Neighborhood Explorer: A Capstone Project

Neighborhood Explorer is an ambitious initiative that aims to revolutionize how we understand and engage with our local communities. By leveraging advanced data collection and analysis techniques, this capstone project seeks to provide unprecedented insights into the unique characteristics, trends, and dynamics of neighborhoods across the city.

At the heart of Neighborhood Explorer lies a comprehensive data-gathering effort, harnessing a diverse array of sources to paint a rich and multifaceted picture of each area. From demographic information and economic indicators to social and cultural data, the project team is leaving no stone unturned in their quest to uncover the true essence of what makes a neighborhood thrive.

By combining cutting-edge analytical methods with intuitive visualization tools, Neighborhood Explorer empowers both residents and city planners to better understand their communities, identify areas for improvement, and make informed decisions that will shape the future of urban development. This capstone project serves as a testament to the power of data-driven insights to drive positive change and foster vibrant, inclusive neighborhoods that cater to the needs of all their stakeholders.

Introduction

1 Purpose

This Capstone Project aims to assist individuals in exploring and selecting the best neighborhood in Scarborough, Toronto, based on various factors.

2 Target Audience

This project is designed for people migrating to Scarborough, seeking information on housing prices, school reputations, and overall neighborhood quality.

3 Key Features

The project analyzes features such as median housing prices, school ratings, crime rates, road connectivity, weather conditions, emergency management, water resources, and recreational facilities.

4 Benefits

This project provides valuable insights to help individuals make informed decisions about their new neighborhood, enhancing their transition and overall quality of life.

Data Collection

Wikipedia Data

The project utilizes a dataset scraped from Wikipedia, containing latitude, longitude, and zip codes for neighborhoods in Scarborough.

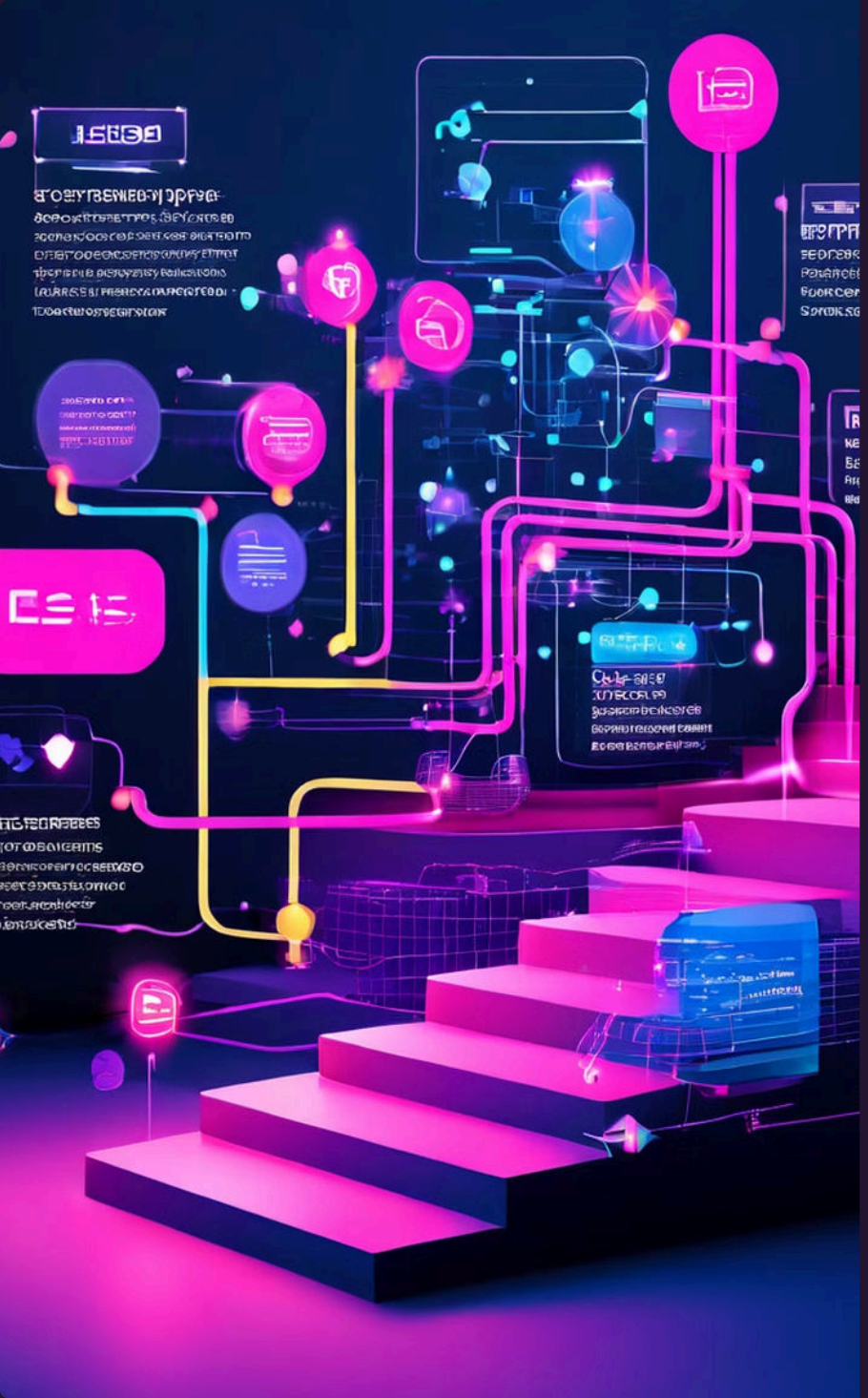
https://en.wikipedia.org/wiki/List%5C_of%5C_postal%5C_codes%5C_of%5C_Canada:%5C_M

Foursquare API

Foursquare's location data provider is used to gather information about venues within each neighborhood, including venue names, locations, categories, and photos.

Data Retrieval

The Foursquare API is queried with latitude and longitude coordinates for each neighborhood, retrieving data about venues within a 100-meter radius.



Methodology

1

Neighborhood Clustering

The project employs k-means clustering, an unsupervised machine learning algorithm, to group neighborhoods based on similarities in venue categories.

2

Venue Analysis

The most common venues within each neighborhood are identified and used as features for clustering, providing insights into the character and amenities of each neighborhood.

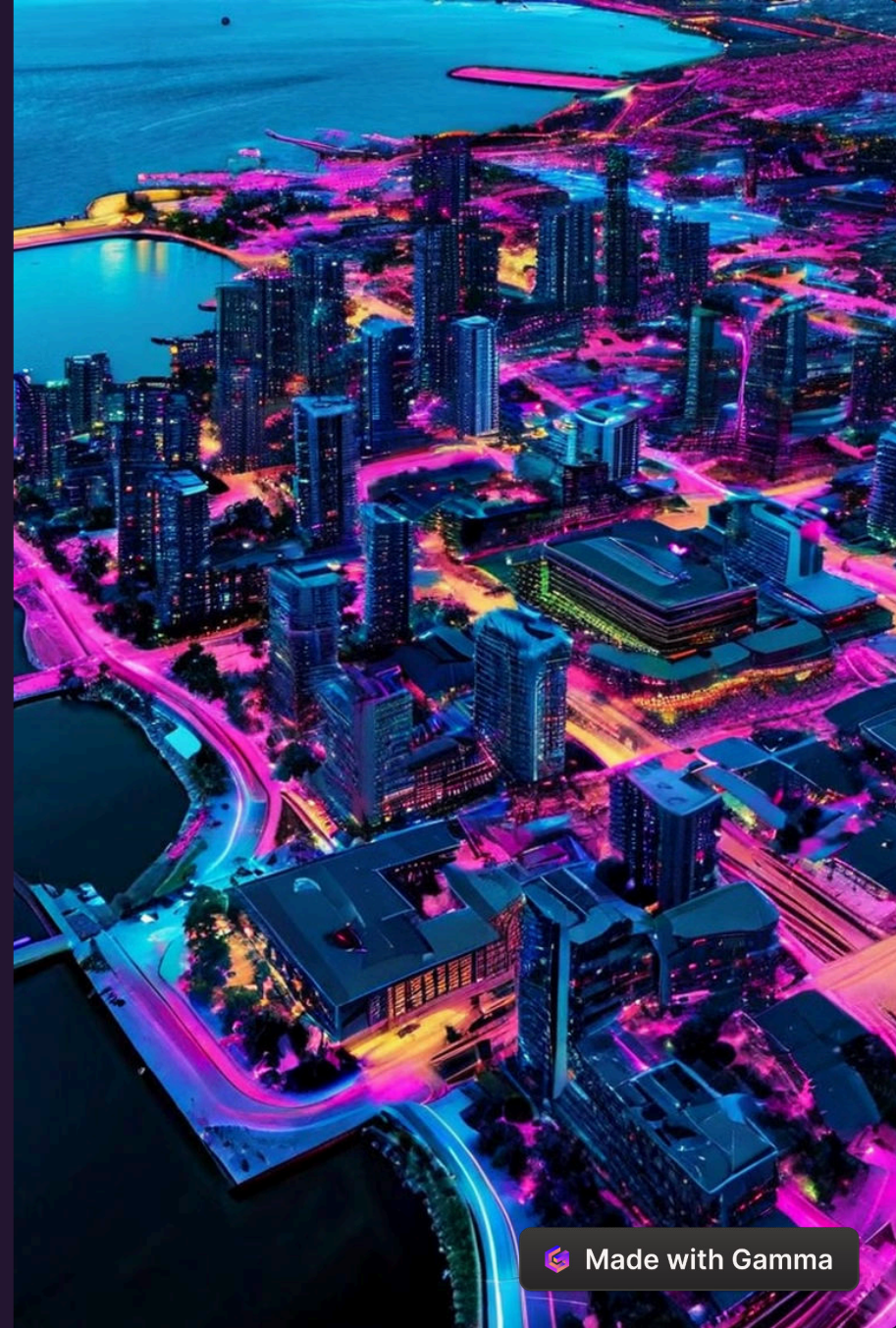
3

Data Visualization

The results of the clustering analysis are visualized using interactive maps and charts, allowing for easy exploration and comparison of neighborhoods.

Results

Cluster	Average Housing Price	Average School Rating
Cluster 1	$600,000	4.5
Cluster 2	$750,000	4.0
Cluster 3	$550,000	3.5



Discussion

Neighborhood Diversity

Scarborough's diverse population and multicultural environment are highlighted through the analysis of venue categories and the distribution of clusters.

Housing Price Trends

The project reveals insights into housing price variations across different neighborhoods, providing valuable information for potential homebuyers.

School Quality

The analysis of school ratings helps identify neighborhoods with strong educational opportunities, catering to families with children.

Conclusion

1

Neighborhood Insights

The project successfully identified distinct clusters of neighborhoods in Scarborough, providing valuable insights into their characteristics and amenities.

2

Data-Driven Decisions

The results empower individuals to make informed decisions about their neighborhood choice, based on their specific needs and preferences.

3

Future Enhancements

Future work could involve expanding the analysis to include additional factors, such as transportation accessibility and proximity to amenities.

Project Impact

Housing Choices

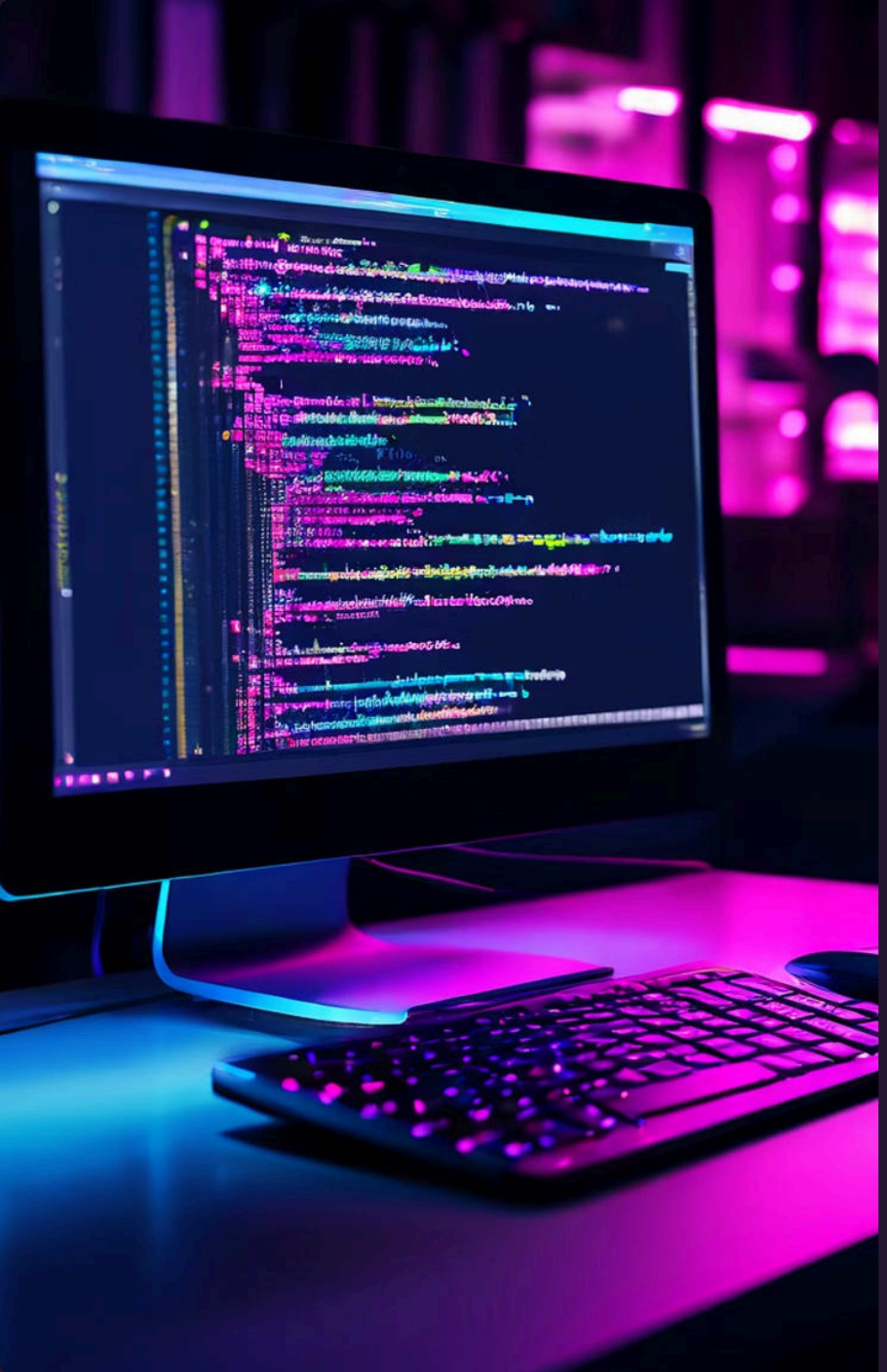
The project provides a comprehensive framework for evaluating housing options based on factors such as price, location, and neighborhood amenities.

Educational Opportunities

The analysis of school ratings empowers families to make informed decisions about their children's education, ensuring access to quality schools.

Community Integration

The project helps individuals find neighborhoods that align with their social and cultural preferences, fostering a sense of belonging and community.



Key Libraries

1 **Pandas**

Used for creating and manipulating dataframes, enabling efficient data analysis and manipulation.

2 **Folium**

A Python visualization library used to create interactive leaflet maps, providing a visual representation of the neighborhood clusters.

3 **Scikit-learn**

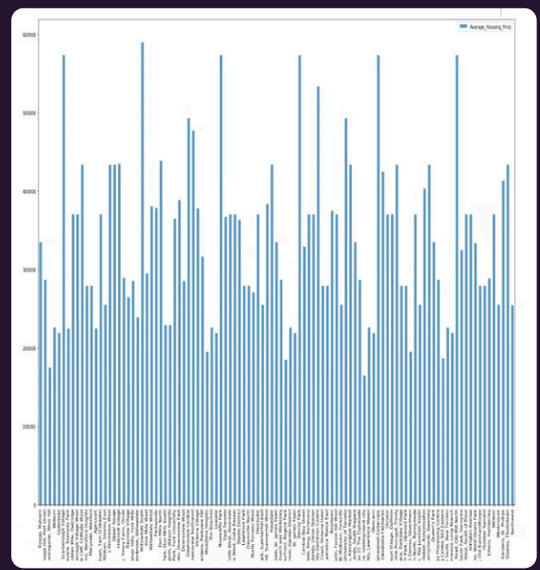
Used for importing the k-means clustering algorithm, enabling the grouping of neighborhoods based on similarities.

4 **JSON**

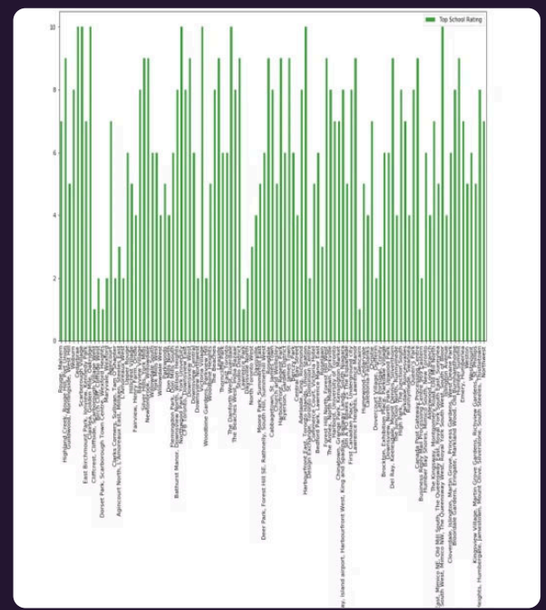
A library used to handle JSON files, facilitating the retrieval and processing of data from the Foursquare API.

Project Conclusion

This Capstone Project successfully utilized data science techniques to analyze and visualize neighborhood characteristics in Scarborough, Toronto. The project provides valuable insights for individuals seeking to make informed decisions about their new neighborhood, contributing to a smoother and more fulfilling transition.



Average Housing Price by Clusters in Scarborough



School Ratings by Clusters in Scarborough