

The Battle of Neighborhoods

APPLIED DATA SCIENCE CAPSTONE BY IBM/COURSERA



Find Optimal Location for Chinese Restaurants

As increasing numbers of consumers want to dine out or take prepared food home, the number of food-service operations has skyrocketed today. But there's still room in the market for your food-service business. Choosing location is vitally important to start a restaurant.

This project is trying to find an optimal location for a restaurant. In particular, this project will be targeted to stakeholders interested in opening a Chinese restaurant in Toronto, Canada.

Data Acquisition and Cleaning

Centers of candidate areas will be generated algorithmically and approximate addresses of centers of those areas will be obtained using geopy library

Number of restaurants and their type and location in every neighborhood will be obtained using Foursquare API

Coordinate of Toronto center will be obtained using geopy library



Decision Criteria



NUMBER OF EXISTING RESTAURANTS
IN THE NEIGHBORHOOD (ANY TYPE
OF RESTAURANT)



NUMBER OF CHINESE RESTAURANTS
IN THE NEIGHBORHOOD, IF ANY

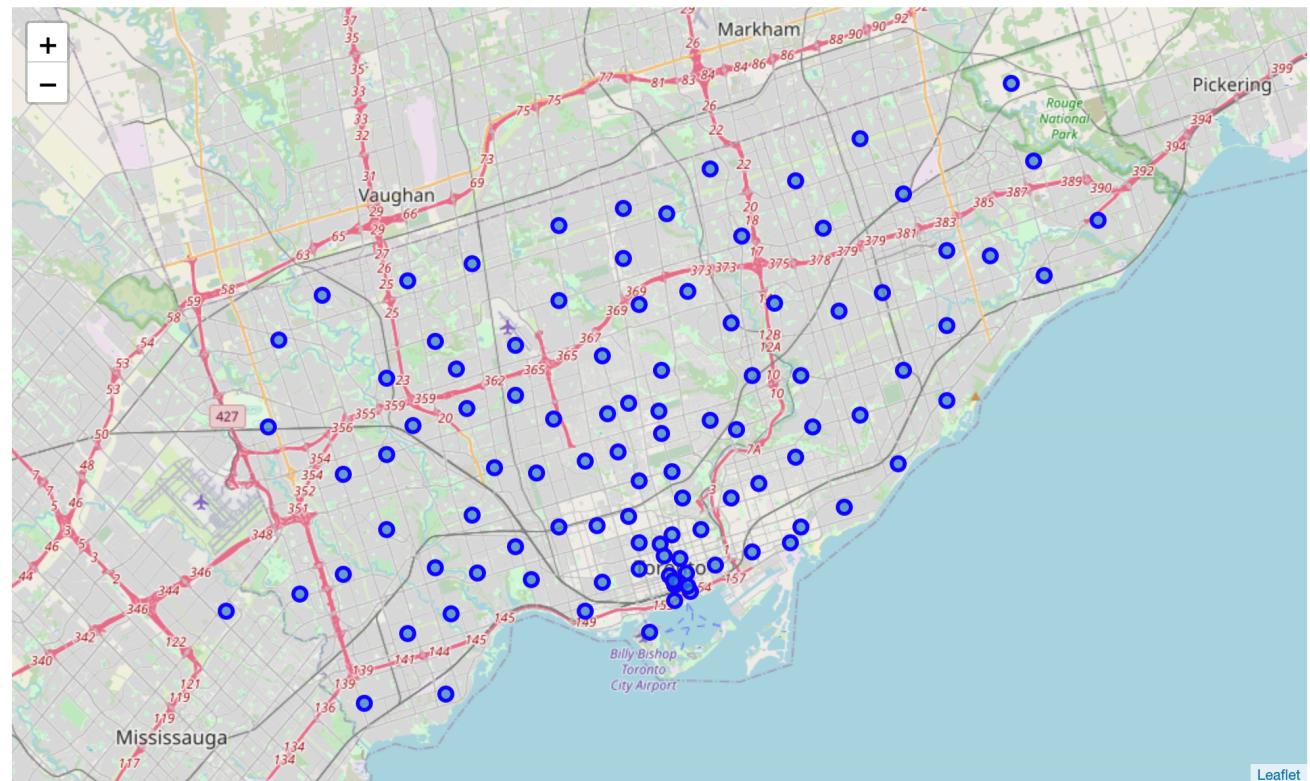


DISTANCE OF NEIGHBORHOOD FROM
CITY CENTER

Methodology

Center of Toronto:

- Longitude: 43.6534817
- Latitude: -79.3839347
- (Generated from geopy library)



Methodology

01

Calculate the distance from the neighbourhoods to the center of Toronto in km using geopy library.

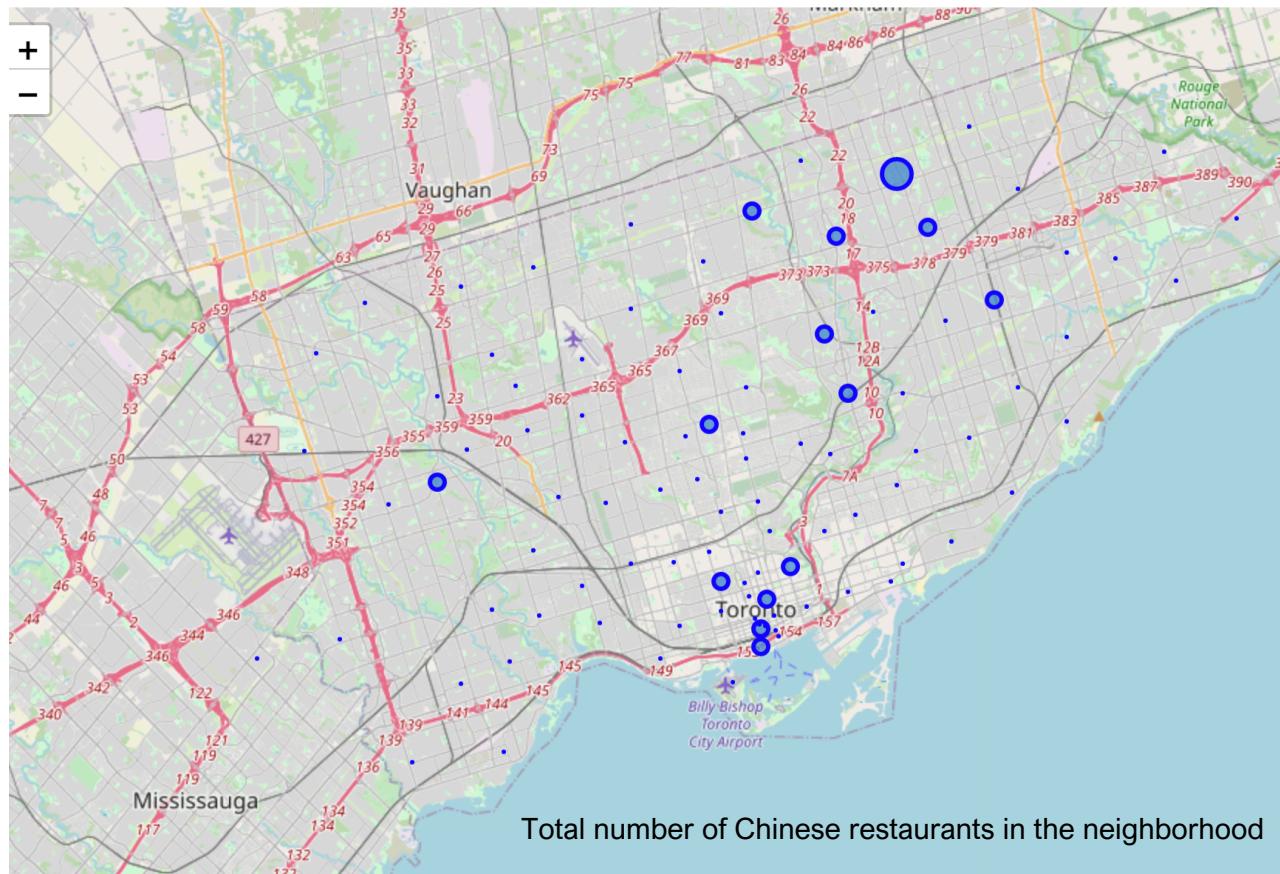
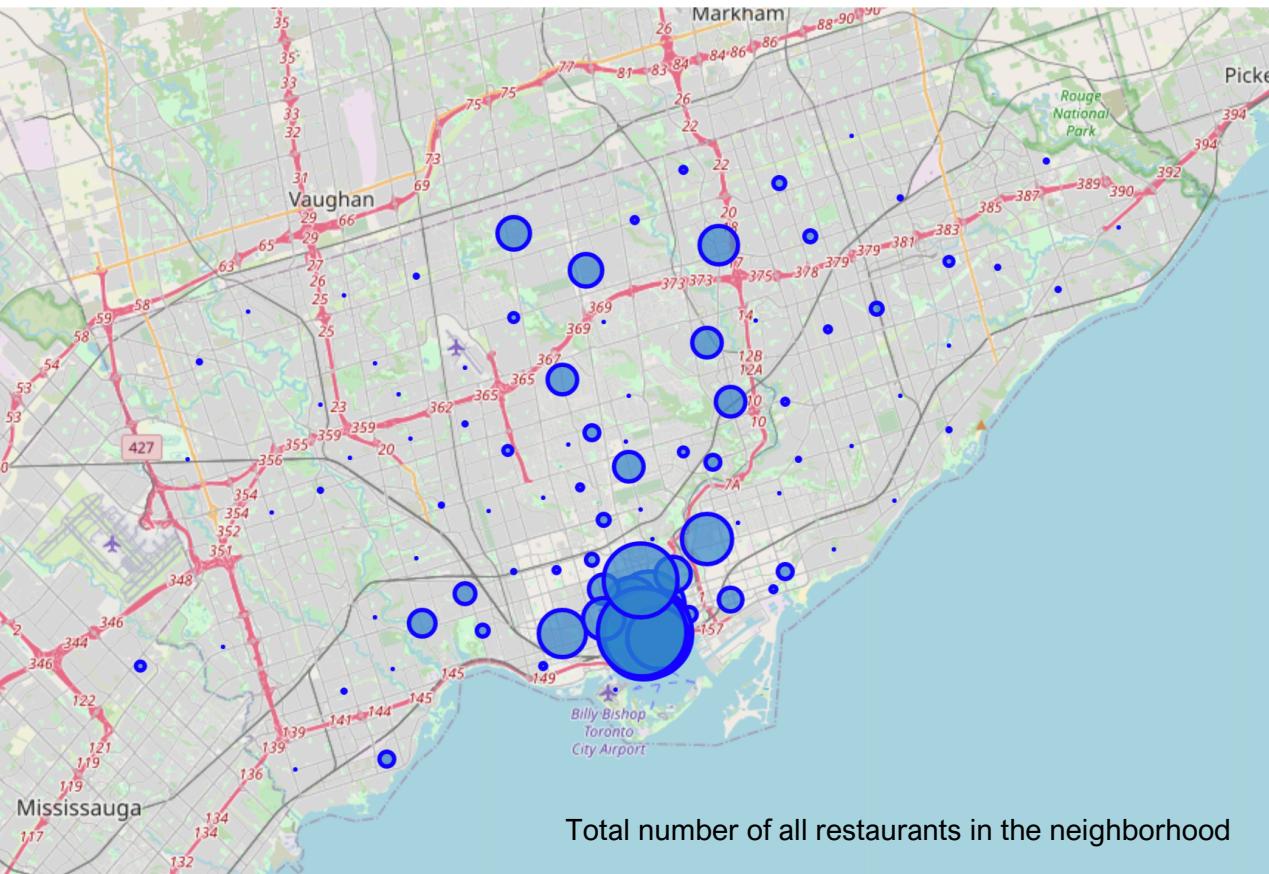
02

Use Foursquare API to get info on restaurants in each neighbourhood:

- Total number of restaurants in the neighbourhood
- Total number of Chinese restaurants in the neighborhood

Data Cleaning Result

| | Postal Code | Borough | Neighborhood | Latitude | Longitude | Distances_from_Centers | Chinese Restaurant | Total |
|----|-------------|------------------|---|-----------|------------|------------------------|--------------------|-------|
| 0 | M3A | North York | Parkwoods | 43.753259 | -79.329656 | 6.400372 | 0.0 | 0.0 |
| 1 | M4A | North York | Victoria Village | 43.725882 | -79.315572 | 7.778012 | 0.0 | 2.0 |
| 2 | M5A | Downtown Toronto | Regent Park, Harbourfront | 43.654260 | -79.360636 | 2.601491 | 0.0 | 5.0 |
| 3 | M6A | North York | Lawrence Manor, Lawrence Heights | 43.718518 | -79.464763 | 9.122914 | 0.0 | 1.0 |
| 4 | M7A | Downtown Toronto | Queen's Park, Ontario Provincial Government | 43.662301 | -79.389494 | 0.646674 | 0.0 | 6.0 |
| 5 | M9A | Etobicoke | Islington Avenue | 43.667856 | -79.532242 | 16.562078 | NaN | NaN |
| 6 | M1B | Scarborough | Malvern, Rouge | 43.806686 | -79.194353 | 21.405203 | 0.0 | 1.0 |
| 7 | M3B | North York | Don Mills | 43.745906 | -79.352188 | 4.023882 | 1.0 | 10.0 |
| 8 | M4B | East York | Parkview Hill, Woodbine Gardens | 43.706397 | -79.309937 | 8.334155 | 0.0 | 1.0 |
| 9 | M5B | Downtown Toronto | Garden District, Ryerson | 43.657162 | -79.378937 | 0.563126 | 1.0 | 24.0 |
| 10 | M6B | North York | Glencairn | 43.709577 | -79.445073 | 6.922737 | 0.0 | 3.0 |
| 11 | M9B | Etobicoke | West Deane Park, Princess Gardens, Martin Grov... | 43.650943 | -79.554724 | 19.069812 | NaN | NaN |
| 12 | M1C | Scarborough | Rouge Hill, Port Union, Highland Creek | 43.784535 | -79.160497 | 25.096198 | 0.0 | 0.0 |
| 13 | M3C | North York | Don Mills | 43.725900 | -79.340923 | 5.029201 | 1.0 | 10.0 |
| 14 | M4C | East York | Woodbine Heights | 43.695344 | -79.318389 | 7.369382 | 0.0 | 0.0 |



Data Visualization

Result

| | Postal Code | Borough | Neighborhood | Latitude | Longitude | Distances_from_Centers | Chinese Restaurant | Total |
|----|-------------|------------------|---|-----------|------------|------------------------|--------------------|-------|
| 30 | M5H | Downtown Toronto | Richmond, Adelaide, King | 43.650571 | -79.384568 | 0.092617 | 0.0 | 24.0 |
| 97 | M5X | Downtown Toronto | First Canadian Place, Underground city | 43.648429 | -79.382280 | 0.211978 | 0.0 | 30.0 |
| 99 | M4Y | Downtown Toronto | Church and Wellesley | 43.665860 | -79.383160 | 0.268979 | 0.0 | 25.0 |
| 24 | M5G | Downtown Toronto | Central Bay Street | 43.657952 | -79.387383 | 0.395811 | 0.0 | 18.0 |
| 48 | M5L | Downtown Toronto | Commerce Court, Victoria Hotel | 43.648198 | -79.379817 | 0.472455 | 0.0 | 30.0 |
| 4 | M7A | Downtown Toronto | Queen's Park, Ontario Provincial Government | 43.662301 | -79.389494 | 0.646674 | 0.0 | 6.0 |
| 83 | M4T | Central Toronto | Moore Park, Summerhill East | 43.689574 | -79.383160 | 0.747643 | 0.0 | 0.0 |
| 91 | M4W | Downtown Toronto | Rosedale | 43.679563 | -79.377529 | 0.894210 | 0.0 | 0.0 |
| 15 | M5C | Downtown Toronto | St. James Town | 43.651494 | -79.375418 | 0.951829 | 0.0 | 22.0 |
| 92 | M5W | Downtown Toronto | Stn A PO Boxes | 43.646435 | -79.374846 | 1.025117 | 0.0 | 21.0 |

Conclusion

In this project, we have proposed some optimal solutions to open a Chinese restaurant in Toronto, Canada based on geospatial data analysis and data visualization.

We choose the candidate neighborhood in Toronto based on distance from the center of Toronto, the number of restaurants in the neighborhood and the total number of Chinese restaurants in the neighborhood.

From the result, we can see that Moore Park, Summerhill East, Rosedale, Queen's Park, Ontario Provincial Government are the optimal locations for opening a Chinese restaurant.

THANK YOU

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