

COURSERA CAPSTONE PROJECT

BATTLE OF THE NEIGHBORHOODS - OAK PARK VS. EVANSTON, IL

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1.0 Introduction

In this notebook we will analyze two affluent suburbs of Chicago, IL.

The suburbs are Evanston and Oak Park.

Evanston, which is 12 miles (19 km) north of Chicago, is known for being home to Northwestern University, a well-known college.¹

Oak Park, on the other hand, sits 10 miles (16 km) west of Chicago, and it is known for architect Frank Lloyd Wright and writer Ernest Hemingway.²

Both places are the most common consideration for couples with kids looking to move out of Chicago for more space while retaining easy access to the city.

Evanston and Oak Park have good schools, and similar real estate markets. Access to Chicago is easy by using both train or the subway system, in addition to interstates for car access.

This project aims to help couples make an informed decision based on their personal preferences.

2.0 Data Needs

For this study, we will leverage Python library Geocode, in order to find the latitude & longitude for both Oak Park and Evanston.

Using those coordinates we will print the maps of both locations using Python library Folium. I will then use Foursquare³ in order to fetch data on a variety of options including restaurants, entertainment, and public interest places.

Finally, we will use Python pandas or numpy to compare both Oak Park and Evanston using the results obtained from Foursquare.

3.0 Methodology

3.1 Python Interface

I leveraged a Jupyter notebook in order to produce the results for this project. Jupyter provides several advantages, such as ability to save the work locally, run only portions of the code, and push manually to Github. When compared to other option, this has proven superior thus far.

3.2 Source for Geographical Location

Using Python, we imported the library Geocode, which allows me to create a query to get the latitude and longitude of both Evanston and Oak Park.

3.3 Foursquare

I used the Foursquare API to fetch data on all the venues and point of interest within 1km of the latitude and longitude acquired from Geocode, as described above.

The data obtained from Foursquare was downloaded in json format, which required work to clean-up and convert into a Python data frame so I could run data analysis.

Running the methodology of “one-hot encoding” allowed us to have one dataset with all venues needed for our analysis.

1 https://en.wikipedia.org/wiki/Evanston,_Illinois

2 https://en.wikipedia.org/wiki/Oak_Park,_Illinois

3 <https://foursquare.com>

3.4 Calculations and Data Analysis

With data properly prepared, we were able to check the number of venues per neighborhood. In addition, I calculated the frequencies of the top 10 most common venues for both Oak Park and Evanston. This makes a comparison between both neighborhoods straightforward as we will discuss in the results section below.

3.5 Data Comparison

I used primarily pandas to create different data frames focusing on venues that are exclusive to Oak Park, venues exclusive to Evanston, and venues that are common to both neighborhoods. There was no significant difference in the frequencies of venues that are common to both places. We also noted that some data from Foursquare is duplicate on some categories, for instance classifying “gym” and “gym/fitness center” separate.

4.0 Results

4.1 Maps

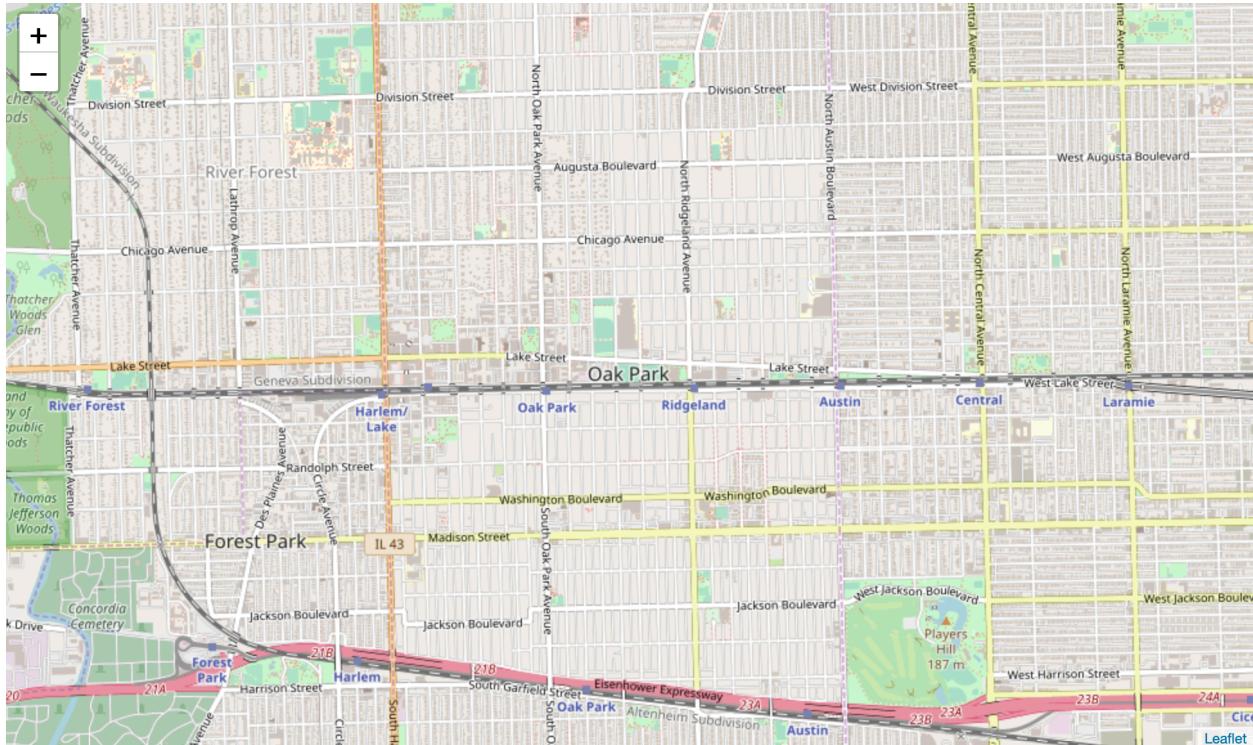


Figure 1 shows the map of Oak Park, IL

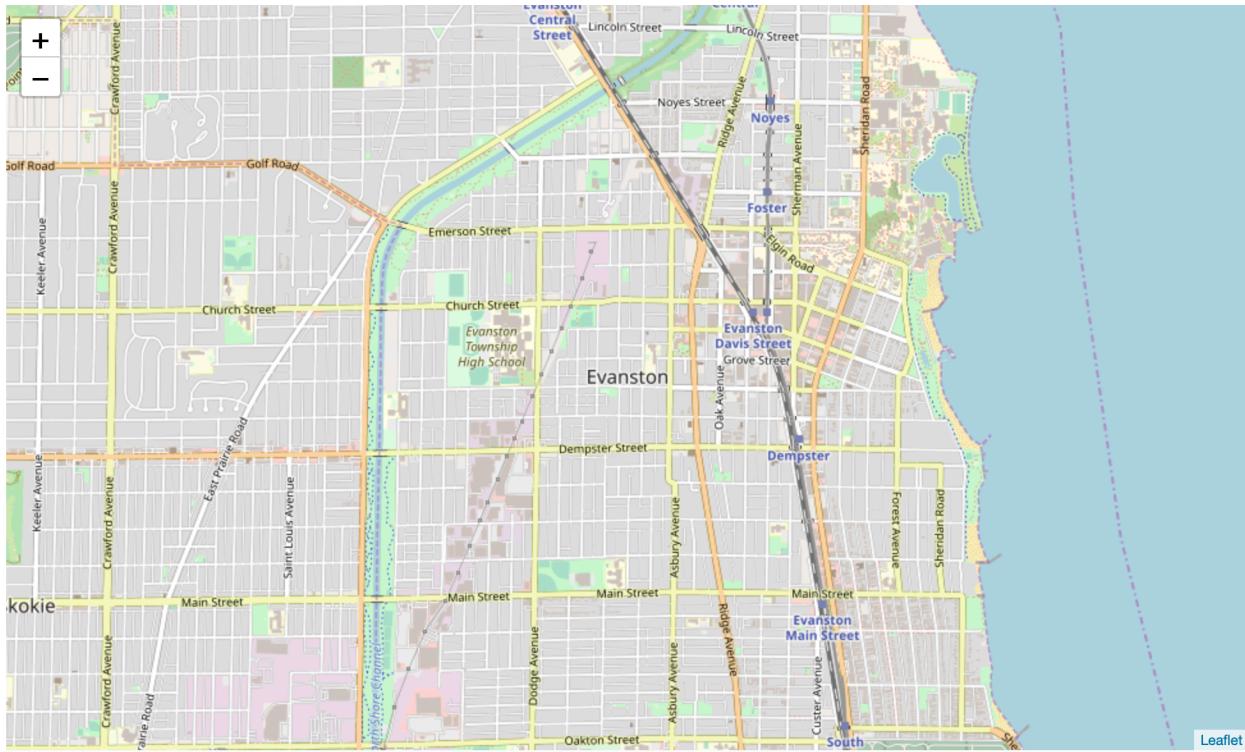


Figure 2 shows the map of Evanston, IL

4.2 Results from Data

From the Foursquare data discussed previously, we concluded Oak Park has 51 venues while Evanston has 87. There is a clear advantage, in number of venues, for Evanston.

4.3 Most Common Venues with Frequencies

----Evanston----

	venue	freq
0	Coffee Shop	0.05
1	Thai Restaurant	0.04
2	Café	0.04
3	American Restaurant	0.03
4	Rental Car Location	0.03
5	Bar	0.03
6	Sandwich Place	0.02
7	Donut Shop	0.02
8	Convenience Store	0.02
9	Playground	0.02

----Oak Park----

	venue	freq
0	Italian Restaurant	0.06
1	Toy / Game Store	0.06
2	Historic Site	0.06
3	Bakery	0.04
4	American Restaurant	0.04
5	Gym	0.04
6	Coffee Shop	0.04
7	Pharmacy	0.02
8	Mediterranean Restaurant	0.02
9	Multiplex	0.02

Figure 3 shows the top 10 most common venues of both Oak Park and Evanston

4.4 Exclusive Venues

ATM
Bank
Food Truck
French Restaurant
Grocery Store
Historic Site
Hobby Shop
Latin American Restaurant
Lounge
Mediterranean Restaurant
Multiplex
Nail Salon
New American Restaurant
Park
Pharmacy
Record Shop
Residential Building (Apartment / Condo)
Southern / Soul Food Restaurant
Tapas Restaurant
Toy / Game Store
Train Station
Vietnamese Restaurant
Yoga Studio

Figure 4 shows exclusive venues to Oak Park

Antique Shop
Arts & Crafts Store
Asian Restaurant
Athletics & Sports
Automotive Shop
BBQ Joint
Bed & Breakfast
Bike Shop
Burger Joint
Clothing Store
Cocktail Bar
Discount Store
Donut Shop
Fast Food Restaurant
Food Stand
Fruit & Vegetable Store
Furniture / Home Store
Garden
Gastropub
Government Building
Gym Pool
Hotel
Jewelry Store
Liquor Store
Metro Station
Mexican Restaurant
Mobile Phone Shop
Movie Theater
Music Store
Noodle House
Paper / Office Supplies Store
Pet Store
Playground
Plaza
Ramen Restaurant
Rental Car Location
Salon / Barbershop
Shopping Mall
Spa
Sporting Goods Shop
Steakhouse
Storage Facility
Sushi Restaurant
Swim School
Taco Place
Tea Room
Tex-Mex Restaurant
Thai Restaurant
Thrift / Vintage Store
Wine Bar

Figure 5 shows the exclusive venues for Evanston

4.5 Common Venues to both Neighborhoods



Figure 6 shows venues that are present to both Oak Park and Evanston

5.0 Discussion

By analyzing the top 10 frequencies for Oak Park and Evanston, we note there is a good variety among those neighborhoods, with little overlap. We also noticed some categories are duplicates, due to Foursquare classification.

Some highlights for Oak Park are a train station. A quick search on the web shows Metra line that runs non-stop from Oak Park to Chicago, which is an advantage. Evanston does have train service but not non-stop.

Evanston, on the other hand, benefits from the sheer number of venues. Evanston is home to a large university, so the number of venues might be correlated due to student life, etc. One highlight is a shopping mall, which displays a measure of convenience not verified in Oak Park.

6.0 Conclusion

Looking at the overall data, we can see both neighborhoods differ significantly in terms of venues and options offered.

Oak Park has a small number of venues but certainly strong variety. It benefits from transportation to/from Chicago.

Evanston has an edge in overall sheer number and this adds to convenience, including the shopping mall.

We can finally conclude that a family with kids looking to move out of Chicago would be served well in both neighborhoods, with the differentiation in terms of transport vs. overall neighborhoods convenience and number of venues.