

Decision making for opening a restaurant

Yonglok Kim

March 5, 2020

1. Introduction / Business Problem

■ Background

- New York city or Toronto city.
- Foursquare
- making a decision of opening a restaurant

■ Problem

- No sufficient datum
- use possibly wikipedia data by internet.

■ Interest

- population, density and GDP to solve my porject
- Fouresquere API

2. Data acquisition and cleaning

- **Data sources**

- population, population density and GDP.
- wikipedia
- Foursquare API

- **Data cleaning**

- the historical populations of New York and Toronto
- pandas' fillna (method = 'ffill', limit = 1) method

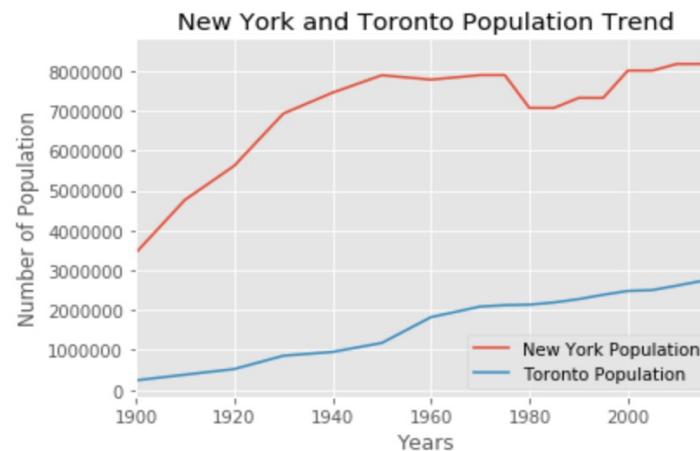
3. Methodology

- city -> borough -> downtown -> neighborhood
- venues provided by Foursquare

4. Results

- First choice of city : New York city

| item | New York | Toronto |
|-----------------------------|--------------|--------------|
| Population | 8,175,133 | 2,954,024 |
| Population Density (/sq mi) | 27,751 | 12,140 |
| GDP (US\$ billion) | 842.3 (2018) | 276.3 (2014) |



- Second choice of borough : Manhattan

| Borough | County | Population | Gross Domestic Product (billions US\$) | Gross Domestic Product (per capita US\$) | Land area (square miles) | Land area (square km) | Density (persons / sq. mi) | Density (persons / sq. km) |
|---------------------|----------|------------|--|--|--------------------------|-----------------------|----------------------------|----------------------------|
| 0 The Bronx | Bronx | 1,432,132 | 42.695 | 29,200 | 42.10 | 109.04 | 34,653 | 13,231 |
| 1 Brooklyn | Kings | 2,582,830 | 91.559 | 34,600 | 70.82 | 183.42 | 37,137 | 14,649 |
| 2 Manhattan | New York | 1,628,701 | 600.244 | 360,600 | 22.83 | 59.13 | 72,033 | 27,826 |
| 3 Queens | Queens | 2,278,906 | 93.310 | 39,600 | 108.53 | 281.09 | 21,460 | 8,354 |
| 4 Staten Island | Richmond | 476,179 | 14.514 | 30,300 | 58.37 | 151.18 | 8,112 | 3,132 |
| 5 City of New York | | 8,398,748 | 842.343 | 97,700 | 302.64 | 783.83 | 28,188 | 10,947 |
| 6 State of New York | | 19,745,289 | 1,701.399 | 85,700 | 47,214 | 122,284 | 416.4 | 159 |

■ Third choice of neighborhood : Midtown

| | Manhattan downtown | Neighborhoods Numbers | | Neighborhoods | Venue numbers | Venue per Neighborhoods |
|---|--------------------|-----------------------|---|---------------|---------------|-------------------------|
| 0 | Lower Manhattan | 25 | [Alphabet City, Battery Park City, Bowery, Chi... | | 2768 | 111 |
| 1 | Midtown | 11 | [Columbus Circle, Diamond District, Flatiron D... | | 1356 | 123 |
| 2 | West Side | 12 | [Chelsea, Hell's Kitchen, Hudson Yards, develo... | | 1242 | 104 |
| 3 | East Side | 16 | [Carnegie Hill, Gramercy Park, Kips Bay, Lenox... | | 1561 | 98 |
| 4 | Upper Manhattan | 14 | [Astor Row, East Harlem, Hamilton Heights, Har... | | 1228 | 88 |

■ Fourth choice of neighborhood : Flatiron District

| | Midtown | latitude | longitude | Venue numbers |
|----|-------------------|----------|-----------|---------------|
| 0 | Columbus Circle | 40.7681 | -73.9819 | 118 |
| 1 | Diamond District | 40.7572 | -73.9801 | 128 |
| 2 | Flatiron District | 40.7411 | -73.9897 | 133 |
| 3 | Garment District | 40.7537 | -73.9905 | 125 |
| 4 | Herald Square | 40.7495 | -73.988 | 120 |
| 5 | Koreatown | 40.7476 | -73.9865 | 128 |
| 6 | Madison Square | 42.8759 | -75.6803 | 121 |
| 7 | NoMad | 40.7447 | -73.9883 | 119 |
| 8 | Silicon Alley | | | 119 |
| 9 | Theater District | 40.758 | -73.9855 | 123 |
| 10 | Times Square | 40.7573 | -73.9859 | 122 |

- A map of 11 neighborhoods near Midtown



- map the venues related to korean food near Midtown



5. Discussion

- cost of renting the building as a factor

6. Conclusion

- New York city
- Manhattan borough
- Midtown downtown
- Flatiron District neighborhood

Thank you!