

New baseball stadium in Montreal

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Introduction

- 16 years ago, Montreal lost its baseball team, the Montreal Expos.
- Fans lost interest in their team.
- The team was moved to Washington D.C.
- **WHY?**
 - > The poor location of the Olympic Stadium.
Far from population centres, restaurants, and bars.



Problem & Interest

- For 5 years, private investors have been looking to bring baseball back in town and to acquire a Major League Baseball (MLB) team.
- **CONDITION**
 - > A new stadium in a good location
- **GOAL**
 - > Convince both Montreal City Council and MLB that return of baseball in Montreal is possible by presenting an optimal location for a new stadium

Data acquisition

- Montreal was divided into neighborhoods with the help of its postal codes (ex: H1A, H2J, etc.)
- For each neighborhood, we obtained its population with Statistics Canada 2016 Census
- For each neighborhood, we got nearby bars, restaurants and shops with Foursquare API

Data frame after cleaning

	PostalCode	Neighborhood	Latitude	Longitude	Population
0	H1A	Pointe-aux-Trembles	45.67474	-73.50009	32516
1	H2A	Saint-Michel,East	45.56153	-73.59985	19651
2	H3A	Downtown Montreal North	45.50533	-73.57488	3580
3	H4A	Notre-Dame-de-Grâce Northeast	45.47241	-73.61586	26453
4	H5A	Place Bonaventure	45.49878	-73.56580	0

Reduction of dataset

- Top 60 neighborhoods with biggest populations

+

- 5 neighborhoods in downtown Montreal (for workers, tourists...)

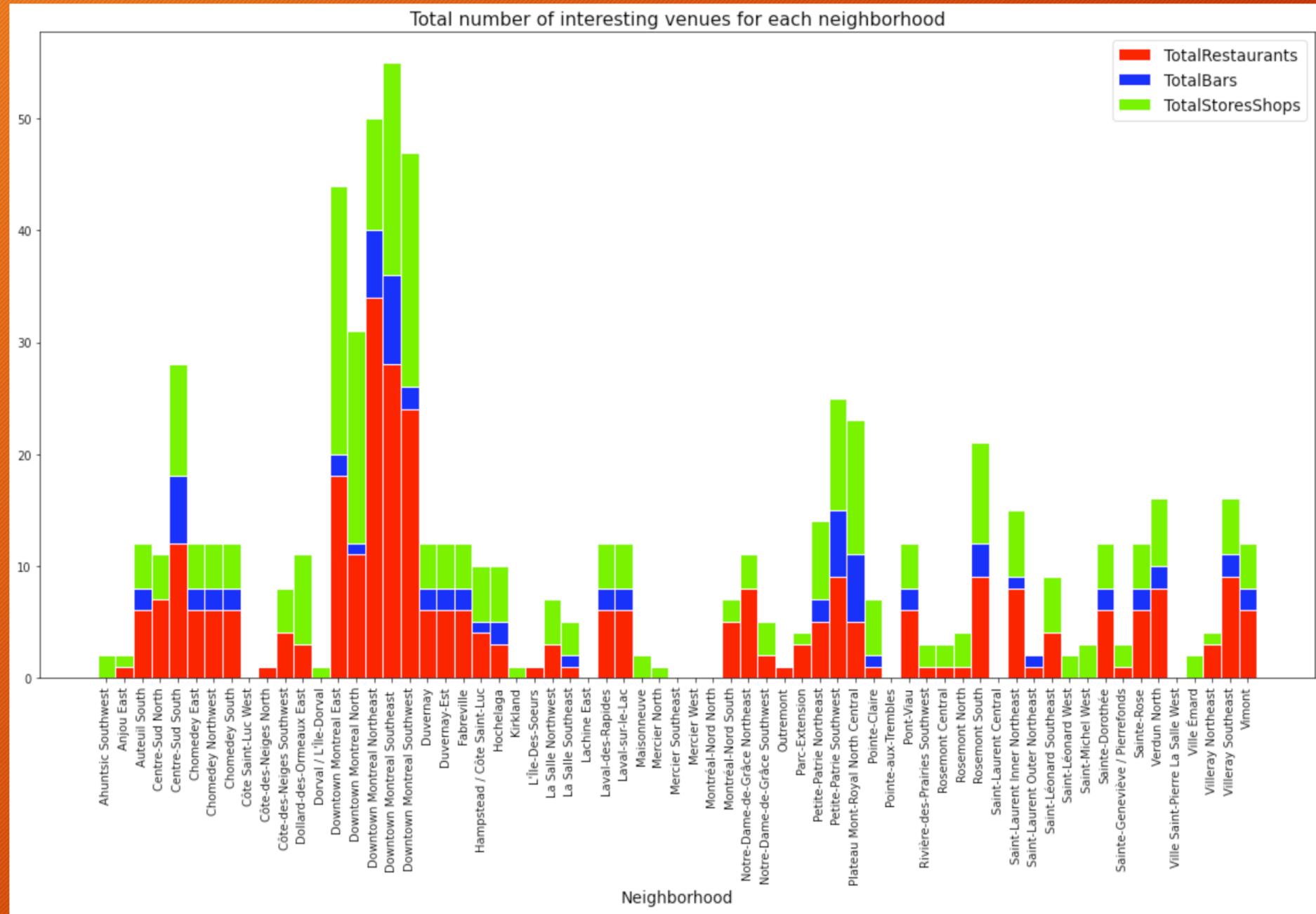
Montreal with the remaining neighborhoods



Collecting venues from Foursquare

- For each neighborhood, explore venues within a radius of 500 meters.
- 42 categories were grouped together as “Restaurant”, 12 categories were grouped together as “Bar” and 52 categories were grouped together as “Shop/Store”

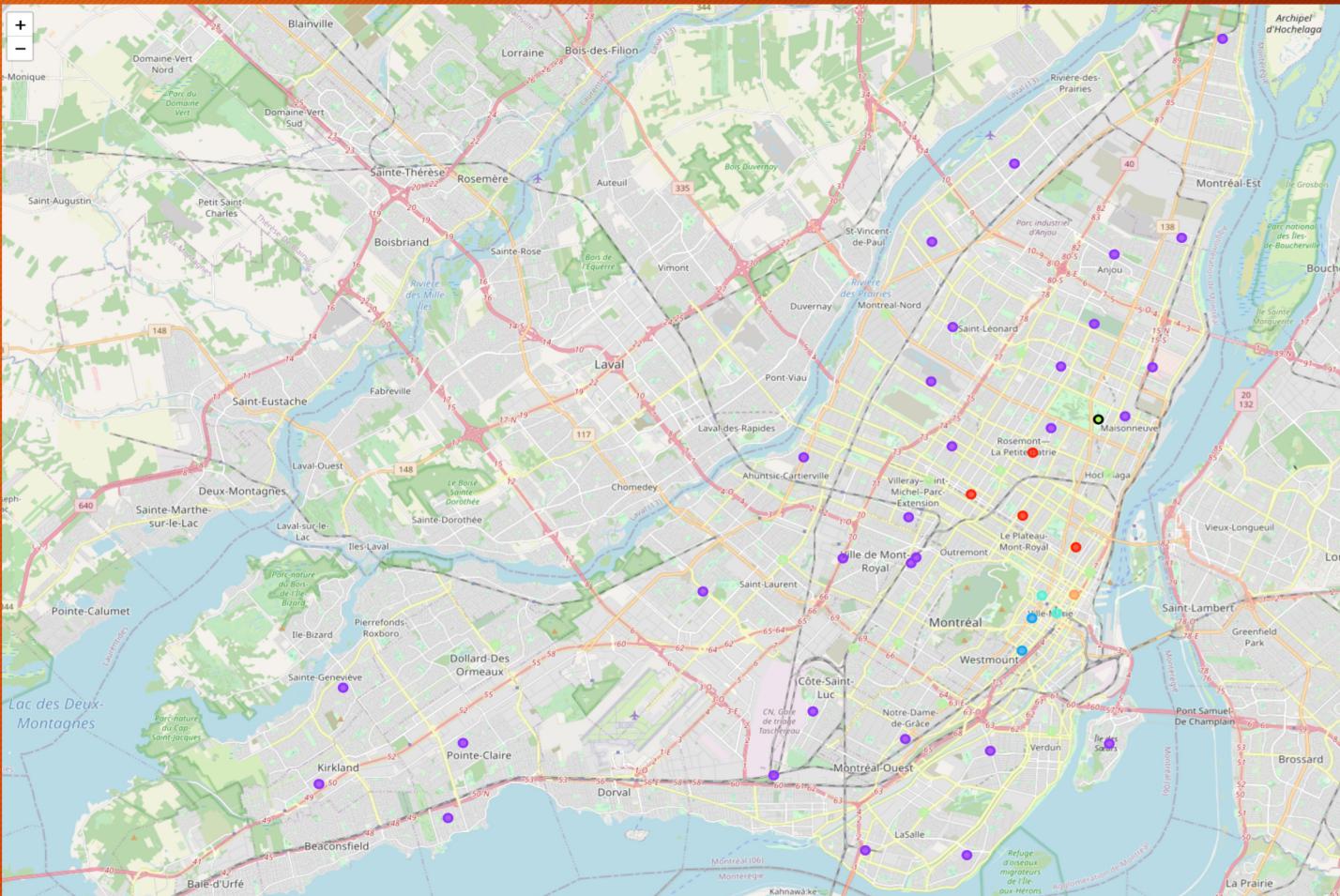
	Neighborhood	TotalRestaurants	TotalBars	TotalStoresShops
0	Ahuntsic Southwest	0	0	2
1	Anjou East	1	0	1
2	Auteuil South	6	2	4
3	Centre-Sud North	7	0	4
4	Centre-Sud South	12	6	10



Machine learning to cluster neighborhoods

- We want to cluster together similar neighborhoods based on the number of restaurants, bars and stores
- Algorithm: k-means clustering, one of the most popular algorithms for unsupervised machine learning
- Based on the bar chart in the previous slide, we decided to cluster the neighborhoods into 6 clusters.

Result of clustering



Optimal location for new stadium

- We strongly suggest one of these 4 neighborhoods: *Centre-Sud South, Petite-Patrie Southwest, Plateau-Mont-Royal North Central and Rosemont South.*

	Neighborhood	Population	Cluster Labels	TotalRestaurants	TotalBars	TotalStoresShops
29	Petite-Patrie Southwest	27359	0	9	6	10
30	Rosemont South	27172	0	9	3	9
32	Plateau Mont-Royal North Central	26559	0	5	6	12
41	Centre-Sud South	24222	0	12	6	10

- Vacant land can be found, the number of restaurants, bars and stores is really big compared to the other neighborhoods outside downtown and a lot of people live there, potential new fans for the baseball team.

Conclusion

- We used a machine learning algorithm, k-means clustering, in order to support the decision of a new location for a baseball stadium in Montreal.
- Possible improvements
 - > Consider vacant lands in Montreal
 - > Consider neighborhoods in suburban area of Montreal