Relocation around Minneapolis-St.Paul-Bloomington Metropolitan

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Introduction

1. Background

As the world is becoming more connected through different means of transportation, it is now much easier to relocate and move from city to city, even country to country. When relocating, one of the key decisions that need to be made is deciding on a neighborhood to live. Different individuals have preferences for different features; for example, home prices, school district for those with kids, proximity to airports if a frequent traveler. After the examining different factors, the decision is different for each person. Therefore, there's no way to develop a standard or universal way to find the best relocation choice for everyone. However, based on each person's preference, some key factors could be investigated with data analysis process. By exploring the data from public resources, including Zillow and Foursquare, such analysis will lead to a customized result to be provided to meet customers' interest and requirement to the utmost extent.

1.2 Problem

In the relocation analysis, the two most popular factors when choosing where to live is neighborhood location and home value. The problem is to find the optimized choice among many neighborhoods based on the current interested parameters, by applying clusters and performing data analysis.

1.3 Interest

In this project, the neighborhoods around Minneapolis-St. Paul-Bloomington metropolitan will be analyzed from venue types, prices and home value increasing percentage for the future, and the analysis will result in a relocation suggestion presuming a move from St. Paul to Minneapolis as an example.

2. Data

2.1 Data Sources

To acquire the housing price around target metropolitan, the price data sorted by neighborhood from Zillow was utilized targeting 1 bedroom 1 bathroom apartment purchase. The home price increasing data was also acquired from Zillow. On the other hand, venue data was requested from Foursquare for the estimate of neighborhood venues.

2.2 Data cleaning

After downloading data from Zillow data website https://www.zillow.com/research/data/, only data related to Minneapolis-St. Paul-Bloomington metropolitan were kept for following analysis.

For Zillow housing data sets, there're some neighborhoods of which either housing prices or value-increasing data are not shown. For the accuracy of the analysis, such data lacking neighborhoods were excluded since unknown parameters will not be guaranteed to meet the requirements. The historical data were also ignored, and only 2019 Zillow data were extracted for accuracy purpose.

For Foursquare data set, no modification was needed. Venue information were joined with their respective neighborhoods to understand the venue related data.

3. Exploratory Data Analysis

3.1 Retrieving Venue information and grouping by clusters

One of the key factors in determining how similar neighborhoods were between St. Paul and Minnesota was to look at the composition of venues in each neighborhood. For the purpose of this project, I downloaded the venue information for each neighborhood from Foursquare. Then, neighborhood within Minneapolis and St Paul were grouped based on similarity of venues. From the visual mapping, it looks like each cluster contains neighborhoods from both cities, which suggest it's possible to find a similar neighborhood across the cities (Figure 1). This suggests that the comparison is at least meaningful.

Looking at the map in detail, we can see that most neighborhoods in Minneapolis and St. Paul can be categorized into two major clusters. This result indicates that the both cities contain neighborhoods that are very similar to each other. It is highly likely to find a similar neighborhood in the alternate city when deciding to move between these two cities.

Figure 1

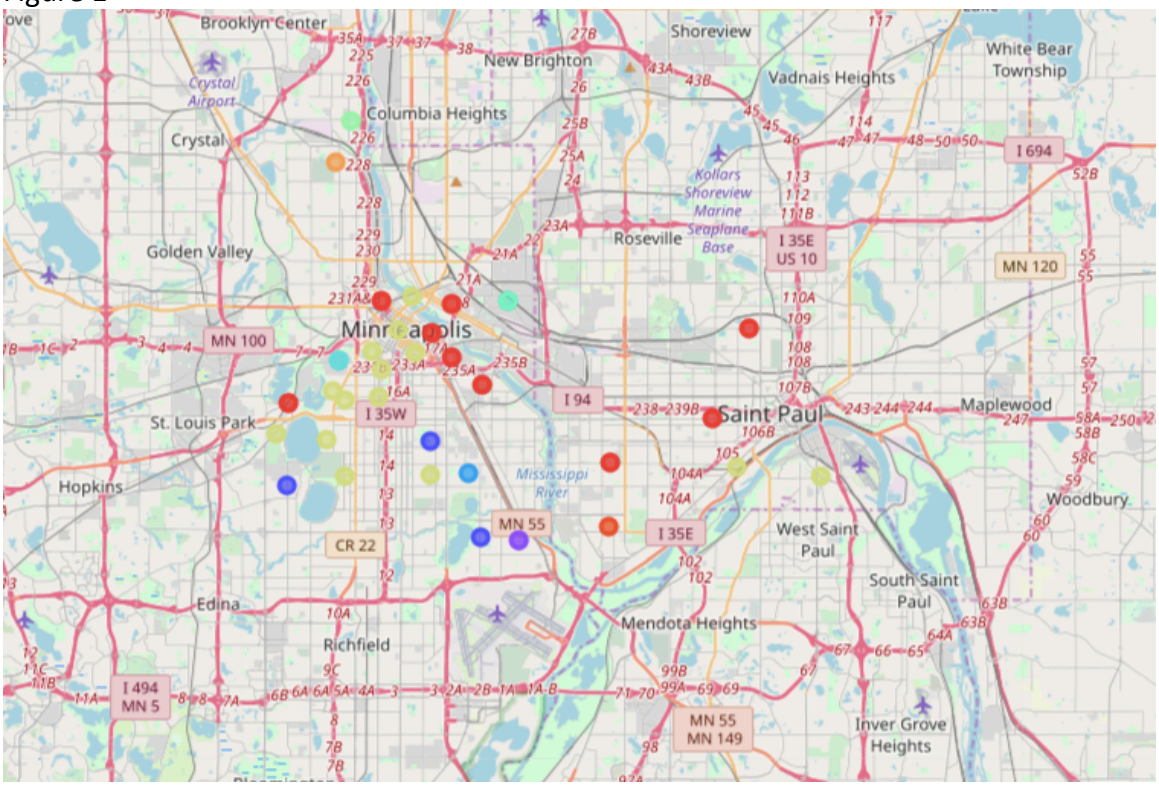


Figure 2

	Neighborhood	City	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
2	Elliot Park	Minneapolis	7	Coffee Shop	Bus Station	Sports Bar	Brewery	Moving Target	Café	Outdoors & Recreation	Restaurant	Food Court	Greek Restaurant
4	East Bank-Nicollet Island	Minneapolis	7	Park	Burger Joint	Lounge	Piano Bar	Pizza Place	Playground	Restaurant	River	Eastern European Restaurant	Cocktail Bar
6	Downtown West	Minneapolis	7	Coffee Shop	Food Truck	Sandwich Place	Hotel	Pizza Place	New American Restaurant	American Restaurant	Cosmetics Shop	Salad Place	Italian Restaurant
9	Loring Park	Minneapolis	7	Coffee Shop	Gym	Hotel	Gym / Fitness Center	Sandwich Place	American Restaurant	Salon / Barbershop	Liquor Store	New American Restaurant	Diner
11	East Isles	Minneapolis	7	Pizza Place	Boutique	Coffee Shop	Mexican Restaurant	ATM	Tea Room	Burger Joint	Skating Rink	Smoke Shop	Pet Café
12	West Calhoun	Minneapolis	7	Mexican Restaurant	Event Space	Sushi Restaurant	Burger Joint	Supplement Shop	Coffee Shop	Grocery Store	Juice Bar	Liquor Store	Noodle House
15	East Calhoun	Minneapolis	7	Playground	Coffee Shop	Bus Station	Shoe Store	Massage Studio	Scenic Lookout	Beach	Cosmetics Shop	Ice Cream Shop	Discount Store
16	East Harriet	Minneapolis	7	Garden	Pub	Park	Playground	Health & Beauty Service	Coffee Shop	Dog Run	Food	Fondue Restaurant	Fast Food Restaurant
18	Lowry Hill East	Minneapolis	7	Coffee Shop	Pizza Place	Breakfast Spot	Gym / Fitness Center	Mexican Restaurant	Electronics Store	Café	Yoga Studio	Boutique	Asian Restaurant
19	West 7th	Saint Paul	7	Accessories Store	Hot Dog Joint	Mexican Restaurant	Check Cashing Service	Massage Studio	Steakhouse	Bar	Grocery Store	Boat or Ferry	Liquor Store
20	West Side	Saint Paul	7	Pizza Place	Grocery Store	Burrito Place	Skating Rink	Mexican Restaurant	Fast Food Restaurant	Chinese Restaurant	Scenic Lookout	Liquor Store	Latin American Restaurant
24	Stevens Square	Minneapolis	7	Coffee Shop	Park	Brewery	Grocery Store	Fast Food Restaurant	Music Venue	Chinese Restaurant	Sandwich Place	Liquor Store	Gay Bar
29	Whittier	Minneapolis	7	Vietnamese Restaurant	Mexican Restaurant	Coffee Shop	Grocery Store	Caribbean Restaurant	Pizza Place	Theater	Bakery	Gym / Fitness Center	College Arts Building
30	Bancroft	Minneapolis	7	Yoga Studio	Grocery Store	Southern / Soul Food Restaurant	Discount Store	Fast Food Restaurant	Caribbean Restaurant	Food Court	Food	Fondue Restaurant	Farmers Market

Figure 3

	Neighborhood	City	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Downtown East	Minneapolis	0	Theater	American Restaurant	Bar	Hotel Bar	Park	Sports Club	Japanese Restaurant	Sporting Goods Shop	Pub	Brewery
1	North Loop	Minneapolis	0	Brewery	Gym / Fitness Center	American Restaurant	Food Truck	Bar	Italian Restaurant	Café	Spa	Coffee Shop	Comedy Club
3	Cedar-Isles-Dean	Minneapolis	0	Gym / Fitness Center	American Restaurant	Tourist Information Center	Bakery	Beach	Electronics Store	Football Stadium	Food Truck	Food Court	Food
10	Summit-University	Saint Paul	0	Home Service	Irish Pub	Organic Grocery	Liquor Store	Boutique	Café	Thai Restaurant	Theater	Gym / Fitness Center	Bakery
22	Cedar-Riverside	Minneapolis	0	Sandwich Place	Bar	Theater	ATM	Bookstore	Bus Station	Chinese Restaurant	Rock Club	Coffee Shop	College Residence Hall
25	Marcy Holmes	Minneapolis	0	Hotel	Historic Site	Café	New American Restaurant	Greek Restaurant	Park	Gym	Bus Station	Intersection	Art Gallery
28	North End	Saint Paul	0	Sporting Goods Shop	Gym / Fitness Center	Deli / Bodega	Bowling Alley	Thai Restaurant	Grocery Store	Cosmetics Shop	American Restaurant	History Museum	Eastern European Restaurant
31	Seward	Minneapolis	0	Bar	Playground	Spiritual Center	Gas Station	Bowling Alley	Liquor Store	Sandwich Place	Latin American Restaurant	Sushi Restaurant	Café
32	Macalester-Groveland	Saint Paul	0	Spa	Tailor Shop	Wine Shop	Pilates Studio	Restaurant	Massage Studio	Bookstore	Liquor Store	Bar	Food Court

3.2 Finding home values and grouping by clusters

Similarly, the other key factor when choosing a location to live is the expense of living in such neighborhood. For the purpose of this exercise, I used Zillow Home Value Index for a 1bedroom 1bathroom, which provides a median estimated home value for each neighborhood.

First this data was graphed by its home value against the anticipated rise in value. From the graph, it's clear to see that there are a few outliers. Areas near downtown of cities typically have higher home values, as shown by Downtown East. Most neighborhood home value falls within $100,000 - $200,000 range, which can help us to identify similar neighborhoods. (Figure 4).

Then, neighborhoods were grouped into clusters based on this index. This helps to identify neighborhoods in the two cities that are similar in home value. Again, we can see that each cluster contains neighborhoods from both cities, suggesting we can find similar neighborhoods in terms of price. (Figure 5)

Figure 4

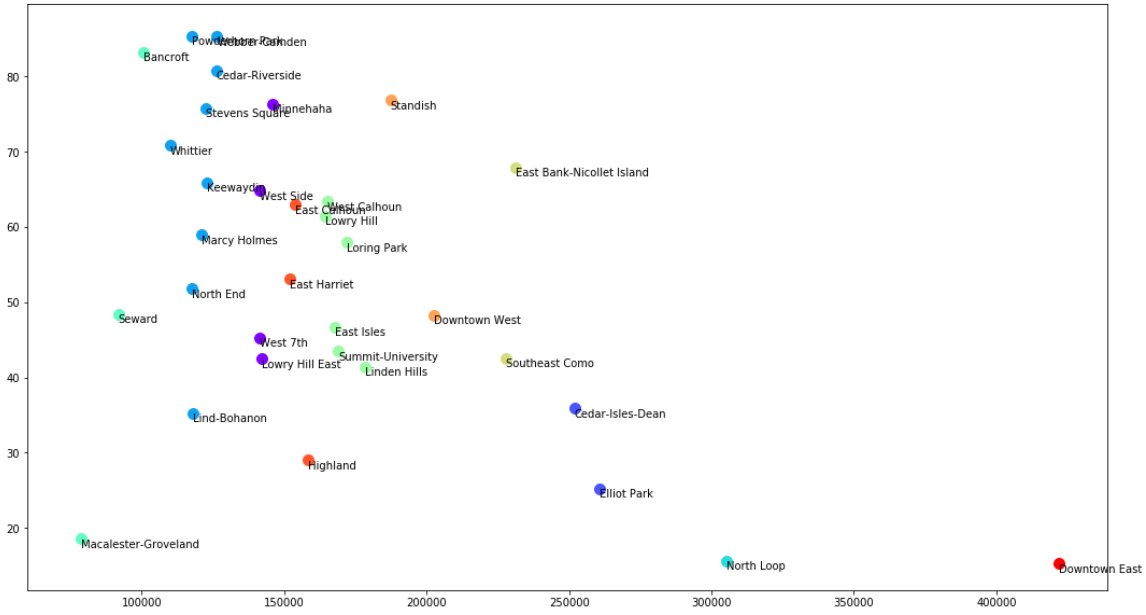
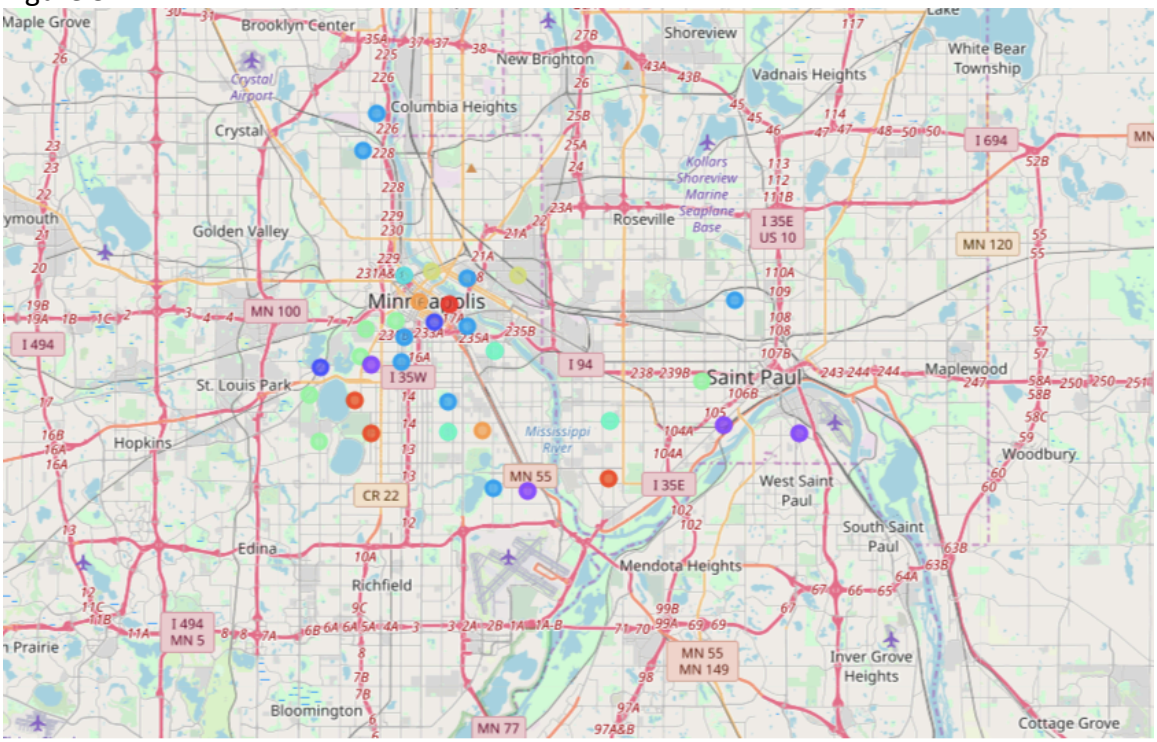


Figure 5



3.3 Relationship between neighborhood venue composition and its price

After grouping the neighborhoods independently by its venue composition and home value, the hypothesis was that we could find a neighborhood depending on venue or home value. Although initially this data was calculated independently, it was found that there was some correlation between the venue and home value. (Figure 6) Thinking through; it makes sense, since home value will take into account its surrounding neighborhood. Usually, an area with more diverse venues (like city downtowns) will cost more.

Figure 6

	Neighborhood	Venue Cluster	Price Cluster
0	Downtown East	7	0
1	North Loop	0	4
2	Elliot Park	0	2
3	Cedar-Isles-Dean	0	2
4	East Bank-Nicollet Island	7	7
5	Southeast Como	7	7
6	Downtown West	7	8
7	Standish	7	8
8	Linden Hills	7	6
9	Loring Park	7	6
10	Summit-University	9	6
11	East Isles	2	6
12	West Calhoun	6	6
13	Lowry Hill	2	6
14	Highland	7	9
15	East Calhoun	4	9
16	East Harriet	7	9
17	Minnehaha	0	1
18	Lowry Hill East	0	1
19	West 7th	1	1
20	West Side	0	1
21	Webber-Camden	0	3
22	Cedar-Riverside	2	3
23	Keewaydin	0	3
24	Stevens Square	5	3
25	Marcy Holmes	3	3
26	Lind-Bohanon	7	3
27	Powderhorn Park	0	3
28	North End	8	3
29	Whittier	7	3
30	Bancroft	7	5
31	Seward	7	5
32	Macalester-Groveland	7	5

4. Results

Once we were able to cluster neighborhoods by both price and venue, we can now use these two sets of data to calculate a “target neighborhood” if someone were to move from St. Paul to Minneapolis. The target neighborhood is a derived value based on clusters on both venues and home value. This value would suggest that for a certain neighborhood in one city, there could be 1 or more neighborhoods that are similar, which will offer similar living environments at similar price. (figure 7)

Figure 7

	Current Neighborhood	Current City	Target City	Target Neighborhood
0	Highland	Saint Paul	Minneapolis	East Harriet
1	Macalester-Groveland	Saint Paul	Minneapolis	Bancroft, Seward
2	West Side	Saint Paul	Minneapolis	Minnehaha, Lowry Hill East

However, understanding that some may only care solely for home value or venue, so a similar table was constructed with that in mind. In this table, two values are calculated – similar neighborhoods by home value OR similar neighborhoods by venues. The two lists are not mutually exclusive and do contain overlapping neighborhoods, which are captured by initial table. (Figure 8)

Figure 8

	Current Neighborhood	Current City	Target City	Suggested Neighborhood_Price	Suggested Neighborhood_Venue
0	Highland	Saint Paul	Minneapolis	East Calhoun, East Harriet	Downtown East, East Bank-Nicollet Island, Southeast Como, Downtown West, Standish, Linden Hills, Loring Park, East Harriet, Lind-Bohanon, Whittier, Bancroft, Seward
1	Macalester-Groveland	Saint Paul	Minneapolis	Bancroft, Seward	Downtown East, East Bank-Nicollet Island, Southeast Como, Downtown West, Standish, Linden Hills, Loring Park, East Harriet, Lind-Bohanon, Whittier, Bancroft, Seward
2	North End	Saint Paul	Minneapolis	Webber-Camden, Cedar-Riverside, Keewaydin, Stevens Square, Marcy Holmes, Lind-Bohanon, Powderhorn Park, Whittier	NaN
3	Summit-University	Saint Paul	Minneapolis	Linden Hills, Loring Park, East Isles, West Calhoun, Lowry Hill	NaN
4	West 7th	Saint Paul	Minneapolis	Minnehaha, Lowry Hill East	NaN
5	West Side	Saint Paul	Minneapolis	Minnehaha, Lowry Hill East	North Loop, Elliot Park, Cedar-Isles-Dean, Minnehaha, Lowry Hill East, Webber-Camden, Keewaydin, Powderhorn Park

5. Discussions and recommendations

Through both tables, we can see that some neighborhoods may not have a suggested neighborhood in Minneapolis. Due to the nature of the data and city structure, it's difficult to find any counterparts. We can solve for this by leveraging only one dataset but the suggested list will become much larger and less targeted.

In the future, there can be other factors that are included in the table to calculate the suggested neighborhood, such as school district, distance to metropolis area, distance to airport, all of which can play a part in the decision factor when someone chooses to relocate from one city to another. This can also help to increase the success rate of such suggestion.

6. Conclusion

I wanted to understand if there's data to help me make a decision when moving from St. Paul to Minneapolis. Ideally, I'd like to continue living in an environment similar to the neighborhood in St. Paul. Narrowing down to two main factors – home value and venues, I constructed a table to evaluate which neighborhoods were most similar across the cities. The downside to using both cluster data to determine similar neighborhoods is that some neighborhoods will not have an exact counterpart.