

Relationship between Neighbourhood and Crime Rates in Vancouver City

Capstone Project for IBM Data Science on Coursera

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Abstract—Space reserved for abstract.

I. INTRODUCTION

Background

RECENT studies in social science suggest that the local crime rate may be correlated with the characteristics of the neighbourhood [1]–[3]. On the other hand, neighbourhoods can be categorized by the types of venues located within them. Since high crime rates can have a negative impact on the property value [4], it is in stakeholders' best interests to invest in areas with low crime rate not only at the moment but also in the future.

Problem

This study aims to discover the relationship, if any, between popular venues in the neighbourhood and local crime rates. Vancouver city was selected as the real life example and a recommendation of the best neighbourhood in Vancouver is made based on results of the analysis.

Target Audience

Real estate companies and individual house buyers will certainly benefit from the insight given by this report.

II. MATERIALS AND METHODS

A. Data Sources

The geographic data of Vancouver city can be downloaded from Vancouver city open data portal [5] and can be used under the terms of the Open Government Licence – Vancouver [6]. The crime data is available in Vancouver police department website [7]. Finally, the venue information is provided by Foursquare Places API [8].

B. Data Description

The geographic data set contains the boundaries of 22 neighbourhoods in Vancouver city. Their names and center coordinates are extracted and visualized in Fig. 1.

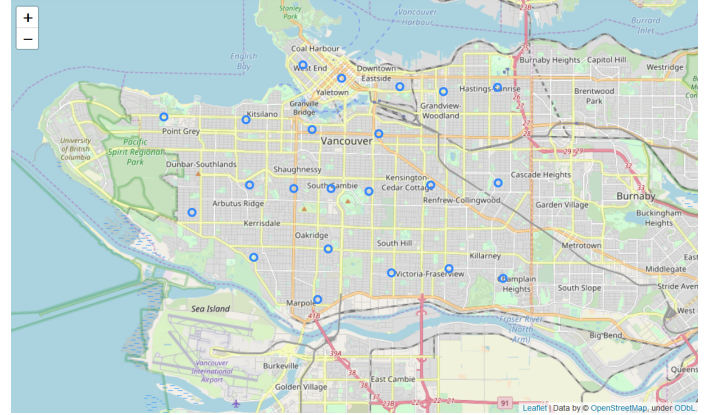


Fig. 1. Neighbourhoods in Vancouver city. (Centrals of the respective neighbourhoods are marked by blue circles.)

The crime data set consists of 627174 records from year 2003 to 2019 which contains information about the type, time, and location of the crime. The coordinates in the original data set are Universal Transverse Mercator (UTM) coordinates and are converted to latitude and longitude for plotting. Lastly, for the purpose of this study, time information is not needed. Therefore, columns that represent the date of the crime are dropped. The first five rows of the data set after cleaning are shown in Table II-B.

Type	Neighbourhood	Latitude	Latitude
Break and Enter Commercial	Fairview	49.266678	-123.129029
Break and Enter Commercial	West End	49.285255	-123.123649
Break and Enter Commercial	West End	49.285181	-123.123536
Break and Enter Commercial	West End	49.285132	-123.123461
Break and Enter Commercial	West End	49.285132	-123.123461

TABLE I
FIRST FIVE ROWS OF CRIME DATA SET.

The last data set used in this study is the venue data set obtained from Foursquare Place API. Foursquare API returns a list of venues around the specific location within the user defined radius. In this study, the searching radius is set to 2 kilometers and the location coordinates are the coordinates in the neighbourhood data set.

III. RESULTS

IV. DISCUSSION AND SUMMARY

REFERENCES

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