

Applied Data Science Capstone by IBM/Coursera

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Business problem

- The idea here is to explore the city trying to find the distribution of a particular business over the city, trying to find some gaps, which may help entrepreneurs to find places to start new business.
- We will demonstrate the solution with pharmacies. But you may notice that with just small changes, it will work with any sort of business.

Data

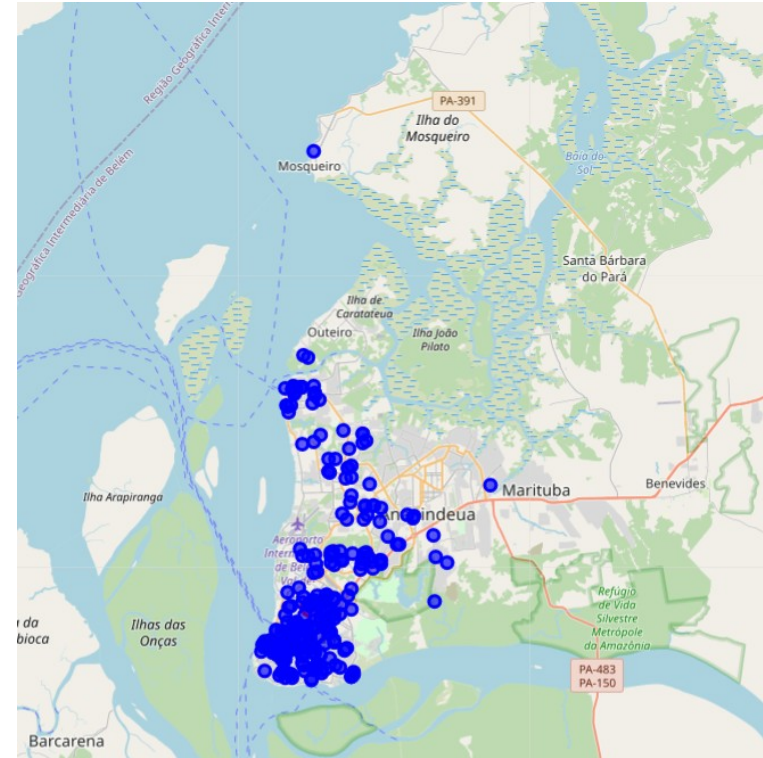
- Based on definition of our problem, factors that will influence our decision are:
 - number of existing pharmacies in the neighborhood
 - the size of district/neighborhood
- We will get the names of districts on an **Wikipedia page**. Then, the geolocation will be returned by **geocoder** python library.
- Another source of data is the list of pharmacies from **Foursquare API**.

Methodology

- Having the main data, we can see the distribution, the density and the gaps on the map;
- We may now intersect the amount of pharmacies on each district and their population to find the best places where an entrepreneur may use the data.

Analysis

- Pharmacies in Belém
- The city is a peninsula, including the Ilha de Mosqueiro and Ilha de Caratateua



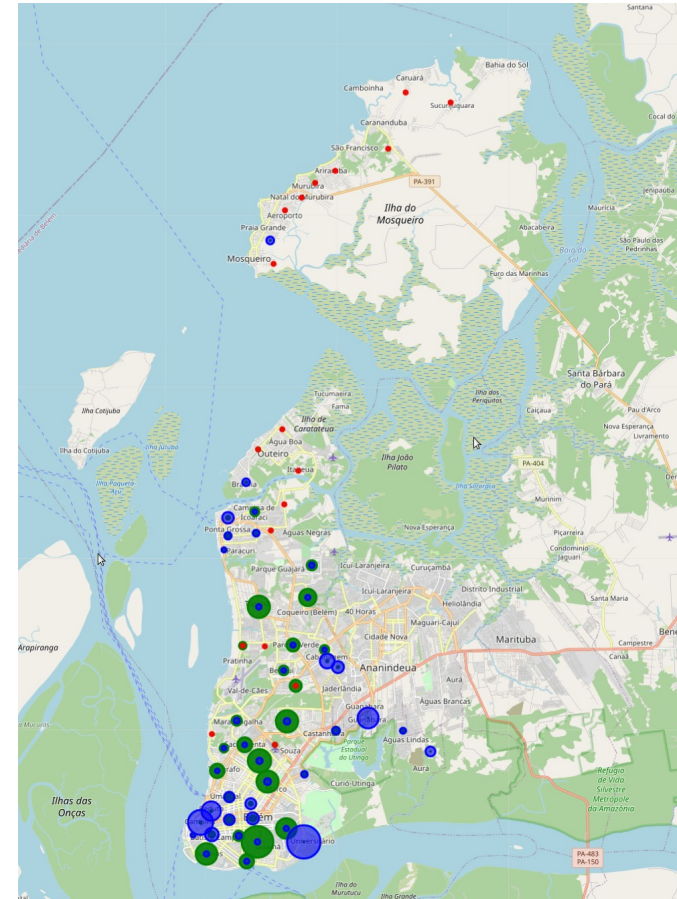
Analysis

- Some districts have 0 pharmacies,
- Some have high density of pharmacies,
- Some of them have high density of people, others have low density
- These have the highest pharmacy density

| District | Population | Pharmacies | Pharmacies per 1000 |
|---------------|------------|------------|---------------------|
| Val-de-Cans | 7032 | 7.0 | 0.995449 |
| Reduto | 6336 | 9.0 | 1.420455 |
| Guanabara | 1919 | 3.0 | 1.563314 |
| Campina | 6156 | 12.0 | 1.949318 |
| Universitário | 2557 | 7.0 | 2.737583 |

Analysis

- On the following map, we combined the size of neighborhood (green) with the number of pharmacies per 1000 inhabitants (blue). The red circles are districts with no pharmacies.



Analysis

- We assume the greener the dot, the better the opportunity;
- Numerically, we created the Opportunity index
- These are the best districts based on opportunity index

| district | inhabitants | pharmacies | Pharmacies per 1000 | Opportunity index |
|------------|-------------|------------|---------------------|-------------------|
| Guamá | 94610 | 12.0 | 0.126836 | 19.637808 |
| Pedreira | 69608 | 14.0 | 0.201126 | 12.792990 |
| Tapanã | 66669 | 8.0 | 0.119996 | 12.707284 |
| Jurunas | 64478 | 8.0 | 0.124073 | 12.126913 |
| Marambaia | 66708 | 15.0 | 0.224861 | 11.878115 |
| Montese | 61439 | 7.0 | 0.113934 | 11.448277 |
| Marco | 65844 | 17.0 | 0.258186 | 11.395512 |
| Coqueiro | 51776 | 5.0 | 0.096570 | 9.171441 |
| Sacramenta | 44413 | 3.0 | 0.067548 | 7.562868 |
| Telégrafo | 42953 | 2.0 | 0.046563 | 7.365750 |

Conclusion

- The best district to place a new business is Guamá because it has a big population and almost no competitors;
- Some places have no pharmacies at all: they should be in mind too:
 - the Island of Mosqueiro, the Island of Caratateua, Manguetirão district and around Pratinha neighborhood.
- This project analysis only 2 aspects: density of pharmacies and population;
 - For real interest, other aspects should be evaluated, as safety;