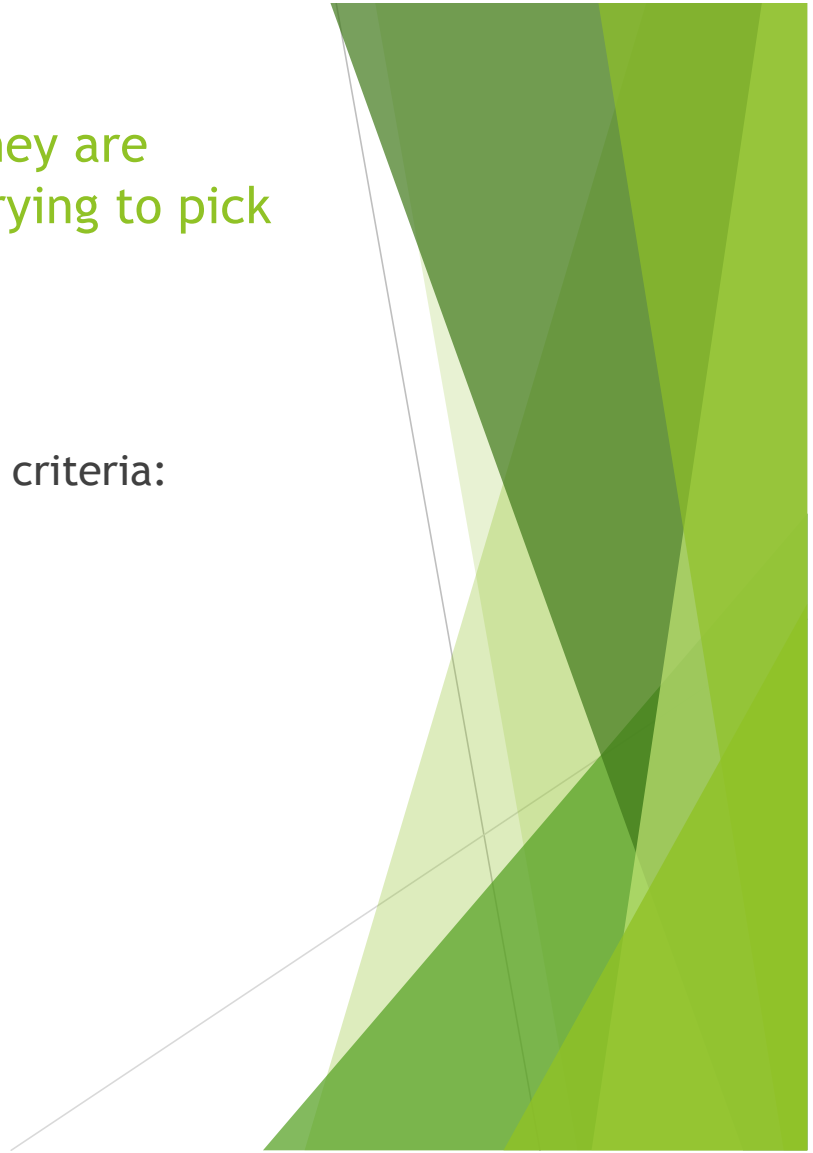# Location Selection for ODF Pet Store in Toronto

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Jan 10, 2021

ODF is a pet store in Greater Vancouver area, they are planning to open another store in Toronto and trying to pick a location.

They require to pick a location meeting the following two criteria:

▶ Locate their store near dog parks.

▶ Stay away from other pet stores.

Data

▶ Information of neighbourhoods in Toronto will be sourced from Wikipedia webpage: https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

▶ The geographic coordinates of Toronto neighbourhoods are gained from this webpage: http://cocl.us/Geospatial_data

▶ Foursquare location data will also be used to get venues in each Toronto neighbourhoods.

Methodology

- ▶ Scrape table from Wikipedia to get the name of each neighbourhoods, its postal code, and its borough.

- ▶ Gain the geographic coordinates of Toronto neighbourhoods from the other webpage

- ▶ Merge the two sets of data together

	Postal Code	Borough	Neighbourhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494

Methodology

▶ Foursquare URL is defined and the information of venues that are nearby (within 3km and limited to 10000 number of venues) each neighbourhood are queried from Foursquare.

	Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Parkwoods	43.753259	-79.329656	Allwyn's Bakery	43.759840	-79.324719	Caribbean Restaurant
1	Parkwoods	43.753259	-79.329656	Tim Hortons	43.760668	-79.326368	Café
2	Parkwoods	43.753259	-79.329656	Galleria Supermarket	43.753520	-79.349518	Supermarket
3	Parkwoods	43.753259	-79.329656	Graydon Hall Manor	43.763923	-79.342961	Event Space
4	Parkwoods	43.753259	-79.329656	LCBO	43.757774	-79.314257	Liquor Store

Methodology

▶ The neighbourhoods that contains a Dog Run are selected to build a new data frame.

▶ Likely, the neighbourhoods that contains a pet store are extracted as well.

▶ The data of neighbourhoods with a pet store are removed from the dog parks dataframe.

▶ The remaining locations are dog parks that do not have a pet store nearby.

	Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
299	Regent Park, Harbourfront	43.654260	-79.360636	Cherry Beach Off-Leash Dog Area	43.636727	-79.344335	Dog Run
1679	Eringate, Bloordale Gardens, Old Burnhamthorpe...	43.643515	-79.577201	Doggie Central	43.623252	-79.575922	Dog Run
1870	The Beaches	43.676357	-79.293031	Kew Beach Off Leash Dog Park	43.665815	-79.296988	Dog Run
2534	Cedarbrae	43.773136	-79.239476	Thomson Memorial Dog Park	43.756253	-79.253294	Dog Run
2757	Bathurst Manor, Wilson Heights, Downsview North	43.754328	-79.442259	Avondale Park	43.757053	-79.408127	Dog Run

Methodology

- ▶ Finally, these locations will be clustered into five groups by k-means clustering.

- ▶ The centroid of each cluster is the point that has the shortest distance to nearby dog parks.

- ▶ The locations and their centers will be visualized by folium map, and geographic coordinate of each centroids will be listed out.

- ▶ ODF staff can start their search for store locations from these cluster centers.

Results

▶ After filtering out neighbourhoods that do not meet the requirement, 26 dog parks are listed out.

▶ After dividing them into clusters, the following centroids are found.

	lat	lng
0	43.737218	-79.399558
1	43.643360	-79.437120
2	43.623252	-79.575922
3	43.756253	-79.253294
4	43.653322	-79.333105

Discussion

▶ Since there are 26 dog parks that do not have a pet store nearby, people live nearby would have to go far away to buy pet supplies, which means, for ODF, it is a good choice to open a pet store nearby.

▶ Meanwhile, two out of the five centroids are overlapped with a dog park. It means while these two locations are dog parks, they are also the nearest location to other dog parks nearby. ODF can mark these two points a priority when starting their search.

Conclusion

26 dog parks

5 centre points

(ODF can start their search from these five points)

These locations are only a recommendation produced by analyzing data. The specific location should be considered thoroughly depending on the actual situations in real world.