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| **Best Toronto Neighborhood to Open a Bakery (Or Other Dessert-type Venue)**  Introduction  Problem  Opening a business is a challenging task and in my quest to become a business owner, I need to know which businesses are thriving and in which neighborhoods. This project tries to create a content based recommendation system for assisting those entrepreneurs, like myself, in choosing a neighborhood basis ranked by a number of lifestyle categories. For testing this system, I will use Toronto (Canada) as an example city.  Toronto is the [provincial](https://en.wikipedia.org/wiki/Provinces_and_territories_of_Canada) [capital](https://en.wikipedia.org/wiki/Capital_city) of [Ontario](https://en.wikipedia.org/wiki/Ontario) and the [most populous city in Canada](https://en.wikipedia.org/wiki/List_of_the_100_largest_municipalities_in_Canada_by_population), with a population of 2,731,571 in 2016. According to a new study published in 2019 from Ryerson University's Centre for Urban Research and Land Development, Toronto is the fastest-growing city in both Canada and the United States. Toronto is an international center of business, finance, arts, and culture, and is recognized as one of the most [multicultural](https://en.wikipedia.org/wiki/Multicultural) and [cosmopolitan](https://en.wikipedia.org/wiki/Cosmopolitanism) cities in the world. Its [economy](https://en.wikipedia.org/wiki/Economy_of_Toronto) is highly diversified with strengths in technology, design, financial services, life sciences, education, arts, fashion, business services, environmental innovation, food services, and tourism. The median economic family income was $82,859 in 2015.  Interest  Although my business interest lies in opening a bakery or other dessert-type of venue, my recommendation system can be useful to entrepreneurs looking to open and/or invest in a variety of venues in Toronto. Recommendations will be based on an area’s popularity and currently operating venues.  Data acquisition and cleaning  Data sources  For the purpose of this project I used data from a few sources:  [¶](https://dataplatform.cloud.ibm.com/data/notebooks/converter/assets/3760a13f-235f-4ee6-96b1-41009f4f14ce?project=8a71b642-f47c-43c0-b0c9-def17e0f47cf#For-the-purpose-of-this-project-I-used-data-from-two-sources:-I-scrapped-the-Neighborhood/area-data-for-Toronto-from-Wikipedia-to-create-a-list-of-Neighborhoods-with-geographical-coordinates-and-then-using-the-Foursquare-(online-venue-recommendation-platf)  *List of Toronto Neighborhoods organized by Postal Codes:* This data set contains the required information and was used to explore various neighborhoods of Toronto, narrowing down a specific area of Toronto to open a bakery. <https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M>  *List of Coordinates:* By using this geo space data, I was able to obtain boundaries that help to visualize choropleth map.  <http://cocl.us/Geospatial_data>  *For the venue categories:* By using Foursquare API I identified the venues in each neighborhood thereby filtering the venues by bakeries and dessert-type venues.  <https://developer.foursquare.com/docs/api/venues/explore>  Approach  I scrapped the Neighborhood data for Toronto from Wikipedia to create a list of Neighborhoods with geographical coordinates and then using the Foursquare API, explored the various venues listed in Toronto. I visualized the neighborhoods in the Toronto area and identified the number of bakeries per neighborhood. Based on the information, I highlighted the downtown area and further focused on the Downtown Toronto area, segmenting and clustering neighborhoods within that area to identify the best area to open and operate a bakery.  Analysis and Results  Summary  The full code can be found [here](https://github.com/Duneya/Coursera_Capstone/blob/master/Battle%20of%20the%20Neighborhoods%20-%20CapstoneProject.ipynb). With the data obtained, I mapped the Toronto area using Folium library. This map shows all of the neighborhoods within Toronto.    Additionally, I’ve added a bar graph denoting the number of bakeries per neighborhood. There are over ten thousand (10,550) bakeries across Toronto.    Based on the cluster and analysis results, bakeries (and other dessert-type venues such as Chocolate Shops, Dessert Shops, Donut Shops and Ice Cream Shops) are among the top 10 most common venues in the Downtown Toronto area. Out of the 18 neighborhoods in Downtown Toronto, bakeries (and similar venues, i.e. Ice Cream Shop, Bubble Tea Shop and Creperie) were among the top 5 most frequented venues in the following areas: *Berczy Park, Cabbagetown/St. James Town, Central Bay Street, Harbourfront/Regent Park, Harbord/University of Toronto, The Esplanade.*  ----Berczy Park----  venue freq  0 Coffee Shop 0.10  1 Cocktail Bar 0.06  2 Farmers Market 0.04  3 Steakhouse 0.04  4 Bakery 0.04  ----Cabbagetown, St. James Town----  venue freq  0 Café 0.07  1 Coffee Shop 0.07  2 Bakery 0.05  3 Restaurant 0.05  4 Italian Restaurant 0.05  ----Central Bay Street----  venue freq  0 Coffee Shop 0.14  1 Ice Cream Shop 0.06  2 Café 0.06  3 Bubble Tea Shop 0.04  4 Spa 0.04  ----Harbourfront, Regent Park----  venue freq  0 Coffee Shop 0.16  1 Park 0.06  2 Café 0.06  3 Bakery 0.06  4 Gym / Fitness Center 0.04  ----Harbord, University of Toronto----  venue freq  0 Café 0.14  1 Bar 0.06  2 Bakery 0.06  3 Bookstore 0.06  4 Restaurant 0.06  ----Stn A PO Boxes 25 The Esplanade----  venue freq  0 Café 0.06  1 Cocktail Bar 0.06  2 Coffee Shop 0.06  3 Seafood Restaurant 0.04  4 Creperie 0.04  Conclusion  Based on the data, bakeries seem to do well in all of the six areas listed above. Because neither The Esplanade nor Central Bay Street areas offer a bakery, per se but similar dessert-type venues, I would choose one (or both) of those areas to open a bakery as to not be in competition with other bakeries as in other areas. A bakery would complement the other venues located in both Central Bay Street and The Esplanade.  (Central) Bay Street is a major thoroughfare in Downtown Toronto and is the center of Toronto's Financial District. The area attracts many who work in the financial district and those who work in the Discovery District, nearby hospitals and schools (Ryerson University and the University of Toronto). More than 67% (or 10,380) of residents in this area are in the working ages of 25-64.  The Esplanade meets the revamped—and [award-winning](http://urbantoronto.ca/news/2015/09/winners-announced-2015-toronto-urban-design-awards)—Market Street just west of the landmark St. Lawrence Market. Widely considered a prime example of successful heritage restoration, Market Street's renewed frontages have recently been populated by new retail, adding vibrancy to the area.  Keeping in mind that the average household income in Toronto was $82,859 (2015) there is room for discretionary spending as is evidenced by the patronage of dessert-type, restaurants and retail venues. |