



# **DISTRIBUTION NETWORK OF CRAFT BEER FOR A START-UP**

# INTRODUCTION

- OUR CLIENT IS A STARTUP CRAFT BEER BREWER, THEY LOOK FOR A DISTRIBUTION NETWORK OF THEIR CRAFT BEER IN ONE OF THE AREA IN TORONTO. SINCE THE SUPPLY OF CRAFT BEER IS LIMITED, THEY WOULD LIKE TO FIND OUT THE MOST SUITABLE AREA TO MAXIMIZE THEIR PROFIT.
- CHALLENGE:
  - LIMITED SUPPLY AND “BEST TASTING PERIOD“
  - HIGH TARGET SELLING PRICE (I.E. 60% MORE EXPENSIVE THAN BRANDED BEERS E.G. HEINEKEN, BUDWEISER),
  - SPECIAL FLAVOUR LIKE HERBS, SOURS, SALTY LEMON, ETC. (ASIAN FLAVOUR)



## REQUIREMENT FROM CLIENT

- LOOK FOR AN AREA WITH LOTS OF BAR/PUBS/RESTAURANTS
- AREA WITH ASIAN RESTAURANTS IS PREFERRED (CLIENT THINK THAT IT WOULD BE AN ADVANTAGE IF PEOPLE HAS EXPOSURE ON ASIAN CULTURE)
- PEOPLE ARE WILLING AND AFFORDABLE TO SPEND MONEY ON THE BEERS. (PRICEY RESTAURANTS)



# DATA ACQUISITION AND CLEANING

## ○ DATA SOURCE:

- FOURSQUARE DEVELOPER API
- [HTTPS://EN.WIKIPEDIA.ORG/WIKI/LIST\\_OF\\_POSTAL\\_CODES\\_OF\\_CANADA:\\_M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M) (LIST OF POSTAL CODES OF CANADA)
- [HTTP://COCL.US/GEOSPATIAL\\_DATA](http://cocl.us/geospatial_data) (LATITUDE AND LONGITUDE DATA)

## ○ WORKFLOW:

- EXTRACT THE LIST OF POSTAL CODES OF CANADA AND INCORPORATE LATITUDE AND LONGITUDE FROM URL
- GET THE NEARBY VENUE INFO VIA FOURSQUARE API
- FILTER OUT DESIRED VENUE
- GET THE VENUE DETAIL AND ANALYZE THE DATA



# AREAS AROUND TORONTO AND ITS LATITUDE AND LONGITUDE

	Postcode	Borough	Neighbourhood	Latitude	Longitude
0	M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917

- 103 RECORDS ARE GENERATED



# NEARBY VENUES IN AREAS AROUND TORONTO

	Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category	Venue ID	Category ID
0	Rouge, Malvern	43.806686	-79.194353	Images Salon & Spa	43.802283	-79.198565	Spa	4d669cba83865481c948fa53	4bf58dd8d48988d1ed941735
1	Rouge, Malvern	43.806686	-79.194353	Canadiana exhibit	43.817962	-79.193374	Zoo Exhibit	4c97975582b56dcb8320ebaa	58daa1558bbb0b01f18ec1fd
2	Rouge, Malvern	43.806686	-79.194353	Caribbean Wave	43.798558	-79.195777	Caribbean Restaurant	4b914562f964a520d4ae33e3	4bf58dd8d48988d144941735
3	Rouge, Malvern	43.806686	-79.194353	Staples Morningside	43.800285	-79.196607	Paper / Office Supplies Store	4bcb612d3740b713f0606265	4bf58dd8d48988d121951735

- 6833 RECORDS OF NEARBY VENUES
- INCLUDING VENUE CATEGORY, VENUE ID AND CATEGORY ID FOR FURTHER ANALYSIS



# VENUE DETAILS OF RESTAURANT AND BAR

Neighbourhood	Venue	Venue Latitude	Venue Longitude	Venue Category	Venue ID	Category ID	Target_Restaurant
Guildwood, Morningside, West Hill	House Of Wong	43.773841	-79.183125	Asian Restaurant	4c02f2350d0e0f4764ea019a	4bf58dd8d48988d142941735	Yes
Woburn	Govardhan Thal	43.767496	-79.228476	Indian Restaurant	4bd48a734e32d13a4254bf80	4bf58dd8d48988d10f941735	Yes
Woburn	Booster Juice	43.766159	-79.205821	Juice Bar	4de678298877a085f8ca16fe	4bf58dd8d48988d112941735	Bar
Woburn	Pho Dau Bo	43.761286	-79.225170	Vietnamese Restaurant	4b9be5d8f964a5200e3336e3	4bf58dd8d48988d14a941735	Yes
Woburn	A&W	43.761066	-79.225290	Fast Food Restaurant	5b0d6ad9f5e9d7002c6dbf16	4bf58dd8d48988d16e941735	No

- ONLY VENUES CONTAIN "RESTAURANT, DINER, BAR, BEER, PUB, BREWERY, LOUNGE" ARE SELECTED
- 3706 RECORDS OF TARGETED VENUES
- COLUMN OF "TARGET\_RETAURANT" CREATED TO INDICATE ASIAN RESTAURANT ("YES"), OTHER RESTAURANT ("No"), AND BAR
- VENUE CATEGORY, VENUE ID AND CATEGORY ID FOR FURTHER ANALYSIS



# K-MEAN CLUSTERING

Target_Restaurant Neighbourhood	Bar	No	Yes	Sum	Bar%	No%	Yes%	Yes_No_Ratio	Bar_Restaurant_Ratio	Cluster Labels
Cabbagetown, St. James Town	9	13	19	41	21.951220	31.707317	46.341463	1.461538	0.281250	0
Willowdale South	2	12	25	39	5.128205	30.769231	64.102564	2.083333	0.054054	0
Brockton, Exhibition Place, Parkdale Village	10	23	11	44	22.727273	52.272727	25.000000	0.478261	0.294118	1
Business Reply Mail Processing Centre 969 Eastern	14	18	10	42	33.333333	42.857143	23.809524	0.555556	0.500000	1
Chinatown, Grange Park, Kensington Market	11	23	8	42	26.190476	54.761905	19.047619	0.347826	0.354839	1
Christie	12	17	10	39	30.769231	43.589744	25.641026	0.588235	0.444444	1
Harbord, University of Toronto	13	22	5	40	32.500000	55.000000	12.500000	0.227273	0.481481	1
Studio District	11	16	13	40	27.500000	40.000000	32.500000	0.812500	0.379310	1
Dovercourt Village, Dufferin	19	18	7	44	43.181818	40.909091	15.909091	0.388889	0.760000	2
Little Portugal, Trinity	22	16	10	48	45.833333	33.333333	20.833333	0.675000	0.846154	2

- GROUP BY “NEIGHBOURHOOD” AND CALCULATE NUMBER OF BAR, ASIAN RESTAURANT AND OTHER RESTAURANT .
- USE K-MEANS CLUSTERING TO CATEGORIZE THE AREAS ( $K = 4$ )
- SELECT CLUSTER WITH BEST “BAR TO RESTAURANT RATIO” AND “ASIAN TO OTHER RESTAURANT RATIO”





# SCORING ON SELECTED AREAS (RESULT)

Target_Restaurant	Bar	No	Yes	Sum	Bar%	No%	Yes%	Yes_No_Ratio	Bar_Restaurant_Ratio	Cluster Labels	Rating	Price	Norm_Rating	Norm_Price	Scoring
Neighbourhood															
Little Portugal, Trinity	17	21	10	48	35.416667	43.750000	20.833333	0.476190	0.548387	0	8.606250	2.170213	1.000000	1.000000	2.000000
Christie	11	18	10	39	28.205128	46.153846	25.641026	0.555556	0.392857	0	8.253846	2.027027	0.667861	0.685946	1.353807
Studio District	12	19	9	40	30.000000	47.500000	22.500000	0.473684	0.428571	0	8.055000	1.975000	0.480449	0.571833	1.052282
Cabbagetown, St. James Town	9	17	15	41	21.951220	41.463415	36.585366	0.882353	0.281250	0	8.260976	1.714286	0.674580	0.000000	0.674580
Business Reply Mail Processing Centre 969 Eastern	9	23	10	42	21.428571	54.761905	23.809524	0.434783	0.272727	0	7.545238	2.000000	0.000000	0.626667	0.626667

- SEARCH VIA FOURSQUARE API AND CALCULATE THE MEAN OF “RATING” AND “PRICE” OF EACH SELECTED AREA
- NORMALIZED THE MEAN OF “RATING” AND “PRICE”
- NORM\_RATING + NORM\_PRICE AS SCORING
- RESULT: LITTLE PORTUGAL, TRINITY TO BE THE MOST SUITABLE AREA (I.E. PROPER BAR AND RESTAURANT RATIO, HIGHEST RATING AND PRICEY INDEX)



# CONCLUSION

- BY USING GEOGRAPHICAL DATA AND VENUE DETAILS VIA FOURSQUARE API, A SET OF DATA IS FORMED FOR ANALYSIS
- IDENTIFY TARGETED VENUES TO NARROW DOWN THE AREA OF STUDY
- EXTRACTED NECESSARY INFORMATION VIA FOURSQUARE FOR SCORING (I.E. RATING AND RICE INDEX)
- LITTLE PORTUGAL, TRINITY TO BE THE MOST SUITABLE AREA
  - MANY BAR AND RESTAURANT IN THIS AREA ← LARGER MARKET, PEOPLE ARE WILLING TO SPEND
  - HIGH RATIO OF ASIAN RESTAURANT ← HIGHER CHANCE THAT PEOPLE ACCEPT THE SPECIAL FLAVOUR OF CRAFT BEER
  - HIGH “PRICE” AND “RATING” INDEX IN AVERAGE ← PRICEY RESTAURANT INDICATE THAT PEOPLE ARE WILLING TO SPEND MONEY ON BAR / RESTAURANT, AND PROBABLY ON THE PRICEY CRAFT BEER
- FOR DEEPER ANALYSIS, WE COULD FURTHER STUDY THE VENUE DETAILS FROM FOURSQUARE (E.G. MENU, COMMENT)

