

# Finding Ideal Location to Start Restaurant in Toronto

# Location, Location, Location Decides Success of Restaurants

- ▶ High population density = more people passing by restaurant
- ▶ High number of people per restaurant = less competition for customers
- ▶ Predominant ethnic group = many customers for restaurants serving food catering to the dominant ethnic group
- ▶ Growing population trend = more potential customers in the future

# Data Acquisition

- ▶ City of Toronto [Open Data Portal](#) provides datasets on all 25 administrative city wards in Toronto
- ▶ Ward data from 2011 and 2016 census on:
  - ▶ Land area size
  - ▶ Total Population
  - ▶ Population segmented by country ethnic origin
  - ▶ Population segmented by income brackets
- ▶ Foursquare API: most common restaurant venue in wards' land area
- ▶ Toronto Food Inspection dataset listing every food establishment in the city

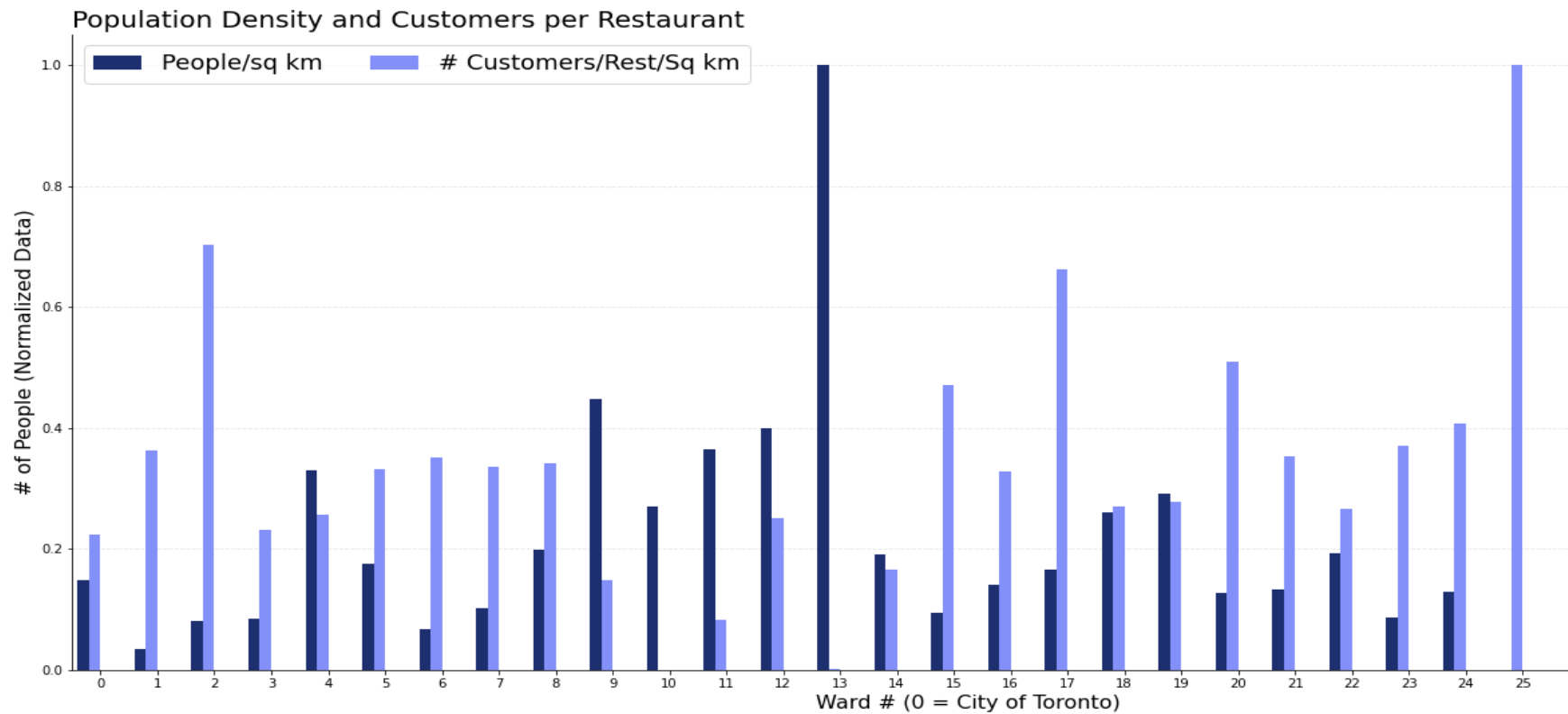
# Data Cleaning

- ▶ Google Maps to find latitude and longitude of each ward's geographical center point based on approximated center point
- ▶ # of Restaurants per Ward determined by allocating each food establishment to ward based on the ward center it is closest to
- ▶ Only food establishments that serve “ready-to-eat food accessible to the general public” were included as possible restaurant competitors in data reducing original data from 62,271 establishments to 14,469 establishments

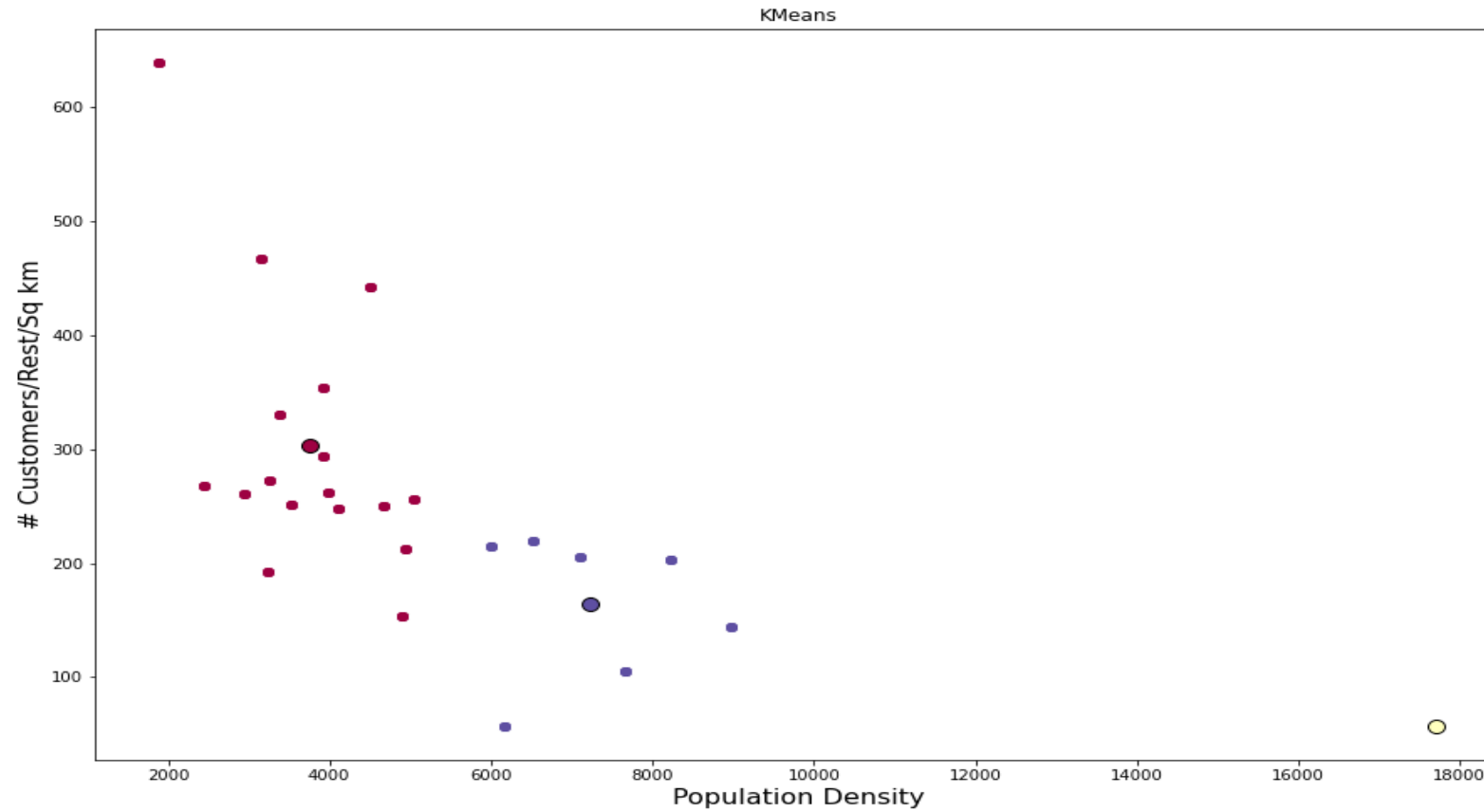
# Key Features

- ▶ Radius of Wards
- ▶ Population Density of Wards (People/Sq km)
- ▶ Population Density per Restaurant (# of Customers/Restaurant/Sq km)
- ▶ Top 5 Ethnic Groups per Ward
- ▶ Ward Population Growth
- ▶ Ward Individual Income Characteristics
- ▶ Most Common Restaurants per Ward

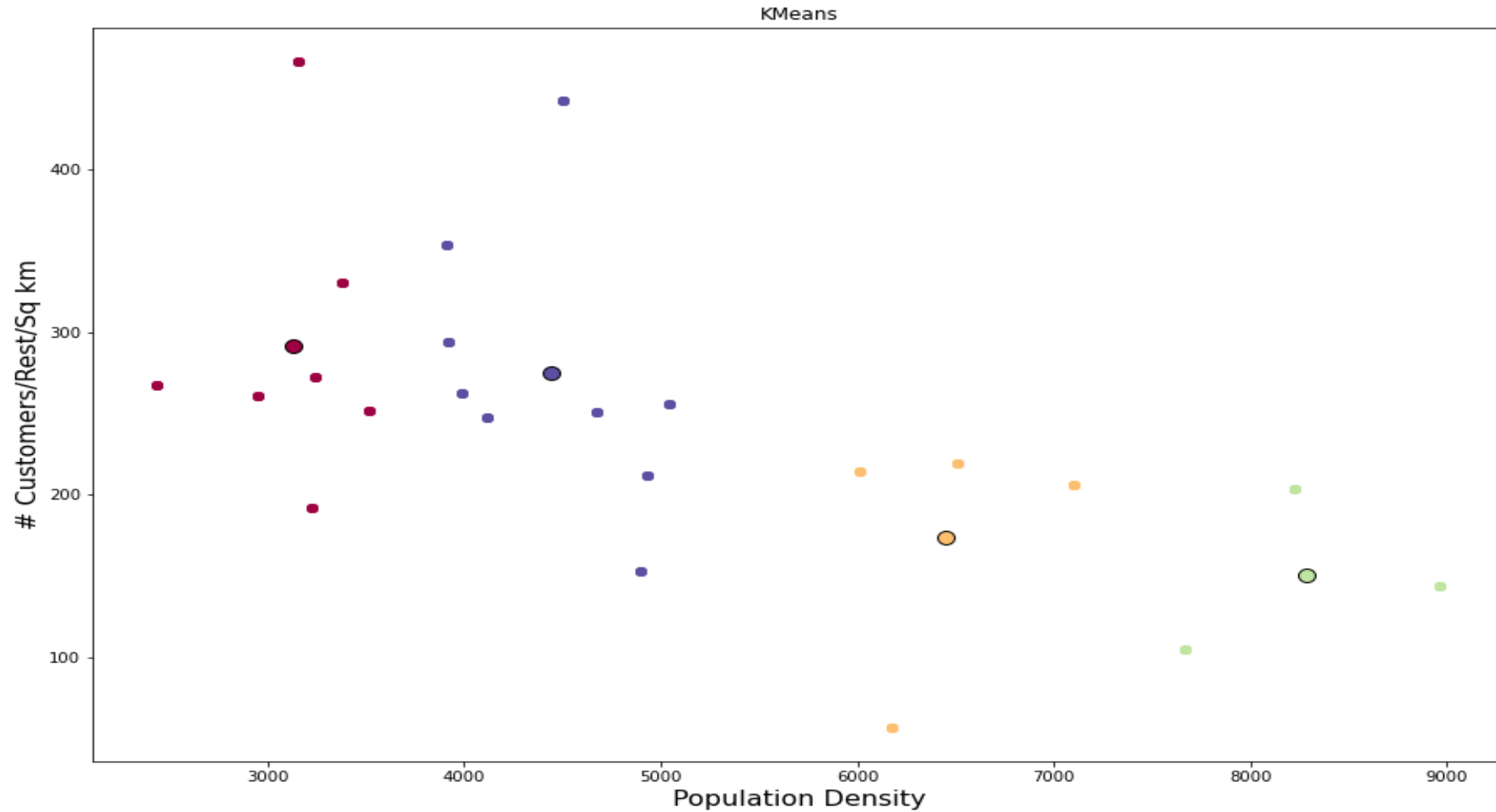
# Population Density and Customers per Restaurant



# K Means Clustering Including Outliers



# K Means Clustering Excluding Outliers





# Location of Candidate Wards



# 4 Candidate Wards

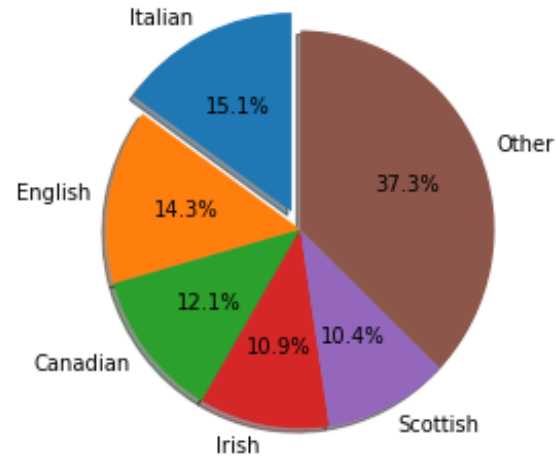
| Ward # | Cluster Labels | # of Food Service Businesses | Area (sq km) | Total - Age | People/sq km | rest_per_1000 | rest_per_sqkm | # Customers/Rest/Sq km |
|--------|----------------|------------------------------|--------------|-------------|--------------|---------------|---------------|------------------------|
| 2      | 1              | 253                          | 37.36        | 118020      | 3158.993576  | 2.143704      | 6.771949      | 466.482213             |
| 15     | 1              | 310                          | 30.30        | 102510      | 3383.168317  | 3.024095      | 10.231023     | 330.677419             |
| 17     | 2              | 249                          | 24.43        | 110080      | 4505.935325  | 2.261991      | 10.192386     | 442.088353             |
| 20     | 2              | 312                          | 28.20        | 110280      | 3910.638298  | 2.829162      | 11.063830     | 353.461538             |

► For the 4 Candidate Wards, let's investigate:

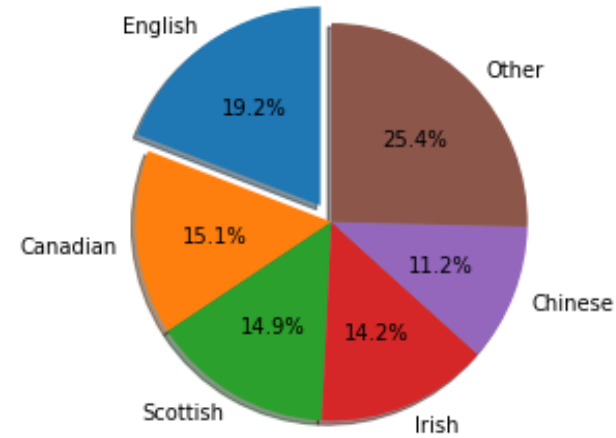
- Ward Ethnicity
- Ward Income Level
- Ward Population Growth
- Most Common Restaurant per Ward

# Candidate Ward Ethnicity

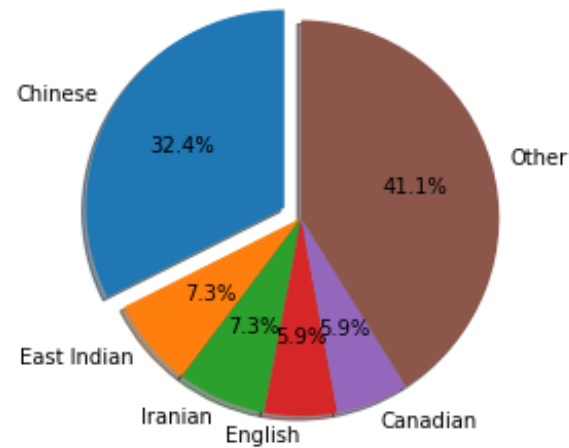
Ward 2 Top 5 Ethnicities



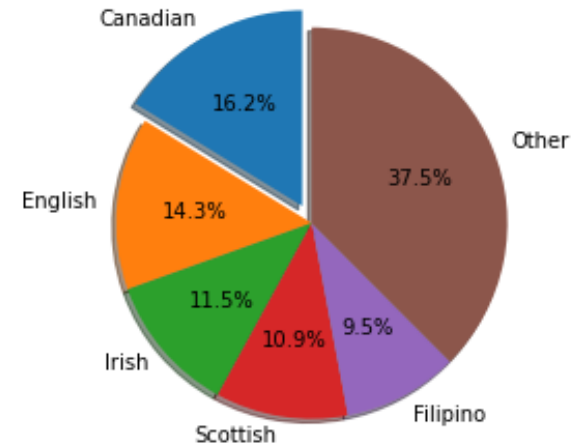
Ward 15 Top 5 Ethnicities



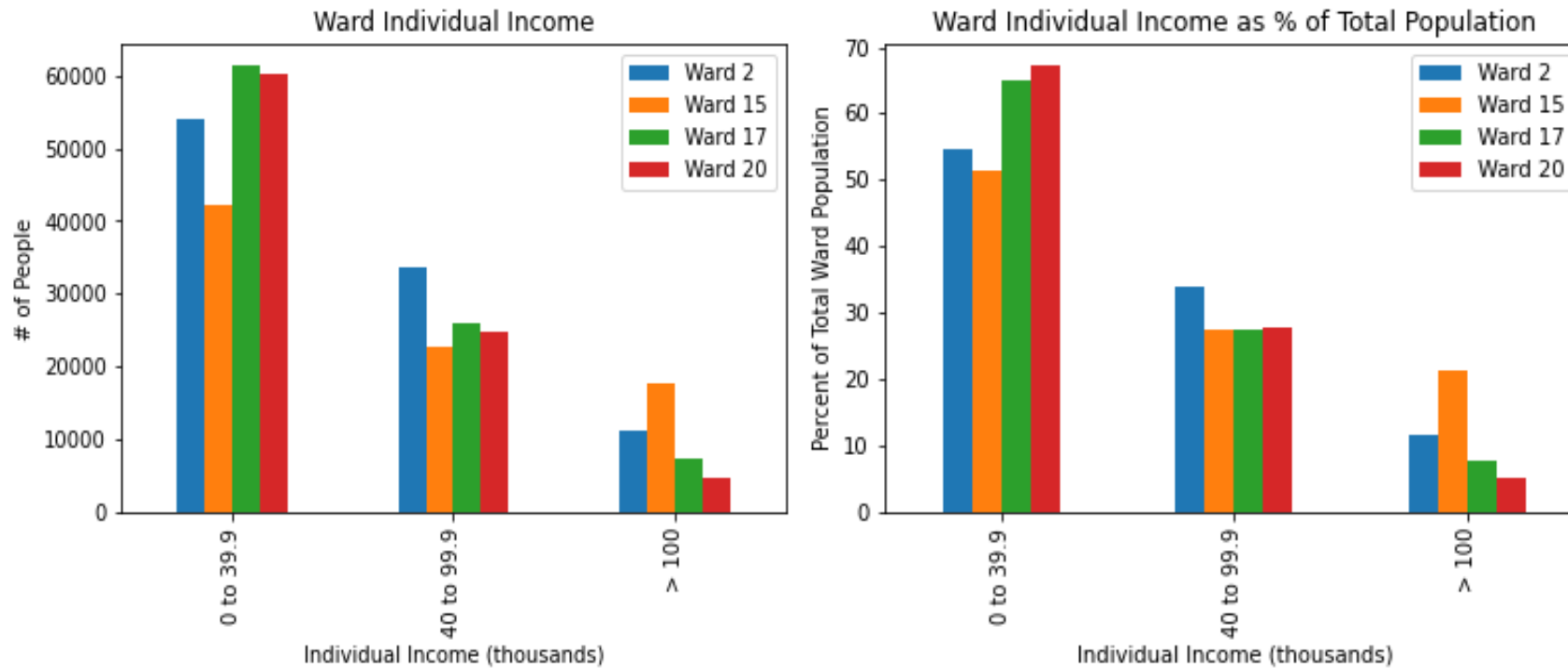
Ward 17 Top 5 Ethnicities



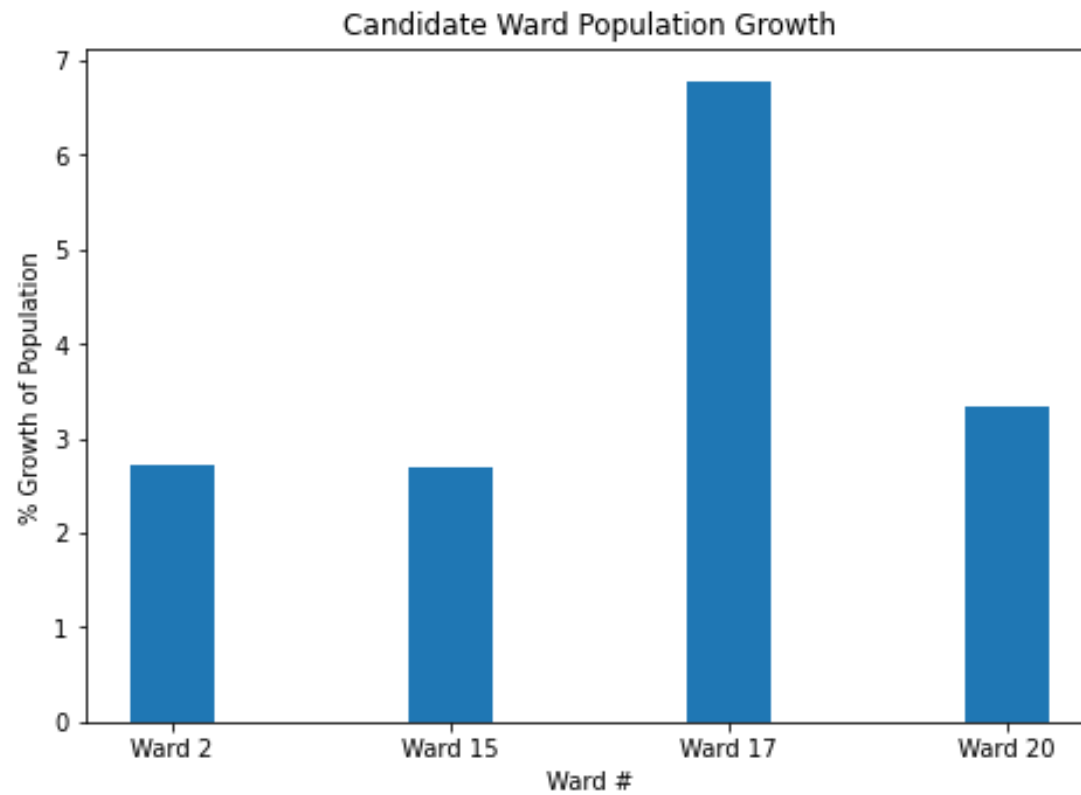
Ward 20 Top 5 Ethnicities



# Candidate Ward Individual Income



# Candidate Ward Population Growth



# Candidate Wards Most Common Venues

## -Ward 2---

| venue          | freq % |
|----------------|--------|
| Coffee Shop    | 11.0   |
| Bank           | 7.0    |
| Pharmacy       | 7.0    |
| Sandwich Place | 6.0    |
| Grocery Store  | 5.0    |
| Pizza Place    | 3.0    |
| Bakery         | 3.0    |
| Restaurant     | 3.0    |
| Beer Store     | 3.0    |
| Liquor Store   | 3.0    |

## -Ward 17---

| venue                     | freq % |
|---------------------------|--------|
| Coffee Shop               | 10.0   |
| Sandwich Place            | 6.0    |
| Bakery                    | 6.0    |
| Bank                      | 6.0    |
| Chinese Restaurant        | 6.0    |
| Pharmacy                  | 3.0    |
| Pizza Place               | 3.0    |
| Middle Eastern Restaurant | 3.0    |
| Japanese Restaurant       | 3.0    |
| Caribbean Restaurant      | 2.0    |

## -Ward 15---

| venue               | freq % |
|---------------------|--------|
| Italian Restaurant  | 6.0    |
| Coffee Shop         | 6.0    |
| Bakery              | 5.0    |
| Café                | 5.0    |
| Sushi Restaurant    | 4.0    |
| Ice Cream Shop      | 4.0    |
| Park                | 3.0    |
| Grocery Store       | 3.0    |
| Sporting Goods Shop | 3.0    |
| Burger Joint        | 2.0    |

## -Ward 20---

| venue                | freq % |
|----------------------|--------|
| Coffee Shop          | 9.0    |
| Sandwich Place       | 7.0    |
| Pizza Place          | 5.0    |
| Pharmacy             | 4.0    |
| Grocery Store        | 4.0    |
| Ice Cream Shop       | 4.0    |
| Fast Food Restaurant | 4.0    |
| Park                 | 4.0    |
| Discount Store       | 3.0    |
| Burger Joint         | 3.0    |

# Observations and Recommendation

|  | Pop Density per km | # Customers/Rest/Sq km | Ethnicities Greater Than 15% of Total Ward Population | Income Level | Population Growth | Most Common Restaurant                 |
|--|--------------------|------------------------|---|--------------|-------------------|--|
| Ward 2   | 3159               | 466                    | Italian   | Middle       | 2.71%             | Sandwich Place, Pizza Place            |
| Ward 15  | 3383               | 331                    | English, Canadian                                     | High         | 2.69%             | Italian Restaurant, Sushi Restaurant   |
| Ward 17  | 4506               | 442                    | Chinese   | Low to Mid   | 6.79%             | Sandwich Place, Chinese Restaurant     |
| Ward 20  | 3911               | 353                    | Canadian  | Low to Mid   | 3.33%             | Sandwich Place, Pizza Place, Fast Food |
| * City of Toronto average population density = 4,250       |                    |                        |   |              |                   |  |
| * City of Toronto average # Customers / Rest / Sq km = 188 |                    |                        |   |              |                   |  |
| * City of Toronto average Ward Population Growth = 4.46%   |                    |                        |   |              |                   |  |

- ▶ 2 Choices:
- ▶ Ward 15:
  - ▶ High Priced Restaurant
  - ▶ Italian and Japanese Restaurant
- ▶ Ward 17:
  - ▶ Mid Priced Restaurant
  - ▶ Chinese Restaurant

# Conclusion and Next Steps

- ▶ Found location by trying to maximize both population density and restaurant scarcity
- ▶ Wards selected are not saturated by too many restaurants
- ▶ Need to continue research to find specific locations (intersection or neighborhood) within wards
- ▶ Need to look into commercial rental prices in the wards for comparison of cost between wards
- ▶ Need to look at effect of cost of labor on decision about type of restaurant (preparing certain types of food may require more or less expensive workers)