**Empirical Analysis of Toronto Neighbourhoods - A New Immigrant’s Perspective**

**A. Introduction**

**A.1. Description & Discussion of the Background**

As I was writing this post, I came across a news article which read *"Canada to welcome 1.2 Million immigrants by 2023."* [[1]](#bookmark=id.gjdgxs) and could not be more excited for the millions of people looking for a pathway to one of the best countries in the world since I recently became an immigrant. A 2020 US news ranking showed Canada as the 2nd best country in the world, so it is not a surprise that every year, thousands of people choose to migrate to Canada. [[2]](#bookmark=id.30j0zll) Several factors such as citizenship, quality of life and entrepreneurship were the most significant criteria for the rankings. Asides from having a strong and stable economy, cultural diversity and many opportunities for growth, Canada has offered many immigrants a new home through its programs such as Federal Skilled Workers/Trades Program (Express Entry Program) or Provincial Nominees Program. Overall, it is also a decent place for you and your family when it comes to education, housing, personal security, and health care. In 2019, Canada opened its borders to **341,000** people across the world with India and China being the countries with the most immigrants. 45% of these immigrants chose to settle in Ontario province with over 35% of them settling in the City of Toronto (**118,000** immigrants in total). [[3]](#bookmark=id.1fob9te)

So, here is the catch. Toronto covers 630km2 of land mass with a population of over **6 million people** and population density of 9,410 per km2 (This is quite high considering average population density for Canada is 4 people per km2). [[4]](#bookmark=id.3znysh7) The City of Toronto has 6 distinct boroughs with a total 140 neighborhoods. As a new immigrant, a vital question to answer is “What neighborhood or borough do I settle in?”.

Several factors such as housing prices, employment rates, crime rates amongst others should be considered when settling down in a particular location. This project seeks to analyse the different neighborhoods in the City of Toronto using various metrics as we will see in the later sections. The aim is to group desirable neighborhoods for new immigrants coming into Toronto using Machine Learning and Data Visualization techniques.

**A.2. Data Description**

For this analysis, most of the datasets used were obtained from the City of Toronto Open Data Portal. This portal was launched in fall of 2009 to meet the demand for open data and it contains over 370 datasets which are refreshed periodically. Other datasets were scraped from the web as highlighted below:

1. *Neighborhood Boundaries Map for City of Toronto (GEOJSON)*: This GEOJSON file obtained from Open Data Portal (ODP) contains standard geospatial data and geographic features (i.e. coordinates and boundary shapes) for each neighbourhood in Toronto. This will be critical for map visualizations. [[5]](#bookmark=id.2et92p0)
2. *COVID-19 Data Report for all Toronto Neighbourhoods:* This dataset was imported from the City of Toronto website and it contains total number of cases per neighbourhood. [[6]](#bookmark=id.tyjcwt)
3. *Crime rates for all Toronto Neighbourhoods:* This dataset depicts the total number of crimes (Theft, Assault, Homicide etc.) committed in each neighbourhood from 2014 to 2019. [[7]](#bookmark=id.3dy6vkm)
4. *2016 City of Toronto Neighbourhood Profiles/Census dataset:* The last census for Canada was conducted in 2016. This dataset is based on data collected by Statistics Canada that census campaign and will be used to extract information on employment rate per neighborhood. [[8]](#bookmark=id.1t3h5sf)
5. *Housing rental prices scraped from websites:* This dataset was the most difficult to come by due to the number of neighbourhoods under consideration. Most of the rental information available were for boroughs or only popular neighborhoods. However, a rental website, Zumper, was used to obtain data on average rental prices per neighborhood. [[9]](#bookmark=id.4d34og8)

**REFERENCES**

[1] [News Article: Canada to welcome over 1.2 million immigrants](https://www.aljazeera.com/news/2020/10/30/canada-aims-to-bring-in-over-1-2-immigrants-over-next-3-years)

[2] [US News Best Countries for Immigrants Rankings](https://www.usnews.com/news/best-countries/best-immigrants)

[3] [News Article: Canada Immigration Statistics](https://www.cicnews.com/2020/02/canada-broke-another-record-by-welcoming-341000-immigrants-in-2019-0213697.html?_gl=1*7xjcrn*_ga*YW1wLTVFcnozdmhPVFpfTmtraWpTWnRaSG5tRmdGQjQ4RS1jQWxOS2Frc1ZTVVVGVDlqdGg5MWZneVE1Tzk0eW9OWUY.#gs.jilivu%5D)

[4] [2016 Canada Population Census](https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/pd-pl/Table.cfm?Lang=Eng&T=201&SR=1&S=3&O=D&RPP=25)

[5] [Boundaries of City of Toronto Neighbourhoods](http://open.toronto.ca/dataset/neighbourhoods/)

[6] [COVID-19: Status of Cases in Toronto](https://www.toronto.ca/home/covid-19/covid-19-latest-city-of-toronto-news/covid-19-status-of-cases-in-toronto/)

[7] [City of Toronto Neighbourhood Crime Rates](https://open.toronto.ca/dataset/neighbourhood-crime-rates/)

[8] [City of Toronto Neighbourhood Profiles](https://open.toronto.ca/dataset/neighbourhood-profiles/)

[9] [Average Housing Rental Prices for City of Toronto](https://www.zumper.com/rent-research/toronto-on)