Crime Rate & Venues Data Analysis of Montreal

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Our analysis will help international students to find the accommodations that best fit their needs

- Montreal is the second most populous city in Canada, and is often ranked the best city to be a university student in the world. It is also a popular destination for international students [1]
- New to a foreign environment, it is important for international students to find suitable accommodations so they can focus on their academic pursuits
- This analysis aims to help international students to find the best accommodations that fit their needs

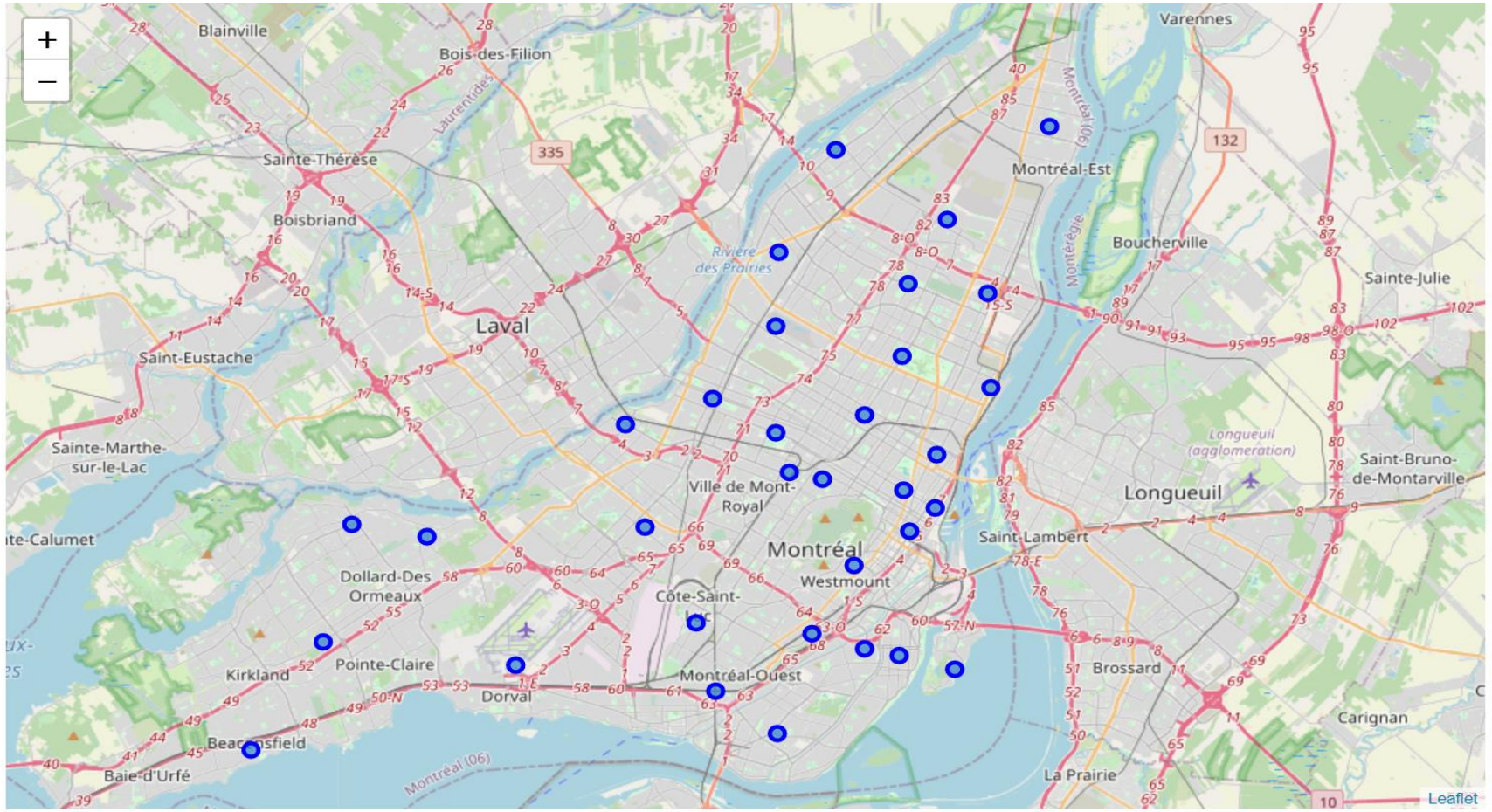
Two criteria used in evaluating the best suitable accommodation in our analysis

- First, the neighbourhoods can provide good amenities and lively social scenes, such as restaurants, cafes, gyms, libraries and so on
- Second, the communities should offer a safe living environment with few reported crimes
- Lastly, we will create a map where the reported crime rate is placed in Montreal and each community is clustered based on the venue density

Several data are utilized to support this analysis

- "Data on the Limit of Police District Station Sectors" from the City of Montreal website: This is a .csv file which has the coordinates of Montreal based on the locations of its Police Department Quarters (PDQs) [2]
- "Montreal Crimes Data" from the City of Montreal website: This .csv file has the recorded crimes in Montreal since the year of 2015. The annual crime data from 2019 is used for the fair and complete presentation of the data set [3]
- Foursquare API is used to get the most common venues of Montreal. [4]

Python folium library is used to create the map of Montreal



Foursquare API is used to obtain venues information on different parts of Montreal

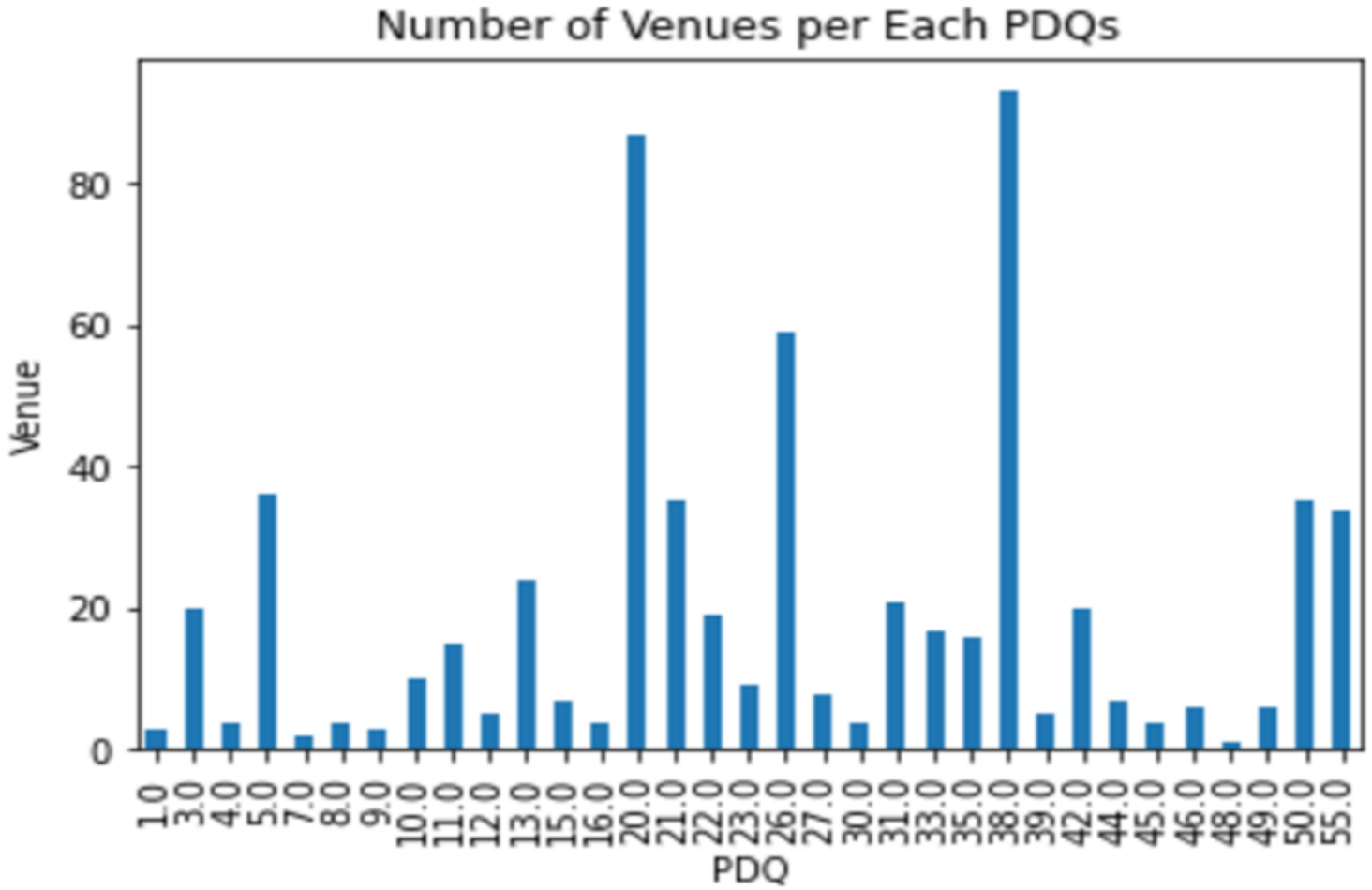
	name	categories	lat	lng
0	Arena Beaconsfield	Hockey Arena	45.425651	-73.866593
1	park city lane	Soccer Field	45.425301	-73.865801
2	Plaza Elm	Pizza Place	45.431739	-73.865350
3	Cugini's Pizza Cafe	Pizza Place	45.431706	-73.864628

- Venue limit: 100

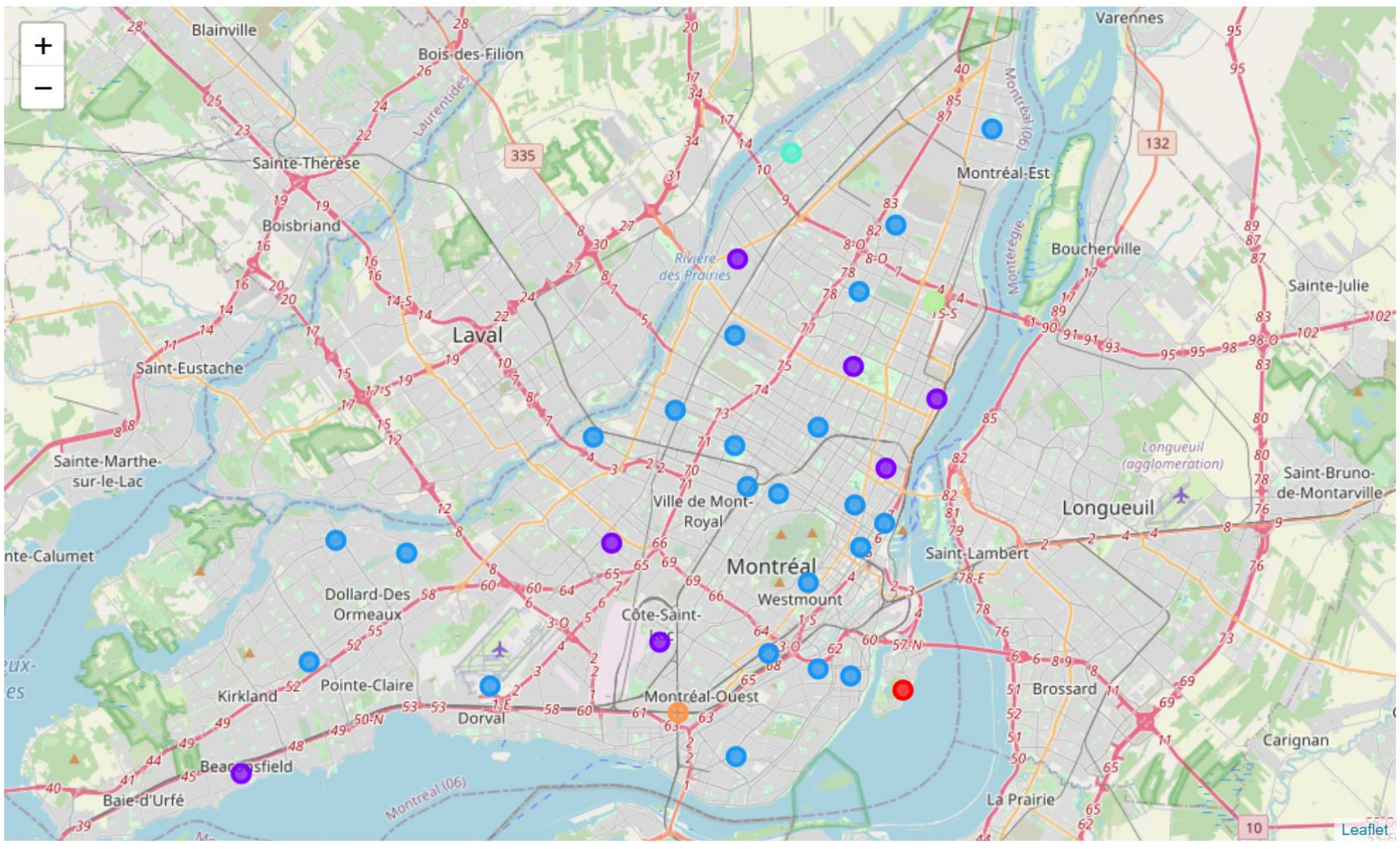
- Radius: 1000M

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	1.0	45.426522	-73.868164	Arena Beaconsfield	45.425651	-73.866593	Hockey Arena
1	1.0	45.426522	-73.868164	park city lane	45.425301	-73.865801	Soccer Field
2	1.0	45.426522	-73.868164	City Park	45.425026	-73.865735	Park
3	3.0	45.505988	-73.821669	Restaurant Bombay Choupati	45.508404	-73.820454	Indian Restaurant
4	3.0	45.505988	-73.821669	Aryana	45.504587	-73.817885	Middle Eastern Restaurant

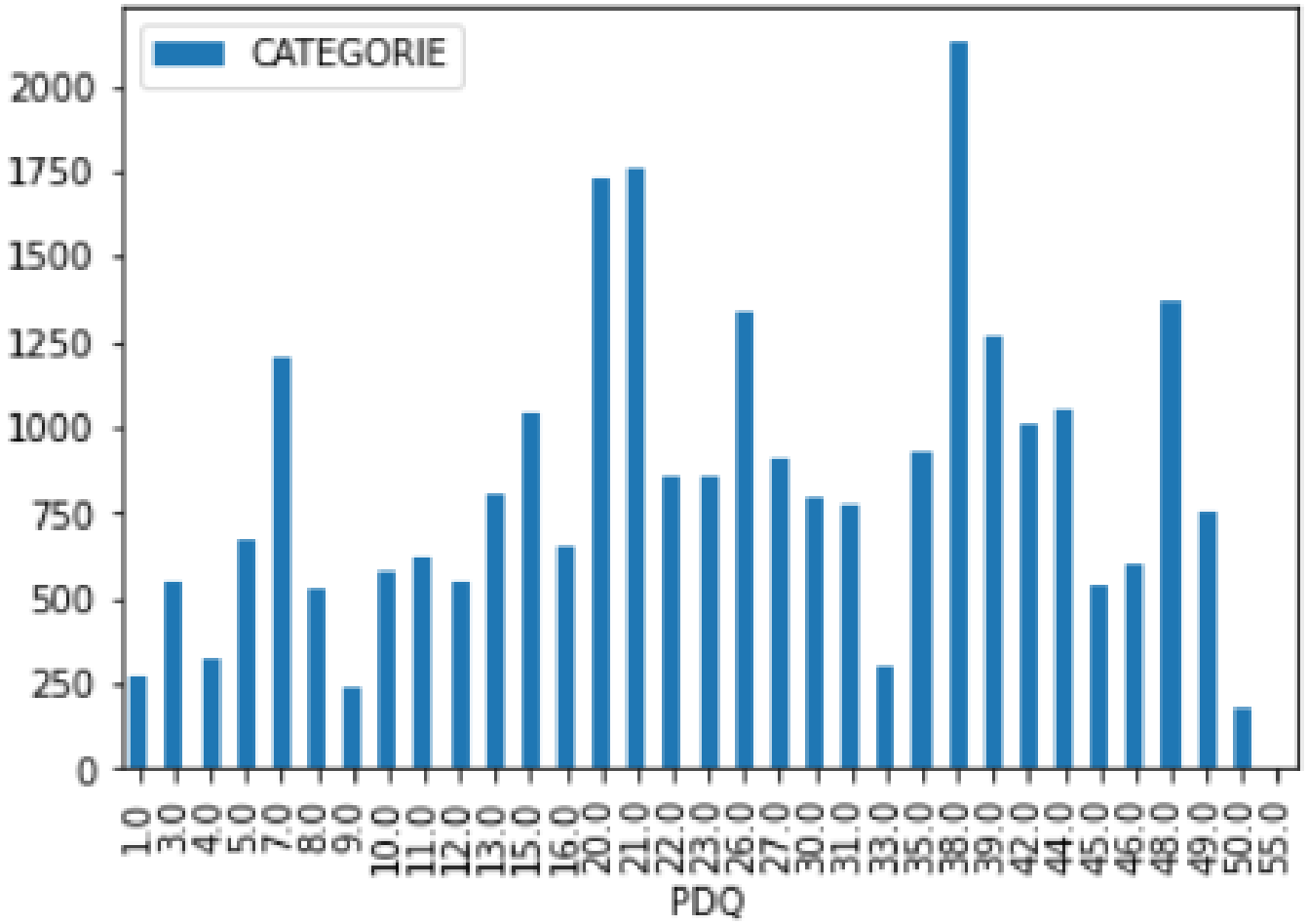
Data suggests neighbourhoods near PDQ 20, 26 and 38 have higher venue density than the rest



The K-means algorithm approach is used to analyze the six clusters in Montreal

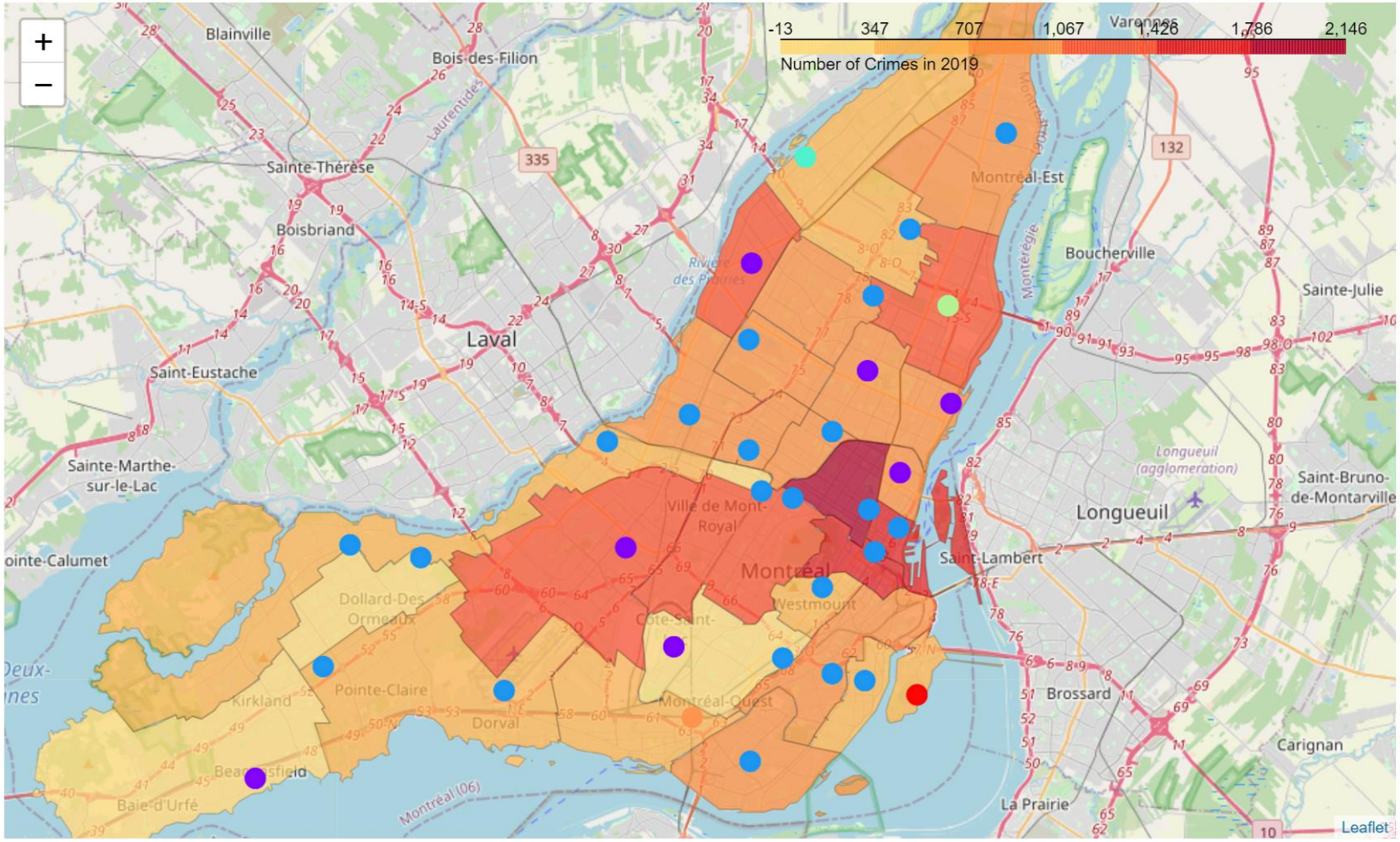


Data suggests that PDQ 20, 21 and 38 reported higher crime rates than the other parts of the city



We can see these PDQs coordinate with the areas with higher venue density (refer to slide 7). It makes sense, as the higher the venue and population density, the higher the crime rate would likely to be

Choropleth map demonstrates both the crime rate and six clusters by venues across city of Montreal



Conclusion and Discussion

- This analysis can be used by international students and potentially any newcomers to help analyze the Montreal neighbourhoods
- Various methodologies can be used in evaluating and clustering the city. Our analysis used K-means algorithm
- Room for improvement if further information and data can be obtained, such as more detailed coordinates data, population density data and demographic data
- The analysis is stored on GitHub and can be constantly updated and improved

References

- [1] Montreal: https://en.wikipedia.org/wiki/Montreal
- [2] Neighborhood police stations on the island of Montreal Data: https://donnees.montreal.ca/ville-de-montreal/carte-postes-quartier
- [3] Montreal Crimes Data: https://donnees.montreal.ca/ville-de-montreal/actes-criminels
- [4] Foursquare API