

A NEW PIZZA RESTAURANT FOR TORONTO

Optimising Location Through Data

THE CHALLENGE

- Toronto is the most populous city in Canada.
- In 2016 the population was over 2.7m people.
- The maximum north-south distance in the city is 13 miles.
- East to West is 27 miles.
- There are 29 miles of waterfront.
- In order to focus down on a good location for a new restaurant many factors come into play.
- This presentation will consider two models of disruption with regard to siting a new restaurant based on data about current restaurant location and measures of popularity.

MODELS OF DISRUPTION

- Two models of disruption will be considered:
 1. Greenfield – where would a new pizza restaurant have the least competition?
 2. Disruption - Where is the competition weakest from current restaurants?
- In order to answer these two questions we will consider:
 - The density of restaurants across the city postcodes.
 - The current location of pizza restaurants within this competitive landscape.
- We will use Foursquare API to search for the density of all restaurants in each postcode.
- We will then use Foursquare API to show pricing, ratings and likes for each pizza restaurant.
- Finally we will cluster the restaurants and consider the interaction between location and popularity.

DATA FRAME OF RESTAURANT DENSITY BY POSTCODE

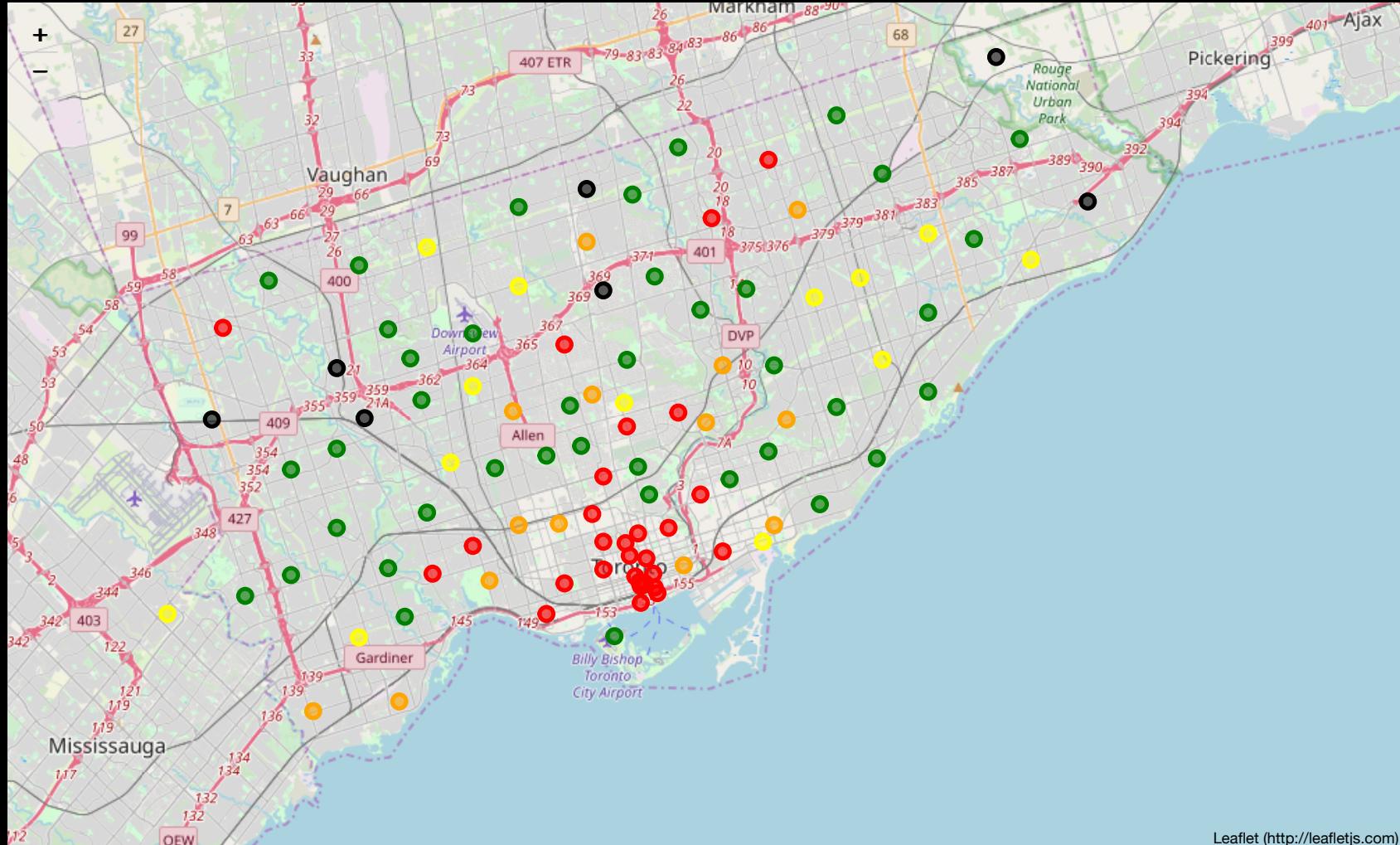
```
In [119]: pc_table_grouped.head()
```

Out[119]:

	Postcode	Borough	Neighbourhood	Latitude	Longitude	Number
0	M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353	2
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497	0
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711	10
3	M1G	Scarborough	Woburn	43.770992	-79.216917	5
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476	16

DENSITY OF RESTAURANTS BY POSTCODE

- Number within 500m of postcode.
- Black is zero
- Green is less than 10
- Yellow is less than 20
- Orange is less than 30
- Above 30 is red



Leaflet (<http://leafletjs.com>)

DATA FRAME OF PIZZA RESTAURANTS – PRICE TIER, RATING AND LIKES

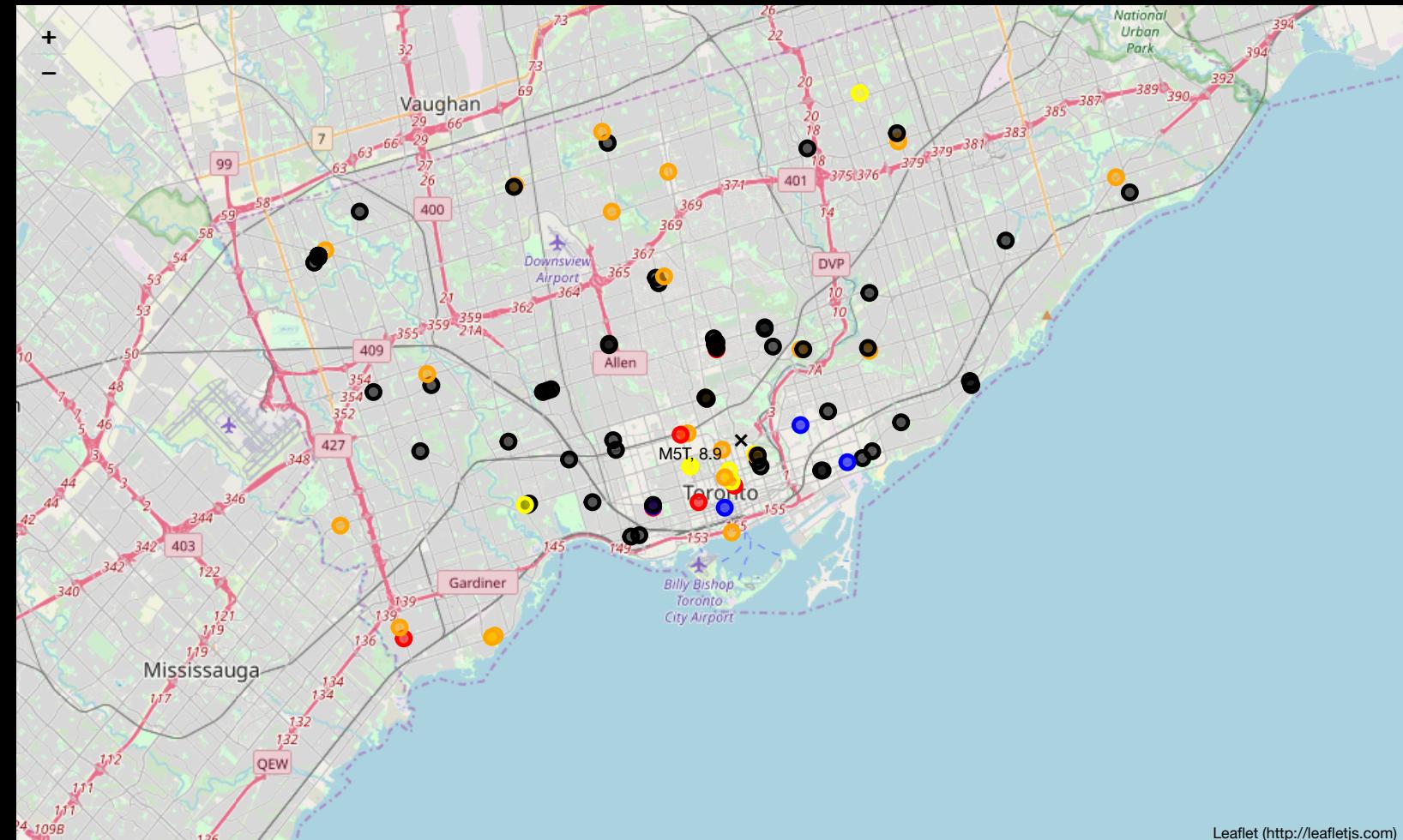
```
In [126]: #Write foodplaces_pizza to file to limit Foursquare use  
foodplaces_pizza.to_csv('foodplaces')  
foodplaces_pizza.head()
```

Out[126]:

	Postcode	Name	ID	Type	Price	Rating	Likes	Latitude	Longitude
6	M1E	Swiss Chalet Rotisserie & Grill	4b6074e3f964a5200fe729e3	Pizza	1	6.5	10	43.767697	-79.189914
11	M1E	A1 Pizza	58cb03605a5869277d557db0	Pizza	1	0.0	0	43.762176	-79.183076
33	M1J	Primo Pizza	4c97ad9238dd8cfa61bfe562	Pizza	1	0.0	0	43.744759	-79.244751
52	M1N	Enrico's Pizza	58e385043f5a5c5d21c557d1	Pizza	1	0.0	0	43.692887	-79.262425
55	M1N	Enricos Pizza	4bdf3db10ee3a5930a7533b0	Pizza	1	0.0	1	43.694003	-79.262701

PIZZA RESTAURANTS LOCATION AND RATINGS

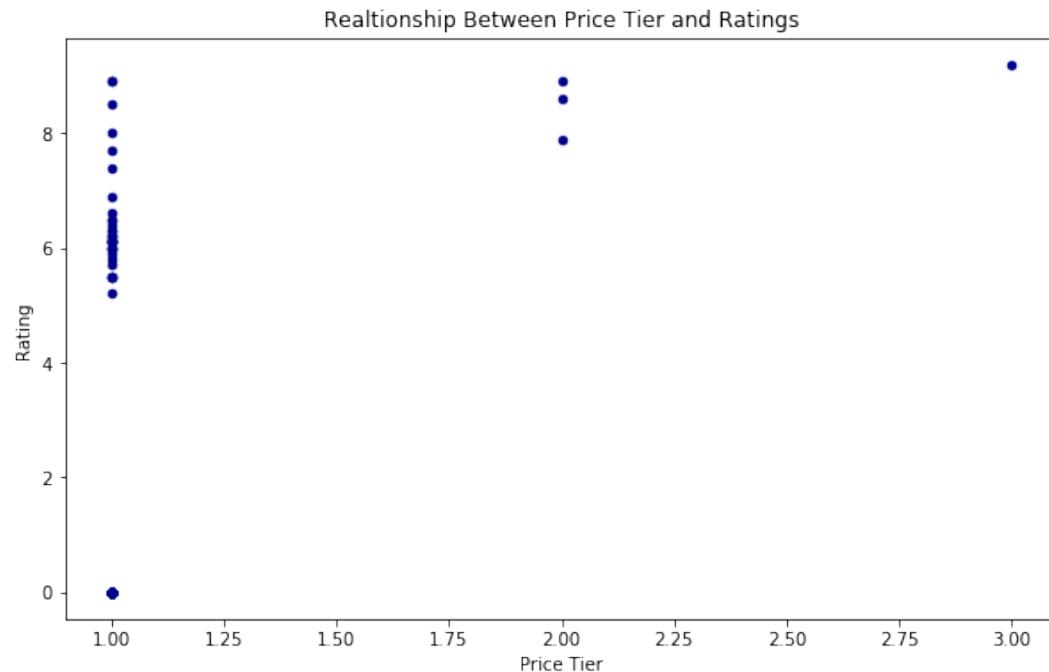
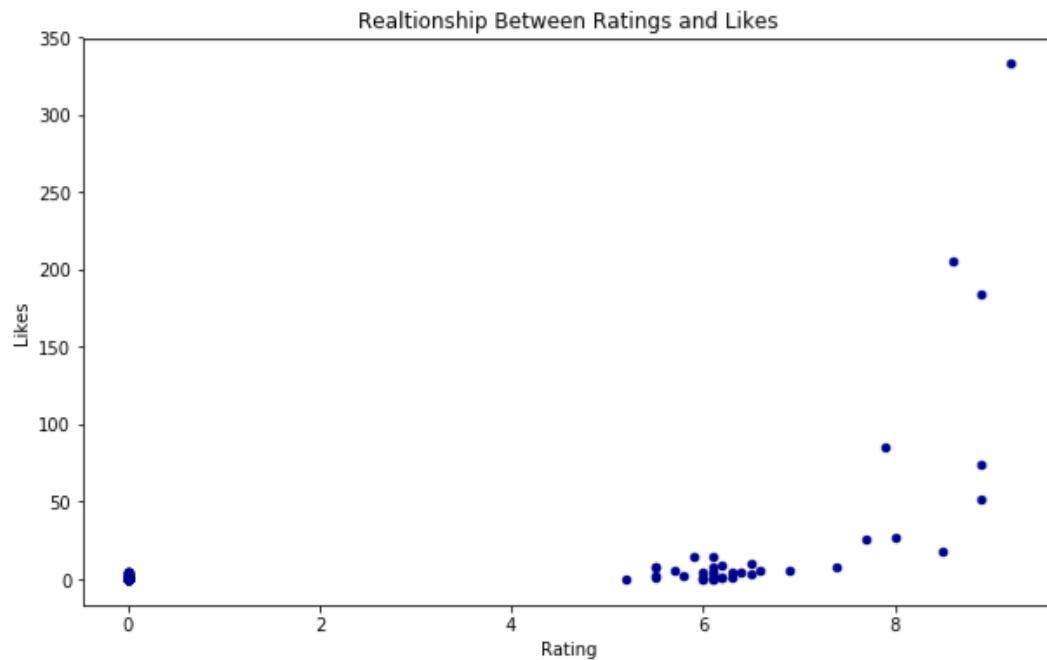
- Actual Pizza restaurant locations.
- Colours indicate pricing and ratings.
- All pricing is tier 1 (cheap) except for the blue dots which are tier 2.
- The black dots have no rating.
- Green, Yellow and Orange are 5, 6 and 7 ratings out of 10.
- Red are above 7 ratings.



Leaflet (<http://leafletjs.com>)

POPULARITY AND PRICE

- The relationship between ratings and likes is very non-linear.
- There is strong correlation between price and rating.
- This would indicate that the disruption strategy is well-founded and that quality competition could disrupt mediocre locations.

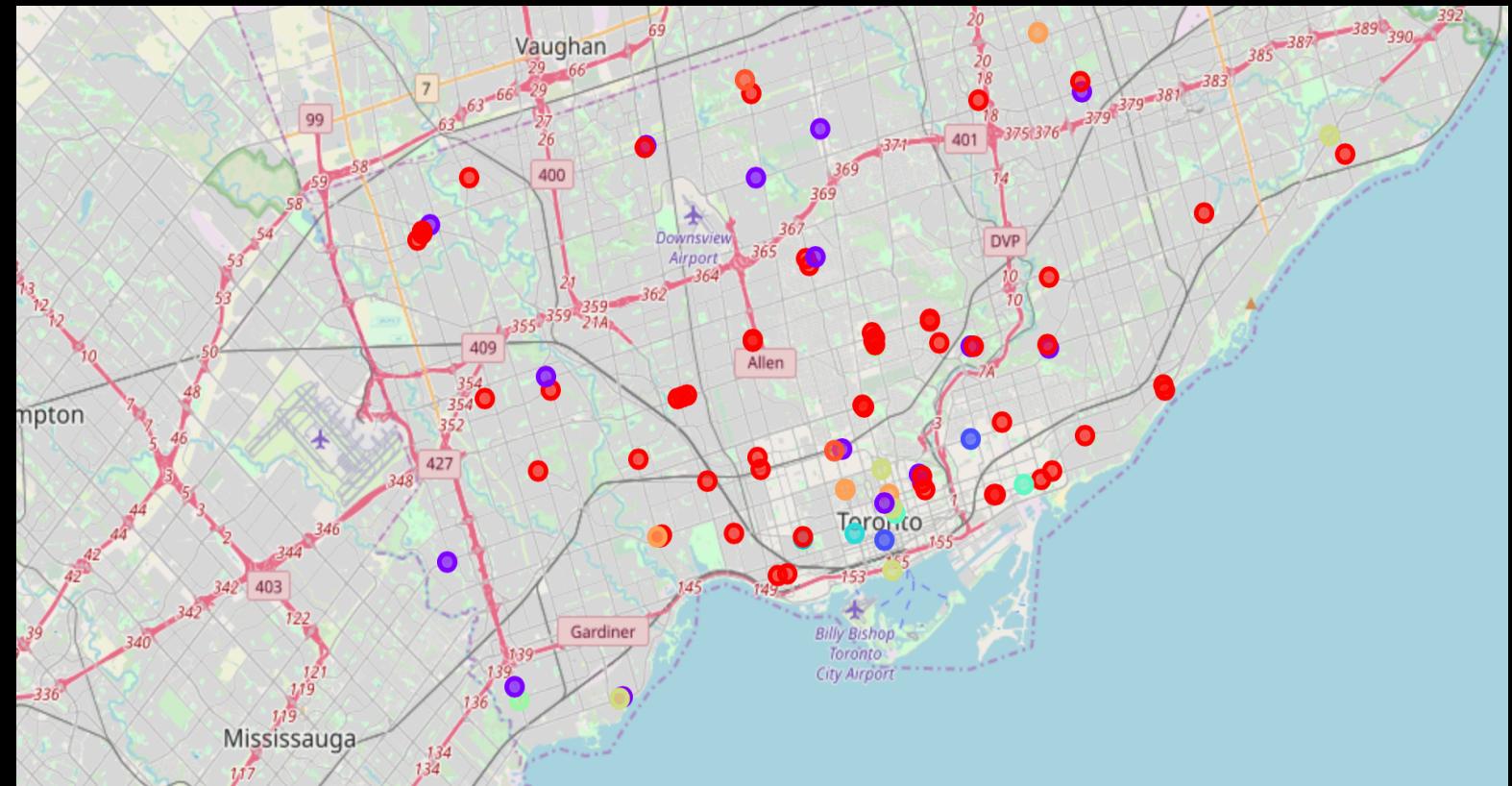


DATA FRAME OF PIZZA RESTAURANTS – CLUSTERS

Cluster Labels	Postcode	Name	ID	Type	Price	Rating	Likes	Latitude	Longitude
6	7	M1E Swiss Chalet Rotisserie & Grill	4b6074e3f964a5200fe729e3	Pizza	1	6.5	10	43.767697	-79.189914
11	0	M1E A1 Pizza	58cb03605a5869277d557db0	Pizza	1	0.0	0	43.762176	-79.183076
33	0	M1J Primo Pizza	4c97ad9238dd8cfa61bfe562	Pizza	1	0.0	0	43.744759	-79.244751
52	0	M1N Enrico's Pizza	58e385043f5a5c5d21c557d1	Pizza	1	0.0	0	43.692887	-79.262425
55	0	M1N Enricos Pizza	4bdf3db10ee3a5930a7533b0	Pizza	1	0.0	1	43.694003	-79.262701

CLUSTERED BY RATINGS AND LIKES

- If we cluster by ratings and likes into 10 clusters we see that the red and purple indicate a lot of zero rating and few likes.
- The variation in colour around downtown is due the the non-liberality we saw earlier in relation between ratings and likes.
- It is unsurprising that downtown and along the waterfront have the most purple and yellow.



CONCLUSIONS

- The analysis of price, ratings and likes indicates that higher pricing is acceptable for higher quality.
- Downtown and along the waterfront show the highest density of restaurants in general and concentration of higher quality. This area will be subject to high competition.
- Both the greenfield and the disruptive models appear to be viable:
 1. A high quality pizza restaurant located on the edge of downtown away from the waterfront would provide an opportunity to disrupt.
 2. There is a broadband of opportunity inland where the density for restaurants drops off and there are poorly performing locations.
- The next stage would be to overlay property cost values to assist in picking a location.