



COFFEE SHOP RECOMMENDATION SYSTEM

PROBLEM

Our Problem to develop a recommender system that will help the restaurant manager to find the best suitable place to open a Coffee Shop.



INTRODUCTION



Toronto is the provincial capital of Ontario with estimated population of 6,341,935.



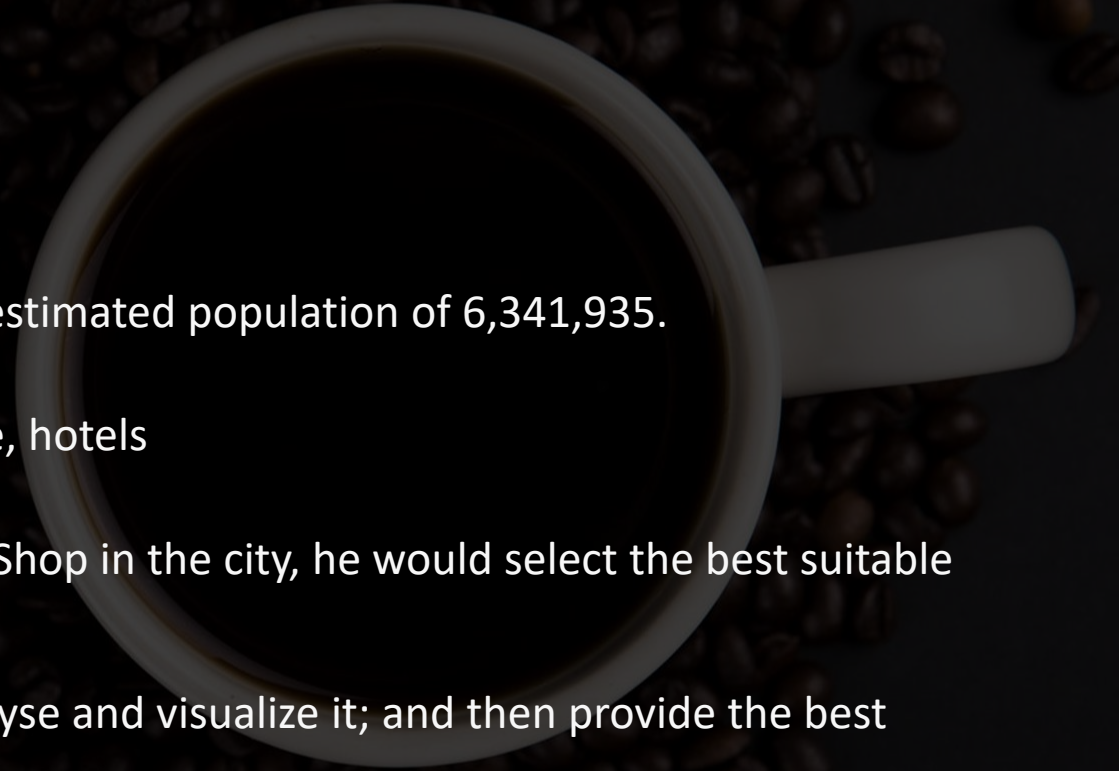
The city has many restaurants, coffee shops, cafe, hotels



Therefore, if someone decides to open a Coffee Shop in the city, he would select the best suitable place for the shop.



This recommender system will get the data, analyse and visualize it; and then provide the best place to open a shop or restaurant.



QUESTIONS THAT SHOULD BE ANSWERED?

Which place is the most suitable and popular for the Coffee Shop?

What type of Coffee should be provided? What type is preferred by people in that area?

What type of people live in that area (students, company employees, etc)?

How many similar shops are present in that area?

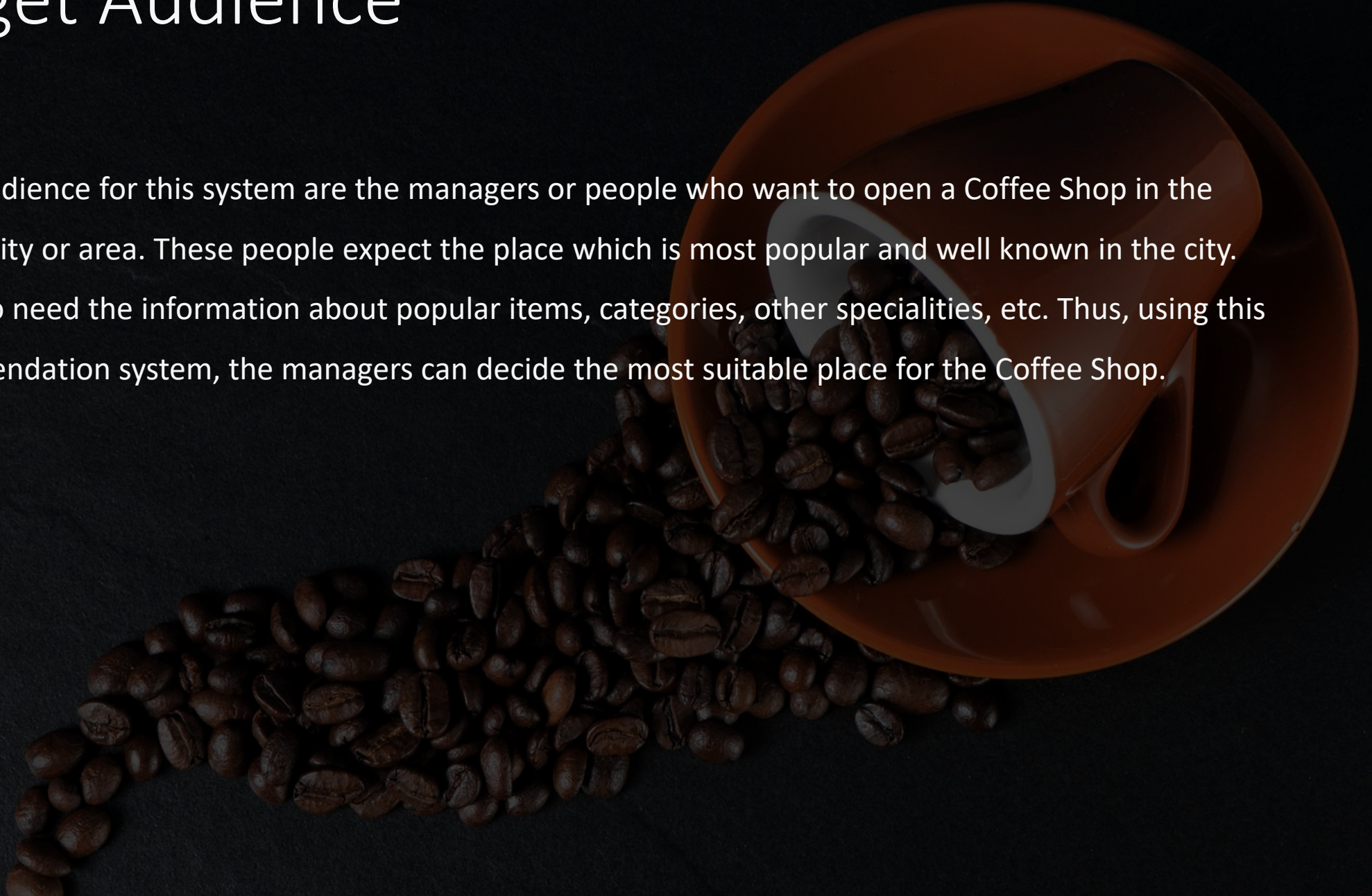
What other specialities should be provided to attract customers?

What should be the cost of the Coffee provided?



Target Audience

Target audience for this system are the managers or people who want to open a Coffee Shop in the specific city or area. These people expect the place which is most popular and well known in the city. They also need the information about popular items, categories, other specialities, etc. Thus, using this recommendation system, the managers can decide the most suitable place for the Coffee Shop.



DATA

Required Data :

Geographical coordinates of the area

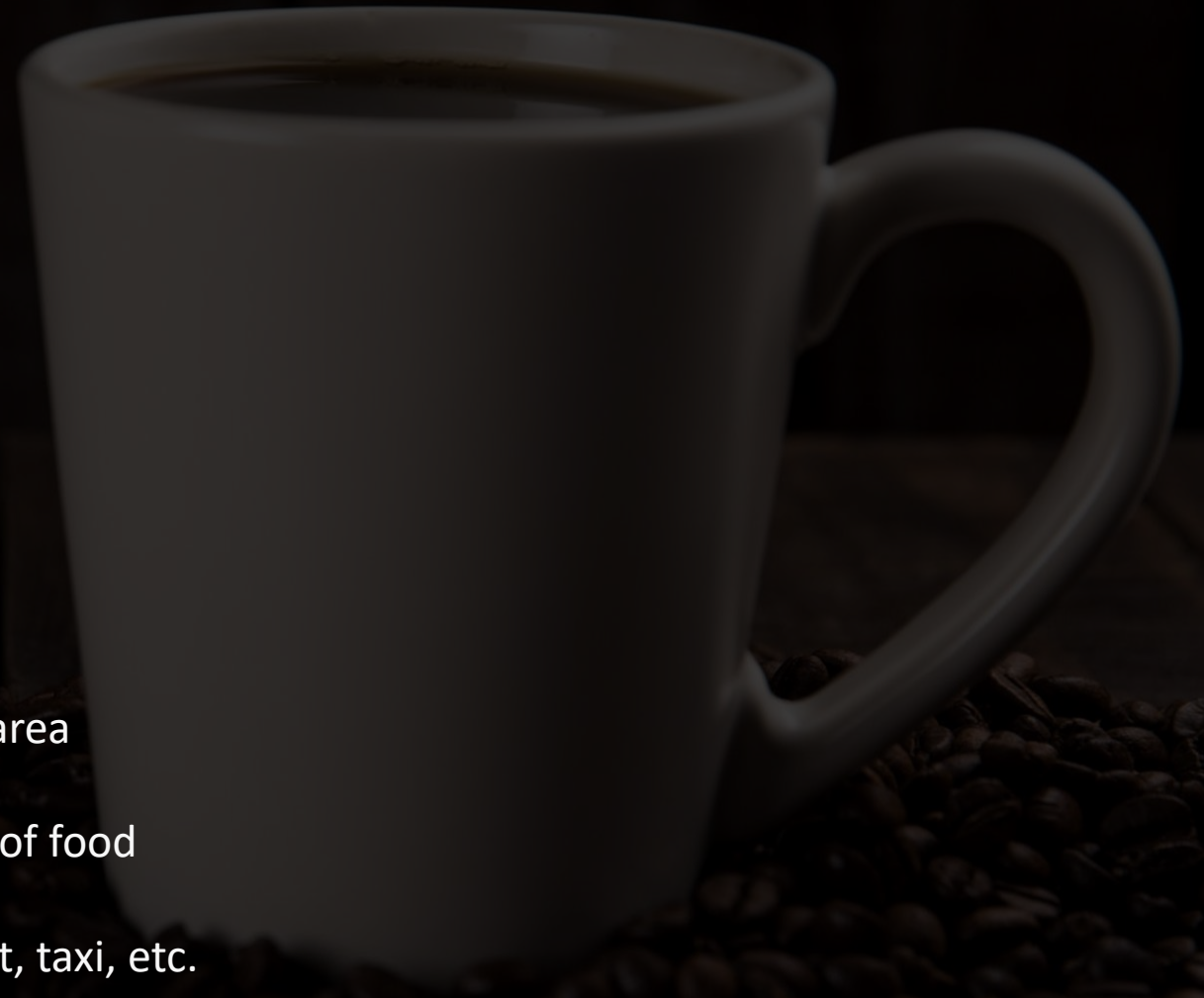
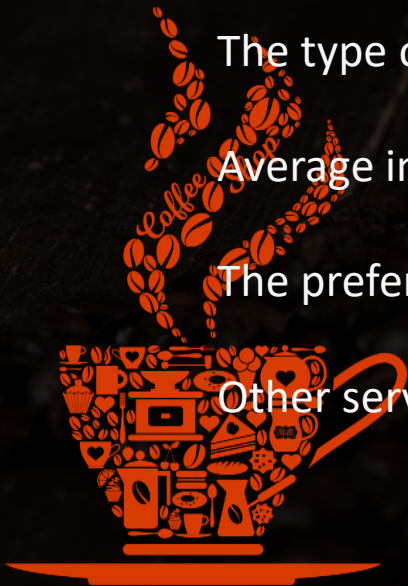
The population of the neighbourhood

The type of people in the neighbourhood

Average income of the people nearby that area

The preference of people towards the type of food

Other service details such as juice, transport, taxi, etc.



Data Collection

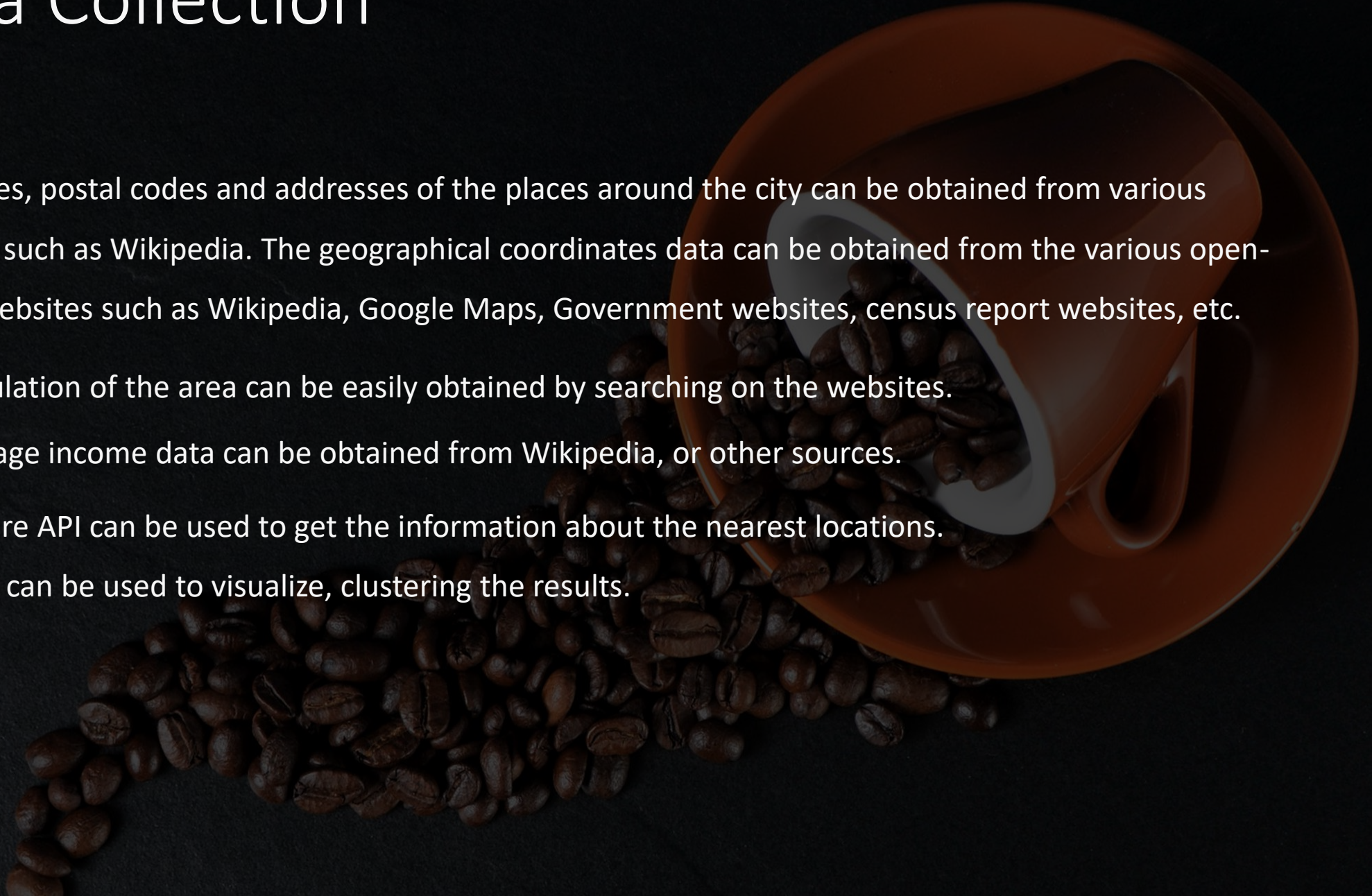
The names, postal codes and addresses of the places around the city can be obtained from various websites such as Wikipedia. The geographical coordinates data can be obtained from the various open-source websites such as Wikipedia, Google Maps, Government websites, census report websites, etc.

The population of the area can be easily obtained by searching on the websites.

The average income data can be obtained from Wikipedia, or other sources.

Foursquare API can be used to get the information about the nearest locations.

This data can be used to visualize, clustering the results.



METHODOLOGY

Following Steps were followed –

- Get the data of neighbourhood of Toronto
- Use the pandas HTML table scripting method for scraping
- Get the latitude and longitude .
- Match areas with coordinates
- Visualize the map of Toronto using Folium package
- Get list of top nearest places using Foursquare API
- Select category as Coffee Shop
- By analysing the result final results were obtained.



Initial Data

```
[3]:
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	Postal code	Borough	Neighborhood
0	M1A	NaN	NaN
1	M2A	NaN	NaN
2	M3A	North York	Parkwoods
3	M4A	North York	Victoria Village
4	M5A	Downtown Toronto	Regent Park / Harbourfront

Matching Venues and coordinates

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[33]:
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	Postal code	Borough	Neighborhood	Latitude	Longitude
0	M1B	Scarborough	Malvern / Rouge	43.806686	-79.194353
1	M1C	Scarborough	Rouge Hill / Port Union / Highland Creek	43.784535	-79.160497
2	M1E	Scarborough	Guildwood / Morningside / West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476



RESULT

MAP



RESULT

TABLE CLUSTER - 0

	Neighborhood	Coffee Shop	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
25	Richmond, Adelaide, King	0.083333	0	43.650571	-79.384568	Dineen @CommerceCourt	43.648251	-79.380127	Coffee Shop
25	Richmond, Adelaide, King	0.083333	0	43.650571	-79.384568	Starbucks	43.646731	-79.383951	Coffee Shop
25	Richmond, Adelaide, King	0.083333	0	43.650571	-79.384568	M Square Coffee Co	43.651218	-79.383555	Coffee Shop
25	Richmond, Adelaide, King	0.083333	0	43.650571	-79.384568	Bulldog On The Block	43.650652	-79.384141	Coffee Shop
25	Richmond, Adelaide, King	0.083333	0	43.650571	-79.384568	HotBlack Coffee	43.650364	-79.388669	Coffee Shop
...
0	Berczy Park	0.103448	0	43.644771	-79.373306	Starbucks	43.644489	-79.368639	Coffee Shop
13	Garden District, Ryerson	0.110000	0	43.657162	-79.378937	Hailed Coffee	43.658833	-79.383684	Coffee Shop
13	Garden District, Ryerson	0.110000	0	43.657162	-79.378937	Tokyo Smoke	43.657230	-79.380870	Coffee Shop
13	Garden District, Ryerson	0.110000	0	43.657162	-79.378937	Balzac's Coffee	43.657854	-79.379200	Coffee Shop
13	Garden District, Ryerson	0.110000	0	43.657162	-79.378937	Second Cup	43.656027	-79.380575	Coffee Shop

83 rows × 9 columns

RESULT

TABLE CLUSTER - 1

	Neighborhood	Coffee Shop	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
38	University of Toronto, Harbord	0.029412	1	43.662696	-79.400049	Elchi Chai Shop	43.662695	-79.404652	Coffee Shop

RESULT

TABLE CLUSTER - 2

	Neighborhood	Coffee Shop	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category	
21	North Toronto West, Lawrence Park						43.715590	-79.400450	Coffee Shop	
		Neighborhood	Coffee Shop	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
21	North Toronto West, Lawrence Park	0.117647	2	43.715383	-79.405678	Starbucks	43.715590	-79.400450	Coffee Shop	
21	North Toronto West, Lawrence Park	0.117647	2	43.715383	-79.405678	Tim Hortons	43.714894	-79.399776	Coffee Shop	
4	Central Bay Street	0.184615	2	43.657952	-79.387383	Starbucks	43.659509	-79.382132	Coffee Shop	
4	Central Bay Street	0.184615	2	43.657952	-79.387383	The Library Specialty Coffee	43.654413	-79.390902	Coffee Shop	
4	Central Bay Street	0.184615	2	43.657952	-79.387383	Coffee Public	43.660763	-79.386184	Coffee Shop	
...	
4	Regent Park, Harbourfront	0.148936	2	43.654260	-79.360636	Arvo	43.649963	-79.361442	Coffee Shop	
4	Regent Park, Harbourfront	0.148936	2	43.654260	-79.360636	Sumach Espresso	43.658135	-79.359515	Coffee Shop	
...	Regent Park, Harbourfront	0.148936	2	43.654260	-79.360636	Rooster Coffee	43.651900	-79.365609	Coffee Shop	
...	Queen's Park, Ontario Provincial Government	0.218750	2	43.662301	-79.389494	Starbucks	43.658204	-79.388998	Coffee Shop	
24	Commerce Court, Victoria Hotel	0.130000	2	43.648198	-79.379817	Tim Hortons	43.646862	-79.382544	Coffee Shop	
68 rows x 9 columns										
24	Regent Park, Harbourfront	0.148936	2	43.654260	-79.360636	Sumach Espresso	43.658135	-79.359515	Coffee Shop	
24	Regent Park, Harbourfront	0.148936	2	43.654260	-79.360636	Rooster Coffee	43.651900	-79.365609	Coffee Shop	
23	Queen's Park, Ontario Provincial Government	0.218750	2	43.662301	-79.389494	Starbucks	43.658204	-79.388998	Coffee Shop	
7	Commerce Court, Victoria Hotel	0.130000	2	43.648198	-79.379817	Tim Hortons	43.646862	-79.382544	Coffee Shop	

68 rows × 9 columns

RECOMMENDATION

By analysing nearby venues, we can conclude that the cluster 1 does not have many Coffee shops in that areas. Thus, it would be suitable to select these locations for opening Coffee shops.

Therefore, locations like Rosedale, Roselawn , University of Toronto Harbord etc will be good to open a new Coffee Shop.

CONCLUSION

The recommender system correctly recommends the most suitable place to open a Coffee Shop. Thus, it can provide good results to the users of the system. The system can also be used as recommendation system for opening the restaurants, coffee shops, street food shop, etc. Using this method, the recommendation system for malls, theatres, shops can also be designed.

THANK YOU!

- Omkar Najan

