Italian & Asian Gourmet (IAG) Restaurant Chain in Toronto

Andrija Mihoci

Motivation

⊡ Company aims expanding to a new city

⊡ Data science team supports management

⊡ Data on restaurants in Toronto

⊡ Priority: extracting sufficient and relevant information

Objectives

(i) Identifying restaurant clusters
  - ▶ Expansion strategy, city of Toronto
  - ▶ Economic and geographical data

(ii) Finding central interest areas
  - ▶ Three focal points - potential restaurant locations
  - ▶ Properties: location, connectivity, distance

Benefits

- ⊡ Enhancing customer experience: culinary variety
- ⊡ Finding precise locations of three potential restaurants
- ⊡ Supporting the IAG inter-culinary expansion strategy

Outline

1. Motivation   ✓
2. Data
3. Methodology
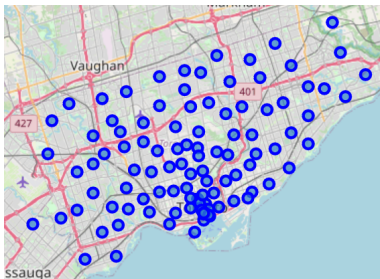4. Results & Discussion
5. Conclusion

Location Data

Figure 1: Neighborhoods in Toronto

Location Data

Postal Code	Latitude	Longitude
M3A	43.75	-79.33
M4A	43.73	-79.32
M5A	43.65	-79.36
M6A	43.72	-79.46
M7A	43.66	-79.39

Table 1: Selected neighborhoods in Toronto

Business Data

Restaurant Type	Attractiveness
Italian Restaurant	0.11
Japanese Restaurant	0.06
Sushi Restaurant	0.06
Indian Restaurant	0.06
Middle Eastern Restaurant	0.05

Table 2: Average proportion across 98 neighborhoods

Methodology

- ⊡ Cluster analysis, k nearest neighbors algorithm
- ⊡ Data matrix: attractiveness & geographical features, all neighborhoods
- ⊡ Neighborhood names important for area identification

Algorithm

- ⊡ Finding the best k (high-dimensional) data points in the data cloud, distance matrix
- ⊡ Iterative procedure, initialization repeated several times
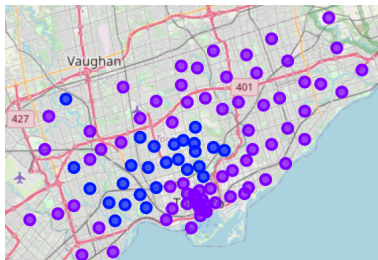- ⊡ Selecting k based on experience

Clusters

Figure 2: Restaurant clusters in Toronto

Attractiveness

Restaurant Type	Cluster 1	Cluster 2
Italian Restaurant	0.30	0.05
Japanese Restaurant	0.05	0.07
Sushi Restaurant	0.06	0.06

Table 3: Average attractiveness of restaurant types.
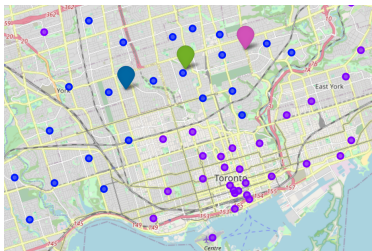
Focal Points

Figure 3: Identified focal points for IAG expansion in Toronto

Key Findings

- ⊡ Restaurant type: core Italian, flexible Japanese and/or Sushi
- ⊡ Clusters: Italian vs Asian restaurants
- ⊡ 3 Locations: Oakwood and Bayview Avenue, Avenue Road all 3 are connected to the Eglinton Avenue

Conclusion

(i) Identifying restaurant clusters   ✓
  - ▶ Expansion strategy, city of Toronto: Italian and Japanese/Sushi restaurant
  - ▶ Economic and geographical data: k-means clustering

(ii) Finding central interest areas   ✓
  - ▶ Three focal points/streets identified
  - ▶ Properties: locations connected, relatively short distance

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