VENUE RECOMMENDATION

- A CONTENT BASED RECOMMENDATION APPROACH USING FOURSQUARE PLACES API DATA

Venue recommendation can be leveraged by both users and businesses alike

Being able to predict what a person will like based what he has liked in the past is powerful

- Explorers can make the best of their time in a new place by visiting the places they like.
- Businesses can proactively provide more personalized services to customers.
- Businesses can forge and leverage business partnerships based on the profiles of regular customers.

Data Sources and pre-processing

- The primary source of data for this project is Foursquare Places API
- The following Foursquare Places API Endpoints have been used
  - Venues->explore
  - Users->lists
  - Lists->Details
- Data scraping and cleansing to only retain relevant features like Venue Name, Location details, Venue Categories and Neighborhood.
- Remove Venue Categories that are not necessary.

Understand the user in focus by understanding what venues he has liked

- Retrieved the list of venues a user has liked from Foursquare
- Got the combined Venue Category list from the users liked venues and the venues to rank
- Create a user profile by finding the weight of each Venue category in the list.

	Value
American Restaurant	1
Bakery	2
Bank	0
Café	0
Cantonese Restaurant	0
Chiropractor	0
Coffee Shop	1
Cosmetics Shop	2
Department Store	1
Design Studio	1

Diner	1
Elementary School	1
Fried Chicken Joint	1
Gastropub	0
Greek Restaurant	1
Grocery Store	2
Gym	0
Halal Restaurant	1
Home (private)	2
Japanese Restaurant	0
Laundry Service	1
Mexican Restaurant	1
Nail Salon	1
Pharmacy	0

Pizza Place	2
Restaurant	0
Salon / Barbershop	1
Sandwich Place	1
School	1
Seafood Restaurant	1
Shopping Mall	1
Southern / Soul Food Restaurant	1
Supermarket	1
Sushi Restaurant	0
Tea Room	0
Thai Restaurant	0
Theme Park Ride / Attraction	1
Wings Joint	1
Yoga Studio	0

Prepare the data to rank the venues in the area of interest

- Retrieved the list of venues in the area of interest from Foursquare
- Got the combined Venue Category list from the users liked venues and the venues to rank
- Create a feature matrix that contains each Venue in the list of venues to rank.

VenueId	American Restaurant	Bakery	Bank	Café	Cantonese Restaurant	Chiropractor	Coffee Shop	Cosmetics Shop	Department Store	Design Studio	Dir
52b1e6a8498e43e8f94b4b25	0	0	0	1	0	0	0	0	0	0	
526ecc2b498edb771548d405	0	0	0	0	0	0	0	0	0	0	
4bee9a19e8c3c92897d89892	0	0	0	0	0	1	0	0	0	0	
4af379edf964a52002ee21e3	0	0	0	0	0	0	0	0	0	0	
4b0dc067f964a5206b4f23e3	0	0	0	0	0	0	0	0	0	0	

Use Content based recommendation strategy to assign scores to the venues

- Performed matrix calculations to achieve a single score for each venue based on the user profile
- Drop all venues that have a score = 0
- Retain only the top N recommendations if the list is very large

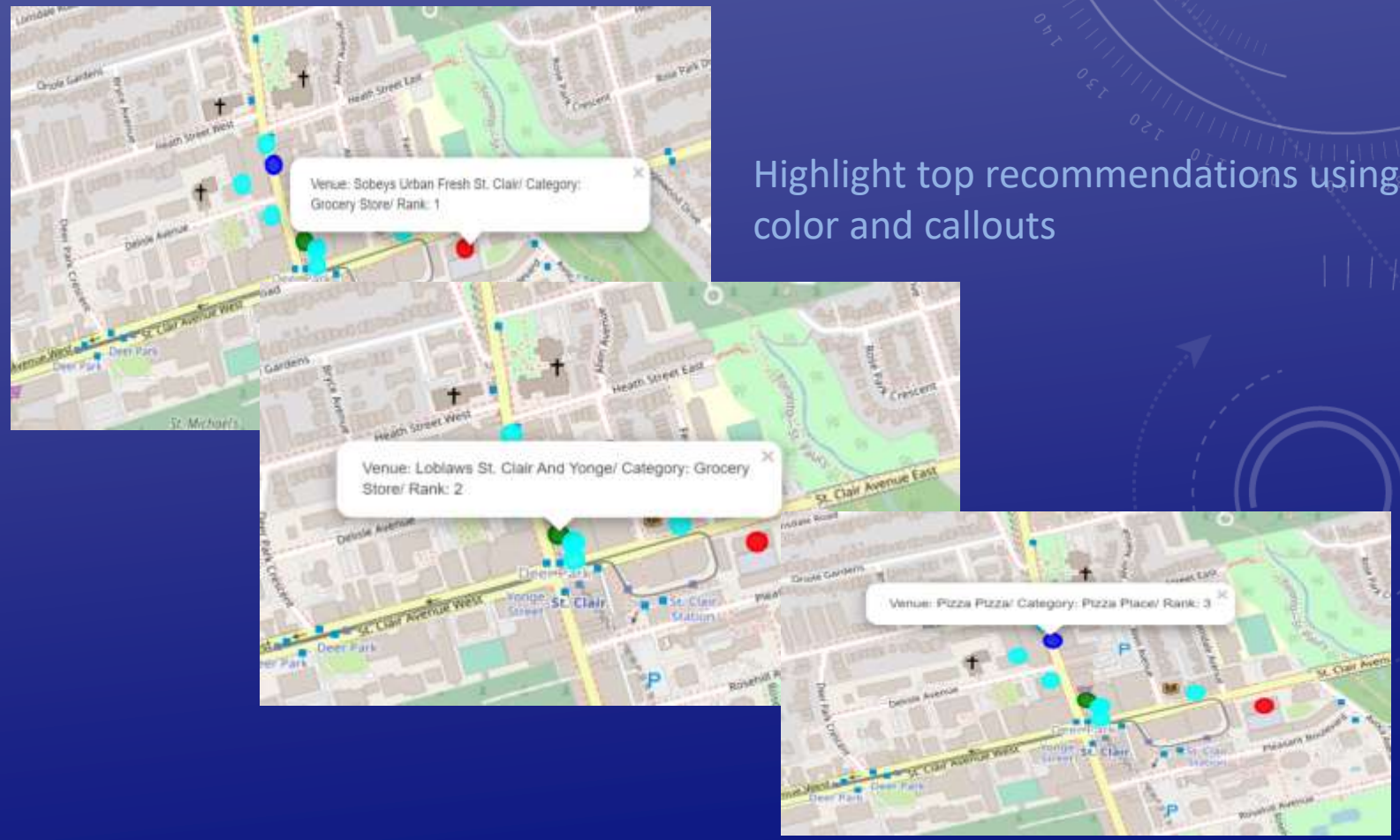
```
VenueId
5be9d391d41bb700391ae899    0.064516
4b50d181f964a520853327e3    0.064516
4aea3276f964a52019ba21e3    0.064516
4c1863af4ff90f47f2670e49    0.064516
4c02943e0d0e0f475549019a    0.032258
4adf0a84f964a5203a7721e3    0.032258
4ae71ecef964a5209ea821e3    0.032258
4af5d177f964a52042fd21e3    0.032258
588d1d78a149261a47e1236d    0.032258
4b4b8601f964a5201c9f26e3    0.032258
4ade2eeff964a520b07321e3    0.032258
Name: Score, dtype: float64
```

Present the data back …

Use a simple list to provide venue details along with the rank

	Neighborhood	VenueId	Venue	Venue Latitude	Venue Longitude	Venue Category	Score
0	Eaton Center, Toronto, ON	4aea3276f964a52019ba21e3	Sobeys Urban Fresh St. Clair	43.688479	-79.390769	Grocery Store	0.064516
1	Eaton Center, Toronto, ON	5be9d391d4f1bb700391ae899	Loblaws St. Clair And Yonge	43.688569	-79.394034	Grocery Store	0.064516
2	Eaton Center, Toronto, ON	4c1863a14ff90f4752670e49	Pizza Pizza	43.689555	-79.394657	Pizza Place	0.064516
3	Eaton Center, Toronto, ON	4b50d1011f964a520853327e3	Loblaws	43.688484	-79.393781	Grocery Store	0.064516
4	Eaton Center, Toronto, ON	4eda2eeff964a520b07321e3	Starbucks	43.688467	-79.393891	Coffee Shop	0.032258

Use maps to visualize venue locations



Highlight top recommendations using color and callouts

This is just the beginning, opportunities for enhancement are limitless..

- This model uses Venue categories as a feature, but a more complete profile can be created using attributes that can be extracted from premium endpoints.
- The content-based recommendation approach is heavily dependent on historical likes and does not address new recommendations that a user could try. A collaborative filtering strategy can help address this issue.
- The model can be fine-tuned to focus on specific categories and areas of interest e.g. food, tourist attractions, etc.