

Coursera Capstone Week 4: Opening a Tim Hortons Shop in Ottawa, Canada

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Introduction

Tim Hortons, since its opening in 1964, has become a staple in Canadian culture. As one of the most popular fast food chains in the country, it specializes in coffee and donuts. In Ottawa, a plethora of Tim Hortons shops are scattered across the city, from end to end. It is no surprise that the demand for Tim Hortons coffee and donuts is so prevalent in Ottawa; in turn, competition amongst shops is intense. Thus, for new business owners looking to take advantage of this Canadian staple and open their own shop, location is crucial to the shop's success. There are countless other factors to opening a new business, but the widespread of Tim Hortons in Ottawa makes location a vital one.

Business Problem

This exploration's aim is to closely analyze and pick out the most optimal areas in Ottawa to start a new Tim Hortons shop, utilizing machine learning clustering algorithms as well as a data science methodology. Ultimately this will answer the business question: If a business owner in Ottawa, Canada is looking to open a Tim Hortons shop, where should they do so?

Data

To solve this business problem, we will use several pieces of data:

- A list of neighborhoods in Ottawa, to define the scope of this exploration
- Geographical coordinates of those neighborhoods, to create a map and obtain venue data
- Venue data, to perform clustering

From this Wikipedia page (https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Ottawa) we can obtain the list of Ottawa neighborhoods by web scraping using the Python Requests and BeautifulSoup libraries. Next to obtain the longitude and latitude coordinates of each neighborhood, the Python Geocoder library will be used.

Finally, the Foursquare Locations API will be utilized to obtain venue data for those neighborhoods. The Foursquare Locations database has over 100 million locations and is used extensively, with over 100,000 developers. For this scenario, the focus will be on Tim Hortons shop data from Foursquare. Once this data is obtained, wrangled and cleaned the K-means Machine Learning algorithm will be used to cluster each neighborhood. After the clustering, the map of Ottawa and its Tim Hortons shops will be displayed along with its labelled clusters.