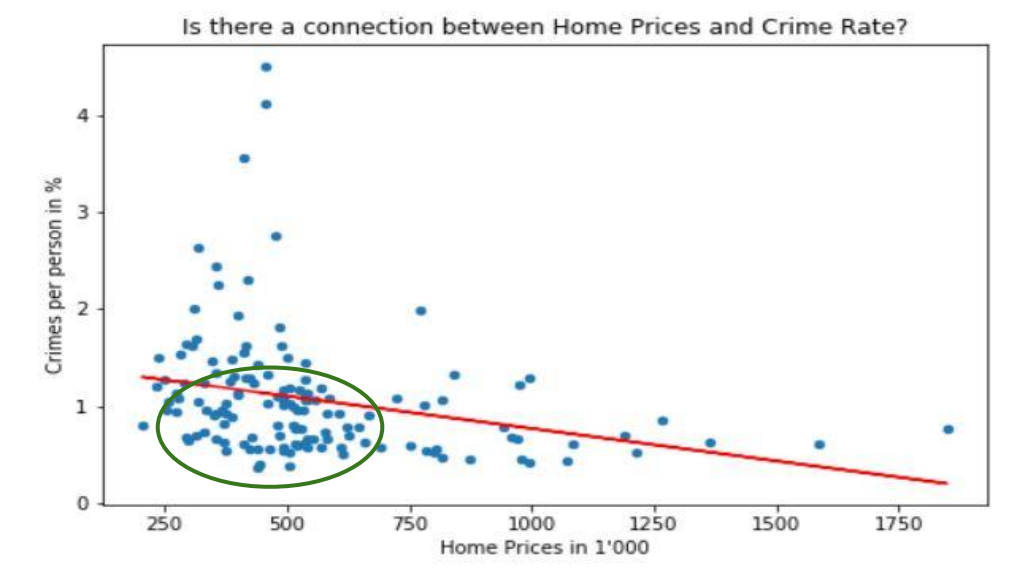
- Toronto will serve as the city of interest
- A neighbourhood in Zurich, Switzerland, will be the point of reference
- Obviously both choices (origin & destination) are exchangeable

Data Sources & Analytic Steps

- Foursquare-API venue data to derive the neighborhood's features
- List of neighbourhoods and housing prices from Toronto's 'Open Data Portal': https://open.toronto.ca/
- Crime statistics using Toronto's 'Police Service Open Data Portal': http://data.torontopolice.on.ca/pages/open-data

- (A) Preselection of neighbourhoods in Toronto based on crime rates and home prices
- (B) Derive the characteristics of the Zurich neighbourhood using Foursquare-API
- (C) Similarly derive the characteristics for the Toronto neighbourhoods
- (D) Define variations of the Zurich neighbourhood (eg more 'nightlife')
- (E) Use k-means clustering to find similar neighbourhoods in Toronto

Preselection on Crime Rates & Home Prices...



	crime_rate	Home Prices
count	140.000000	140.000000
mean	1.069860	548.193407
std	0.643798	267.667427
min	0.365512	204.104000
25%	0.652040	374.964500
50%	0.958526	491.210000
75%	1.242825	590.216000
max	4.504400	1849.084000

...luckily, there are enough safe & affordable neighbourhoods!

Those are the remaining 47 neighbourhouds

Comparison

On top the Zurich spot is characterised by 7 main categories. The bottom table shows the corresponding statistics for the 47 neighbourhoods in Toronto.

At first glance the Zurich spot has more food and nightlife and less parks and shops compared to the average Toronto neighbourhood.

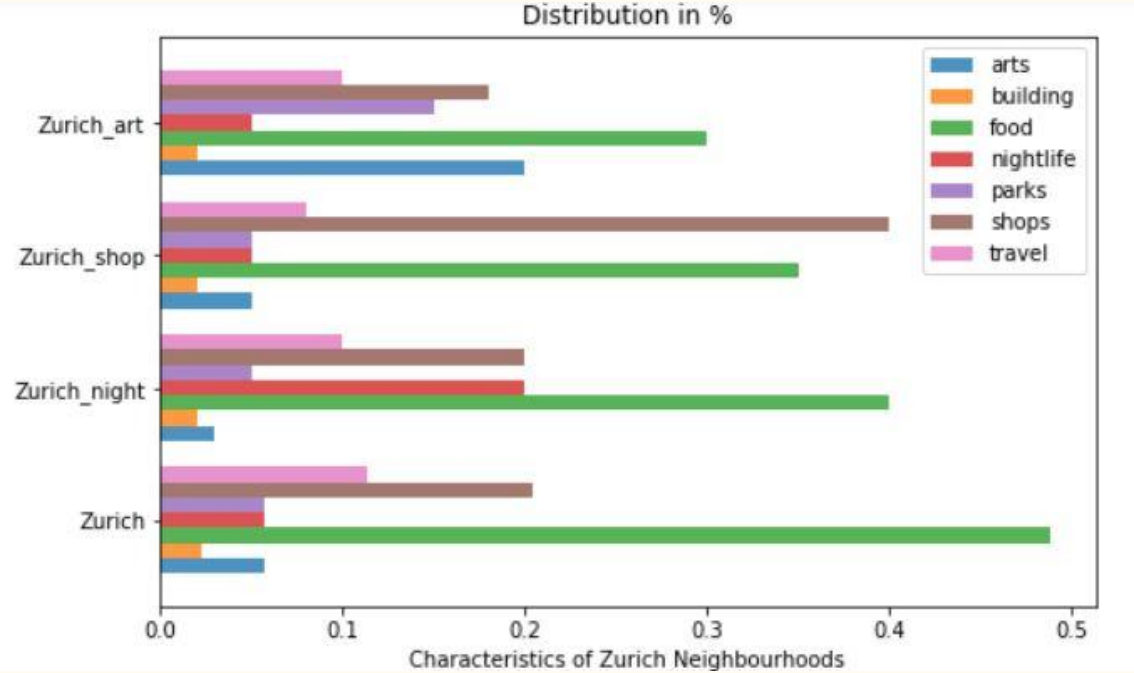
NBH	arts	building	food	nightlife	parks	shops	travel
Zurich	0.056818	0.022727	0.488636	0.056818	0.056818	0.204545	0.113636

	arts	building	food	nightlife	parks	shops	travel
count	47.000000	47.000000	47.000000	47.000000	47.000000	47.000000	47.000000
mean	0.020607	0.027999	0.406608	0.023966	0.157409	0.323099	0.035238
std	0.035309	0.043891	0.179853	0.029478	0.217256	0.149118	0.051381
min	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25%	0.000000	0.000000	0.320714	0.000000	0.020000	0.226496	0.000000
50%	0.000000	0.000000	0.400000	0.000000	0.071429	0.333333	0.000000
75%	0.029412	0.046316	0.538033	0.045549	0.203704	0.393398	0.056619
max	0.125000	0.142857	0.750000	0.086957	1.000000	0.750000	0.181818

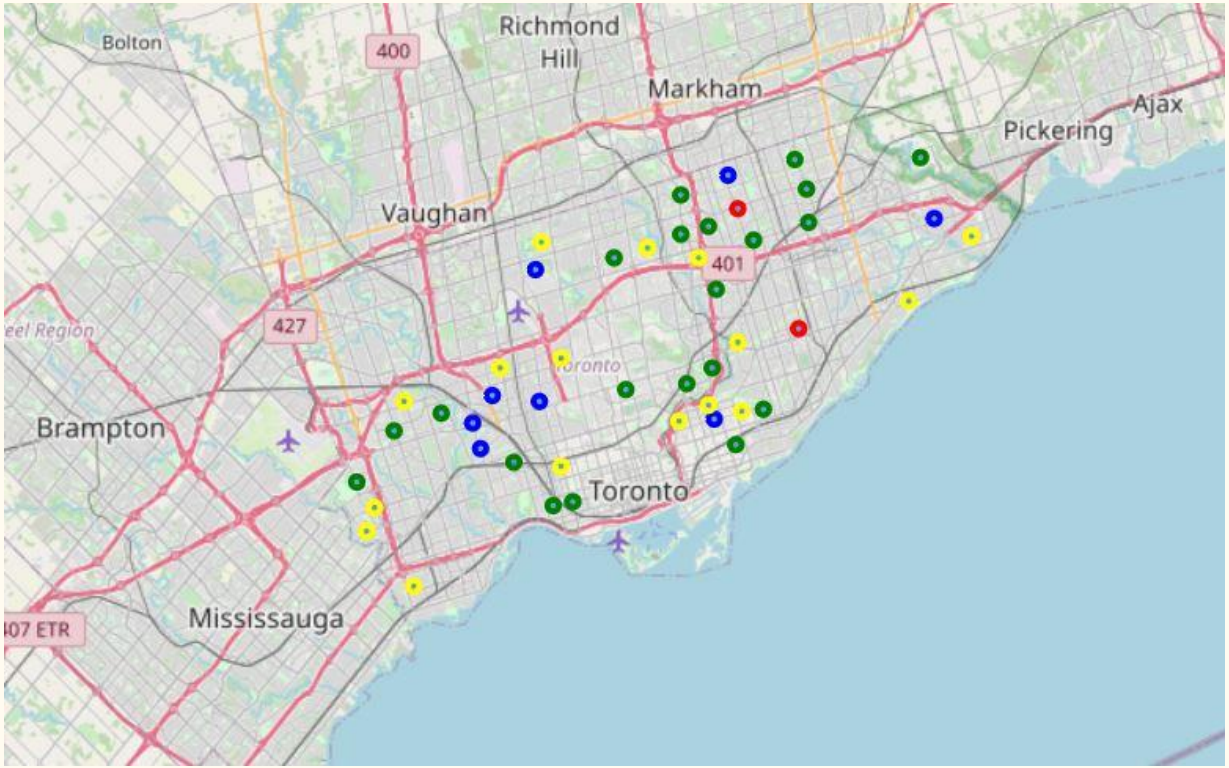
Define Variations

So let's define 3 other vectors based on the Zurich point of reference. The weights in the distribution were moved to emphasize certain categories.

These inputs are then used to perform some k-means clustering...



...and this is the result of the clustering process



- Zurich and Zurich_night are in the **green** cluster
- Zurich_art is in the **blue** cluster
- Zurich_shop is finally in the **yellow** cluster
- By the way, the two **red** dots are areas with a lot of parks

And what do the different clusters represent?

Cluster	arts	building	food	nightlife	parks	shops	travel
Blue	0.031111	0.019012	0.258974	0.025107	0.351376	0.248773	0.061203
Green	0.024754	0.028361	0.555153	0.038754	0.053944	0.262364	0.031235
Red	0.000000	0.071429	0.000000	0.000000	0.928571	0.000000	0.000000
Yellow	0.026824	0.025435	0.326466	0.021523	0.084987	0.464523	0.045917

Good question! So the **blue** cluster is balanced in food, shops and parks. Those neighbourhoods might be nice if you opt for a bit more of nature. The **green** cluster is closest to the original Zurich area, tilted to food and nightlife. The **red** cluster consists - as mentioned - mainly of parks. Finally the **yellow** cluster is not so different in characteristics from the blue one, except there are more shops instead of parks.

What’s left?

Travel to Toronto and explore for yourself…

Unfortunately that is not possible right now…

Stay healthy!