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## What Restaurants to Open Near Public Parks in Chicago

### Coursera Capstone – IBM Data Science Professional Certificate

#### Introduction

I live in the Lincoln Square neighborhood of Chicago and frequently visit a local taqueria for Mexican food. In the summer, the restaurant is especially busy with kids and families who participate in little league baseball at Welles Park, just across the street.



People claim that 9 out of 10 restaurants fail within the first year of opening. One of the major reasons is location, if potential customers cannot easily visit a restaurant they will patron another more convenient option. Nielsen reports there are over 22,000 restaurants in Chicago.<sup>1</sup> Chicagoans have plenty of delicious options to choose from for food.

Using techniques from IBM Data Science Coursework, I want to identify the types of businesses to open near Chicago public baseball fields. This analysis will be valuable to restaurateur owners considering potential locations to open profitable business.

#### Data

1. Average Income by Neighborhood in Chicago
  - o <https://www.chicagocomputerclasses.com/average-city-chicago-income/>
2. Average Rent by Neighborhood in Chicago
  - o <https://www.rentcafe.com/average-rent-market-trends/us/il/chicago/>

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<sup>1</sup> <https://www.nielsen.com/content/dam/corporate/us/en/public%20factsheets/restaurant-growth-index.pdf>

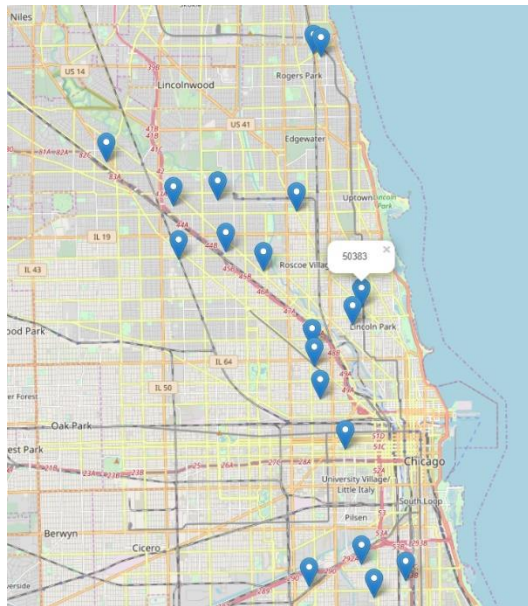
3. Public Baseball Parks in Chicago (Chicago Data Portal)
  - o <https://data.cityofchicago.org/Parks-Recreation/Parks-Chicago-Park-District-Facilities-current-/5yyk-qt9y>
4. Foursquare

## Methodology

I calculated average yearly rent and subtracted this from average income by neighborhood to calculate disposable income. I identified neighborhoods with high disposable income (> \$15,000/year, 70<sup>th</sup> percentile of neighborhoods analyzed) for further analysis, reasoning that these neighborhoods had more money to spend to eat at restaurants.

Community Name	PARK_NO	PARK	the_geom	FACILITY_N	FACILITY_T	Longitude	Latitude	GISOBJID	Neighborhood	Income_per_capita_avg	Avg_rent	disposable_income	Yearly_rent	stuntin
Lincoln Park	1270	JONQUIL	POINT (-87.65407203164379 41.928307025559526)	BASEBALL JR/SOFTBALL	OUTDOOR	-87.654072	41.928307	2821	Lincoln Park	71551	1764	50383	21168	True
Lincoln Park	1017	TREBES	POINT (-87.6580819813362 41.92225736558895)	BASEBALL JR/SOFTBALL	OUTDOOR	-87.658082	41.922258	4185	Lincoln Park	71551	1764	50383	21168	True
Kenwood	1010	KENWOOD COMM.	POINT (-87.59354046393938 41.80444802411607)	BASEBALL JR/SOFTBALL	OUTDOOR	-87.593540	41.804448	2889	Kenwood	35911	1516	17719	18192	True
West Town	412	CHURCHILL FIELD	POINT (-87.67702700711573 41.91432888288015)	BASEBALL JR/SOFTBALL	OUTDOOR	-87.677027	41.914329	1877	West Town	43198	2211	16666	26532	True
West Town	1006	COMMERCIAL CLUB PGD. OF CHICAGO	POINT (-87.67342065043289 41.896679757191094)	BASEBALL JR/SOFTBALL	OUTDOOR	-87.673421	41.896680	1953	West Town	43198	2211	16666	26532	True
West Town	214	WICKER (CHARLES, JOEL)	POINT (-87.67604939154143 41.90778678936269)	BASEBALL JR/SOFTBALL	OUTDOOR	-87.676049	41.907787	4475	West Town	43198	2211	16666	26532	True
Near West Side	211	SKINNER (MARK)	POINT (-87.66161610104675 41.87926812493267)	BASEBALL JR/SOFTBALL	OUTDOOR	-87.661616	41.879268	4060	Near West Side	44689	2296	17137	27552	True
Lincoln Square	110	WELLES (GIDEON)	POINT (-87.68438836527325 41.96161437409272)	BASEBALL JR/SOFTBALL	OUTDOOR	-87.684388	41.961614	4388	Lincoln Square	37524	1193	23208	14316	True

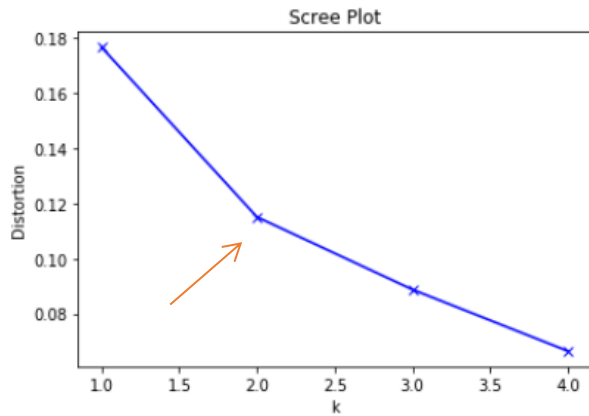
I used the Chicago Data Portal's Park Facilities dataset for coordinates of parks and subset on facilities with baseball fields. I visualized these locations and their average disposable income using the Folium package.



Then, I used Foursquare to identify the most common types of businesses within 500 meters (~.3 miles) of the parks of interest (have baseball fields and were in high disposable income neighborhoods).

	Neighborhood	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
8	COMMERCIAL CLUB PGD. OF CHICAGO	Mexican Restaurant	Bar	Japanese Restaurant	Cosmetics Shop	Dive Bar	Pizza Place	Coffee Shop	Greek Restaurant	Bakery	Café
16	JONQUIL	Hot Dog Joint	Music Venue	Coffee Shop	Sandwich Place	Pizza Place	Theater	Pub	Sushi Restaurant	Bar	Gym / Fitness Center
20	KENWOOD COMM.	Bus Station	Other Great Outdoors	Pizza Place	Gym	Park	Caribbean Restaurant	Dog Run	Fish Market	Fast Food Restaurant	Farmers Market
28	SKINNER (MARK)	Intersection	Bar	Donut Shop	Mobile Phone Shop	Sports Bar	Dance Studio	Yoga Studio	Cosmetics Shop	Sandwich Place	Café
31	TREBES	Yoga Studio	Spa	Japanese Restaurant	Pizza Place	Coffee Shop	Restaurant	Salon / Barbershop	Fish Market	Café	Burger Joint
33	WELLES (GIDEON)	Bar	Pizza Place	Chinese Restaurant	American Restaurant	Breakfast Spot	Bus Station	Mexican Restaurant	Rental Car Location	Pub	Grocery Store
34	WICKER (CHARLES, JOEL)	Pizza Place	Bar	Boutique	Clothing Store	Coffee Shop	Bookstore	Taco Place	Lounge	Ramen Restaurant	Korean Restaurant

Finally, I performed K-Means Clustering on the dataset of common venues near parks of interest. I determined the optimal number of clusters by using a scree plot. The scree plot showed that 2 clusters was the optimal number of clusters because it maximizes efficiency while minimizing error by having low distortion without having unnecessary clusters that impact model interpretability.



## Results

The clustering analysis showed that Kenwood Community Park in the Hyde Park neighborhood of Chicago was different from the others parks of interest when considering the types of venues that surround the parks.

	Cluster Labels	Neighborhood	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
8	0	COMMERCIAL CLUB PGD. OF CHICAGO	Mexican Restaurant	Bar	Japanese Restaurant	Cosmetics Shop	Dive Bar	Pizza Place	Coffee Shop	Greek Restaurant	Bakery	Café
16	0	JONQUIL	Hot Dog Joint	Music Venue	Coffee Shop	Sandwich Place	Pizza Place	Theater	Pub	Sushi Restaurant	Bar	Gym / Fitness Center
20	1	KENWOOD COMM.	Bus Station	Other Great Outdoors	Pizza Place	Gym	Park	Caribbean Restaurant	Dog Run	Fish Market	Fast Food Restaurant	Farmers Market
28	0	SKINNER (MARK)	Intersection	Bar	Donut Shop	Mobile Phone Shop	Sports Bar	Dance Studio	Yoga Studio	Cosmetics Shop	Sandwich Place	Café
31	0	TREBES	Yoga Studio	Spa	Japanese Restaurant	Pizza Place	Coffee Shop	Restaurant	Salon / Barbershop	Fish Market	Café	Burger Joint
33	0	WELLES (GIDEON)	Bar	Pizza Place	Chinese Restaurant	American Restaurant	Breakfast Spot	Bus Station	Mexican Restaurant	Rental Car Location	Pub	Grocery Store
34	0	WICKER (CHARLES, JOEL)	Pizza Place	Bar	Boutique	Clothing Store	Coffee Shop	Bookstore	Taco Place	Lounge	Ramen Restaurant	Korean Restaurant

There is an opportunity to open a Mexican restaurant or sandwich place near the Kenwood Park which would have little competition from other businesses, while also being in a neighborhood where residents have income to spend on dining out.

**Discussion** Below I highlight what Google Maps returns when searching for lower cost restaurants (\$,\$\$) nearby to these parks.

Jonquil Park in Lincoln Park, Chicago



Kenwood Park in Hyde Park, Chicago



Potential customers coming from baseball events near these parks would likely perform searches like these. Near Jonquil Park there is significant competition among restaurants. Near Kenwood Park, there are not many options for customers to eat.

### Conclusion

In this analysis, I highlight locations within Chicago that present an opportunity because of proximity to baseball parks and high disposable income of the neighborhood. Then using Foursquare location data, I defined the businesses present at these locations and recommend the type of business to open. I performed K-means clustering to understand how the parks of interest are similar/dissimilar in the venues that immediately surround the parks. This analysis showed that most of these parks are inundated with restaurants. However, Kenwood Park clustered differently because it does not have the same types of businesses surrounding it compared to other parks. I recommend opening a restaurant near Kenwood park since there is not competition for business and the customers that would patron this restaurant have high disposable income.