Moving to Seattle?
A Guide to the Different Neighborhoods in the Emerald City

1. Introduction

1.1 Background

Seattle is located in the Pacific Northwest and it is the largest city in the state of Washington. It is home to a number of large corporations, national sports teams, and recognized universities and colleges. Seattle is also one of the fastest growing metropolitan cities, due to the booming economy and high job growth. The Seattle housing market has also increased in tandem with the economy as it is becoming more expensive than ever to live in this seaport city. People from all around the world relocate to Seattle to pursue higher education and career advancement. They will undoubtedly rent or buy property in this metropolis if they plan to relocate to the area.

Moving to a new city and adapting to a new place can be overwhelming. Generally, people look for the same elements in choosing a place of residence such as affordability and location. The dwelling should be within the individual's budget and it should also be in close proximity to desirable amenities. In order to make a thorough evaluation of an appropriate place to reside, it is necessary to comparing the pros and cons of nearby neighborhoods.

1.2 Problem

There are over 80 neighborhoods in Seattle. Each neighborhood is unique with its own characteristics and attributes. Someone who is not familiar with this region in the Pacific Northwest may find it difficult to determine the right place to reside in if they relocate to the area. While there are a considerable number of factors to take into account when choosing a place to live, this report will only review some of those factors such as the cost of the residence, crime rate in the neighborhood, and accessibility to public transportation. This report aims to help people choose an ideal location for renting or buying property in Seattle.

1.3 Stakeholders

There are three main stakeholder groups that would be interested in the findings of this report. The three groups consist of people that are considering purchasing a home in the Seattle area, those that are planning to rent housing in Seattle, and investors that intend to buy real estate in this city. Tourists that plan on visiting this area may also find some value in this project.

2. Data Acquisition

2.1 Data Sources

House Price Data
Link: https://www.zillow.com/research/data/

The house price data was obtained from Zillow. Zillow uses the ZHVI to determine the value of houses in a particular location. The ZHVI (Zillow Home Value Index) is a measure of the typical home value in a given region and housing type. It reflects the value for homes in the 35th to 65th percentile range. The ZHVI data will be used to evaluate the average cost of purchasing a one-bedroom house in each of Seattle's neighborhoods. In addition, a bubble plot will be created from the Zillow historical data to show the rise of home prices in each neighborhood. Below is an example of part of the dataset.

	RegionName	9/30/2015	9/30/2016	9/30/2017	9/30/2018	9/30/2019	9/30/2020
312	Adams	355639.0	414813.0	480721.0	541996	495651	499511
429	Admiral	333341.0	378045.0	439491.0	497728	468253	481106
689	Alki	371816.0	423292.0	488989.0	533493	500375	522274
706	Arbor Heights	363980.0	392612.0	439486.0	489120	470015	508474
712	Atlantic	399879.0	460523.0	534057.0	608267	628734	634278

Walk Score and Transit Score
Link: https://www.walkscore.com/WA/Seattle

The walk score and transit score were obtained from the WalkScore website. The walk score is a measure of the walkability of a given location. The walkability is determined by the proximity to nearby amenities and whether most errands can be accomplished by walking. The transit score is a measure of a location's accessibility to public transit. This score takes into account nearby transit routes based on frequency, type of route, and distance to the nearest stop on the route. The walk score and transit score for each Seattle neighborhood will be used to create choropleth maps to indicate the rank of each area. Below is an example of part of the dataset.

	Rank	RegionName	Walk Score	Transit Score	Bike Score	Population
0	72	Alki	51	35	61	6,644
1	83	Arbor Heights	38	43	32	5,056
2	16	Atlantic	84	72	83	6,449
3	13	Ballard	89	54	88	17,010
4	3	Belltown	98	99	75	14,163

Crime Data
Link: https://data.seattle.gov/Public-Safety/SPD-Crime-Data-2008-Present/tazs-3rd5

The crime data and statistics were collected from the Seattle Police Department website. The crime type, location, and date are all recorded in the SPD database, which can be accessed by the public. A bar chart showing the neighborhoods with the highest crime rate will be created from the SPD crime data. Below is an example of part of the dataset.

	Offense Start DateTime	Offense Parent Group	MCPP
0	2020-02-05 10:10:00	DRUG/NARCOTIC OFFENSES	MAGNOLIA
1	2020-02-03 08:00:00	LARCENY-THEFT	ROOSEVELT/RAVENNA
2	2020-02-02 20:30:00	ROBBERY	ROOSEVELT/RAVENNA
3	2020-02-05 01:17:00	DESTRUCTION/DAMAGE/VANDALISM OF PROPERTY	MAGNOLIA
4	2020-02-04 22:41:00	DESTRUCTION/DAMAGE/VANDALISM OF PROPERTY	NORTH BEACON HILL

Number of Coffeeshops
Link: https://developer.foursquare.com/places

The number of coffeeshops in each neighborhood were retrieved by accessing the Foursquare API. An account is required in order to access the API. A bubble plot for the number of coffeeshops within walking distance of each neighborhood will be created from the Foursquare data.

GeoJSON Seattle Neighborhood Data
Link: https://data-seattlecitygis.opendata.arcgis.com/datasets/city-clerk-neighborhoods?geometry=-122.910%2C47.452%2C-121.763%2C47.776

The GeoJSON data was retrieved from the Seattle GeoData website. This data indicates the boundaries of all the Seattle Neighborhoods.

2.2 Data Cleaning

In order to create the choropleth map for the cost of one-bedroom properties in each Seattle neighborhood, the keys of the GeoJSON file need to match with the neighborhood names of the Zillow house price dataset. While most of the keys did match with the neighborhood names after reviewing the datasets, there were some discrepancies that were found. For instance, the GeoJSON file had some sub-neighborhood names such as “Yesler Terrace” and “Central Business District” that the Zillow dataset did not contain. In these cases, the sub-neighborhood entries were updated to the neighborhood names that encompassed the sub-neighborhood so “Yesler Terrace” and “Central Business District” were updated to “Downtown” in the GeoJSON file. Similarly, the WalkScore dataset was reviewed and compared with the GeoJSON file keys. Any necessary updates were made accordingly.

2.3 Feature Selection

The Zillow house price dataset contains property values of houses from 1996 to present-day. Only the property values from 2015 and 2020 will be used in this project in order to show the current house prices for each neighborhood as well as the five-year market value increase in each area.

The WalkScore dataset includes the walk score, transit score, bike score, and population of each neighborhood. The walk score and transit score will be plotted on maps to indicate each area’s walkability and accessibility to public transportation. The bike score may not provide value to everyone as only a fraction of people living in Seattle own bicycles so that metric and the population data will not be analyzed in this report.

The Seattle Police Department crime database consist of data on the nature of the crime incident, offense ID, report number, location, and other information as well. The crime dates and the neighborhoods that the crime took place in will be the only data used in this project to show the crime rate in each area of Seattle.

All of the data from the Seattle neighborhoods GeoJSON file will be required to create choropleth maps for the house price, walk score, and transit score metrics.

3. Exploratory Data Analysis

3.1 Walk Score Choropleth Plot

The walk score for each Seattle neighborhood was plotted on a choropleth map. The GeoJSON file of Seattle neighborhoods and the walk score data were used as inputs to the Folium library in Python. The darker regions indicate a higher walk score and the walkability of a neighborhood is measured by the proximity to nearby amenities. The WalkScore website did not include data for the Lake City, Sand Point or Harbor Island locations so those regions are not shaded. Based on the choropleth map, the most walkable places in Seattle are Downtown, Capitol Hill, South Lake Union, University District, and Ballard. The least walkable area in Seattle is Matthews Beach, which is shaded in white in the map below. This data will be useful for people that do not intend on owning a car after moving to Seattle.

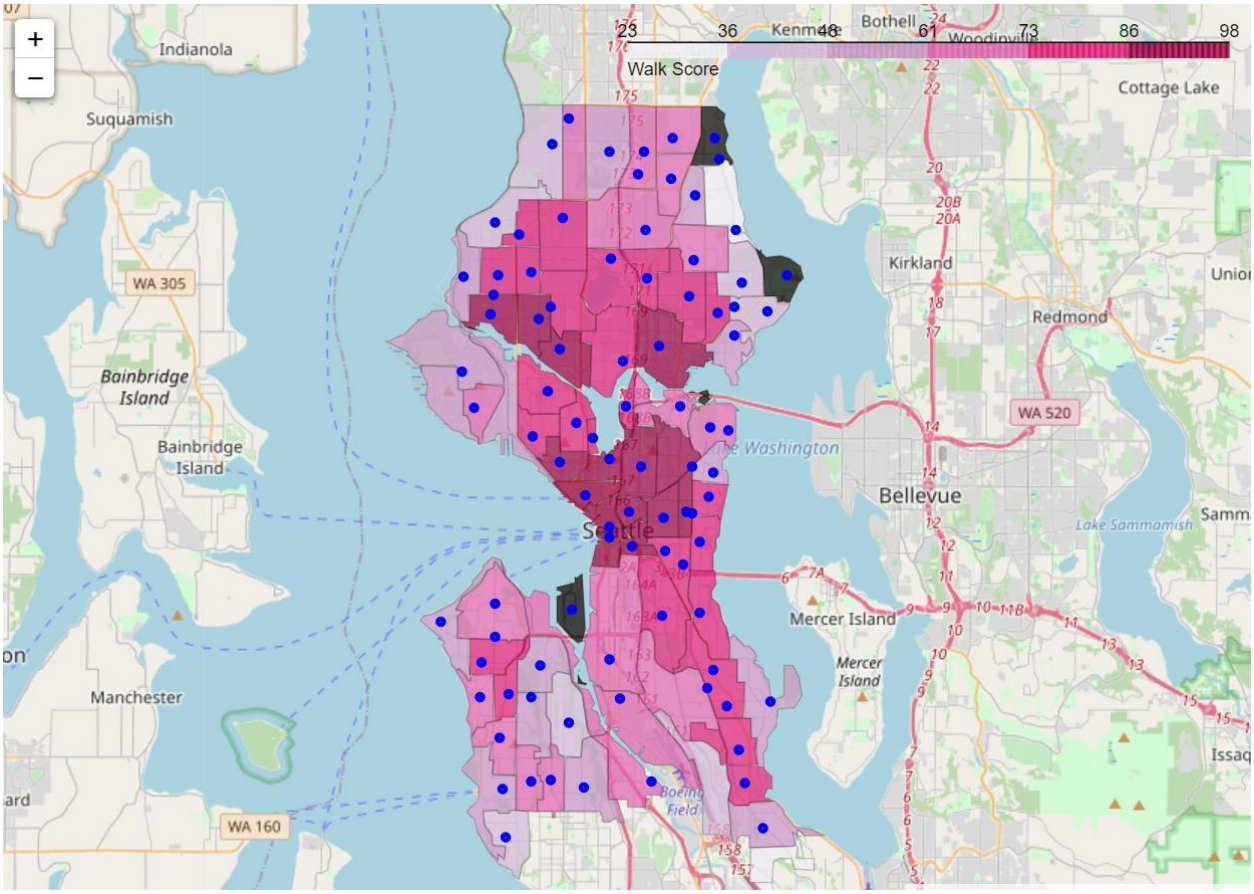

Figure 1. Choropleth Map of Walk Scores in Seattle Neighborhoods

3.2 Transit Score Choropleth Plot

Similar to the walk score metric, the transit score for each Seattle neighborhood was plotted on a choropleth map. The transit score is determined by a location's accessibility to public transportation and the darker regions indicate a higher transit score. The WalkScore website did not include data for the Lake City, Sand Point or Harbor Island locations so those regions are not shaded. The best neighborhoods for access to public transportation is Downtown, International District, Belltown and South Lake Union. This result is reasonable as these areas contain numerous bus routes. The areas with the least access to public transportation are shaded in white and are located on the outskirts of Seattle, which includes the Magnolia and West Seattle areas.

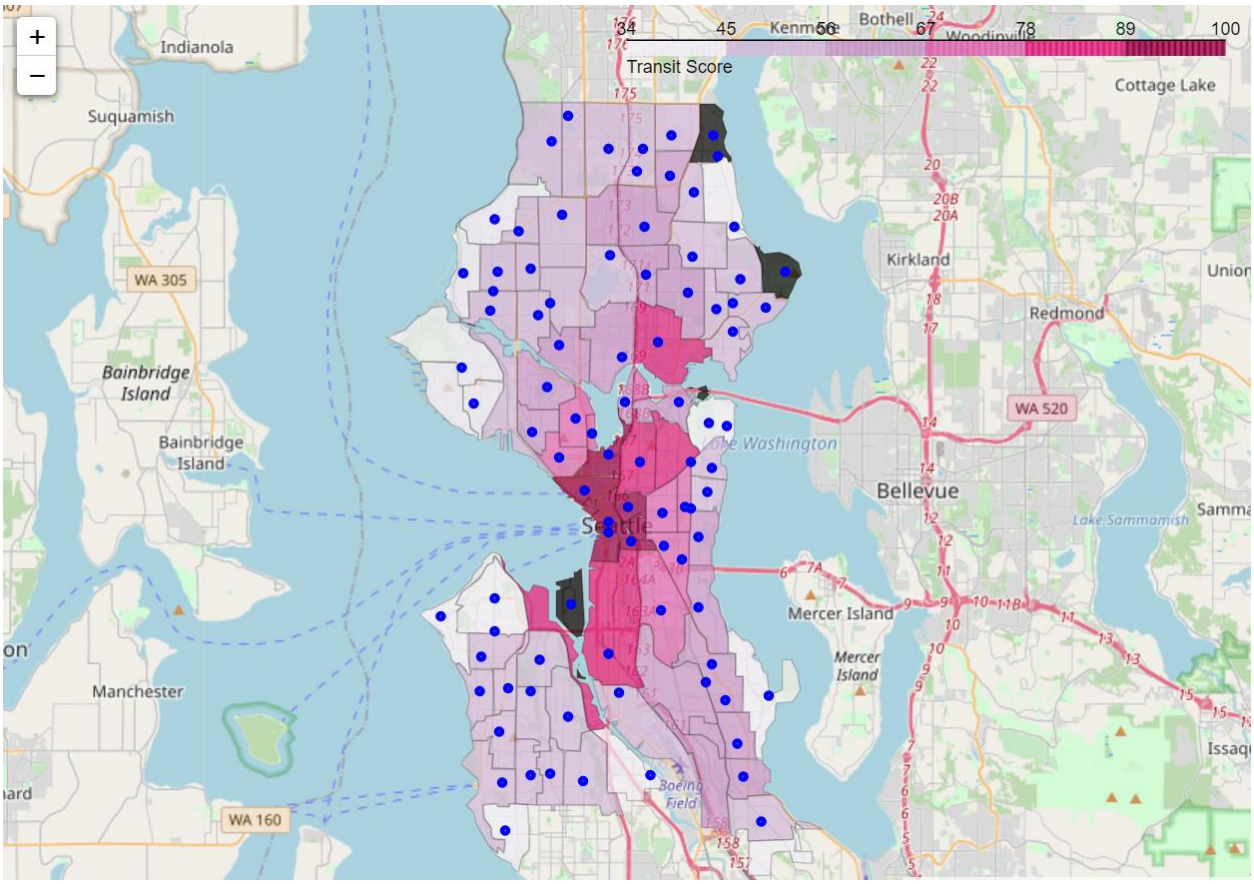

Figure 2. Choropleth Map of Transit Scores in Seattle Neighborhoods

3.3 Property Price Choropleth Plot

The GeoJSON file of Seattle neighborhoods was used along with the Zillow house price data as inputs to the Folium library in Python to create a choropleth map of 1-Bedroom property prices in Seattle neighborhoods. The Zillow database did not include data for Sand Point, Harbor Island, Industrial District, or Georgetown so those regions were omitted. The most expensive 1-Bedroom properties in Seattle are located in the Madrona and Denny-Blaine neighborhoods followed by the northwestern part of Seattle and the Downtown and Seward Park areas. The least expensive properties are located in the northern part of Seattle, which includes Northgate and Greenwood areas as well as the western part of Seattle, which includes Magnolia and Interbay.

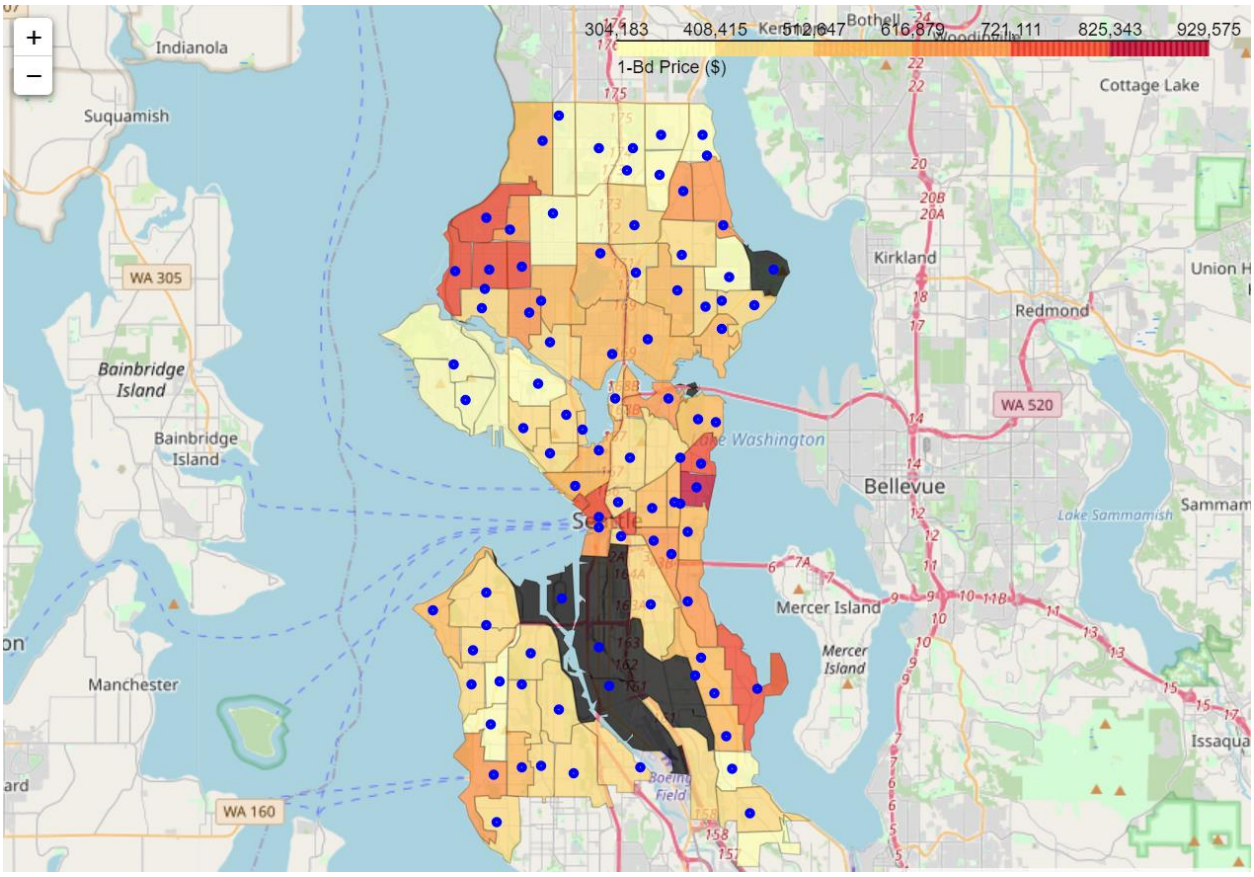

Figure 3. Choropleth Map of One-Bedroom Property Prices in Seattle

3.4 Five-Year Property Price Increase Bubble Plot

To calculate the five-year property price increase for each Seattle neighborhood, the 2015 Zillow house price data was subtracted from the 2020 property prices. A bubble plot was created to show the price increase in each Seattle neighborhood. The radius of each bubble on the plot is proportional to the percentage increase of the property over five years. These values have not been adjusted with inflation. The neighborhoods that have gained the most in value are Bryant (82%), Brighton (79%), and Loyal Heights (78%). This data is valuable to investors planning to purchase real estate in the Seattle area.

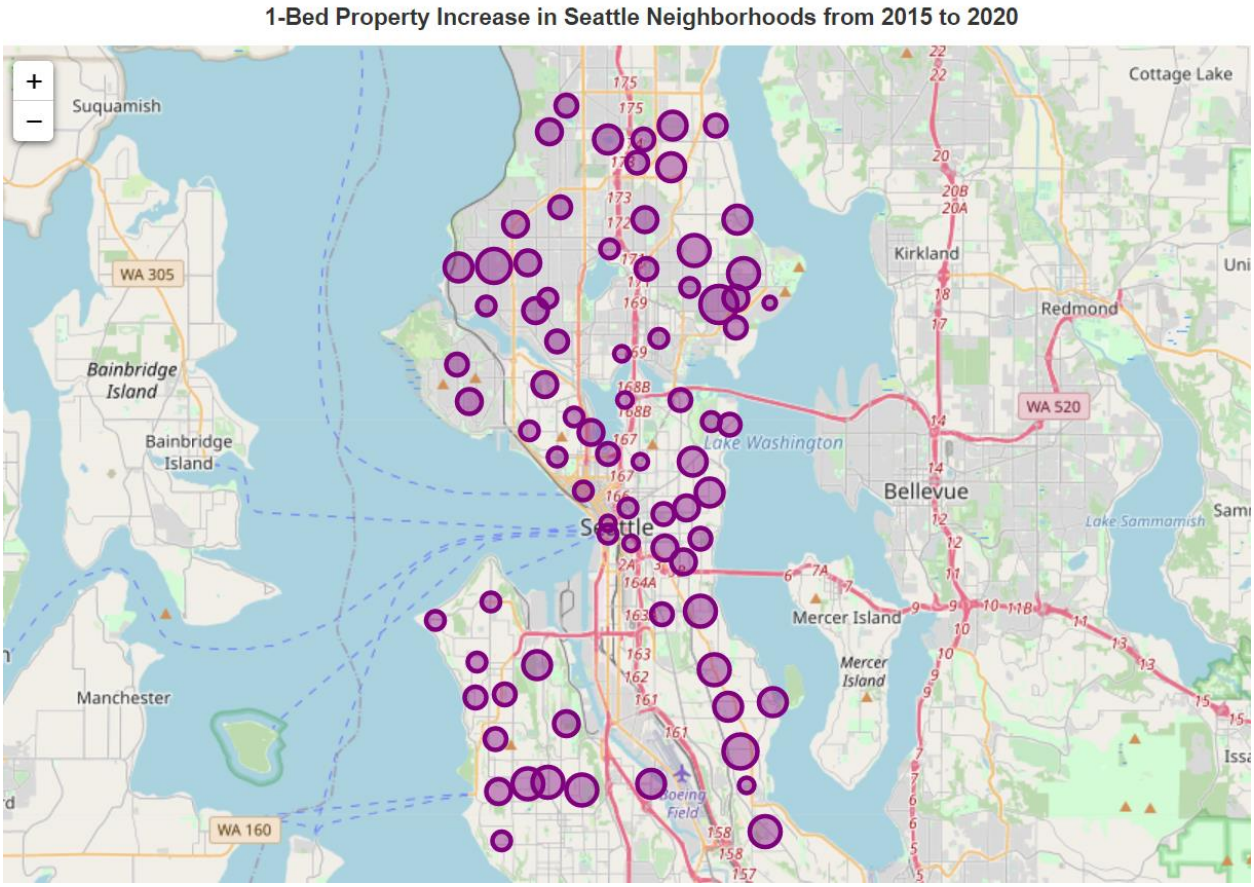

Figure 4. Bubble Plot of Five-Year Market Value Increase of One-Bedroom Properties in Seattle

3.5 Crime Rate in Seattle Bar Graph

The crime data from the Seattle Police Department database was grouped by the neighborhoods in which the incidents occurred. A bar chart was created to show the neighborhoods with the highest crime rate in 2020. The areas with the most crime incidents are Downtown, Capitol Hill, Queen Anne, Northgate, and University District. Any newcomers to Seattle should be cautious of these areas when searching for a place to live.

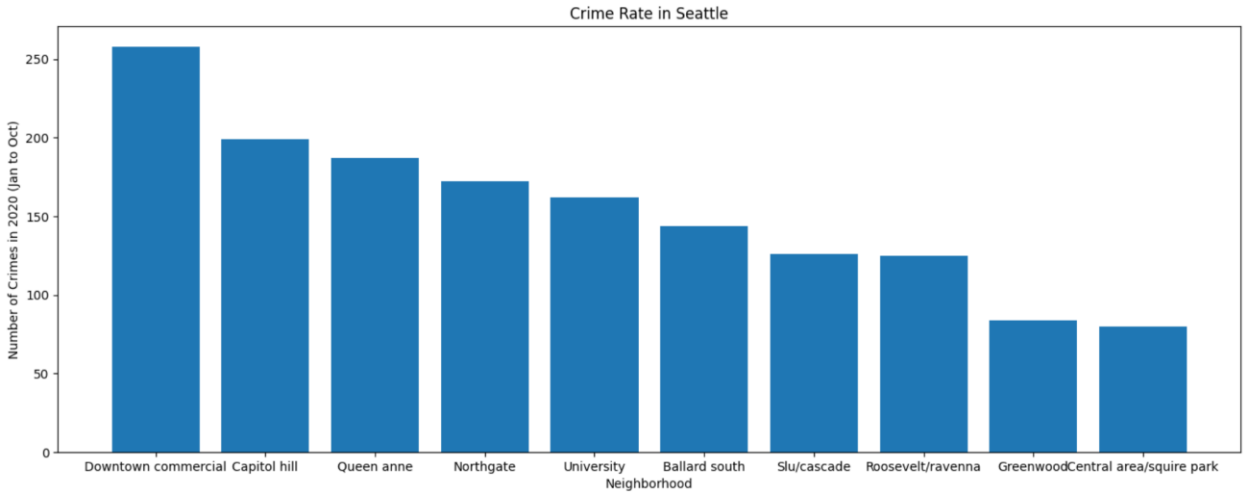

Figure 5. Bar Chart of Crime Rates in Seattle Neighborhoods

3.6 Coffeeshops in Seattle Bubble Plot

To determine the number of coffeeshops within walking distance of each neighborhood, API calls were made to Foursquare with the search query “coffee” and the parameter of 1000 meter radius from each neighborhood coordinate location. A bubble plot was created to show the quantity of coffeeshops in each area. The radius of each bubble on the plot is proportional to the amount of coffee places within 1000 meters of each neighborhood. The coffee shop density is greatest in the Downtown/Capitol Hill/South Lake Union region.

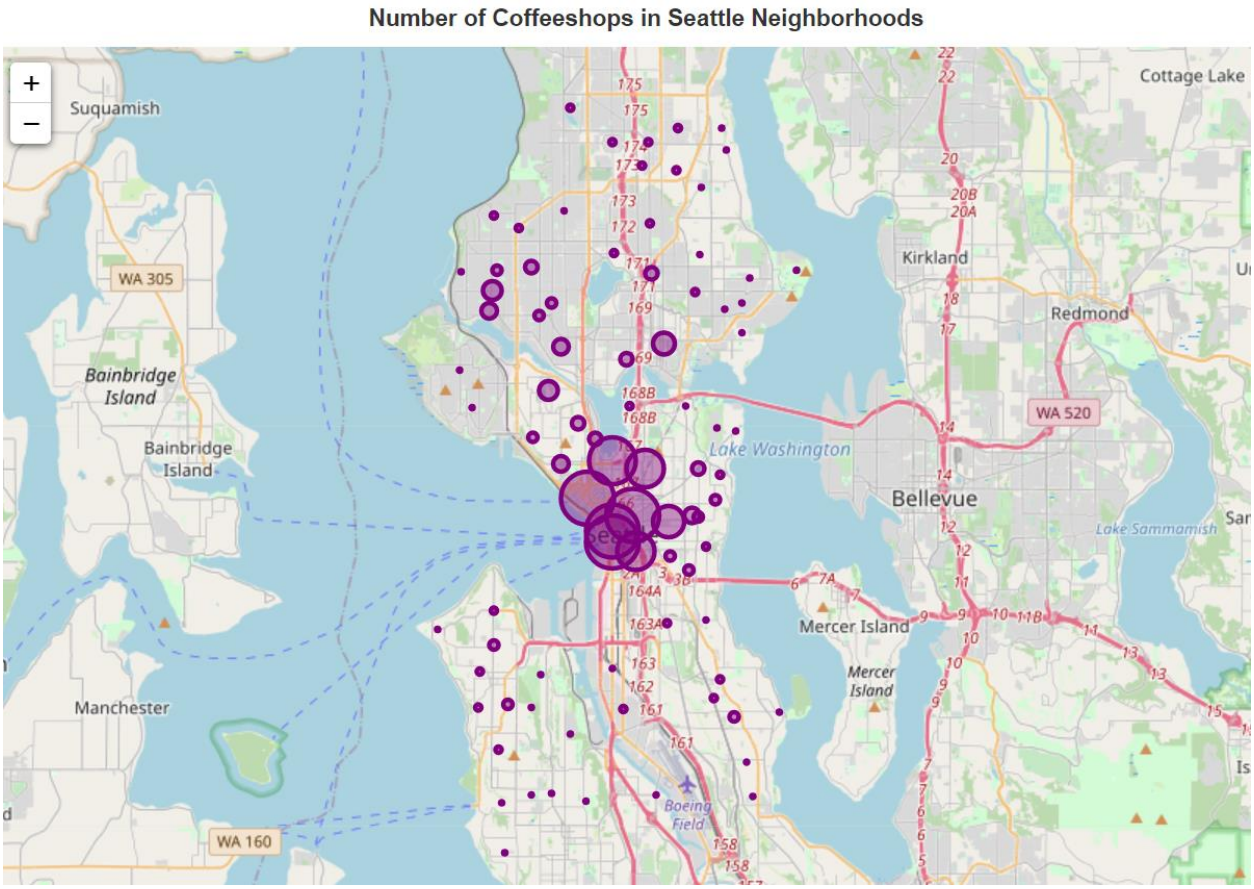

Figure 6. Bubble Plot of Number of Coffeeshops in Seattle

3.7 Relationship Between Walk Score and Property Price Scatterplot

A scatterplot was created to show the relationship between the property price and walk score of each Seattle neighborhood. The coefficient of determination was found to be 0.0089 which means that the relationship between the walk score and property price is not very strong.

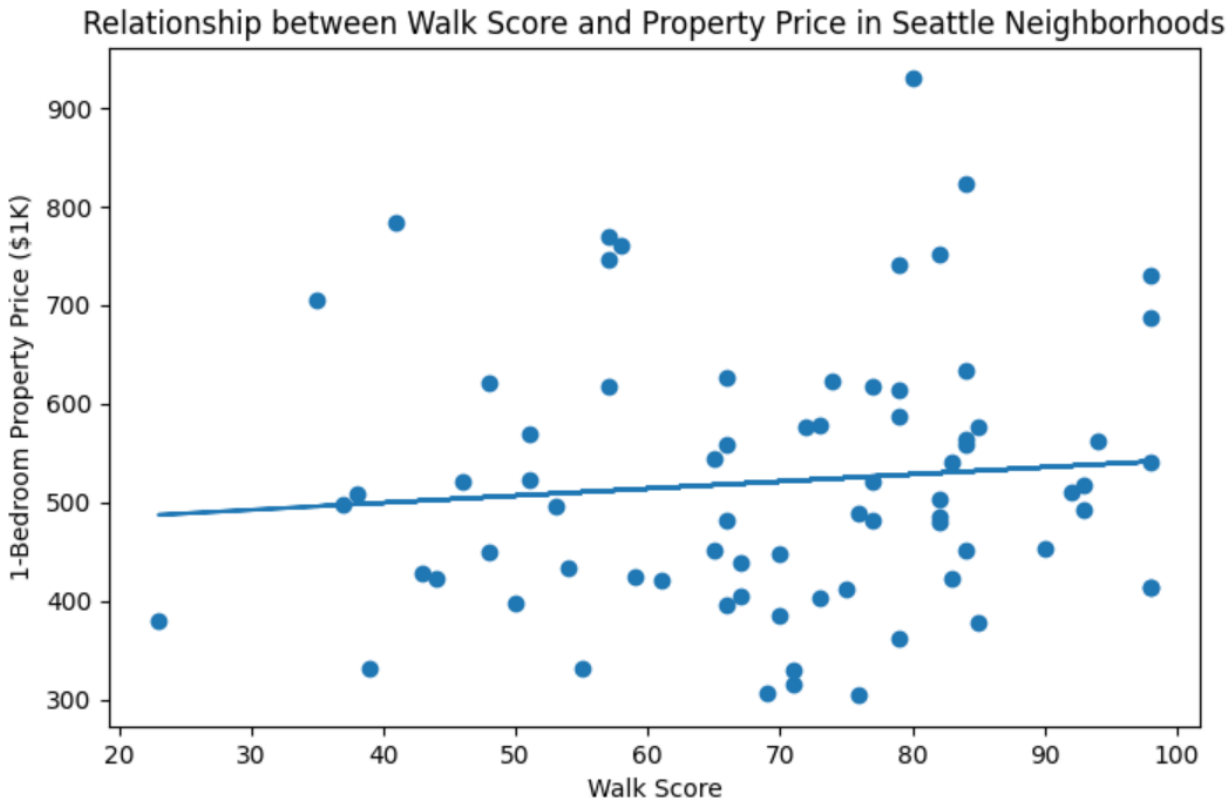

Figure 7. Scatterplot of One-Bedroom Property Price vs. Walk Score in Seattle

3.8 Relationship Between Transit Score and Property Price Scatterplot

Another scatterplot was created to show the relationship between the property price and transit score of each Seattle neighborhood. The coefficient of determination was found to be 0.0001 which means that the relationship between the walk score and property price is not very strong. The regression line is almost perfectly horizontal indicating that the dependent variable cannot be predicted from the independent variable.

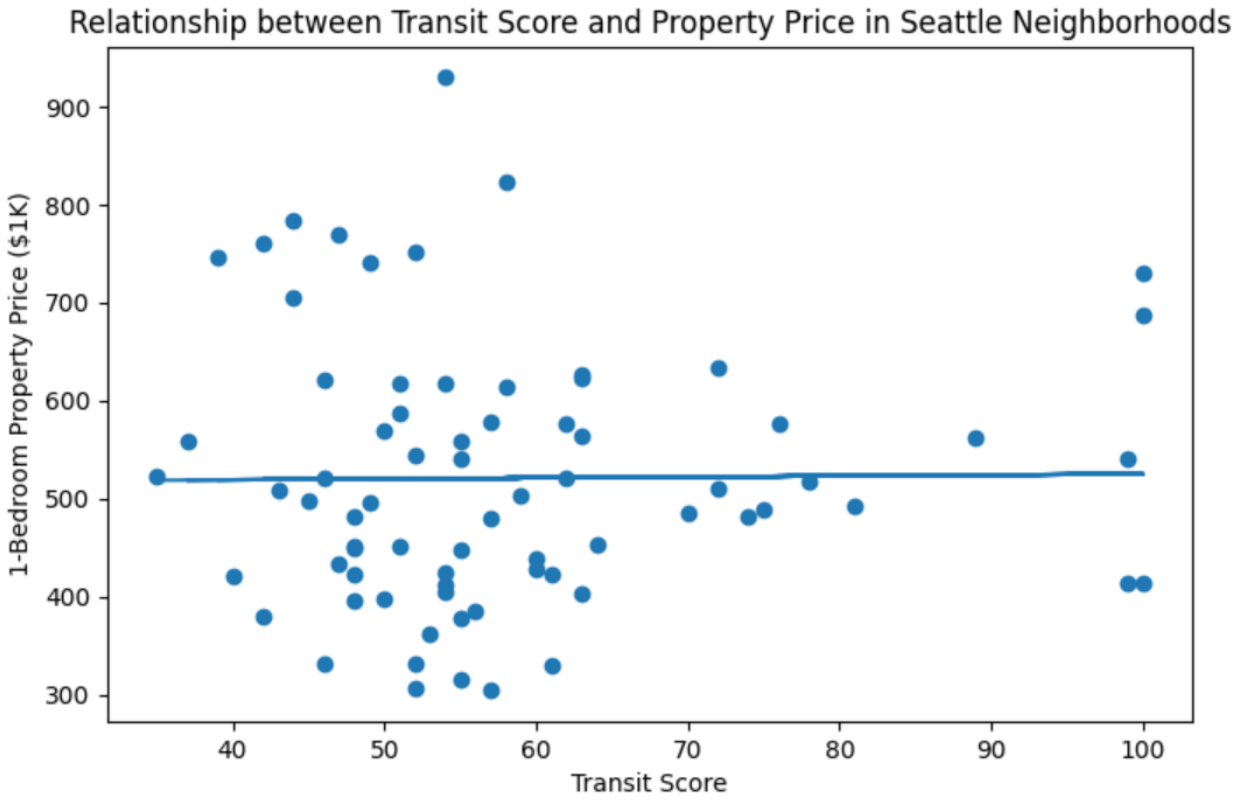

Figure 8. Scatterplot of One-Bedroom Property Price vs. Transit Score in Seattle

4. Discussion

While there are neighborhoods that are strong in some categories, these same neighborhoods may not perform well in other categories. For instance, even though Downtown Seattle has a high walk score and high transit score, it is very expensive to live there and the most crimes occur in that area. Other neighborhoods such as Magnolia are more affordable and safer, however, the walkability and access to public transportation may not be adequate for some people. It is important to take a holistic approach and analyze several different factors when determining a place to live. Some people may prioritize low cost over access to public transportation and others may prioritize low crime rate over property price. There are several desirable neighborhoods in Seattle based on personal preferences. Reviewing the data in this project can give insight to someone making a decision on where to live or where to purchase real estate property.

5. Conclusion

The purpose of this project is to showcase the different attributes of Seattle neighborhoods so that someone that is moving to the area can make an informed decision on which area to live. Property price, crime rate, and access to public transportation are all important factors to consider when relocating to a new place. In addition to these elements, an individual may need to consider other features as well such as a neighborhood's proximity to work or school, whether there are available parking spaces, and if the location has peace and quiet. It is imperative to perform a thorough analysis of all of these factors before purchasing a property as a lack of understanding and awareness may lead to buyer's remorse in the future. All of the research and work performed upfront will pay off in the long run.