

Capstone Project - The Battle of Neighborhoods

SELECTING THE BEST LOCATION TO OPEN A MOVIE THEATER
IN CITY OF CHICAGO

Introduction/Business Problem

- ▶ The City of Chicago is famous for its culture and tourism
- ▶ Chicago served 58 million domestic and international visitors in 2018
- ▶ Movie Theater are very successful and go to places when it comes to entertainment.
- ▶ With the numbers for annual visitors so high and films produced, it would be a good opportunity to open something a business related to Cinema industry



Business Problem

- Our Client has asked to research the are of Chicago for the possibility of new *Movie* theaters in the area.
- Our goal is to identify the suitable places, that have land areas available for purchase from City Govt. as well



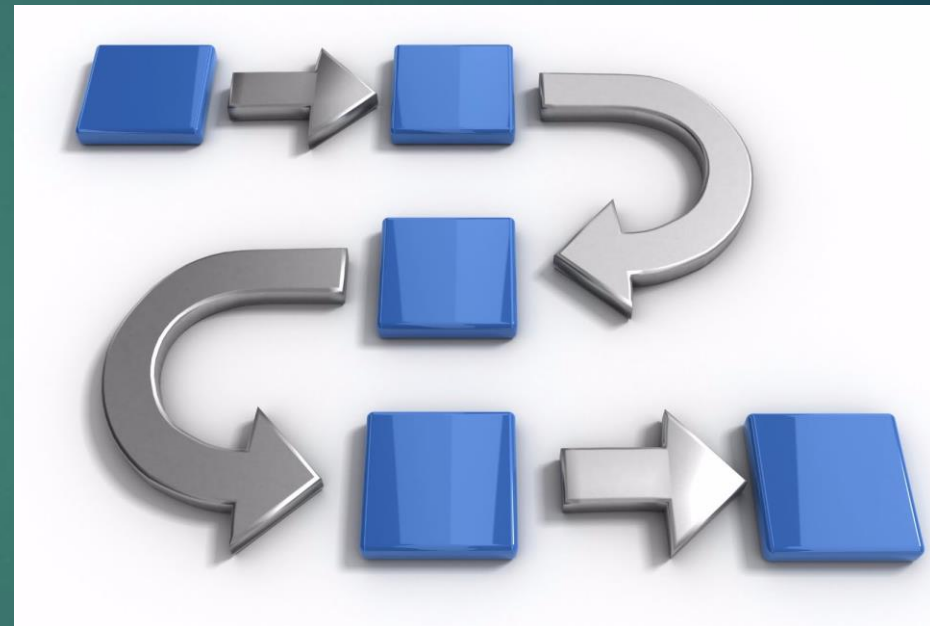
Data

- ▶ We will look for a suitable place for our business based on neighborhoods in City of Chicago.
- ▶ For this we need relevant data to go ahead with our analysis. Such as:
 - ▶ Neighborhoods
 - ▶ Zip Codes
 - ▶ Latitude Longitude
 - ▶ Relevant Venues
 - ▶ Available Sites for Purchase



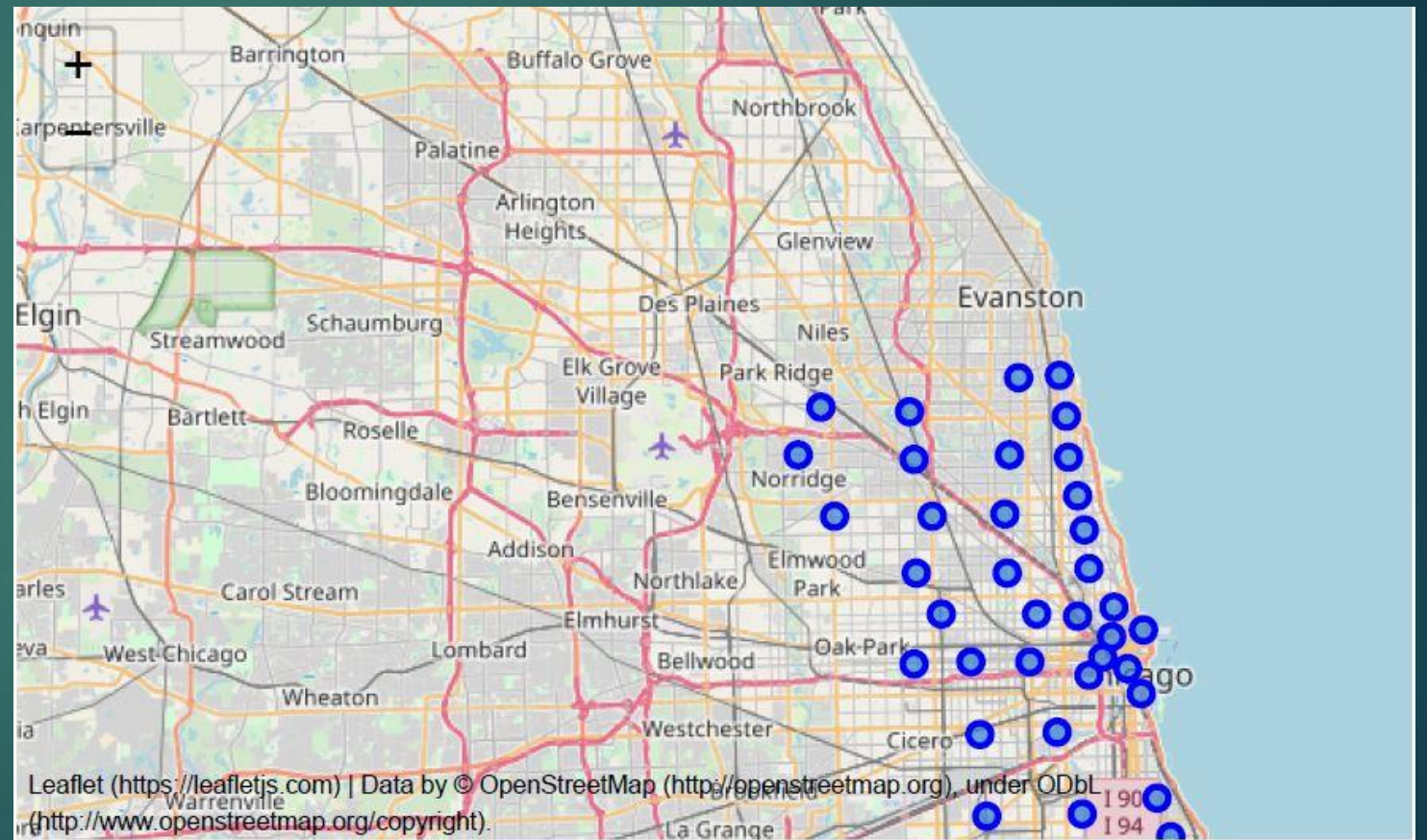
Methodology

- ▶ Zip Codes are mapped into their equivalent latitude and longitude values.
- ▶ Foursquare API is used to explore neighborhoods in Chicago.
- ▶ Explore Movie Theaters categories in each neighborhood.



Methodology

- ▶ Getting Locations of Neighborhoods



Cont..

- ▶ Getting data for movie theater venues
- ▶ Arranging them into respective categories
- ▶ Keeping only targeted venues

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Palmer Square	41.92068	-87.70167	AMC Naperville 16	41.919169	-87.705621	Multiplex
1	Palmer Square	41.92068	-87.70167	Logan Square International Film Series	41.928527	-87.706228	Indie Movie Theater
2	Palmer Square	41.92068	-87.70167	Movies on the lawn	41.918720	-87.698418	Movie Theater
3	Palmer Square	41.92068	-87.70167	Rob's Cinema	41.923706	-87.708672	Indie Movie Theater
4	Palmer Square	41.92068	-87.70167	Red Box	41.924362	-87.710957	Movie Theater

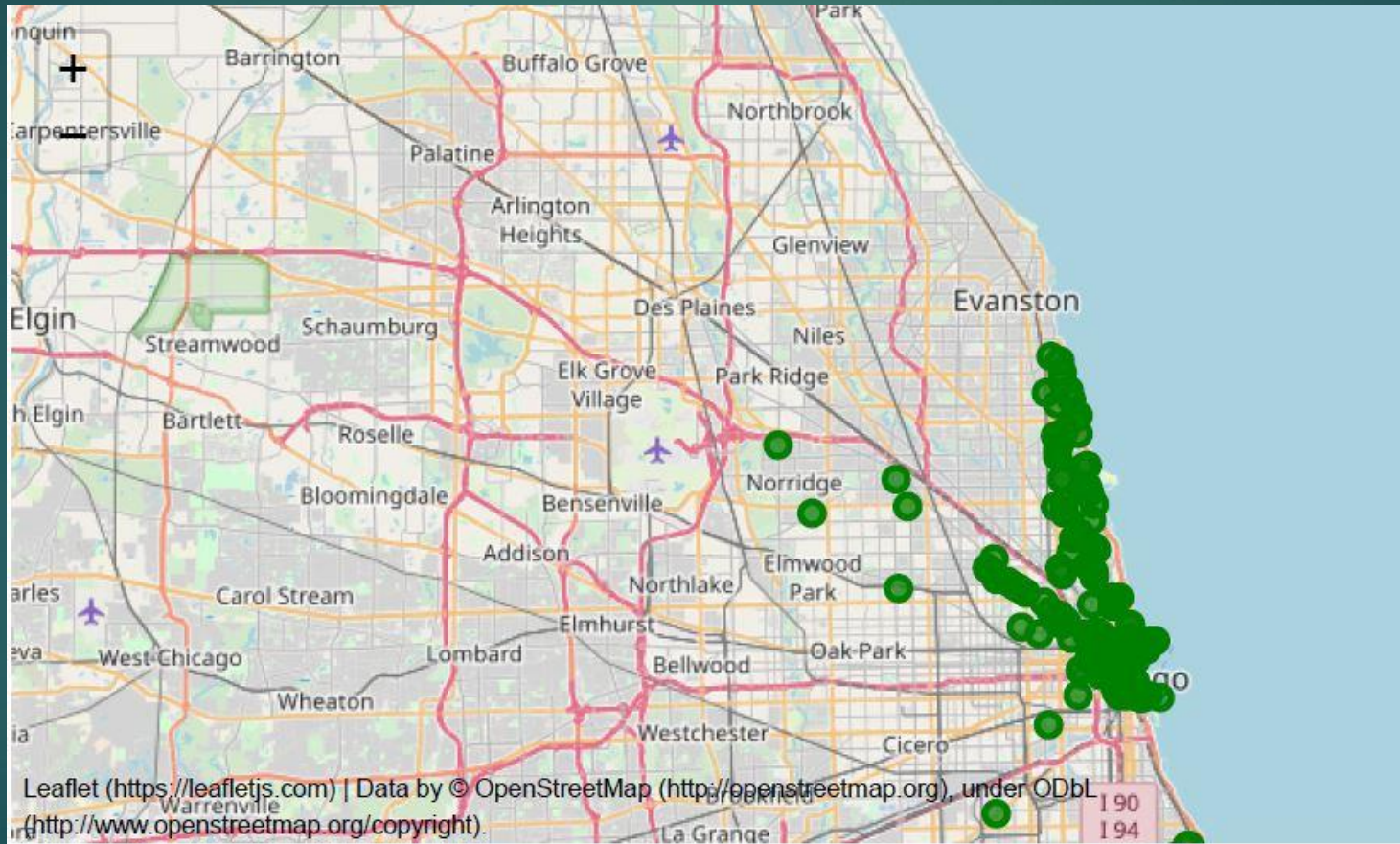
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- ▶ Finding Popular venues
- ▶ Arranging data for clustering
- ▶ Visualization

There are 10 unique categories.

	NeighborhoodLatitude	NeighborhoodLongitude	Venue	VenueLatitude	VenueLongitude
Neighborhood					
Ashburn	1	1	1	1	1
Brighton Park	1	1	1	1	1
Calumet River	2	2	2	2	2
Dunning	1	1	1	1	1
Edgewater Glen	8	8	8	8	8
Englewood	1	1	1	1	1
Goose Island	10	10	10	10	10
Graceland West	9	9	9	9	9
Gresham	1	1	1	1	1

Cont..



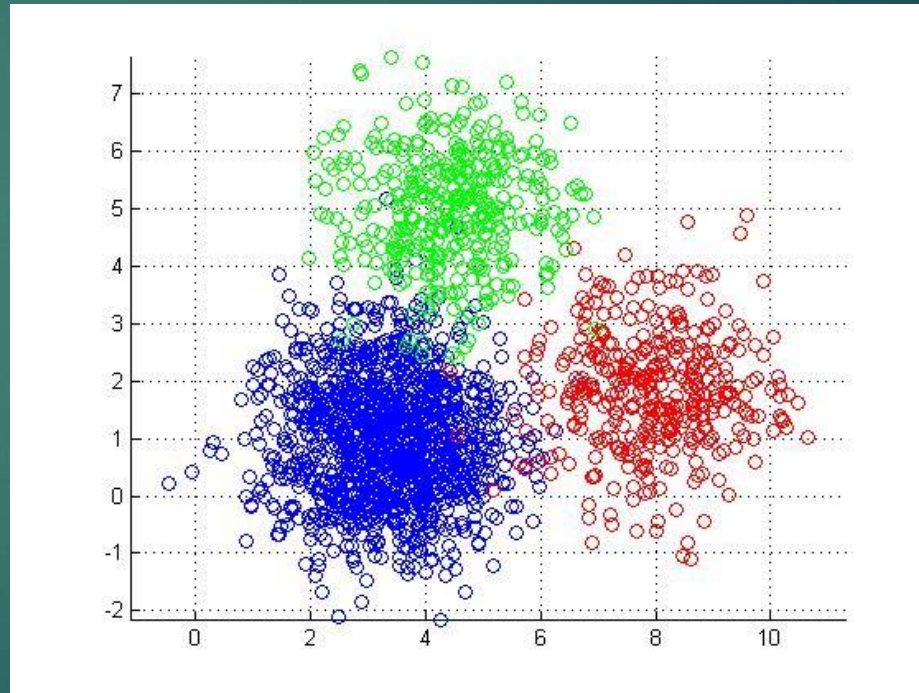
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	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Ashburn	Total	Multiplex	Theater	Movie Theater	Indie Movie Theater
1	Brighton Park	Total	Movie Theater	Theater	Multiplex	Indie Movie Theater
2	Calumet River	Total	Movie Theater	Theater	Multiplex	Indie Movie Theater
3	Dunning	Total	Multiplex	Theater	Movie Theater	Indie Movie Theater
4	Edgewater Glen	Total	Movie Theater	Indie Movie Theater	Theater	Multiplex

VenueCategory	
Movie Theater	114
Indie Movie Theater	52
Multiplex	28
Theater	2
Office	2
Lounge	2
College Arts Building	2
Park	1
Music Venue	1
College Library	1

Clustering

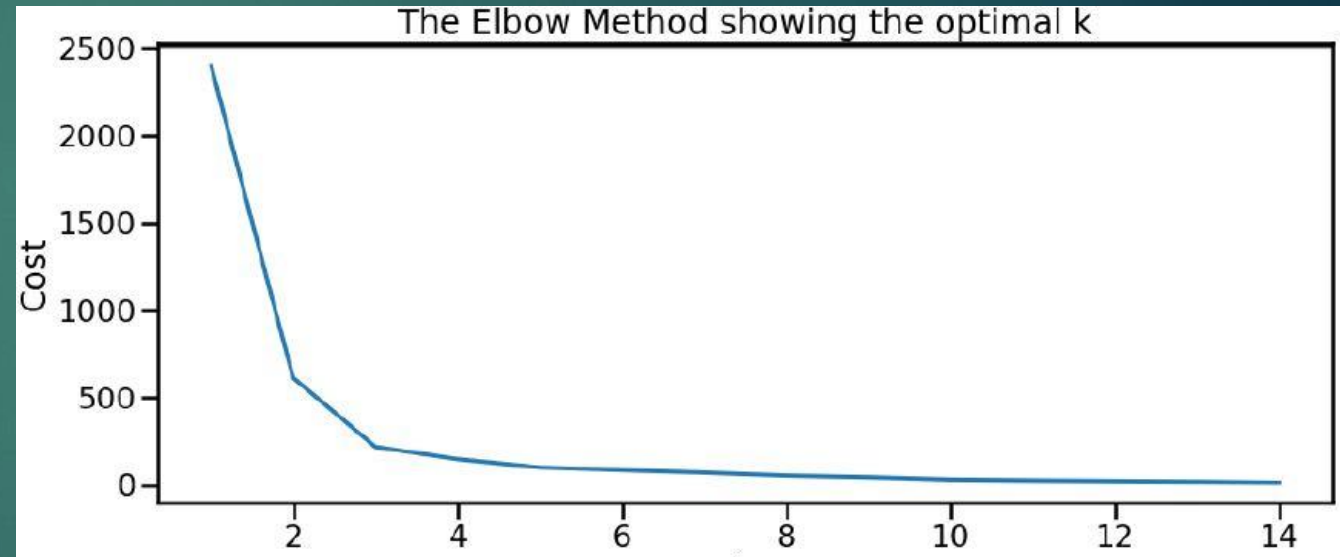
- ▶ Using K-Means to Cluster data
- ▶ Find out which neighborhoods are similar
- ▶ Criteria No. of Movie Theaters in each neighborhood



Choosing optimal K

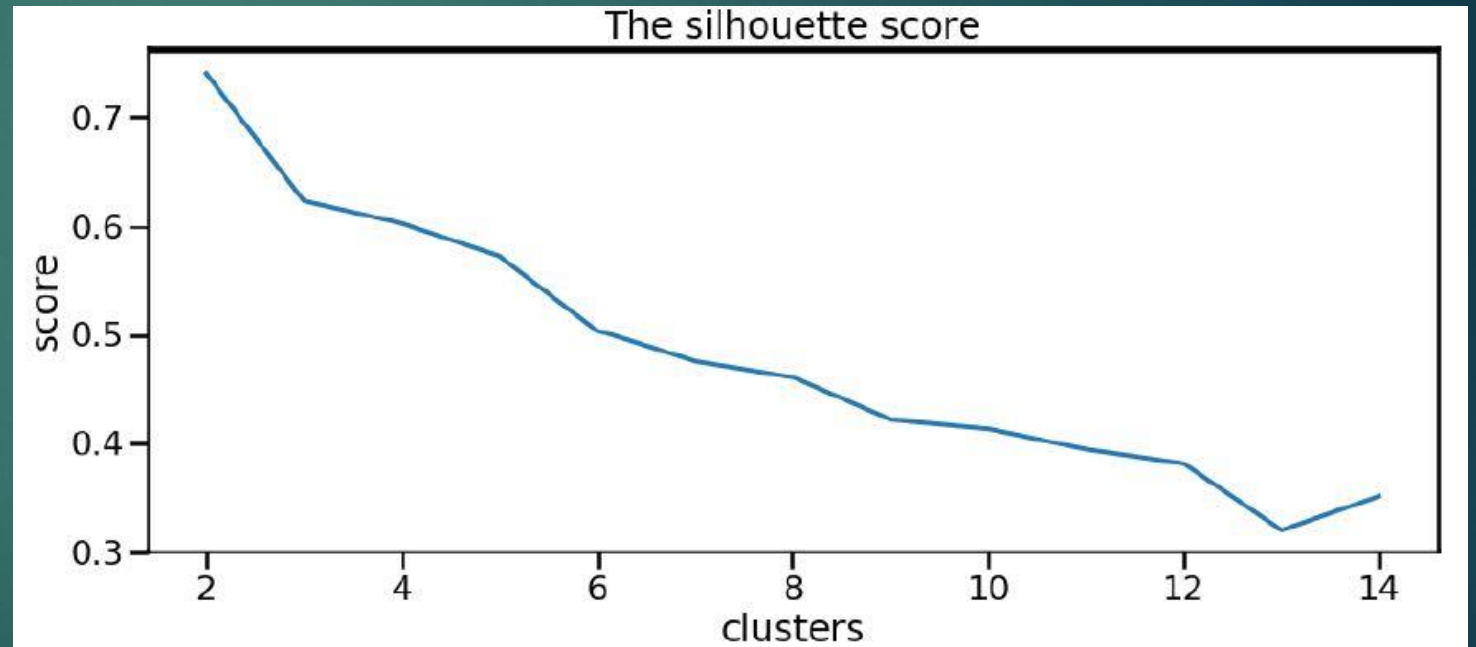
Elbow Analysis

- Optimal value proposed $K=2$

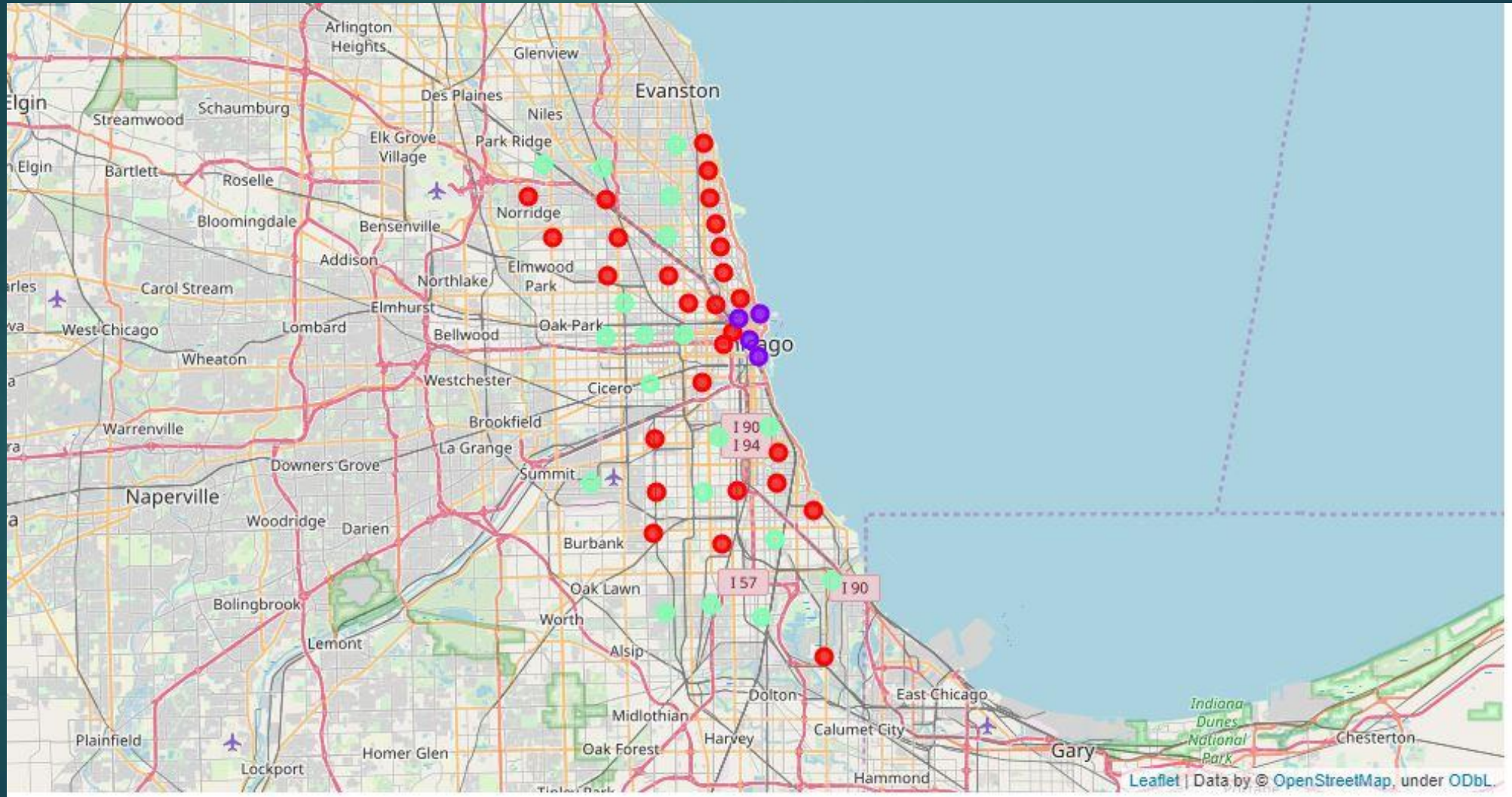


Silhouette Score

- ▶ Value is high at 2
- ▶ Optimal K=2



Visualization



Results

Untapped Markets

```
chicago_df_merge[chicago_df_merge['Total'] == 0].reset_index(drop=True)
```

	ZIP	lat	lng	city	state_id	state_name	population	density	county_name	coord_pairs	Neighborhood	Total	Cluster_Labels
0	60651	41.90206	-87.74095	Chicago	IL	Illinois	64267.0	7099.1	Cook	[41.9021, -87.741]	West Humboldt Park	0.0	2
1	60638	41.78145	-87.77056	Chicago	IL	Illinois	55026.0	1913.0	Cook	[41.7814, -87.7706]	Clearing (W)	0.0	2
2	60645	42.00853	-87.69481	Chicago	IL	Illinois	45274.0	7743.1	Cook	[42.0085, -87.6948]	West Rogers Park	0.0	2
3	60643	41.69957	-87.66277	Chicago	IL	Illinois	49952.0	2625.0	Cook	[41.6996, -87.6628]	East Beverly	0.0	2
4	60631	41.99475	-87.81316	Chicago	IL	Illinois	28641.0	2971.5	Cook	[41.9948, -87.8132]	Norwood Park West	0.0	2
5	60646	41.99304	-87.75962	Chicago	IL	Illinois	27177.0	2295.2	Cook	[41.993, -87.7596]	Edgebrook	0.0	2
6	60628	41.69182	-87.61797	Chicago	IL	Illinois	72202.0	2553.0	Cook	[41.6918, -87.618]	Roseland	0.0	2
7	60625	41.97335	-87.70014	Chicago	IL	Illinois	78651.0	7837.6	Cook	[41.9734, -87.7001]	Ravenswood	0.0	2
8	60636	41.77576	-87.66912	Chicago	IL	Illinois	40916.0	4038.1	Cook	[41.7758, -87.6691]	West Englewood	0.0	2

Neighborhoods with Land to purchase

	Zip Code	lat	lng	city	state_id	state_name	population	density	county_name	coord_pairs	Neighborhood	Total	Cluster_Labels
0	60647	41.92068	-87.70167	Chicago	IL	Illinois	87291.0	8385.0	Cook	[41.9207, -87.7017]	Palmer Square	7.0	0
1	60639	41.92056	-87.75603	Chicago	IL	Illinois	90407.0	7156.5	Cook	[41.9206, -87.756]	Hanson Park	1.0	0
3	60622	41.90274	-87.68331	Chicago	IL	Illinois	52548.0	8213.0	Cook	[41.9027, -87.6833]	Ukrainian Village	5.0	0
4	60651	41.90206	-87.74095	Chicago	IL	Illinois	64267.0	7099.1	Cook	[41.9021, -87.741]	West Humboldt Park	0.0	2
6	60638	41.78145	-87.77056	Chicago	IL	Illinois	55026.0	1913.0	Cook	[41.7814, -87.7706]	Clearing (W)	0.0	2
7	60652	41.74795	-87.71479	Chicago	IL	Illinois	40959.0	3153.6	Cook	[41.748, -87.7148]	Ashburn	1.0	0
8	60626	42.00903	-87.66963	Chicago	IL	Illinois	50139.0	11355.1	Cook	[42.009, -87.6696]	Rogers Park	7.0	0
9	60615	41.80223	-87.60272	Chicago	IL	Illinois	40603.0	7086.4	Cook	[41.8022, -87.6027]	Hyde Park	3.0	0
10	60621	41.77638	-87.63944	Chicago	IL	Illinois	35912.0	3718.9	Cook	[41.7764, -87.6394]	Englewood	1.0	0

- [illegible]

Further Analysis

- ▶ More data required
- ▶ Better Suitable areas e.g. sq/km



Thank You!

