DATA DESCRIPTION

1 Use of the Foursquare API

In this project, the Foursquare API will be used to fetch the data about the veues (like restaurants, night clubs and parks) that exist around the main subway stations of the city of Sao Paulo. This phase will be similar to the work done in the previous weeks of the Casptone. As explaned in the Introduction, the subway stations will be used because they are simplier points of reference to tourists and newcomers when compared to the neighborhoods names. So, each one will become the central point of 500 meters radius circle.

The coordinates (latitude and logitude) of each station will be used in a Foursquare request to discover the venues that exist in a 500 meters radius. This process is show in the figures 1 and 2, using the Estacao Liberdade, one of the most famous subway stations in Sao Paulo, as an example. First, as show in the Figure 1 we use the Nominatim geocoder to retrieve the coordinates of the station. In sequence, as show in the Figure 2, we use these coordinates to retrieve the venues that are located in the desired radius.

Figure 1: Retrieving the Coordinates of Estacao Liberdade.

```
address = 'Estacao Liberdade Sao Paulo'

geolocator = Nominatim(user_agent = "myExplorer")

location = geolocator.geocode(address)

latitude = location.latitude
longitude = location.longitude

print('The geograpical coordinates of Estacao Liberdade - Sao Paulo are {}° and {}°.'.format(latitude, longitude))

    The geograpical coordinates of Estacao Liberdade - Sao Paulo are -23.5627171° and -46.6392845°.
```

Figure 2: Retrieving the Venues around Estacao Liberdade.

```
In [15]: liberdadeVenues = getNearbyVenues(names = namesList, latitudes = latitudeList, longitudes = longitudeList, radius = 500)

         liberdadeVenues.head(10)

Out[15]:
```

	Location	Latitude	Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Estacao Liberdade	-23.562717	-46.639285	Sukiya	-23.562227	-46.638883	Japanese Restaurant
1	Estacao Liberdade	-23.562717	-46.639285	Vila Itororó - Canteiro Aberto	-23.561751	-46.641022	Cultural Center
2	Estacao Liberdade	-23.562717	-46.639285	Paraty- RJ	-23.561243	-46.641310	Rest Area
3	Estacao Liberdade	-23.562717	-46.639285	EVS - Espaço Vida Saudável Herbalife	-23.564457	-46.639275	Tea Room
4	Estacao Liberdade	-23.562717	-46.639285	Lola Espaço da Beleza	-23.562928	-46.641887	Spa
5	Estacao Liberdade	-23.562717	-46.639285	Academia Kyokushin Liberdade	-23.562084	-46.638917	Martial Arts Dojo
6	Estacao Liberdade	-23.562717	-46.639285	Combu - Produtos da Amazônia	-23.562827	-46.641920	Food & Drink Shop
7	Estacao Liberdade	-23.562717	-46.639285	Bar do bezerra	-23.564884	-46.638773	Bakery
8	Estacao Liberdade	-23.562717	-46.639285	Smart Fit	-23.561014	-46.638630	Gym / Fitness Center
9	Estacao Liberdade	-23.562717	-46.639285	A.C. Camargo Cancer Center - Café Médicos	-23.565202	-46.637603	Coffee Shop

When the research is done to all considered regions, the resulting data about the venues will be subject to a clustering analysis, enabling us to discover the regions that are more similar to eah one and what categories of venues are more common in each of them. The final result of this process will be summarized as an relatory and a presentation, enabling it to be understood by the target audience.

2 Use of Other Sources of Data

When the clustering analyis is done, some geographical and social non-structured data will be consulted. These data will be used to provide a brief description of the regions of each cluster, enriching the final product that is delivered to the target audience. This process will help to provide a more in-depth contextualization about what the tourists and newcomers can expect in each cluster.

These data will be retrieved using two guides that were published about the neighborhoods in Sao Paulo. The first one was published by the magazine Veja Sao Paulo and presents the best neighborhood in each of the twenty-three categories that were considered, including shopping, happy hour, restaurants and beauty [1]. The other one was published by the company Tegra Developer and presents some information about each of Sao Paulo neighborhoods [2].

References

[1] VEJA SAO PAULO. The Best Neghborhoods of the City in 23 Categories. https://vejasp.abril.com.br/cidades/bairros-campeoes-sao-paulo/, 2017. Online; acessed 08 February 2020.

[2] TEGRA DEVELOPER. Neghborhoods Guide: Best Neighborhoods in Sao Paulo. https://www.tegraincorporadora.com.br/sp/guia-de-bairro/, 2020. Online; acessed 08 February 2020.