Determining the lowest priced neighborhood amongst similar Denver neighborhoods

Capstone Project - The Battle of Neighborhoods

Background

- Denver is a fast growing city with an ever growing population
- Denver comprises of 78 neighborhoods

Problem

How does a prospective home buyer:

- Determine the characteristics of all the Denver neighborhoods?
- Determine neighborhoods that are similar?
- Amongst similar neighborhoods, determine the least expensive neighborhood to buy a home in

Data Sources

- Scrape Wikipedia for neighborhood names
- Google Maps API to get the coordinates of each neighborhood
- FourSquare API to get venue data for each neighborhood
- Zillow API to get median housing price for each neighborhood
- Shape file from Denver Open Data
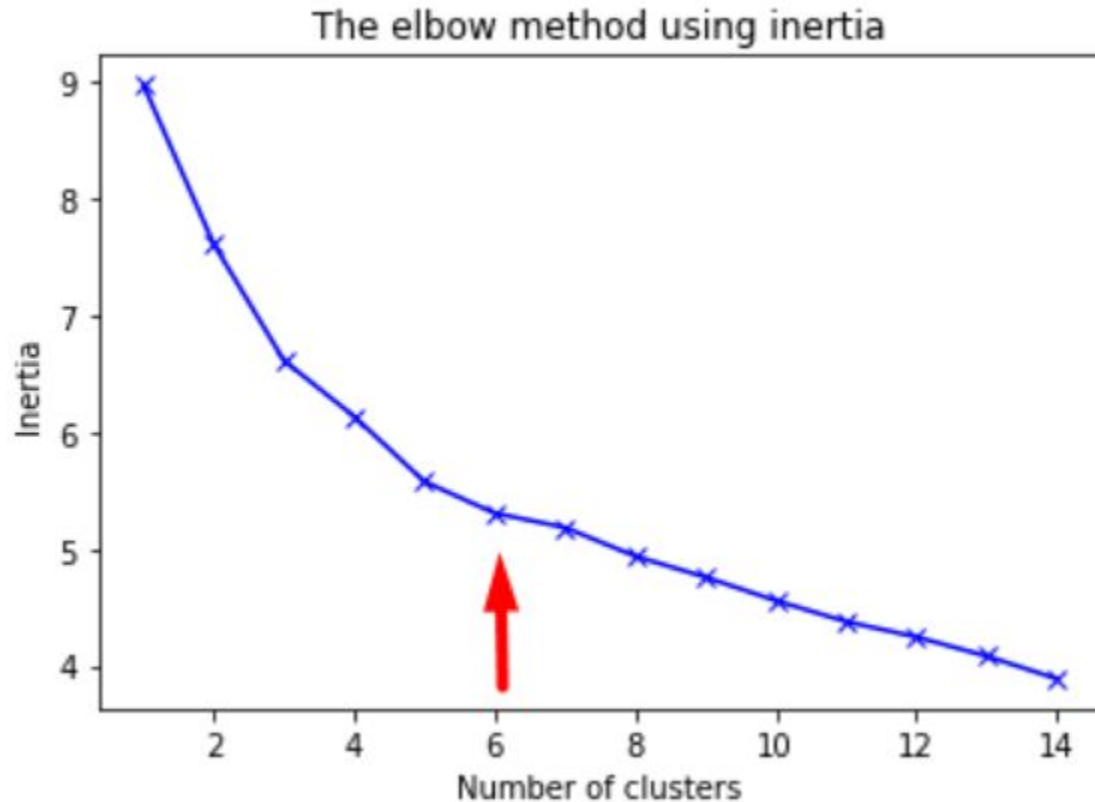- Export GeoJson data from QGIS

Denver neighborhoods
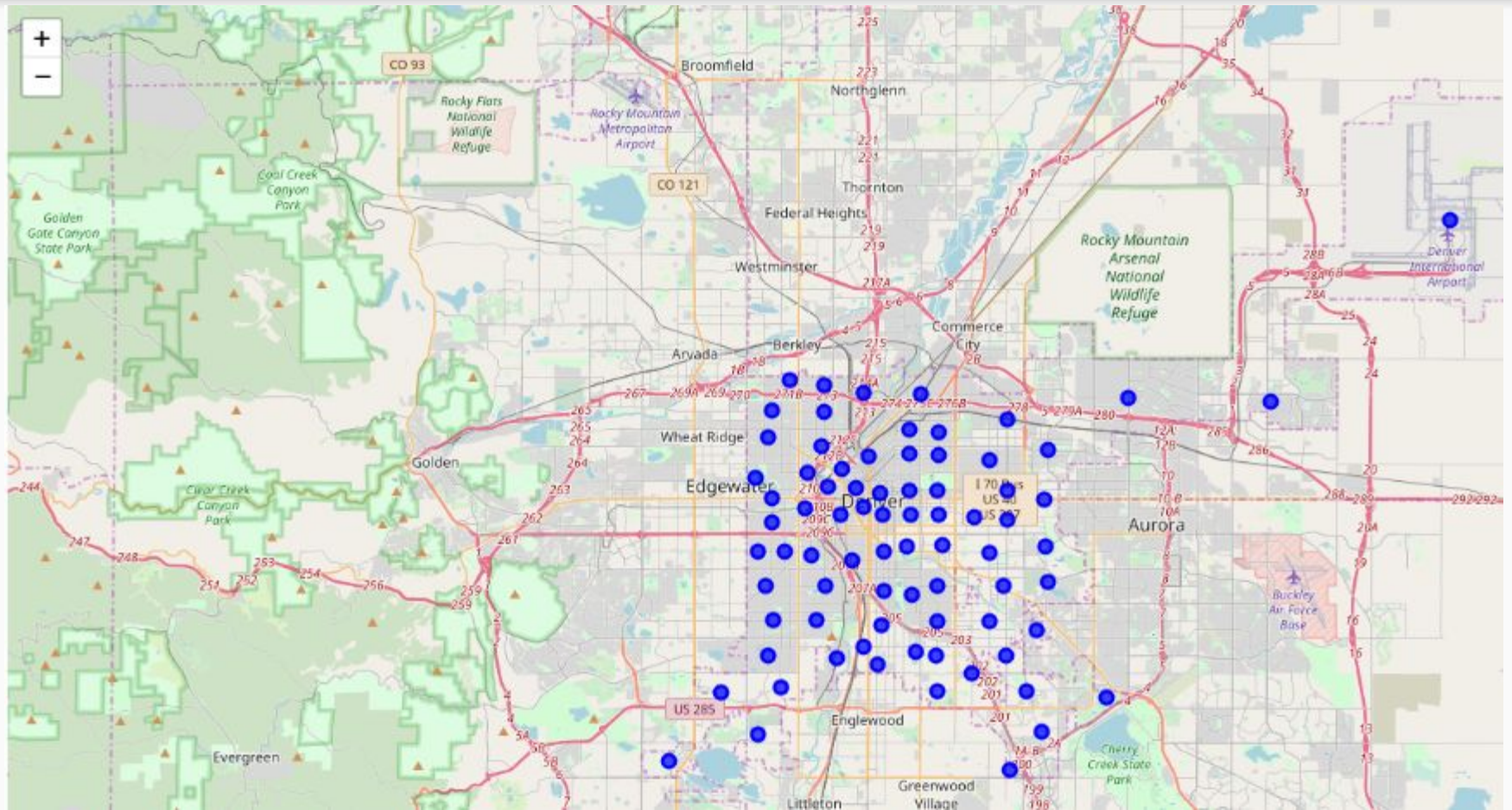
Neighborhoods with their top 5 venue categories

	Denver_Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Athmar Park, Denver	Park	Vietnamese Restaurant	Home Service	Warehouse Store	---
1	Auraria, Denver	Theme Park	Theme Park Ride / Attraction	Light Rail Station	American Restaurant	Fast Food Restaurant
2	Baker, Denver	Coffee Shop	Marijuana Dispensary	Chinese Restaurant	Intersection	Residential Building (Apartment / Condo)
3	Barnum West, Denver	Mexican Restaurant	Convenience Store	Discount Store	Home Service	American Restaurant
4	Barnum, Denver	Mexican Restaurant	Hookah Bar	Marijuana Dispensary	Market	Burger Joint
5	Bear Valley, Denver	Park	Gym / Fitness Center	Pool	---	---
6	Belcaro, Denver	Park	---	---	---	---
7	Berkeley, Denver	Brewery	Coffee Shop	Pizza Place	Breakfast Spot	Bar
8	Capitol Hill, Denver	Pizza Place	Coffee Shop	Sandwich Place	Nightclub	Pub
9	Central Business District, Denver	Hotel	American Restaurant	Theater	Italian Restaurant	Coffee Shop
10	Chaffee Park, Denver	Grocery Store	Pizza Place	Hobby Shop	Park	Thrift / Vintage Store
11	Cheesman Park, Denver	Botanical Garden	Garden	Park	Café	Ice Cream Shop

KMeans clustering - k = 6 (elbow method using inertia)

The elbow method using inertia

- Iterated from k=1 to k=14
- picked the k where an elbow is apparent

Cluster Label	Neighborhood
0	7
1	64
2	2
3	1
4	2
5	2

Clustered Denver neighborhoods

Cluster Label	Denver_Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	House Price
0	Athmar Park, Denver	Park	Vietnamese Restaurant	Home Service	Warehouse Store	---	354100
	Bear Valley, Denver	Park	Gym / Fitness Center	Pool		---	415400
	Fort Logan, Denver	Park	BBQ Joint	Music Venue	Historic Site	---	428900
	Harvey Park, Denver	Historic Site	Construction & Landscaping	Health Food Store	Lake	Mexican Restaurant	381300
	Ruby Hill, Denver	Flower Shop	Gym / Fitness Center	Park	Veterinarian	Home Service	352100
	Stapleton, Denver	Park	Wine Shop	Breakfast Spot	Pool	Gym	616900
	Villa Park, Denver	Park	Liquor Store	Food & Drink Shop	Pizza Place	---	370100
1	Auraria, Denver	Theme Park	Theme Park Ride / Attraction	Light Rail Station	American Restaurant	Fast Food Restaurant	706800
	Baker, Denver	Coffee Shop	Marijuana Dispensary	Chinese Restaurant	Intersection	Residential Building (Apartment / Condo)	501100
	Barnum West, Denver	Mexican Restaurant	Convenience Store	Discount Store	Home Service	American Restaurant	346200
	Barnum, Denver	Mexican Restaurant	Hookah Bar	Marijuana Dispensary	Market	Burger Joint	333100
	Berkeley, Denver	Brewery	Coffee Shop	Pizza Place	Breakfast Spot	Bar	597400
	Capitol Hill, Denver	Pizza Place	Coffee Shop	Sandwich Place	Nightclub	Pub	327700
	Central Business District, Denver	Hotel	American Restaurant	Theater	Italian Restaurant	Coffee Shop	423000
	Chaffee Park, Denver	Grocery Store	Pizza Place	Hobby Shop	Park	Thrift / Vintage Store	377800
	Cheesman Park, Denver	Botanical Garden	Garden	Park	Café	Ice Cream Shop	401600
	Cherry Creek, Denver	Clothing Store	Cosmetics Shop	American Restaurant	Coffee Shop	Furniture / Home Store	904700
	City Park West, Denver	Pizza Place	Mexican Restaurant	Sandwich Place	American Restaurant	Breakfast Spot	544700
	Washington Park, Denver	American Restaurant	Gift Shop	Massage Studio	Boutique	Coffee Shop	916700
	Washington Virginia Vale, Denver	Liquor Store	Pizza Place	Mexican Restaurant	Discount Store	Track	433400
	West Colfax, Denver	Ice Cream Shop	Coffee Shop	American Restaurant	Convenience Store	Mexican Restaurant	562500
	West Highland, Denver	Coffee Shop	Pizza Place	American Restaurant	Brewery	Grocery Store	619000
	Westwood, Denver	Mexican Restaurant	Museum	Food	Nightclub	Hobby Shop	310400
	Whittier, Denver	Liquor Store	Grocery Store	Café	Bar	Baseball Field	564000
2	Belcaro, Denver	Park	---	---	---	---	1101000
	University Park, Denver	Park	Cosmetics Shop	---	---	---	816600
3	Wellshire, Denver	Smoke Shop	---	---	---	---	815100
4	Skyland, Denver	Gym	Shop & Service	---	---	---	505800
	Windsor, Denver	Gym	Pool	Grocery Store	Dog Run	---	211900
5	Harvey Park South, Denver	Indie Theater	Construction & Landscaping	Disc Golf	Park	---	417400
	Indian Creek, Denver	Trail	Park	Construction & Landscaping	---	---	298100

- Top 5 venue categories

- Median housing prices

Choropleth map based on median housing prices
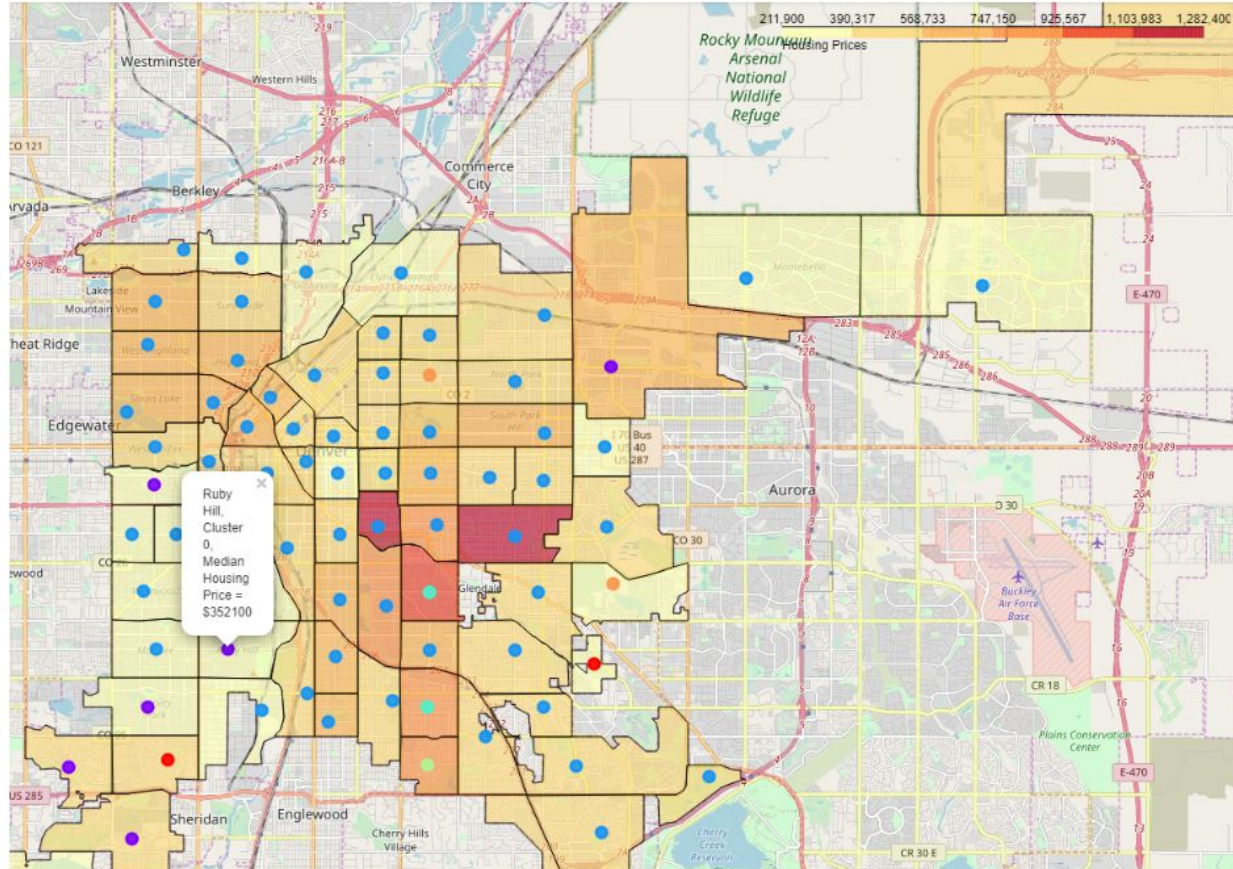
A prospective homebuyer, primarily interested in the outdoors (parks), would benefit most by purchasing her home in the Ruby Hill neighborhood (median home price $352,100)

A significant number of neighborhoods are grouped in one cluster making it difficult to have a wider breakdown of neighborhoods to make a finer-grained selection

Conclusion

Potential to assist a prospective homebuyer purchase a home in the least expensive neighborhood among a group of neighborhoods with similar venue categories