**Toronto Neighborhoods**

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1. **Introduction**

**Toronto Neighborhoods is project which uses various data manipulation techniques like Web Scraping, Data Analysis, Foursquare API request, Clustering and Data Visualization to suggest the best possible choice of a neighborhood for its users according to their preferences. It is built using Python and Jupyter Lab has been used in order to construct the complete project.**

**1.1 Business Problem**

**Sometimes choosing a neighborhood can be a difficult choice for a person while buying a house. Using a dataset I can solve this problem. If someone is looking to buy a house in Toronto, I can suggest him a neighborhood suitable for him according to the things that he prefers. For example, if a person likes to eat, then I can suggest him a neighborhood which has the highest number of restaurants in it.**

**1.2 Prospects**

**This project is basically meant for people who looking to buy a house in Toronto. Also, this project will prove to be very beneficial for any real estate agent who can use this as a tool to sell houses to their customers according to their preferences. This application might boost their sales. Also, this project can be integrated with any online real estate website which will suggest the best suitable neighborhood for its users. This way, users will have more convenience in searching and choosing houses according to their preferences.**

1. **Data**

**I used the data about the neighborhoods in Toronto from Wikipedia. I will use Web Scraping to extract that data from Wikipedia. After that I will use Foursquare API to extract information about the common venues of various neighborhoods in Toronto. I will use this data to perform the final search for the stated problem. The final data is stored in torontofinal.csv. It contains the list of neighborhoods and its related data like postal code, borough, latitude, longitude and 15 most common visited venues. The most common venues of the all the neighborhoods are searched in order to find the suitable neighborhood for the user.**

1. **Methodology**

**In order to suggest a neighborhood to any user, we first need to collect data about the neighborhoods. I first collected data from Wikipedia using Python library Beautifulsoup. Then I used FourSquare API to obtain top 15 most common venues in the neighborhood. Then the program asks for the preferences of the users. According to the keywords entered by the user, the program will look for the best option for the user, and suggest the same to the user. The steps followed in this project can be summarized as follows:**

1. **Extract the list of neighborhoods of Toronto from Wikipedia**
2. **Add latitude and longitude to the extracted data using Geocoder**
3. **Make an account on FourSquare in order to be able to make a request for data using FourSquare API**
4. **Apply k-means clustering on the data**
5. **Visualize the neighborhoods and clusters on a map using Folium.**
6. **Ask user for his preferences**
7. **Use the input in order to find the best output**
8. **Output the suggestions**
9. **Result**

**I was successfully able to implement the project idea using various Python libraries and FourSquare API. This project suggests its users the best suitable neighborhood in Toronto according to their preferred choices.**

1. **Discussion**

**Foursquare API has played a crucial role in the development of this project as the output of the project mostly depends on the data extracted using the FourSquare API. This project can be further developed by asking the user about the things that he least prefers. Also, if we could somehow obtain the types of neighborhoods that the user likes already, and compare it with the list of neighborhoods that we have, we can come up with some really good and better suggestions for the users.**

1. **Conclusion**

This project proves to be a good implementation of Python Libraries like Geocoder, Folium, Pandas, Numpy, Beautifulsoup, Sklearn, and Matplotlib along with the FourSquare API in order to implement the idea of suggesting Toronto neighbourhoods to the potential buyers.