COURSERA CAPSTONE

IBM Applied Data Science Capstone

Optimal Location for a new Bookstore in the city of Auckland, New Zealand

By: Rodrigo Castro

rodrigo20acc@gmail.com

June 2020

1. Introduction

The objective of this Data Science project is to determine an optimal location for a new bookstore in the city of Auckland, New Zealand. In this study, the data was extracted for different sources according to its nature. The information regarding the neighbourhoods in Auckland was retrieved from Wikipedia while the location data of venues was obtained through the Foursquare server. We used as well Machine Learning tools such as K-means in order to obtain data clusters of potential locations. Data wrangling and preprocessing was also necessary to structure the data properly and to facilitate the analysis. Finally, the mean by which we made use of the algorithms and handled the datasets was the programming language Python.

1.1. Background

Even if nowadays the e-commerce of electronic books and books sent by delivery is showing a remarkable growth, it's still very important for booklovers to find a place to take their time and interact with the objects of their affection. Even more so, if this place's surroundings enable the costumers to complement their experience providing them, for instance, with comfortable places to read or spaces of cultural interest to visit. Bookstores are appealing places in which readers can have unexpected encounters and be welcomed with enjoyable surprises. For that very reason, physical bookstores will always be on demand. That is why finding an optimal location is necessary for their success.

1.2. Business Understanding

In 2018, a study conducted in the USA reflected in figures an increase of 35% in the rise of indie bookstores in New Zealand. In fact, they determined the existence of an upward trend of new bookstores opening in the near future. Now, even in the midst of the Covid-19 crisis, bookstores sales are experiencing a considerable boom as an effort to reactivate the economy following the period of lockdown. According to an article from The Guardian, the reason behind this behavior is the people's support to local venues rather than to the bigger enterprises that can provide cheaper books.

It seems that booklovers in New Zealand have a strong presence and that more citizens are coming to understand the value of bookstores around their neighbourhoods. The fact that these bookstores bring support to the local community makes them more welcome.

Auckland, which is the most important metropolitan city in New Zealand and is home to its largest population, provides an attractive environment in which to open a new bookstore. In fact, Auckland is the leading center of New Zealand's business and economic development. Thus, is reasonable to select this city as the subject of study for this project.

What is curious about bookstores is that, unlike other types of stores, they can benefit from sharing the same environment with their competitors as they complement each other. Let’s bear in mind that each bookstore may have a unique profile and also be specialized in a different publishing house. For that reason, in different bookstores we can find the same title not only at a different price, but also with a different editorial work behind it, which gives a totally different value to the book. By consequence, having bookstores located near each other enrich the experience of the costumer and ensure that all of them are eventually visited. In this project, we will focus only in the areas where there already are other bookstores.

1.3. Target Audience

The findings of this capstone project are intended to be of use to any stakeholder who is interested in opening a new bookstore in the city of Auckland by providing useful information that can be of help in order to find an optimal location.

2. Data

The data used to obtain the optimal location for the new bookstore has been retrieved and processed from multiple sources. Now, let’s explain the data in detail.

2.1. Neighbourhoods

In the first place, data regarding the neighbourhoods in Auckland has been retrieved from Wikipedia. In the References section at the end of this document you will find the link to the database. This data contains only the name of each neighbourhood in the city, information such as coordinates has been obtained by other means.

2.2. Latitude and Longitude Coordinates

The coordinates for each neighbourhood in Auckland are determined by the geocoder library of Python given their names. The values obtained were merged then with the names of the neighbourhoods obtained from Wikipedia.

2.3. Venue Data

The location data used in this project to obtain the characteristics of the venues in the different neighbourhoods came from Foursquare by making an API call and passing the required parameters to the server. The values obtained were merged as well with the data above mentioned.