IBM CAPSTONE PROJECT – The Battle of Neighborhoods:

New Location for restaurant by Creppes and Waffles

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Business Problem

- The city of Bogotá, the capital district of Colombia. It is the center of business, economy and financial capital of Colombia. It is multicultural. It provides many business opportunities and a favorable business environment. It has attracted many players from different markets. It is a global center of business and commerce. The city is an important center of banking and finance, retail, world trade.

- This also means that the market is highly competitive. The cost of doing business is also one of the highest. Therefore, any new company or commercial expansion must be analyzed. The knowledge derived from the analysis will provide a good understanding of the business environment that will help to apply strategically to the market. This will help in risk reduction. And the return on investment will be reasonable
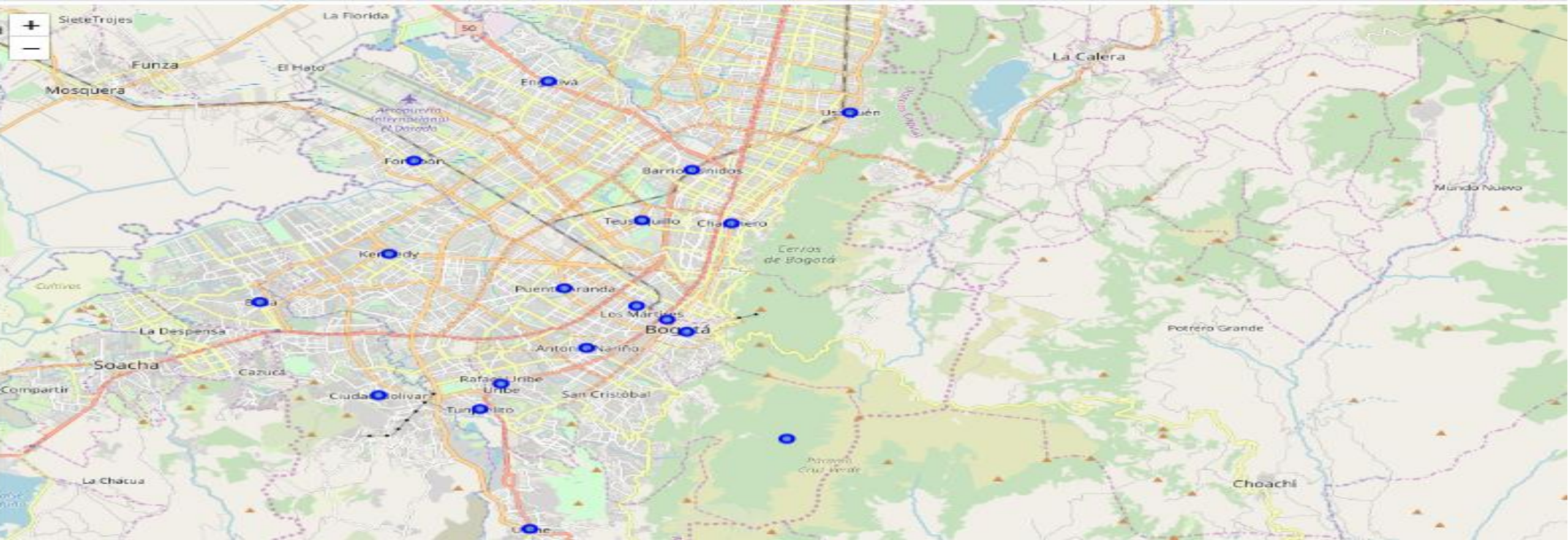
Business Problem section

- The Crepes and Waffles restaurant company. He has decided to open a new store to expand his market in the places of greater affluence of people of the executive or business environment, therefore, he needs to choose the correct location to install his new franchise, if he is successful, they can replicate the same in other situations . For this reason he has decided to invest in a technological solution that will allow him to know the best location of his next restaurant.

Methodology

- The Methodology area will portray the fundamental parts of our investigation and predication framework. The Methodology segment includes four phases:

- 1. Collecting Inspection Data

- 2. Exploring and Understanding Data

- 3. Data preparation and preprocessing

- 4. Analysis Data

- 5. Description of the best option

Data and Methodology

- Data: merging data on London properties and the relative price paid data from the HM Land Registry and data on amenities and essential facilities surrounding such properties from FourSquare API interface.

- Mehodology:

1. Collect Inspection Data;

2. Explore and Understand Data;

3. Data preparation and preprocessing;

4. Modeling

The capital district of Bogotá has 19 locations. To separate the locations and explore them, we will essentially need a set of data that contains the 19 locations that exist in the district, as well as the latitude and latitude coordinates of each neighborhood.
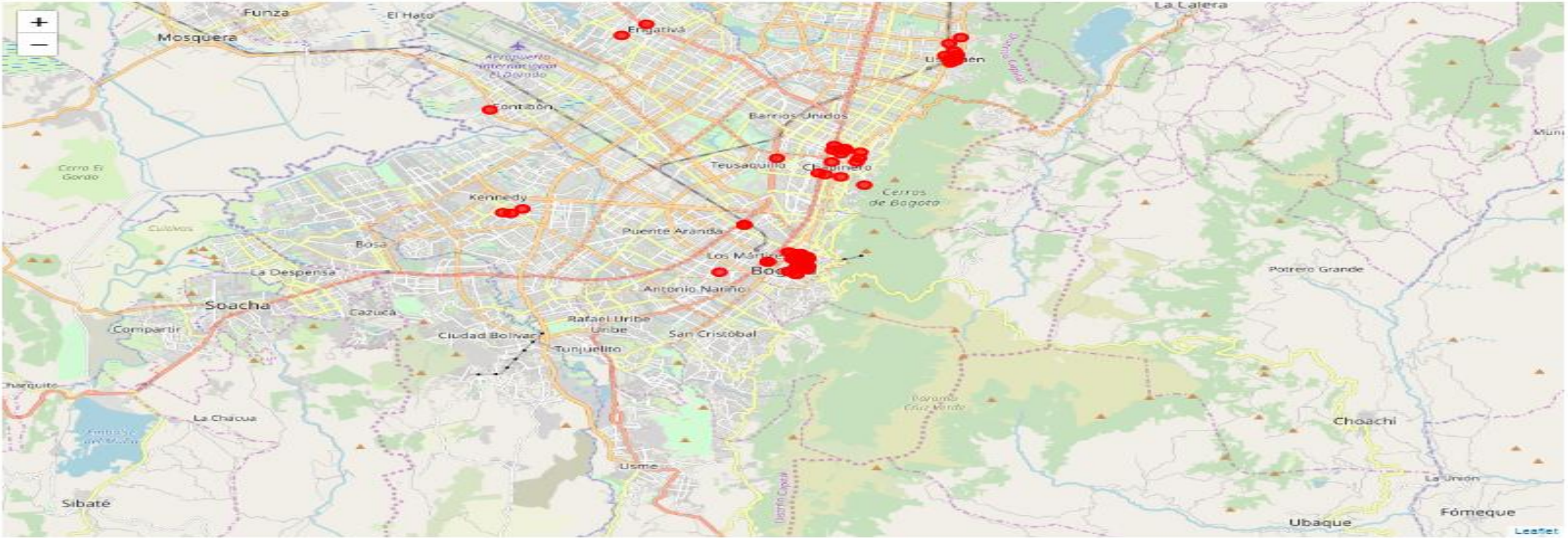
Information dataframe of the towns of Bogota with its latitude and longitude

	Localidades	Latitude	Longitude
0	Usaquén	4.694969	-74.031093
1	Chapinero	4.645377	-74.061943
2	Santa Fe (Bogotá)	4.602204	-74.078837
3	San Cristóbal (Bogotá)	4.548658	-74.047473
4	Usme	4.508155	-74.114328
5	Tunjuelito	4.562204	-74.127647
6	Bosa (Bogotá)	4.609913	-74.184710
7	Kennedy (Bogotá)	4.631582	-74.151319
8	Fontibón	4.673327	-74.144732
9	Engativá	4.708695	-74.109643
10	Suba	4.746565	-74.095228
11	Barrios Unidos (Bogotá)	4.669091	-74.072251
12	Teusaquillo	4.646410	-74.085441
13	Los Mártires	4.608375	-74.086538
14	Antonio Nariño (Bogotá)	4.589429	-74.099568
15	Puente Aranda	4.616071	-74.105433
16	La Candelaria	4.596515	-74.073492
17	Rafael Uribe Uribe (Bogotá)	4.573354	-74.122064
18	Ciudad Bolívar (Bogotá)	4.568230	-74.154055
19	Sumapaz (Bogotá)	4.219417	-74.159785

Restaurant dates

- Information regarding the restaurants located in Bogota is sought to determine the amount of restaurant, the type of restaurant, which will allow later to analyze where the location of the new restaurant. Use category id 4bf58dd8d48988d14e941735 to only get the American Restaurant

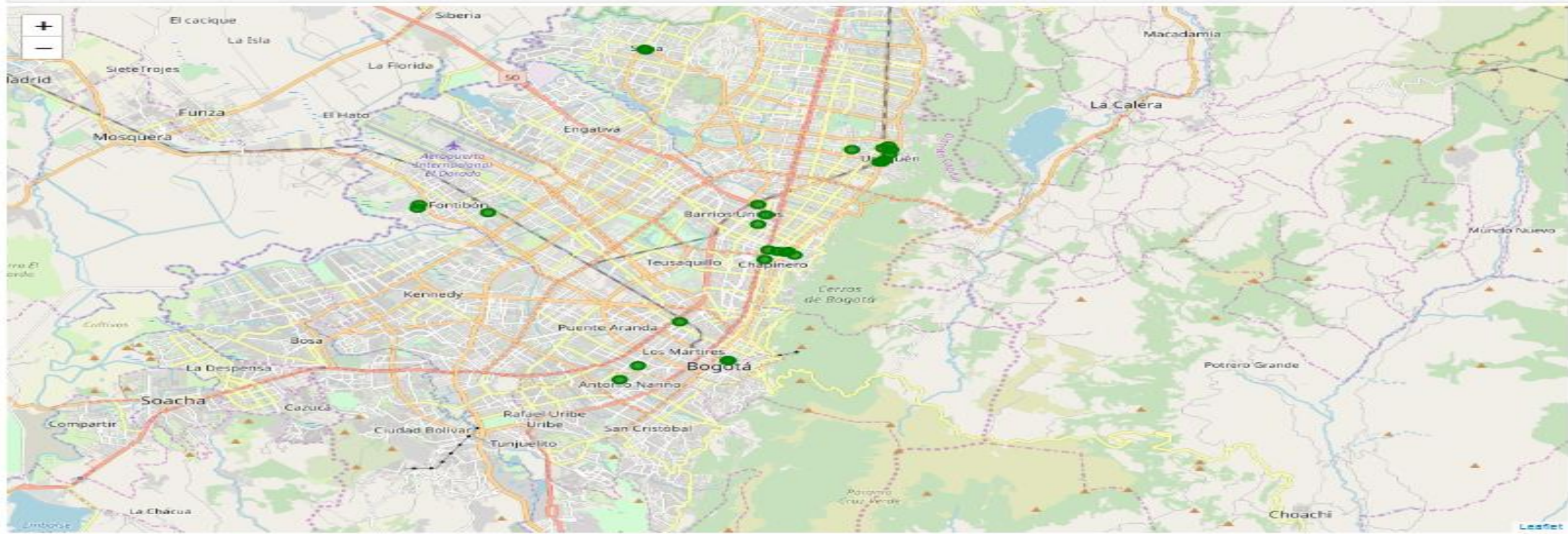|	Localidad	Localidad Latitude	Localidad Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Usaquén	4.694969	-74.031093	La Hamburgueseria	4.695310	-74.031716	Burger Joint
1	Usaquén	4.694969	-74.031093	Mister Ribs	4.695403	-74.030600	American Restaurant
2	Usaquén	4.694969	-74.031093	Rock 'N Stop	4.694666	-74.032456	American Restaurant
3	Usaquén	4.694969	-74.031093	Madison	4.695443	-74.030262	Burger Joint
4	Usaquén	4.694969	-74.031093	Enfuego	4.694105	-74.031857	New American Restaurant

Get a total of 74 restaurants in Bogota that is defined as the competition of the company with its latitude and longitude

Business Center Dates

- Information regarding the Business Center located in Bogota is sought to determine the amount of Business Center, which will allow later to analyze where the location of the new restaurant. Use category id 56aa371be4b08b9a8d573517 to only get the Bussiness Center

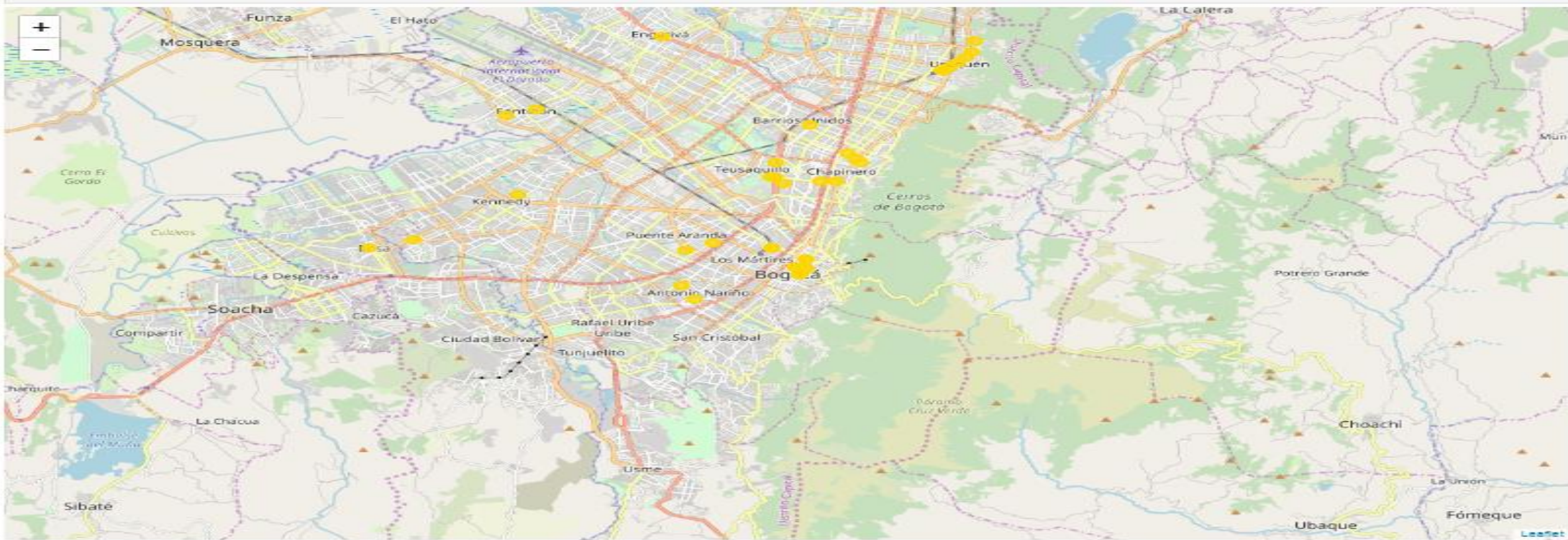|	Localidad	Localidad Latitude	Localidad Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Usaquén	4.694969	-74.031093	Flormorado	4.694266	-74.032539	Business Center
1	Usaquén	4.694969	-74.031093	Usaquén Plaza	4.696983	-74.031150	Shopping Mall
2	Usaquén	4.694969	-74.031093	Kaiwa Centro Empresarial	4.698918	-74.030767	Business Center
3	Usaquén	4.694969	-74.031093	Edwards Lifesciences Colombia	4.692951	-74.033920	Business Center
4	Usaquén	4.694969	-74.031093	Ignition Agencia BTL	4.699775	-74.032768	Business Center

Get a total of 27 Business Center in Bogota that is defined as the competition of the company with its latitude and longitude

Convention Center Dates

- Information regarding the Convention Center located in Bogota is sought to determine the amount of Convention Center, which will allow later to analyze where the location of the new restaurant. Use category id 4bf58dd8d48988d1ff931735 to only get the Convention Center

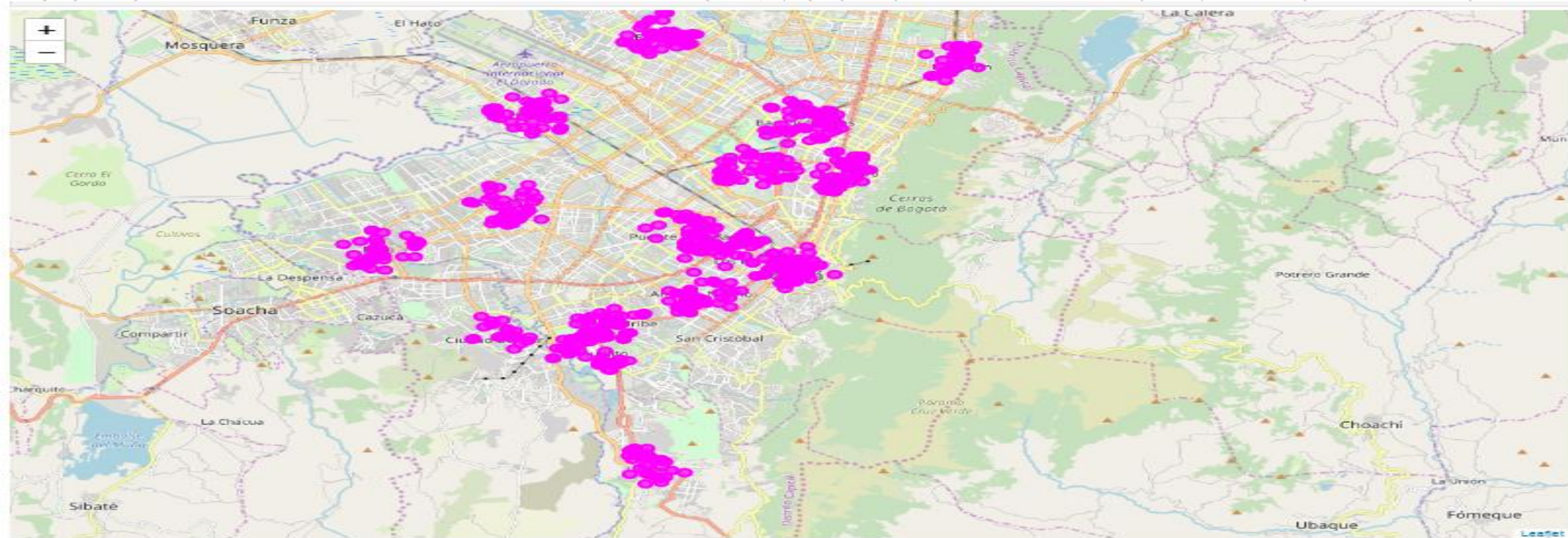|	Localidad	Localidad Latitude	Localidad Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Usaquén	4.694969	-74.031093	Centro Empresarial Paseo Real	4.697782	-74.029324	Convention Center
1	Usaquén	4.694969	-74.031093	AR	4.692235	-74.035281	Convention Center
2	Usaquén	4.694969	-74.031093	AR-centro de convenciones	4.692206	-74.035335	Convention Center
3	Usaquén	4.694969	-74.031093	Villa Santa Maria De Usaquen	4.695387	-74.031345	Meeting Room
4	Usaquén	4.694969	-74.031093	1ra Convención Crowdfunding Prodigy Network	4.693362	-74.033349	Convention Center

Get a total of 41 Convention Center in Bogota that is defined as the competition of the company with its latitude and longitude

Office Date

- Information regarding the office located in Bogota is sought to determine the amount of Convention Center, which will allow later to analyze where the location of the new restaurant. Use category id 4d4b7105d754a06375d81259 to only get the office

	Localidad	Localidad Latitude	Localidad Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Usaquén	4.694969	-74.031093	Bistronomy	4.695679	-74.030267	French Restaurant
1	Usaquén	4.694969	-74.031093	Centro Médico de la Sabana	4.696026	-74.031596	Doctor's Office
2	Usaquén	4.694969	-74.031093	Santa Ana Medical Center	4.696085	-74.032065	Doctor's Office
3	Usaquén	4.694969	-74.031093	Amazon Web Services	4.694108	-74.032392	Office
4	Usaquén	4.694969	-74.031093	Usaquén Plaza	4.696983	-74.031150	Shopping Mall

Get a total of 792 office in Bogota that is defined as the competition of the company with its latitude and longitude

Solution

The number per category corresponding to each location was found. with this, weighting the categories and establishing the best location for the next Crepes and Waffles restaurant

	Localidad	Latitude	Longitude	Restaurant	Business Center	Convention Center	Offices
0	Usaquén	4.694969	-74.031093	12.0	8.0	8.0	50.0
1	Chapinero	4.645377	-74.061943	15.0	6.0	5.0	50.0
2	Santa Fe (Bogotá)	4.602204	-74.078837	15.0	1.0	6.0	50.0
3	San Cristóbal (Bogotá)	4.548658	-74.047473	0.0	0.0	0.0	0.0
4	Usme	4.508155	-74.114328	0.0	0.0	0.0	31.0
5	Tunjuelito	4.562204	-74.127647	0.0	0.0	0.0	44.0
6	Bosa (Bogotá)	4.609913	-74.184710	0.0	0.0	2.0	39.0
7	Kennedy (Bogotá)	4.631582	-74.151319	3.0	0.0	1.0	43.0
8	Fontibón	4.673327	-74.144732	1.0	3.0	2.0	44.0
9	Engativá	4.708695	-74.109643	2.0	0.0	1.0	48.0
10	Suba	4.746565	-74.095228	5.0	2.0	1.0	47.0
11	Barrios Unidos (Bogotá)	4.669091	-74.072251	0.0	3.0	1.0	49.0
12	Teusaquillo	4.646410	-74.085441	1.0	0.0	4.0	47.0
13	Los Mártires	4.608375	-74.086538	3.0	1.0	1.0	43.0
14	Antonio Nariño (Bogotá)	4.589429	-74.099568	1.0	2.0	2.0	45.0
15	Puente Aranda	4.616071	-74.105433	0.0	0.0	2.0	47.0
16	La Candelaria	4.596515	-74.073492	16.0	1.0	5.0	50.0
17	Rafael Uribe Uribe (Bogotá)	4.573354	-74.122064	0.0	0.0	0.0	44.0
18	Ciudad Bolívar (Bogotá)	4.568230	-74.154055	0.0	0.0	0.0	22.0
19	Sumapaz (Bogotá)	4.219417	-74.159785	0.0	0.0	0.0	0.0

Solution

- When obtaining the score it is observed that the town of Usaquen is the best location in the district of Bogota when obtaining 108 points and the second neighborhoods united when obtaining 102 points.

	Localidad	Score
0	Usaquén	108.0
11	Barrios Unidos (Bogotá)	102.5
12	Teusaquillo	99.0
1	Chapinero	98.5
15	Puente Aranda	97.0
9	Engativá	95.5
2	Santa Fe (Bogotá)	95.0
14	Antonio Nariño (Bogotá)	94.0
8	Fontibón	93.0
16	La Candelaria	92.5
10	Suba	92.5
5	Tunjuelito	88.0
17	Rafael Uribe Uribe (Bogotá)	88.0
13	Los Mártires	85.5
7	Kennedy (Bogotá)	84.5
6	Bosa (Bogotá)	81.0
4	Usme	62.0
18	Ciudad Bolívar (Bogotá)	44.0
3	San Cristóbal (Bogotá)	0.0
19	Sumapaz (Bogotá)	0.0

Outcome:

- The stakeholder's problem is resolved. Stakeholder wants to find the best place to build a new restaurant in Bogota, and the factors of "best location" is based on the number of near restaurants, business centers, Convention Center, office category around the location. Stakeholder also provide his favourite list of place to work to further explain what the "best location" is. Content-based filtering ponderation technique is the most suitable method to resolve the problem. It combines stakeholder's preference in the city and profile to make the recommendation result

Thanks!