Data Science Capstone

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Introduction / Business Problem

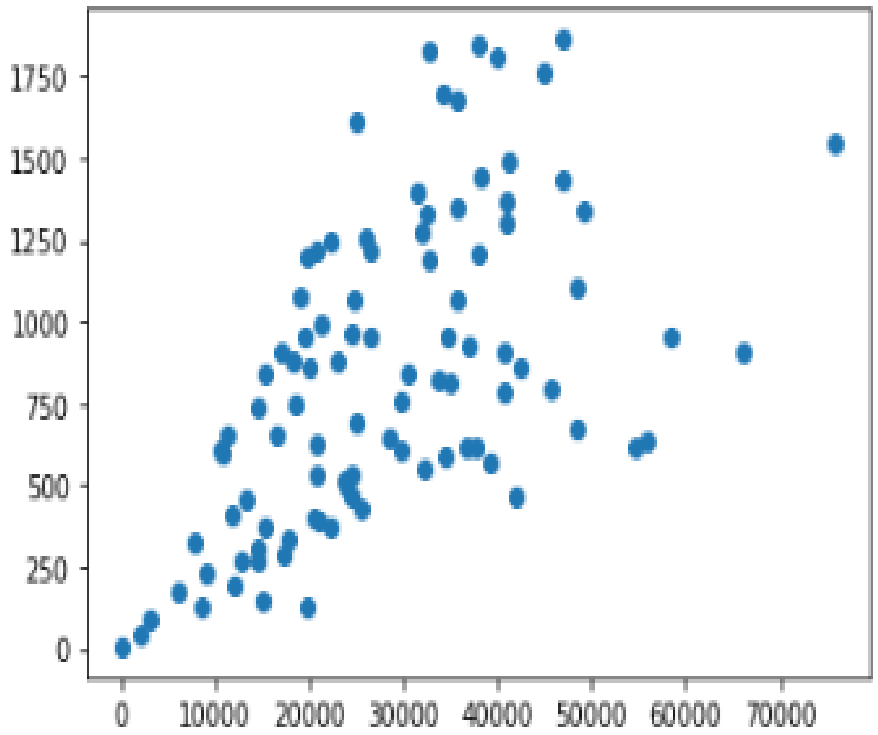
- A business wants to open up a Pet Store in the city of Toronto but the management is not sure where they should do it
- We will try to solve this business problem for the management using the data.
- We will the term Pet stores for venues that are Pet Stores and also the venues that provide Pet Services

Data

- Postal Codes
  https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M
- The data on the number of pets (Cats and Dogs) in every FSA (Postal Code)
  https://open.toronto.ca/dataset/licensed-dogs-and-cats-reports/
- The GeoSpatial data for the Toronto Neighborhoods
  https://cocl.us/Geospatial_data'
- The total population in every FSA (Postal Code) in Toronto
  https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/pd-pl/Tables/CompFile.cfm?Lang=Eng&T=1201&OFT=FULLCSV
- FourSquare - The details of every PetStore in the neighborhood of Toronto
  Category ID : '4bf58dd8d48988d100951735,5032897c91d4c4b30a586d69'

Methodology

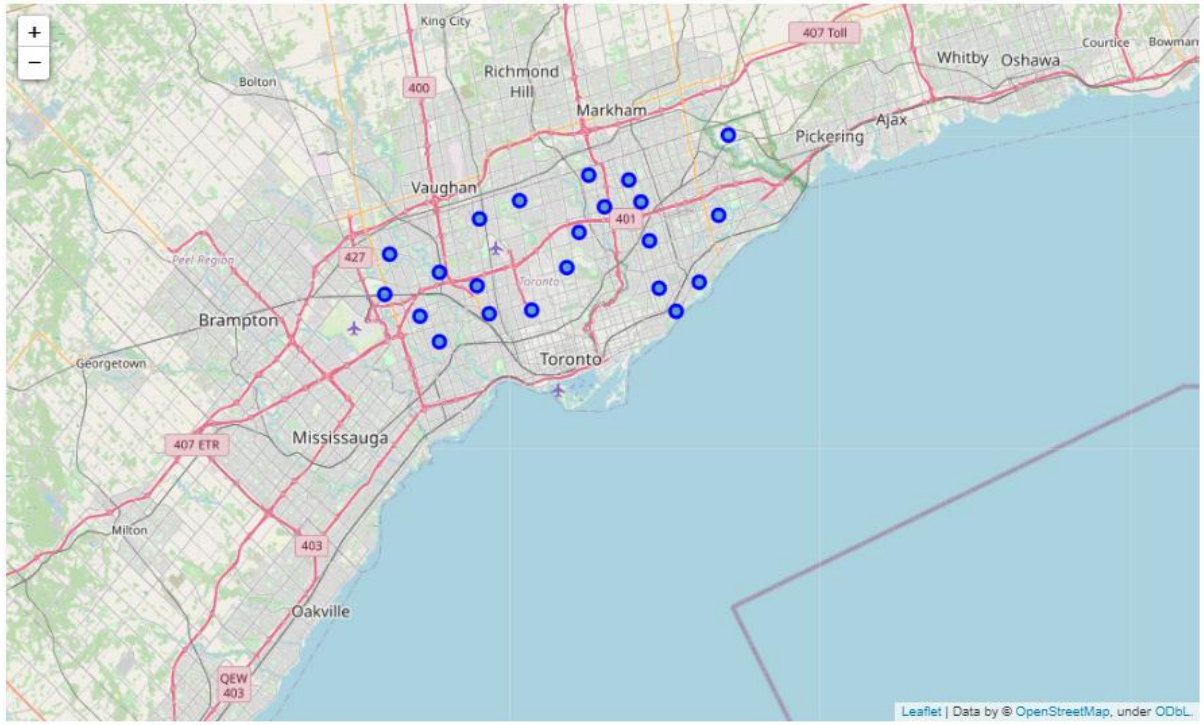
No. of Pets



Population of a FSA (Postal Code)

	Postal Code	Population, 2016	Total
0	M2J	58293.0	954
1	M9V	55959.0	636
2	M1W	48471.0	670
3	M6M	42434.0	863
4	M2R	40792.0	789

Top 5 of 22 FSAs in terms of population and total pets

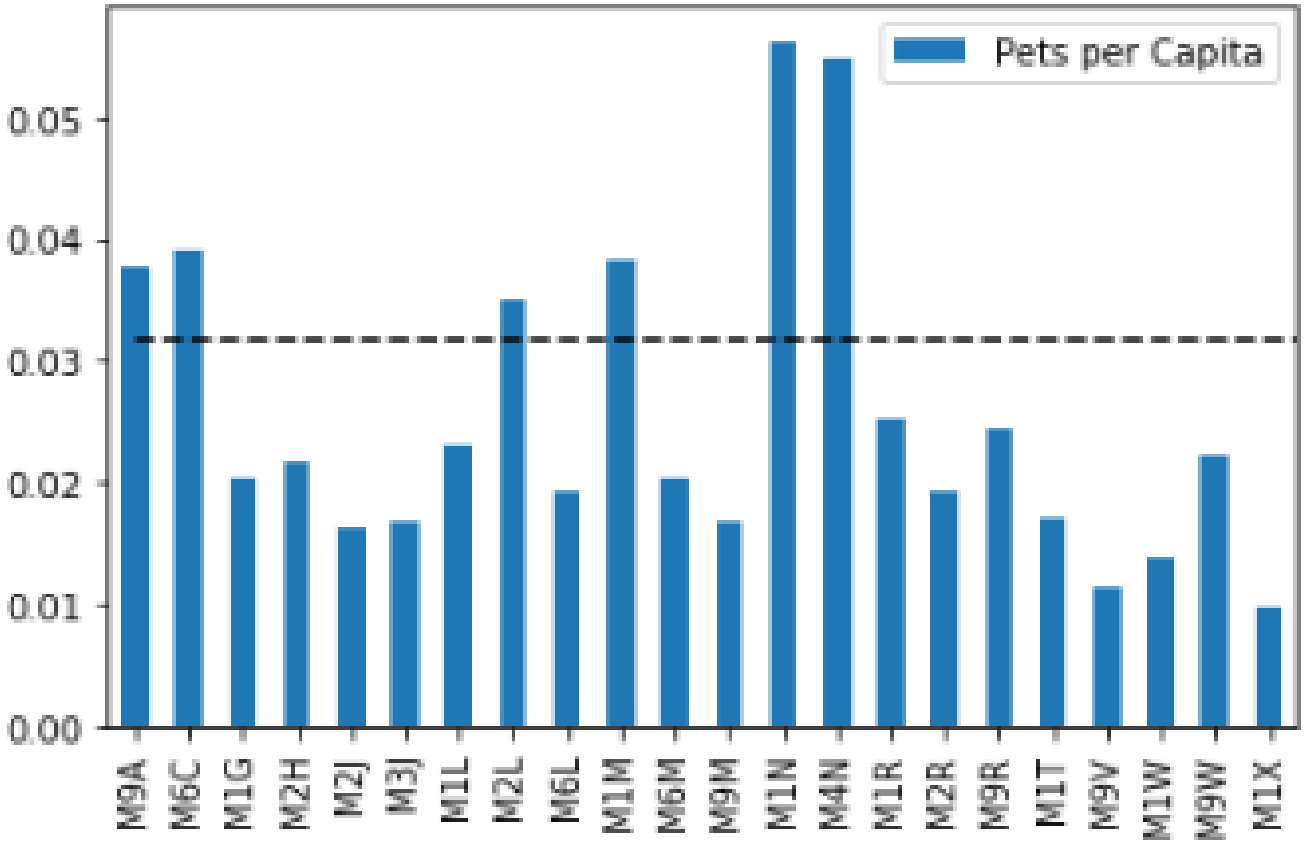


22 FSAs out of 97 that does not have Pet Stores

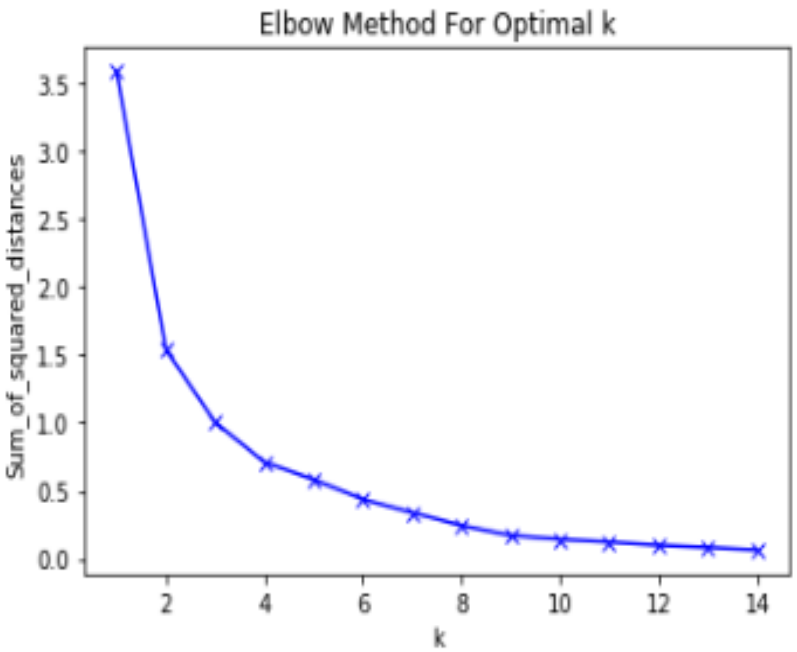
Total Population	2.73211e+06	(% of Total Population)	Total Pets	80954	(% of Total Pets)
Population in FSAs that has Pet Stores	2.04228e+06	74.751	Total Pets in FSAs that has Pet Stores	64997	80.289
Population in FSAs that does not have Pet Stores	689825	25.249	Total Pets in FSAs that does not have Pet Stores	15957	19.711

	Pets Per Capita
All the FSAs	0.0296
FSAs that has Pet Stores	0.0318
FSAs that does not have Pet Stores	0.0231

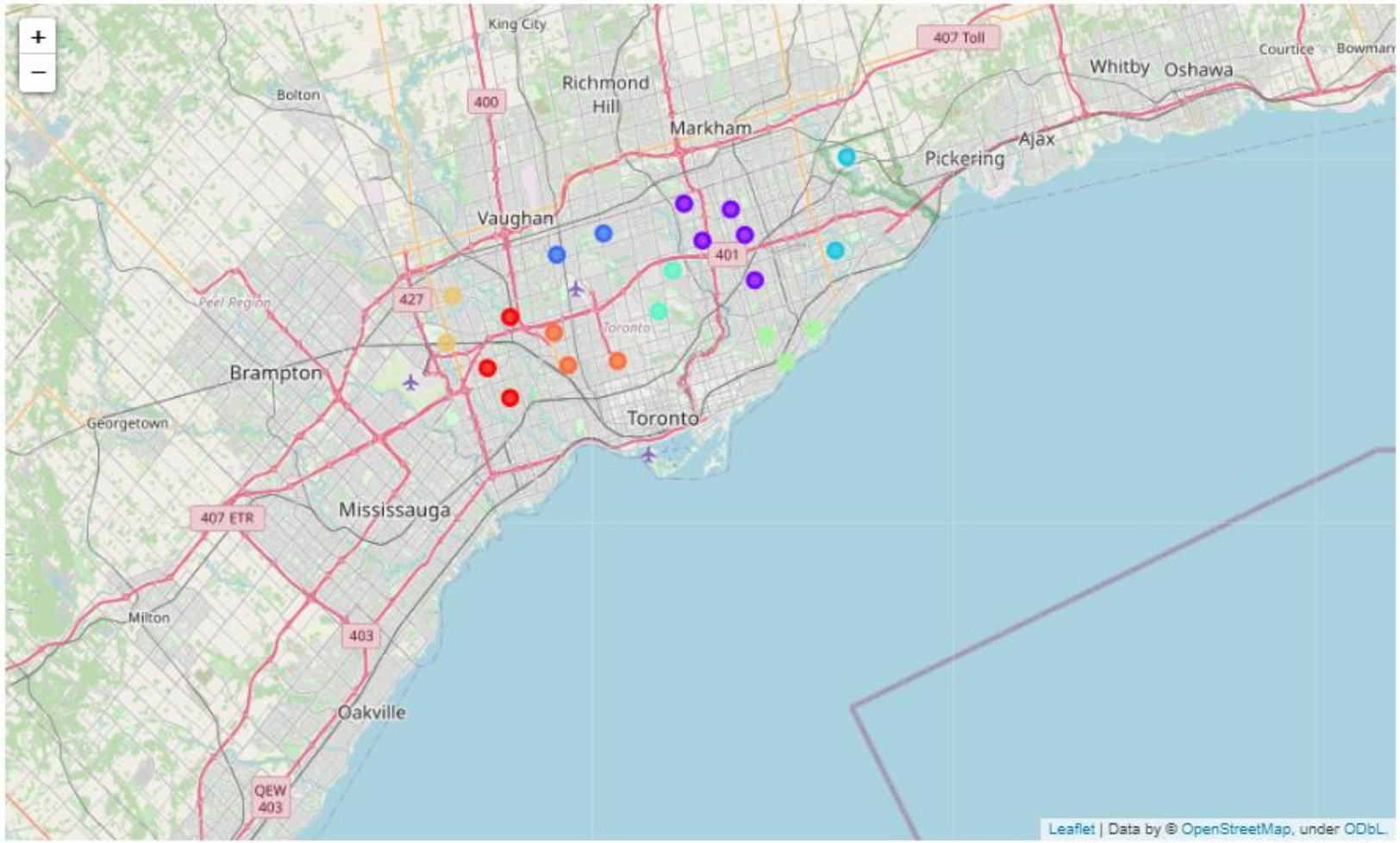
Comparative statistics of FSAs that has Pet Stores vs FSAs that does not



Comparison of pets per capita of 22 FSAs vs the average of stores that has stores



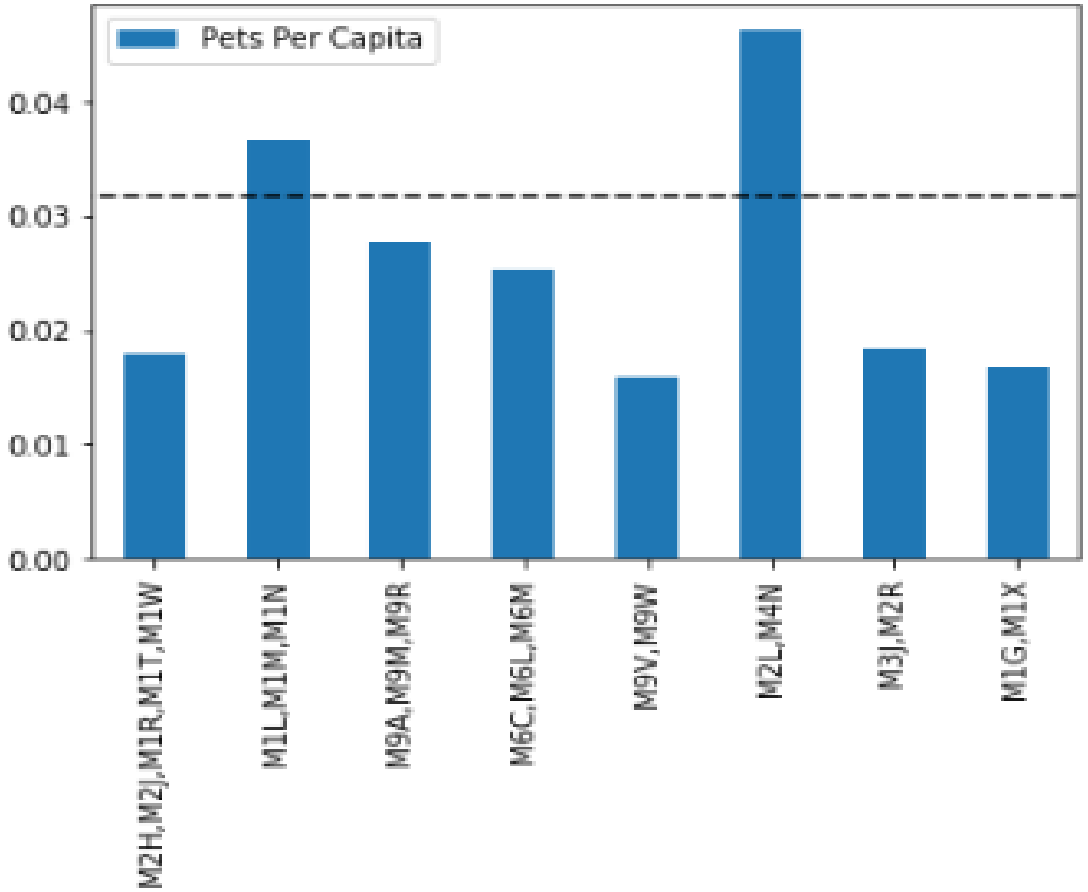
Elbow method : Optimum K=8



Clusters obtained from Kmeans (Unsupervised Learning)

Cluster Labels	Total	Population, 2016	Postal Code
1	3498	195707.0	M2H,M2J,M1R,M1T,M1W
5	2931	80130.0	M1L,M1M,M1N
0	2545	91600.0	M9A,M9M,M9R
7	2223	87646.0	M6C,M6L,M6M
6	1539	96643.0	M9V,M9W
4	1251	27047.0	M2L,M4N
2	1217	66265.0	M3J,M2R
3	753	44787.0	M1G,M1X

Clusters with their total population



Comparison of Pets per Capita of clusters to the Pets per capita of FSAs that has Pet Stores

Conclusion

- Multiple FSAs where the Pet Shops does not exist
- Many of these FSAs are close to each other, so, a single Pet Store can be opened to cater to all these FSAs at a location between them
- FSAs and Clusters can be chosen depending on the maximum number of pets and pets per capita
- The firm should perform cost/benefit analysis to make decisions on how many stores it wants to open to cover the population and the capacity of these stores. FSAs or clusters that have higher pets per capita or total population or pets can be considered for such analysis while others can be ignored
- It is beyond the scope of this report to comment on any of these factors or analyse them.