A Tale of Two Neighborhoods: Toronto & Philadelphia

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This is a quick overview of topic Covered:

- The assignment
- What I chose to focus on, and why
- What I learned and how I learned it
- Conclusions

The **assignment:**

- Now that you have been equipped with the skills and the tools to use location data to explore a geographical location, over the course of two weeks, you will have the opportunity to be as creative as you want and come up with an idea to leverage the Foursquare location data to explore or compare neighborhoods or cities of your choice or to come up with a problem that you can use the Foursquare location data to solve

What I chose to focus on, and why

- I live in Chestnut Hill, in the northwest corner of the city of Philadelphia, in Pennsylvania. It is a lovely place to live and work - leafy green, walkable, and historic. I wondered whether Toronto, Ontario, CA might offers someplace similar - should I ever want to move my business (and myself) there.

What I learned and how I learned it

- Since this was a data science class, the first order of business, of course, was to use data science tools. Thus, my methodology focused most heavily on the use of such tools. Here is a summary of the steps, and what resulted from each.

Conduct a review of the relevant literature, using resources available online. Topics include:

- Toronto's and Philadelphia's history and current state (geographic, demographic, economic, etc
- Business trends

- **Results**
  Both cities are located at the nexus of several major waterways, and have grown partially by virtue of trade. Both were originally inhabited by Indigenous peoples, and both cities were formed along what used to be Native American trails.
- Their metro areas are almost the same size: Toronto's, as of 2016, was 6,417,516; Philadelphia's was, in 2017, 6,096,120. (Sources: US Census Bureau, Canadian Statistics Bureau).
- Toronto and Philadelphia both have made names for themselves as leaders in technology innovation, although Toronto has done more in recent times and is beginning to be a technology/business hub of sufficient force to, someday soon, eclipse Silicon Valley.

- **Review Data specifications and availability**
  - Locate Web sites offering Zip and or Postal Code information that can be readily scraped.

  - We will use python's beautifulsoup library to extract postal code lists.
  - Then, we will get the geographical coordinates (latitude and longitude) so we can use them to query the Foursquare API database.[1] A geocoder will allow us to do so.
  - We will then be able to load this information into a pandas dataframe, then using folium, we will visualize each city's neighbourhoods on the map.[2]
  - Load Foursquare data for all Zip Codes in Philadelphia and all Postal Codes in Toronto.
  - Using the Foursquare API, we will subsequently get the top 100 venues that are within a radius of 500 meters from the center point of each Zip or Postal Code. We do this by making API calls to Foursquare, passing the geographical coordinates until we are done via a Python loop. Foursquare then returns venue data to us in a JSON format, and we extract the venue name, category, latitude, and longitude. With these data, we will be able to check to see how many venues were returned for each neighbourhood and to tally up the number of (somewhat)[3] unique categories can be curated from all the returned venues

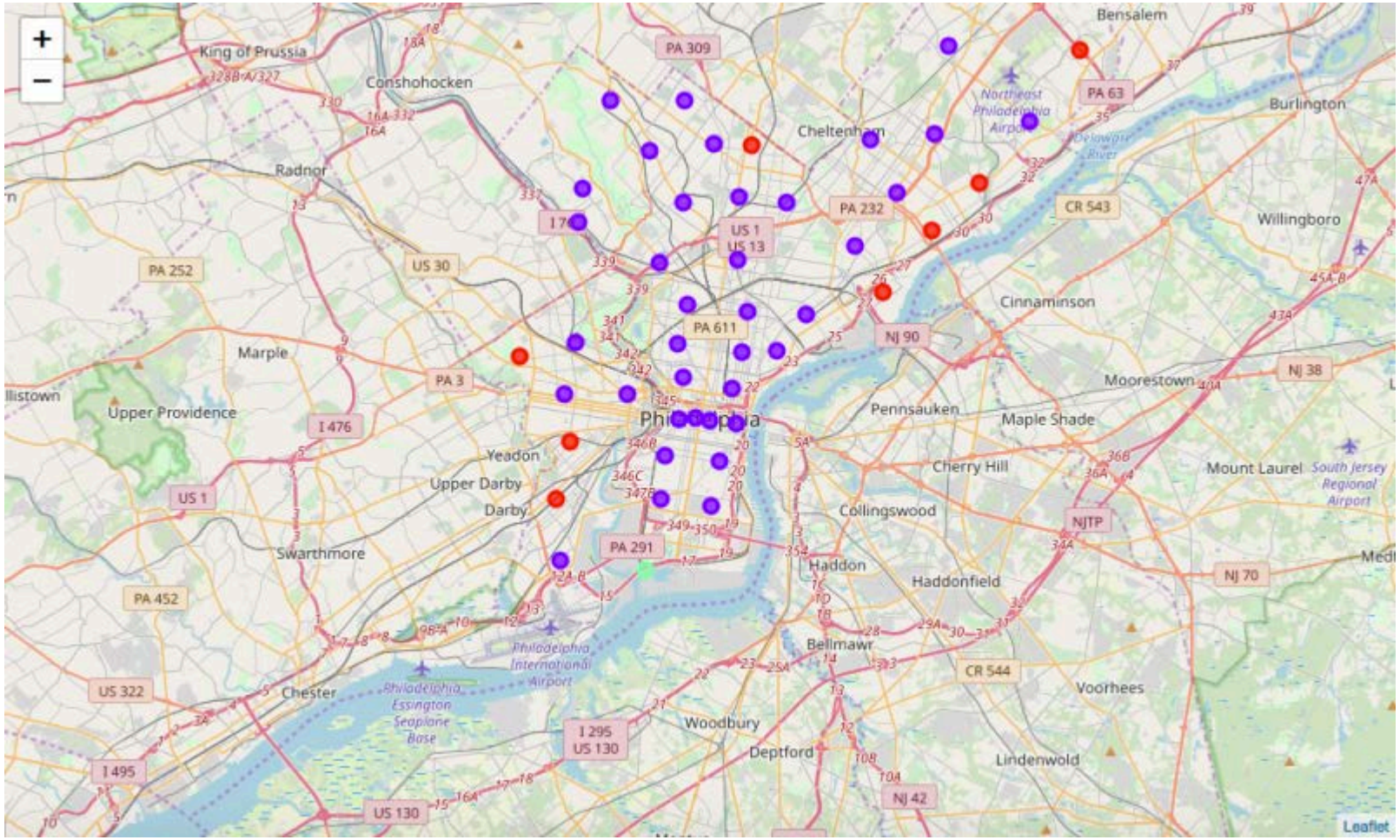
Results

As this table shows, after removing duplicates and P.O. boxes, we find that there are 47 Zip codes in Philadelphia, PA.

0	Zip Code	Latitude	Longitude
1	19102	39.952962	-75.16558
2	19103	39.952162	-75.17406
3	19104	39.961612	-75.19957
4	19106	39.951062	-75.14589
5	19107	39.952112	-75.15853
6	19111	40.057661	-75.08018
7	19112	39.895677	-75.19044
8	19114	40.064257	-75.00155
9	19115	40.09261	-75.04118
10	19116	40.117413	-75.0154
11	19118	40.07236	-75.20772
12	19119	40.053511	-75.18858
13	19120	40.033944	-75.12118
14	19121	39.981062	-75.1745
15	19122	39.977662	-75.14336
16	19123	39.964012	-75.14764
17	19124	40.017362	-75.08769
18	19125	39.978162	-75.12565
19	19126	40.055411	-75.13793
20	19127	40.026626	-75.22311
21	19128	40.038944	-75.22104
22	19129	40.011562	-75.1839
23	19130	39.968262	-75.17222
24	19131	39.981112	-75.22486
25	19132	39.995412	-75.16977
26	19133	39.992862	-75.14054
27	19134	39.991712	-75.11116
28	19135	40.023611	-75.04966
29	19136	40.041111	-75.02644
30	19137	40.000262	-75.07404
31	19138	40.055861	-75.15654
32	19139	39.961812	-75.23003
33	19140	40.012212	-75.14503
34	19141	40.035778	-75.1447
35	19142	39.922612	-75.23453
36	19143	39.944162	-75.22718
37	19144	40.034111	-75.17203
38	19145	39.922262	-75.18259
39	19146	39.938512	-75.18067
40	19147	39.936562	-75.15409
41	19148	39.919812	-75.15803
42	19149	40.037711	-75.06658
43	19150	40.07226	-75.17106
44	19151	39.975929	-75.25256
45	19152	40.059611	-75.04837
46	19153	39.898985	-75.23221
47	19154	40.09146	-74.977

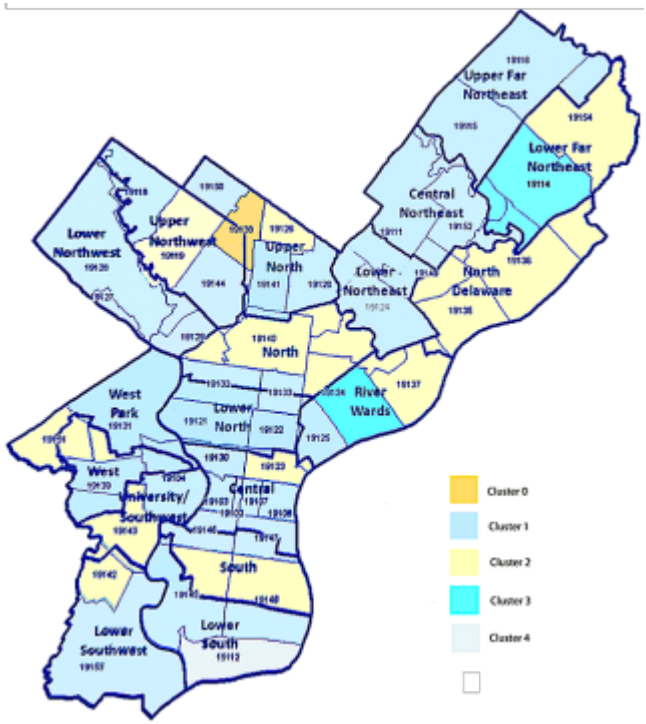
Results

This map depicts the five clusters identified by the analysis, on a map generated using Nominatim, and openstreetmap.org library



When we look more closely at Chestnut Hill (Zip code 19118), this is the mix of venues we find

Venue Number	Venue Name	Venue Category
0	Pastorius Park	Park
1	Weavers Way Co-Op Chestnut Hill	Organic Grocery Store
2	Iron Hill Brewery & Restaurant	Brewery
3	The Fresh Market	Organic Grocery Store
4	El Poquito	Mexican Restaurant
5	Campbell's Place	American Restaurant
6	Bredenbeck's Bakery	Bakery
7	Cake	Bakery
8	Bredenbeck's Ice Cream	Ice Cream Shop
9	Chestnut Hill Grill	American Restaurant
10	Paris Bistro & Jazz Cafe	French Restaurant
11	Chestnut Hill Brewing Company	Brewery
12	Starbucks	Coffee Shop
13	The Chestnut Hill Farmers Market	Farmers Market
14	Flying Fish	Seafood Restaurant
15	Chestnut Hill Cheese Shop	Cheese Shop
16	Ten Thousand Villages - Chestnut Hill	Arts & Crafts Store
17	Osaka	Sushi Restaurant
18	A Taste of Philly	Snack Place
19	Hideaway Music	Used Record Shop
20	Clover Market	Market
21	Chill On The Hill	Ice Cream Shop
22	Fiesta Pizza III	Pizza Place
23	Robertson's Flowers & Events	Flower Shop
24	TD Bank	Bank
25	Mica	American - Fusion Restaurant
26	Jos. A. Bank Clothiers Inc.	Business Clothing Store
27	King's Garden	Chinese Restaurant
28	Greene Street Consignment	Clothing Store
29	Wells Fargo	Bank
30	3000BC WellMed Spa	Spa
31	Roller's Express-O	Café
32	The Bone Appetite	Pet Store
33	Weavers Way Next Door	Organic Health and Beauty
34	Artisans on the Avenue	Boutique
35	McLaughlin	Clothing Store
36	Stagecrafters	Theater Company
37	The Knit Wit	Knitting Store
38	Drake's Gourmet Foods & Catering	Deli / Bodega
39	SEPTA Chestnut Hill West Station	Local Train Station
40	Poppy's Cafe	Coffee Shop
41	The Paperia	Paper / Office Supplies Store
43	Oxford Circus Toys	Toy / Game Store
44	Sue's Custom Dressmaking & Tailor	Tailor Shop
45	Calypso	Caribbean Restaurant



Which should not in any way imply that the clustering process I used should be determinative. See what these clusters look like on a map, below.

• Discussion

The primary purpose of this exercise was to determine whether we were able to use what we learned during the course of this Specialization, independently and without any Lab to provide explicit instructions. In that, this project was successful. I was able to run code that produced a coherent result. I also got to learn more about my own Philadelphia neighbourhood, since that was the topic upon which I chose to focus.

• Conclusions

Relocation analysis is serious business, and this data collection/analysis process is a good beginning. Going forward, I plan to use it as a jumping off point for looking at neighborhoods, using units of measurement (e.g., the Census block group that are more stable and are linked with larger data sets like the Economic Census, as well as differences in governance, etc. - which are a function of differences between Canada and the US. One thing I know and like very much is Canada's approach to immigration (in other words, it is good for society, the economy, the wellbeing of all and should be encouraged).

Still, I did find a partial answer to my question of where I would want to live/work if I moved to Toronto. "Old Toronto" looks very attractive to me for so many reasons - not the least of which is the presence of the University nearby. Thriving educational institutions are essential to a good economy - especially if the type of work one does is cognitive in nature, as is the case for me. This is a pretty large area and includes a broad variety of neighborhoods.

One of the analyses I conducted was to look at the mix of venues in my own neighborhood, then sort the Toronto data to see which among the neighborhoods covered in our class's work was most similar to my own. One thing I noticed: Chestnut Hill likes food, and parks! There are several ice cream parlors and bakeries a farmer's market, and two of the three grocery stores are organic. There are numerous parks, one of which is among the largest in the US, and there are two light commuter rail lines. Among the Toronto Postal Codes covered by our analysis of Foursquare venues, the Toronto neighborhoods called Rosedale, Moore Park," seem to have the qualities I would seek. Yes, more research is required, but Data Science has given me more and better tools. This is just the beginning.

SOURCES: THE SHORT LIST

- US Census
- Canadian Census
- Foursquare Data
- Philadelphia vs. Toronto Web site
- Technical.ly Philly
- History of Toronto
- History of Philadelphia
- The Encyclopaedia of Philadelphia
- Toronto Neighbourhoods and Communities
- The Paris Review: America's First Female Map Maker
- Don Valley Historical Mapping Project
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- [1] At this point, we will have set up Foursquare API accounts and gotten Foursquare credentials.
- [2] We will also conduct a 'sanity check' to make sure that the geographical coordinates data returned by Geocoder are correctly plotted in the cities of Philadelphia PA and Toronto, ON.
- [3] These data are crowd sourced, and the categories are– it seems – far from orthogonal. For example, one category is "food," which could mean any establishment that sells food. How one distinguishes "food" from "grocery store" is a mystery. See: Using Foursquare place data for estimating building block use,
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Thanks