Parking Lots Location Selection in the City of Philadelphia

IBM Applied Data Science Capstone Project Final Report

Background

- Business problem: be the proper strategy to locate the parking lots

- Selection criteria:
  - People will temporary stay
  - In neighborhoods with high densities of crowds, such as shopping centers, restaurants, bus/train stations, and airports

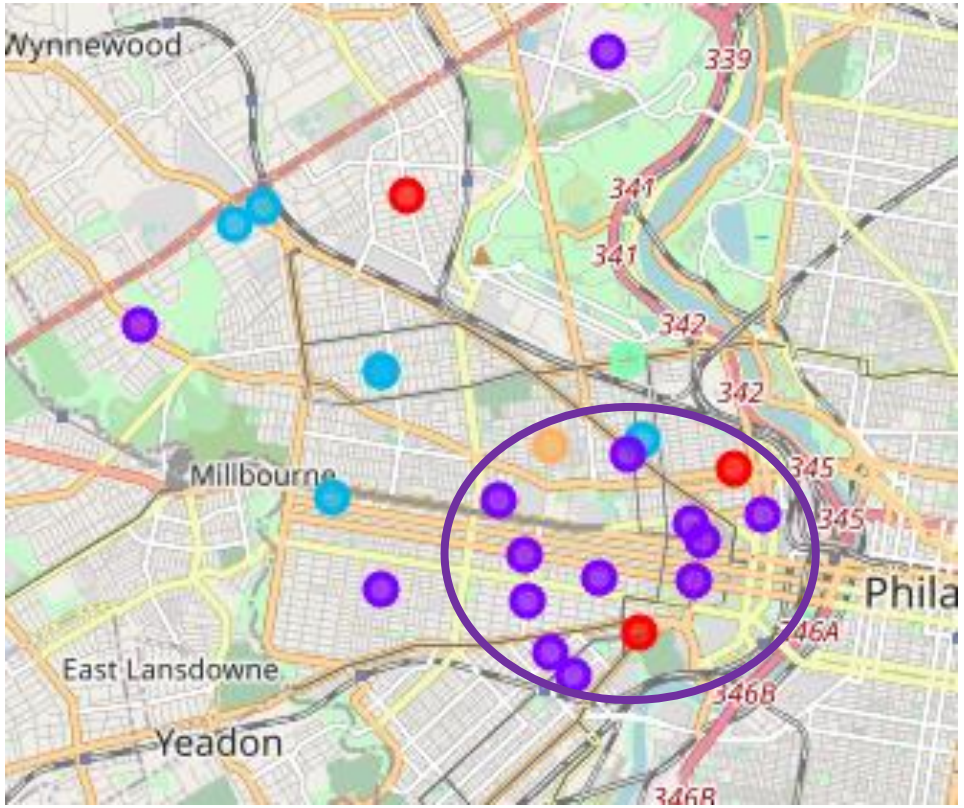
- Stakeholders: individuals or companies who is seeking to construct or investigate a parking lot in cities like Philadelphia

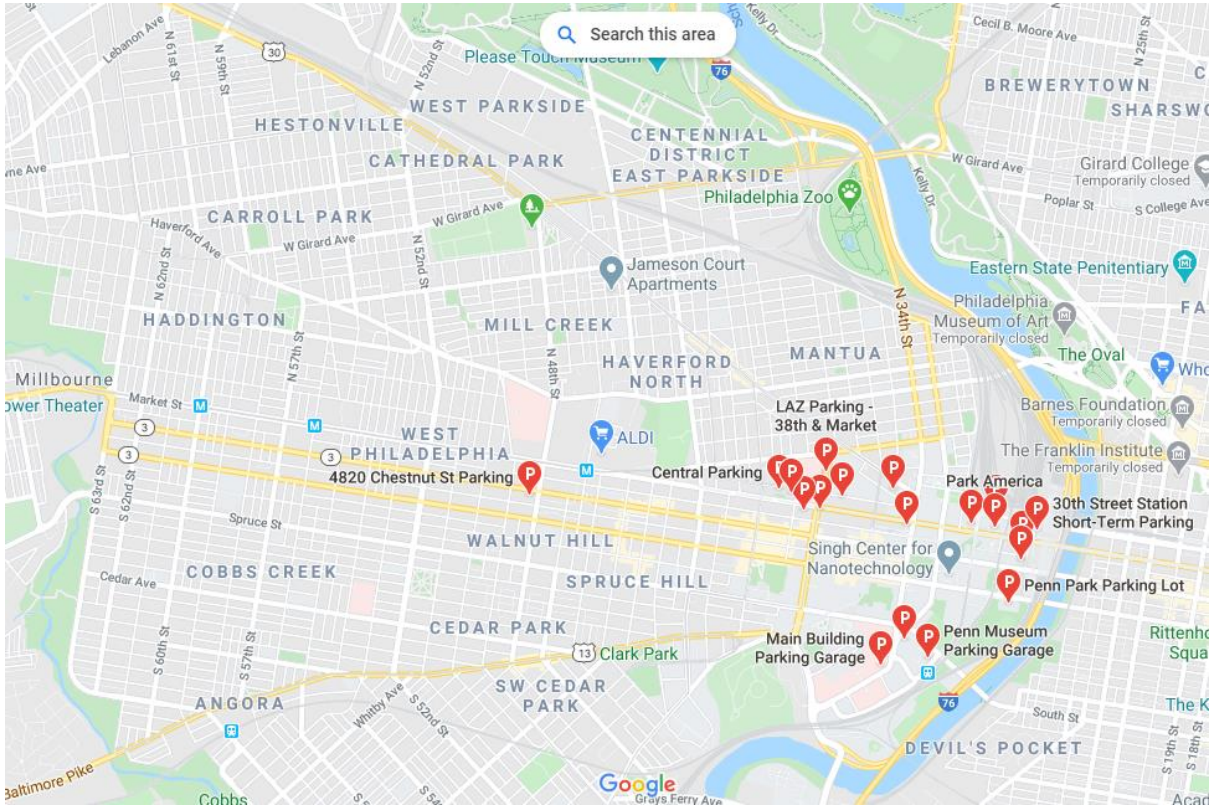
Experimental methods and data selection

Index	Neighborhoods	Latitude	Longitude
1	Belmont District	39.96667	-75.205
2	Black Bottom	39.9574	-75.1978
3	Carroll Park	39.973	-75.236
4	Cathedral Park	39.973	-75.236
5	Cedar Park	39.947	-75.216
6	Cobbs Creek	39.95291	-75.2359
7	Dunlap	39.961	-75.222
8	Garden Court	39.95194	-75.2186
9	Haddington	39.96139	-75.2419
10	Haverford North	39.9653	-75.2066
11	Mantua	39.964	-75.194
12	Mill Creek	39.966	-75.216
13	Overbrook	39.988	-75.25
14	Overbrook Park	39.977	-75.265
15	Overbrook Farms	39.98639	-75.2536
16	Parkside	39.97389	-75.2067
17	Powelton Village	39.95972	-75.1903
18	Saunders Park	39.959	-75.199
19	Spruce Hill	39.954	-75.21
20	Squirrel Hill	39.945	-75.213
21	University City	39.95361	-75.1986
22	Walnut Hill	39.956	-75.219
23	Woodland Terrace	39.94889	-75.2053
24	Wynnefield	39.989	-75.233
25	Wynnefield Heights	40.002	-75.209

- Data focuses on West Philadelphia, neighborhood information available from https://www.philageohistory.org/rdic-images/common/help/PhilaRegions.cfm
- From Foursquare, call the top 10 rated venues within a radius of 500 meter of each location.
- Use “k means” method to cluster the neighborhoods based on their top 10 venues.
- Data visualization achieved using folio package to show the clustered locations on a map of Philadelphia.

Results and discussion





- Purple and red pins contains a combination of restaurants, shopping centers, and stations.
- Blue pins mainly includes restaurants.
- The parking lot should locate close to purple and red neighborhoods, which is in agreement with practical situation as shown in Google map.

Conclusion

- Through clustering the neighborhoods in West Philadelphia by “k means” method, we have found a region where a parking lot should be located to maximize the needs and space utility.

- The cluster 1 neighborhoods are more suitable to hold a parking lot, which is consistent to the actual parking lot distribution based on Google map.