

A New Coffee Shop in Toronto

A white ceramic coffee cup is centered in the frame, filled with a golden-brown liquid. Wisps of white steam rise from the surface of the coffee. The cup sits on a light-colored wooden surface. Scattered around the base of the cup are numerous dark brown coffee beans. The background is dark and out of focus.

The future owner of a Coffee Shop wants to find the **best location** for his activity in Toronto.

How to select it ?

We have to balance the **two constraints** :

- Find a neighborhood providing an interesting **flow of costumers**
- Without too much **competition**



The Data

- **Geographical data** (Neighborhood names, Postal Code Areas) from Wikipedia, and
- Geographical coordinates, from Google Maps API geocoding
- **Income data**, from the Canadian Government official page
- **Venues** information and location in Toronto, from Foursquare's database



Methodology : the correlation rating algorithm

Interesting areas should be where most Coffee Shops are implanted (but in the selected area we want to have as few as possible!)

We identify the elements characterising interesting areas, using correlations between the number of Coffee Shops, other venues, and the median income.

- We obtain a score for each Area (even where no or few Coffee Shops are present)*
- We sort the neighborhoods by their score*



Results

A few categories of venues have high correlations with the number of Coffee Shops and can be used to locate interesting areas.

Number of venues	0.897712
Number of Coffee shops	1.000000
Number of Cafés	0.679196
Total Bar-Pub	0.630347
Number of Breakfast places	0.271065
Total Restaurants	0.779615
Total dessert	0.456652
Number of Hotel	0.804377
Number of Art and Touristic places	0.745104
Number of Parks	0.216403

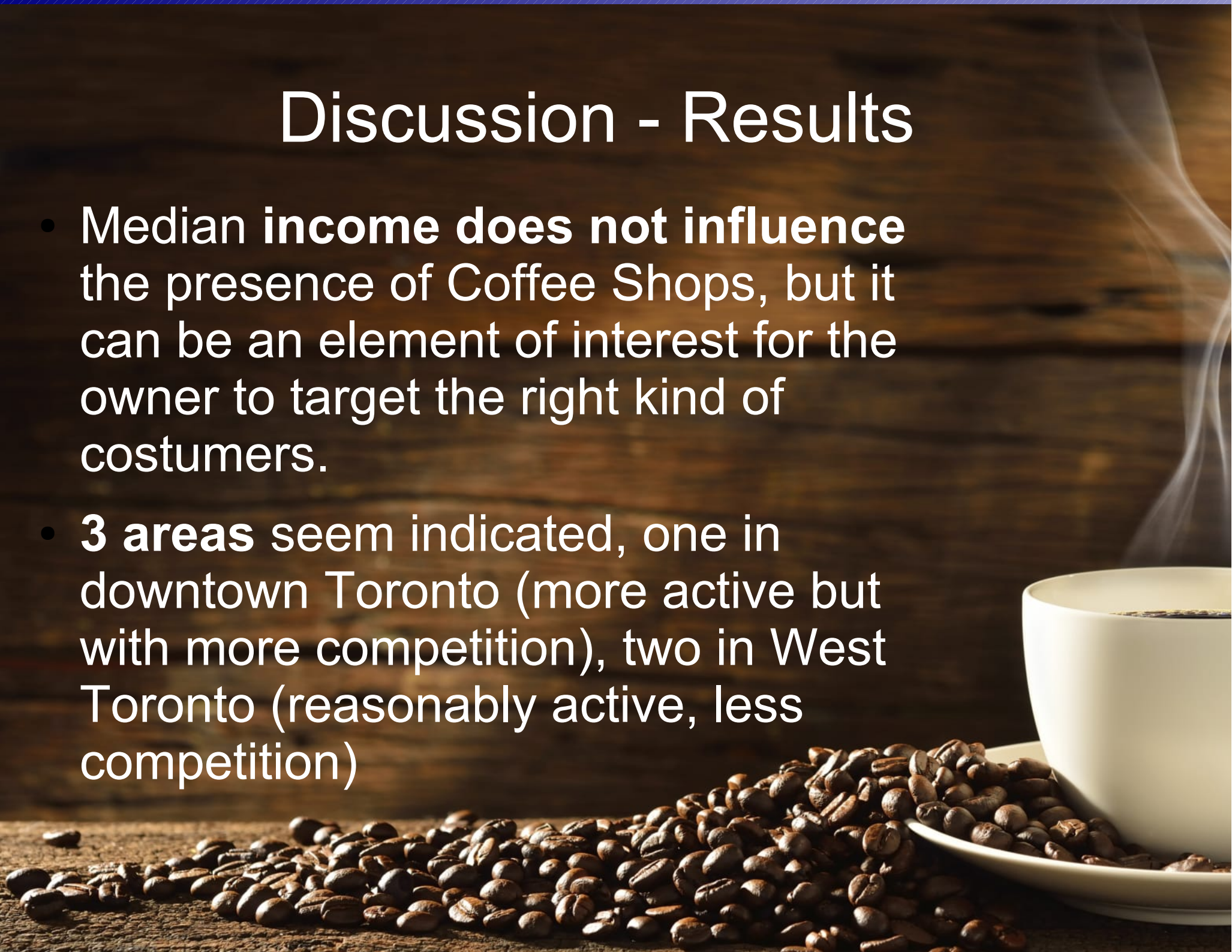
— We use the competition aversion index to penalize the presence of other Coffee Shops in the area.

Results : the list of best locations

Postal Code	Median income	Borough	Neighborhood	Latitude	Longitude	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	Number of venues	Neighborhood rating
M6P	38670	West Toronto	High Park, The Junction South	43.661608	-79.464763	Mexican Restaurant	Café	Bar	Thai Restaurant	Speakeasy	Bakery	Diner	25	0.463838
M5C	53420	Downtown Toronto	St. James Town	43.651494	-79.375418	Coffee Shop	Café	Restaurant	Cocktail Bar	Beer Bar	Gastropub	American Restaurant	85	0.442843
M6J	34260	West Toronto	Little Portugal, Trinity	43.647927	-79.419750	Bar	Coffee Shop	Restaurant	Asian Restaurant	Vietnamese Restaurant	Café	Men's Store	45	0.420575
M4Y	36530	Downtown Toronto	Church and Wellesley	43.665860	-79.383160	Coffee Shop	Japanese Restaurant	Gay Bar	Sushi Restaurant	Restaurant	Bubble Tea Shop	Hotel	75	0.395464
M5T	20270	Downtown Toronto	Kensington Market, Chinatown, Grange Park	43.653206	-79.400049	Bar	Café	Coffee Shop	Mexican Restaurant	Vegetarian / Vegan Restaurant	Vietnamese Restaurant	Bakery	74	0.375834
M5N	45600	Central Toronto	Roselawn	43.711695	-79.416936	Music Venue	Garden	Null	Null	Null	Null	Null	2	0.373946
M5S	30800	Downtown Toronto	University of Toronto, Harbord	43.662696	-79.400049	Café	Bookstore	Bar	Japanese Restaurant	Sandwich Place	Bakery	French Restaurant	34	0.373679
M5E	57340	Downtown Toronto	Berczy Park	43.644771	-79.373306	Coffee Shop	Cheese Shop	Farmers Market	Bakery	Seafood Restaurant	Restaurant	Beer Bar	55	0.355214
M5H	60250	Downtown Toronto	Richmond, Adelaide, King	43.650571	-79.384568	Coffee Shop	Café	Restaurant	Gym	Hotel	Clothing Store	Bar	100	0.342305
M6S	49460	West Toronto	Runnymede, Swansea	43.651571	-79.484450	Café	Coffee Shop	Sushi Restaurant	Pub	Pizza Place	Italian Restaurant	Gym	33	0.333591

Discussion - Results

- **Median income does not influence** the presence of Coffee Shops, but it can be an element of interest for the owner to target the right kind of costumers.
- **3 areas** seem indicated, one in downtown Toronto (more active but with more competition), two in West Toronto (reasonably active, less competition)



Discussion – The model

- The algorithm allows to find interesting areas, even if not yet identified by the market (no or few Coffee Shops present)
- Allows to factor in the stakeholder's aversion to competition
- Easily adaptable to other business or environment
- Could be made even more reliable by training over larger data sets, including other cities.

