

Capstone Project - Coursera

Open an Indian Restaurant in Calgary, AB



Objective

- Gain insight on neighborhoods with high density of Indian restaurants in Toronto, ON.
- Recommend neighborhoods in Calgary based on modeling predictions from Toronto metropolitan area on opening an Indian Restaurant

Methodology

- Following iterative process was implemented to obtain most optimum outcome on the Project's primary objective.



Data Source

- Neighborhood names and location data extracted from Wikipedia
- Webscraper package BeautifulSoup
- Unlike Toronto, data for Calgary needed further processing before being used for this Project.



Results & Discussion

- Explored Toronto neighborhoods of interest by analyzing top 5 venues

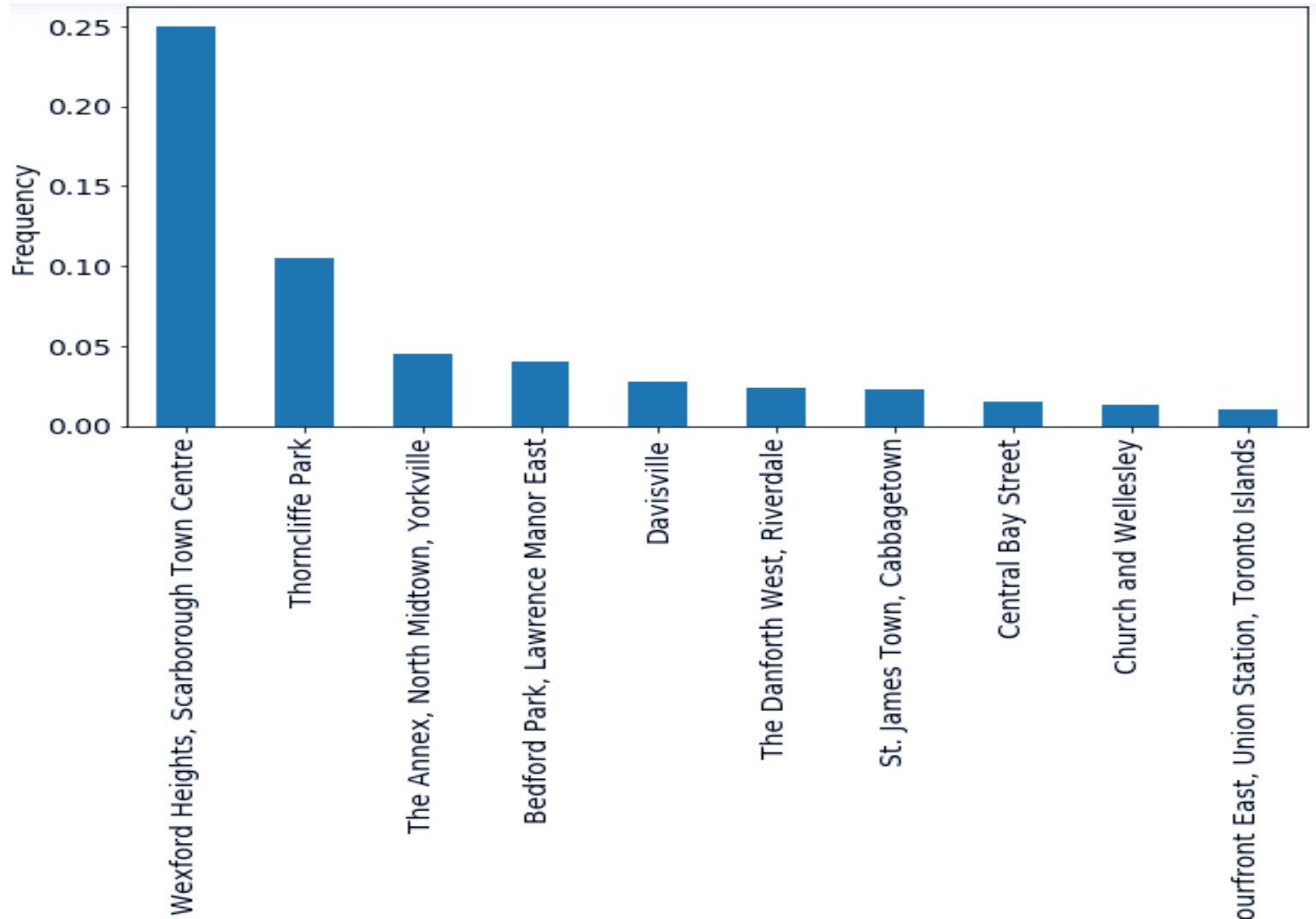
----Dorset Park, Wexford Heights, Scarborough Town Centre----

	venue	freq
0	Indian Restaurant	0.25
1	Light Rail Station	0.12
2	Vietnamese Restaurant	0.12
3	Pet Store	0.12
4	Thrift / Vintage Store	0.12

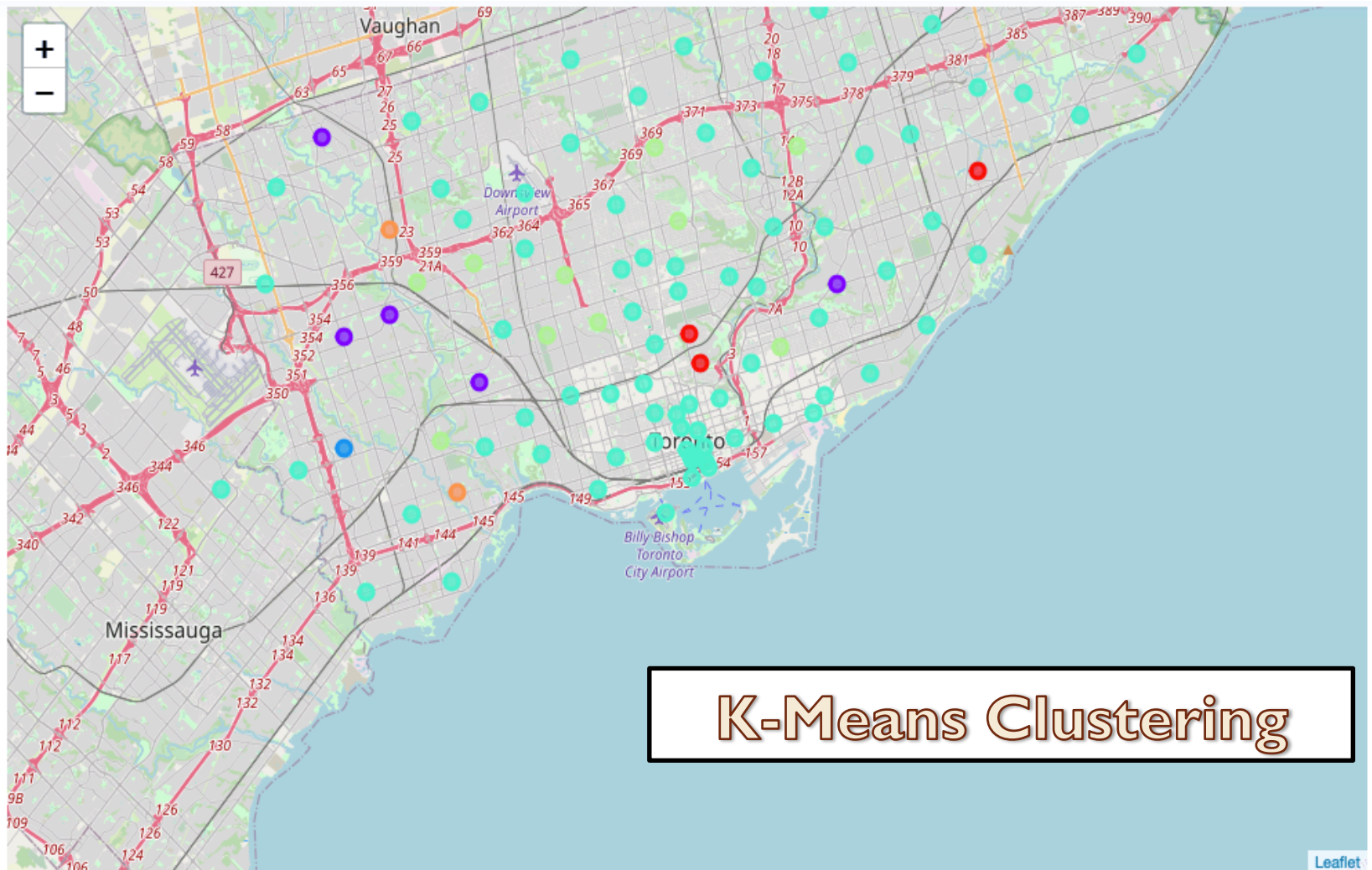
----Thorncliffe Park----

	venue	freq
0	Indian Restaurant	0.11
1	Yoga Studio	0.05
2	Middle Eastern Restaurant	0.05
3	Coffee Shop	0.05
4	Discount Store	0.05

Indian Restaurants in Toronto by Neighborhoods

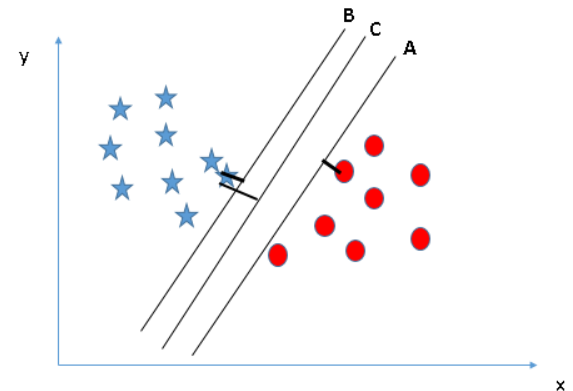


Used Python's Folium Leaflet to Map Neighborhoods with Data



SVM Regressor

- SVM Model parameters fine tuned using python's Sckhit-Learn GridSearch CV



```
# We use SVR Regressor
from sklearn.svm import SVR

#We utilize sckhit-learn parameter tuning function GridSearchCV
from sklearn.model_selection import GridSearchCV
import matplotlib.pyplot as plt

clf = GridSearchCV(SVR(kernel = 'rbf'), cv=5,param_grid=[{"C": [1, 10, 100, 1000],
                                                         "gamma": [0.001,0.0001], 'kernel':['rbf']}]})

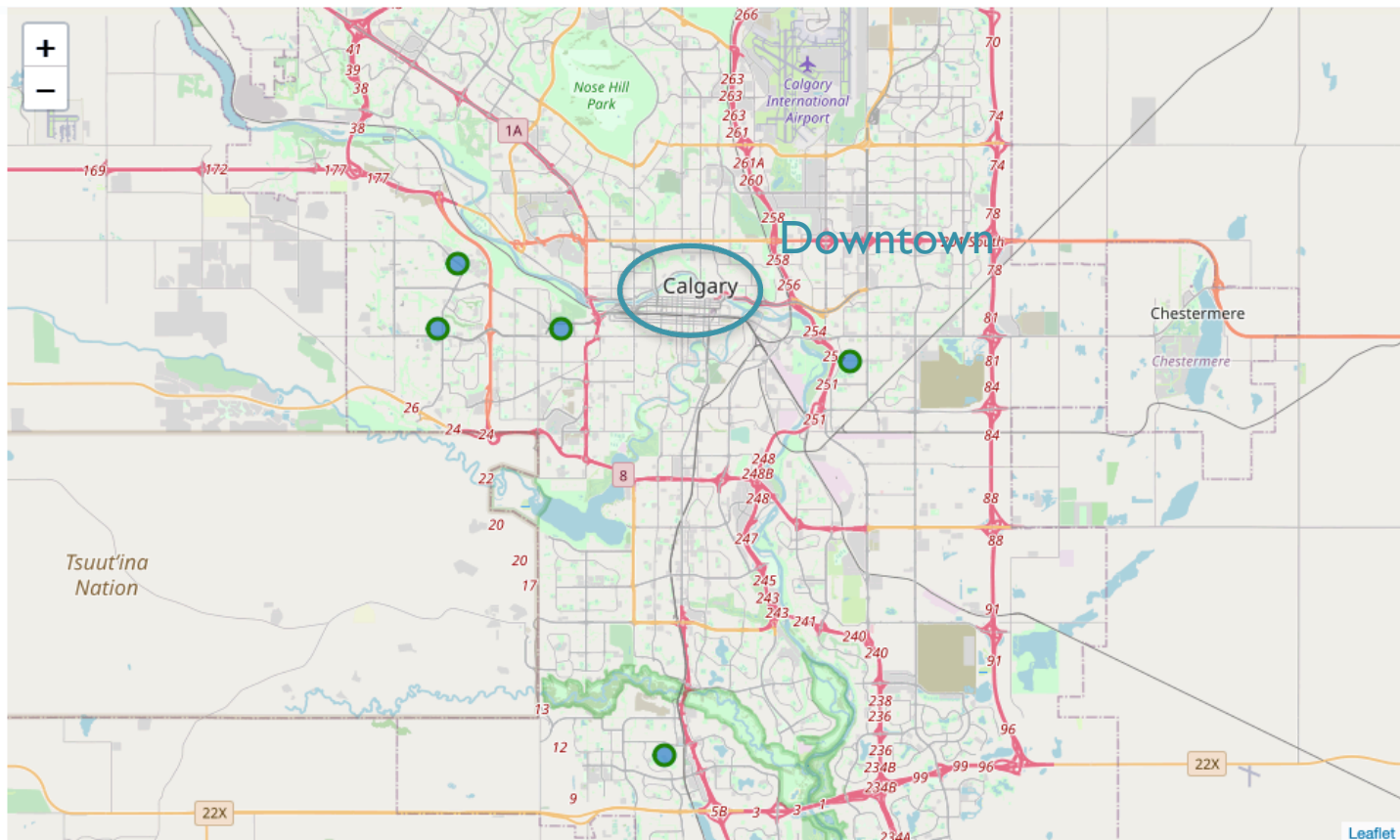
clf.fit(X_train,y_train)
```

```
GridSearchCV(cv=5, error_score=nan,
             estimator=SVR(C=1.0, cache_size=200, coef0=0.0, degree=3,
                           epsilon=0.1, gamma='scale', kernel='rbf',
                           max_iter=-1, shrinking=True, tol=0.001,
                           verbose=False),
             iid='deprecated', n_jobs=None,
             param_grid=[{'C': [1, 10, 100, 1000], 'gamma': [0.001, 0.0001],
                           'kernel': ['rbf']}],
             pre_dispatch='2*n_jobs', refit=True, return_train_score=False,
             scoring=None, verbose=0)
```


Top 5 Neighborhood Recommendations for Calgary, AB

	Neighborhood	Latitude	Longitude	Current	Predicted	Delta
4	Southview	51.03	-113.99	0	0.296086	0.296086
2	Shaganappi	51.04	-114.13	0	0.181105	0.181105
3	Shawnessy	50.91	-114.08	0	0.175498	0.175498
0	Aspen Woods	51.04	-114.19	0	0.162445	0.162445
1	Coach Hill	51.06	-114.18	0	0.162235	0.162235

- All Recommended Neighborhoods outside Calgary downtown core and North East which currently have reasonable number of Indian/Asian Restaurants



Asian Venues present for both Toronto & Recommended Neighborhoods in Calgary

Toronto Neighborhoods

Cluster Labels	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
23	3 Dorset Park, Wexford Heights, Scarborough Town...	Indian Restaurant	Pet Store	Furniture / Home Store	Light Rail Station	Vietnamese Restaurant	Chinese Restaurant	Thrift / Vintage Store	Curling Ice	Dance Studio	Deli / Bodega
82	3 Thorncliffe Park	Indian Restaurant	Yoga Studio	Supermarket	Gas Station	Grocery Store	Gym	Fast Food Restaurant	Discount Store	Middle Eastern Restaurant	Coffee Shop

Calgary Neighborhoods

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Aspen Woods	Light Rail Station	Football Stadium	Supermarket	Dry Cleaner	Food Court	Flower Shop	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant	Event Space
1	Coach Hill	Vietnamese Restaurant	Convenience Store	Bar	Embassy / Consulate	Gas Station	Women's Store	Dry Cleaner	Flower Shop	Filipino Restaurant	Fast Food Restaurant
2	Shaganappi	Pizza Place	Café	Light Rail Station	Asian Restaurant	Convenience Store	Coffee Shop	Pub	Mediterranean Restaurant	Seafood Restaurant	Bistro
3	Shawnessy	Filipino Restaurant	Pet Store	Convenience Store	Gas Station	Women's Store	Drugstore	Fast Food Restaurant	Falafel Restaurant	Event Space	Embassy / Consulate
4	Southview	Playground	Vietnamese Restaurant	Furniture / Home Store	Thrift / Vintage Store	Dog Run	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant	Event Space	Embassy / Consulate

Conclusion/Recommendation

- We recommend considering Calgary's Southview as number one Neighborhood to open an Indian Restaurant.
- However, we also recommend combining other factors such as Calgary's current economic situation, latest demographics and existing restaurants performance before making the final decision.