

Coursera Capstone project:

Finding a location to set up a new medical laboratory in Calgary

Introduction and business problem

Dynacare Medical Laboratories is a Canadian medical laboratory services company. As part of its expansion projects, the company would like to set up a laboratory in Calgary, Alberta, where it does not provide any services yet. They would like to use data science techniques to determine a suitable location within Calgary for their new laboratories.

Methodology and data

To determine which locations in Calgary can be recommended to set up a new laboratory, I compared the different neighbourhoods present in the city to those which already have laboratories from the company elsewhere in Canada.

I extracted the postal codes of the neighbourhoods in Calgary from a wikipedia page (https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_T) using the BeautifulSoup library. I obtained the postal codes for the exemplary laboratories with google maps. Next, I determined the latitudes and longitudes of each postal code using a web based latitude and longitude finder (<https://www.latlong.net/>). I would have used the geocoder library, but it is not working. The raw data that I used in the analysis is found below (Table 1). Once I had put together all this data, I obtained the venues for each neighbourhood using the Foursquare API (example in Table 2). After applying one-hot encoding to the data set, I used K-means clustering to partition de neighbourhoods based on similarities of “venue content.”

Table 1: postal codes and their respective neighbourhood, latitude, and longitude

| Postal Code | Neighborhood | Latitude | Longitude |
|-------------|--|----------|------------|
| T2A | Penbrooke Meadows, Marlborough | 51.04968 | -113.96432 |
| T3A | Dalhousie, Edgemont, Hamptons, Hidden Valley | 51.12454 | -114.14289 |
| T2B | Forest Lawn, Dover, Erin Woods | 51.02533 | -113.97890 |
| R3P | example lab 1 | 49.83926 | -97.20586 |
| J8T | example lab 2 | 45.47843 | -75.70476 |
| K2P | example lab 3 | 45.41614 | -75.69180 |

Table 2 : neighborhoods and present venues

| Neighborhood | Neighborhood Latitude | Neighborhood Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|--|-----------------------|------------------------|------------------------------------|----------------|-----------------|----------------------------|
| Dalhousie, Edgemont, Hamptons, Hidden Valley | 51.12454 | -114.14289 | Tandis Online Cafe | 51.124051 | -114.144602 | Bakery |
| Dalhousie, Edgemont, Hamptons, Hidden Valley | 51.12454 | -114.14289 | Edgemont Construction Ltd | 51.123928 | -114.144313 | Construction & Landscaping |
| Dalhousie, Edgemont, Hamptons, Hidden Valley | 51.12454 | -114.14289 | Western Deep Dish Pizza | 51.126544 | -114.139589 | Pizza Place |
| Dalhousie, Edgemont, Hamptons, Hidden Valley | 51.12454 | -114.14289 | Edgemont City | 51.126473 | -114.138997 | Asian Restaurant |
| Dalhousie, Edgemont, Hamptons, Hidden Valley | 51.12454 | -114.14289 | Friends Cappuccino Bar & Bake Shop | 51.126370 | -114.138676 | Café |