



The Battle of Neighborhoods – São Paulo

A Pet Shop Location Recommendation

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1. Introduction

1.1. Pet Population in Brazil

According to the **Brazilian Association of the Pet Products Industry (ABINPET)**, Brazil has the second largest population of dogs, cats and songbirds and ornamental birds in the world and is the third largest country in total population of pets. There are 54.2 million dogs, 23.9 million cats, 19.1 million fish, 39.8 million birds and 2.3 million other animals. The total is 139.3 million pets, which demonstrates the potential strength of our sector in the Brazilian economy.

Also, according to **ABINPET**, the accumulated growth between the years 2018 and 2019 was 1.7% for dogs, 3% for cats and 1.5% for fish.

According to an article published by **Pet Brazil Institute**, more and more people and families are looking for a pet for company, giving and receiving affection and attention. However, with the largest number of people living alone, and in smaller spaces, there is a clear growth of animals whose daily care is simpler, or which at least require less space. That is why this growth of felines occurs, especially in large cities.

1.2. Distribution of Pets in Brazil

Pet Brazil Institute also mapped where pets are by state and regions of Brazil. In 2018, the highest concentration of pets was in the Southeast, with **47.4%**, followed by the Northeast with **21.4%**; South **17.6%**; Midwest with **7.2%** and North with **6.3%**. The reason is the lower population density in these states when compared to states in other regions of the country.

Population density is a determining factor for the pet population. More than a quarter of Brazilian pets are in São Paulo. The states of Minas Gerais and Rio de Janeiro appear in second and third with the highest concentration, with **10.1%** and **8.8%**, respectively.

1.2.1. Species per State

It is also possible to draw a profile of the concentration of animals per unit and by category, between dogs, cats, birds and fish. The highest concentration of cats in the country is in the

states of **São Paulo (21.6%)**, **Rio de Janeiro (9.1%)**, **Minas Gerais (7.2%)** and **Rio Grande do Sul (7.2%)**. In relation to dogs, there is a greater representation in the states of **São Paulo (24.5%)** and **Minas Gerais (10.0%)**. The same occurs in the concentration of birds, it is also higher in these states. The highest concentration of fish occurs in **São Paulo (47.1%)**, **Santa Catarina (9.8%)** and **Minas Gerais (9%)**.

1.3. Pet Market in Brazil

In 2019, the pet industry's turnover was **R\$ 22.3 billion**, 73.3% of which in the pet food segment, **18.4%** for the **pet vet segment** and **8.3% for pet care**. accumulated growth between 2018 and 2019 of 15% (pet vet), 8.5% (pet care) and 8.4% (pet food).

In relation to specialized retail stores in Brazil, the **Pet shop store in the neighborhood** has the largest share (79%, 26,019 stores), with monthly sales between R\$ 60,000.00 and R\$ 100,000.00, and up to 4 employees; **Medium-sized pet shop** has the second largest share (19%, 6,063 stores), with monthly revenues between R\$ 100,000.00 and R\$ 250,000.00 with 5 to 19 employees.

Although the pet market is constantly growing, the biggest obstacle for the sector is still the high tax rate (51.20%) in Brazil, while in Europe, the tax is 18.5% and in the United States, 7%.

The affection that many owners have for their animals, often considering them as members of the family, justifies the proliferation of pet shops. Today, pet products and services stores specialize in offering essential products to the sophisticated daily lives of these adorable domestic creatures.

Also, according to ABINPET, spending on pet products and services can reach **24%** of the family income, depending on the income class.

According to a survey conducted by the **Faculty of Veterinary Medicine of the University of São Paulo (USP)**, **82% of dog owners are class AB**, with **24% being class A**.

In addition to providing a good service and a good price, the location of the development is fundamental to the success of the business.

1.4. Business Problem

A businessman is interested in investing in the pet market and wants to open a pet shop in the city of São Paulo, but does not have knowledge about the city, its neighborhoods and characteristics, and wants to know which is the best neighborhood in the city to start his business.

Therefore, the present project aims to answer the entrepreneur's question by recommending the best neighborhood in the city of São Paulo to open a pet shop.

1.5. Data

To solve the above problem, were used data about the neighborhoods in the city of São Paulo, referring to income, population, location, among others.

The data on income were taken from the website of the State System of Data Analysis Foundation ([SEADE](#)).

Demographic data of the districts belonging to the Subprefectures were taken from the website of the City of São Paulo.

1.6. Methodology and Target Audience

1.6.1. Methodology:

- Session 1: Load and Data Wrangling.
- Session 2: Geocoding.
- Session 3: Data Exploration and Visualization.
- Session 4: Clustering.
- Session 5: Exploring the Neighborhoods.
- Session6: Conclusion

We used data from geographic coordinates of the city of São Paulo to map its neighborhoods.

Next, we used the Foursquare API to collect neighborhood data and information about venues, such as category and quantities, to help us identify and suggest potential places to start a pet business.

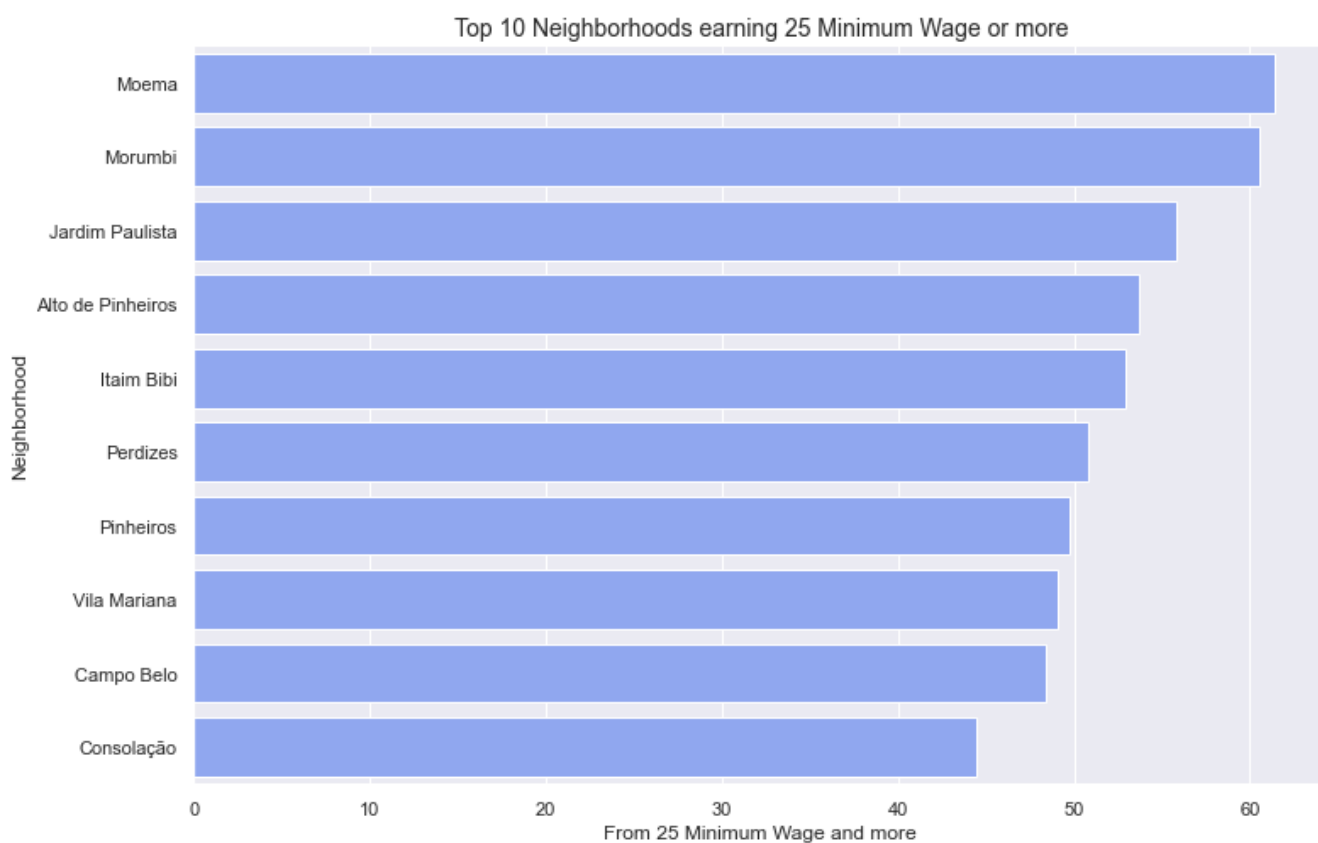
1.6.2. Target Audience:

This project should be interesting for potential entrepreneurs in the pet industry, as well as consumers who want to better understand the market and the availability of this type of service in the city of São Paulo.

2. Discussion and Results

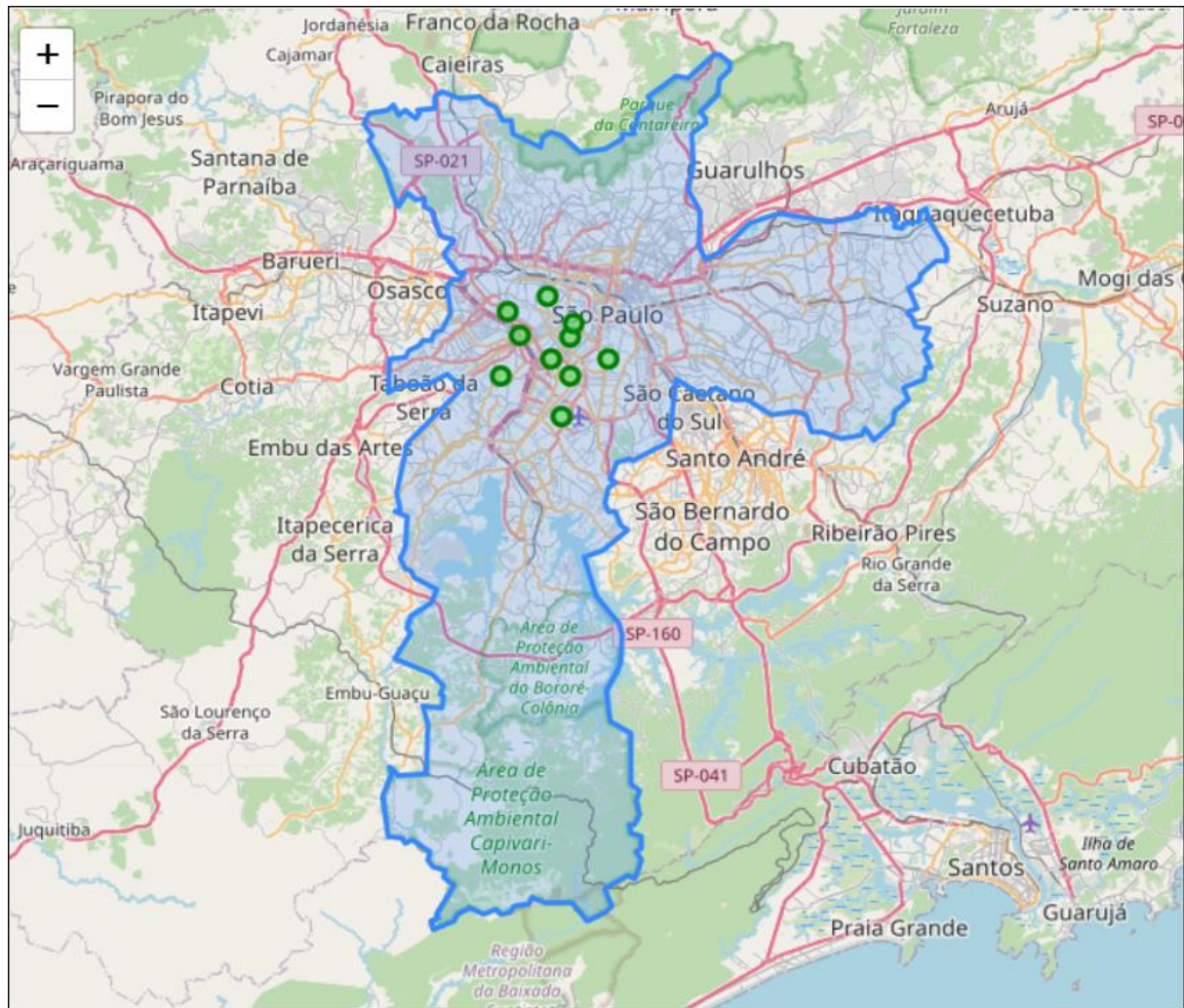
2.1. Data Exploration and Visualization

After the data loading and cleaning steps, data exploration began. First, the **geocoding** of the neighborhoods in the city of São Paulo was carried out, and the map of the city with its respective neighborhoods was generated.



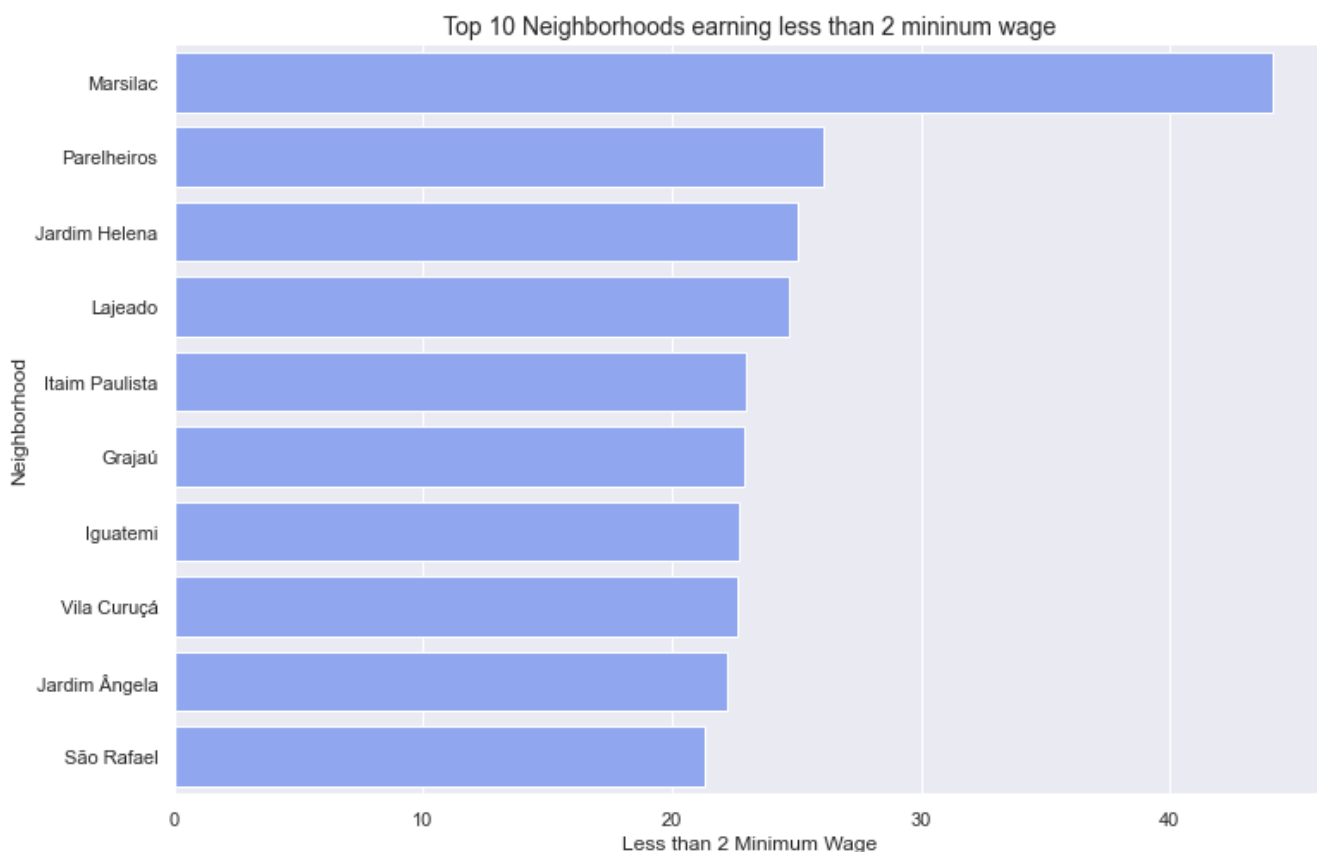
2. Top 10 neighborhoods earning 25 minimum wage or more.

We can see that the neighborhoods with the highest percentage of families earning 25 minimum wages or more are: **Moema** (South zone) with 61.38%, **Morumbi** (West zone) with 60.58%, and **Jardim Paulista** (West zone) with 55, 78%.



3. Top 10 neighborhoods earning 25 minimum wage or more.

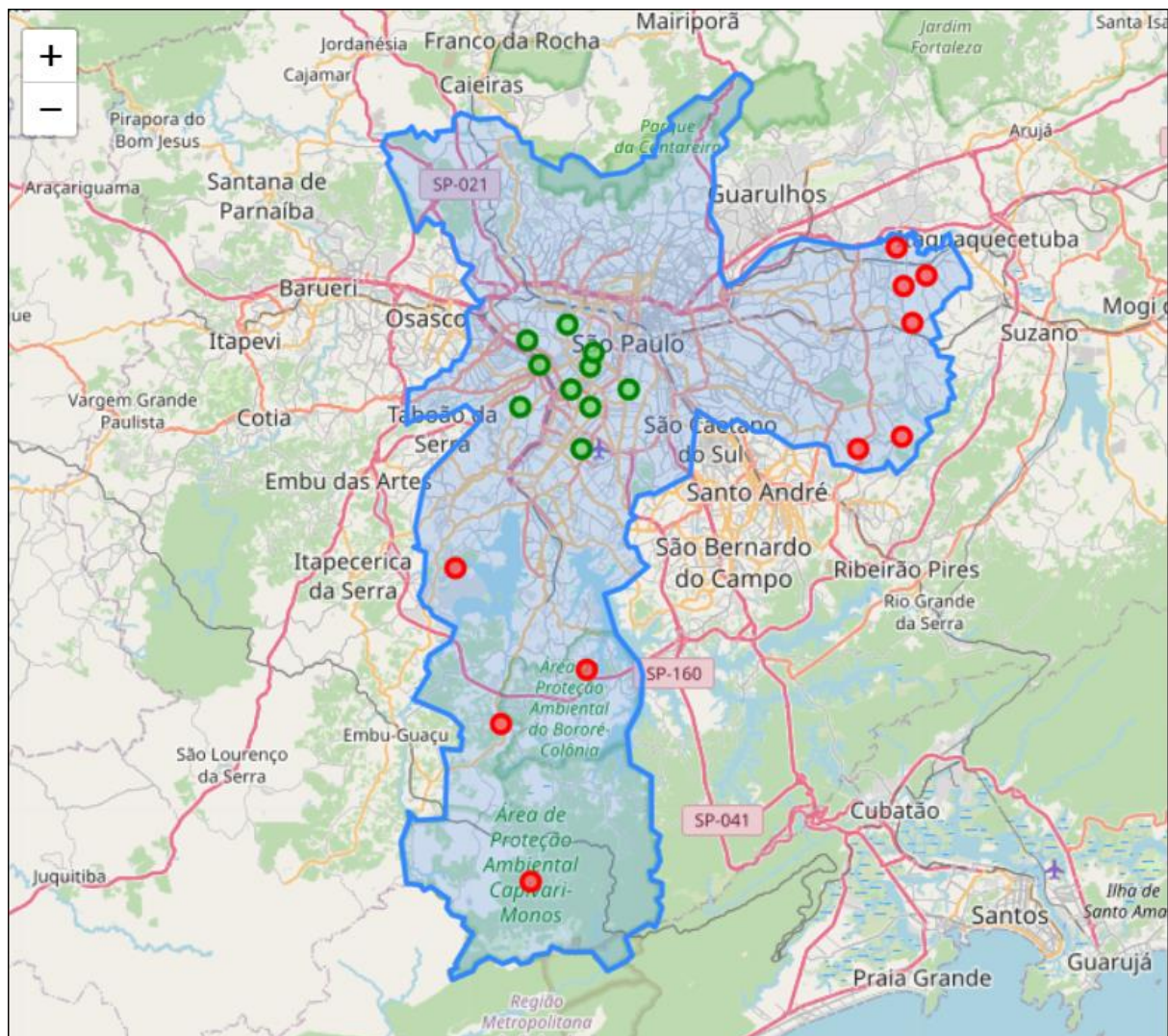
Regarding the neighborhoods that concentrate families that earn less than 2 minimum wages (class E), we can see that there is a greater distribution among the areas of the city of São Paulo. The neighborhoods with the highest percentage of class E families are: **Marsilac** (South zone) with 44.10%, **Parelheiros** (South zone) with 26.06% and **Jardim Helena** (East zone) with 25.07%.



4. Top 10 neighborhoods earning less than 2 minimum wage.

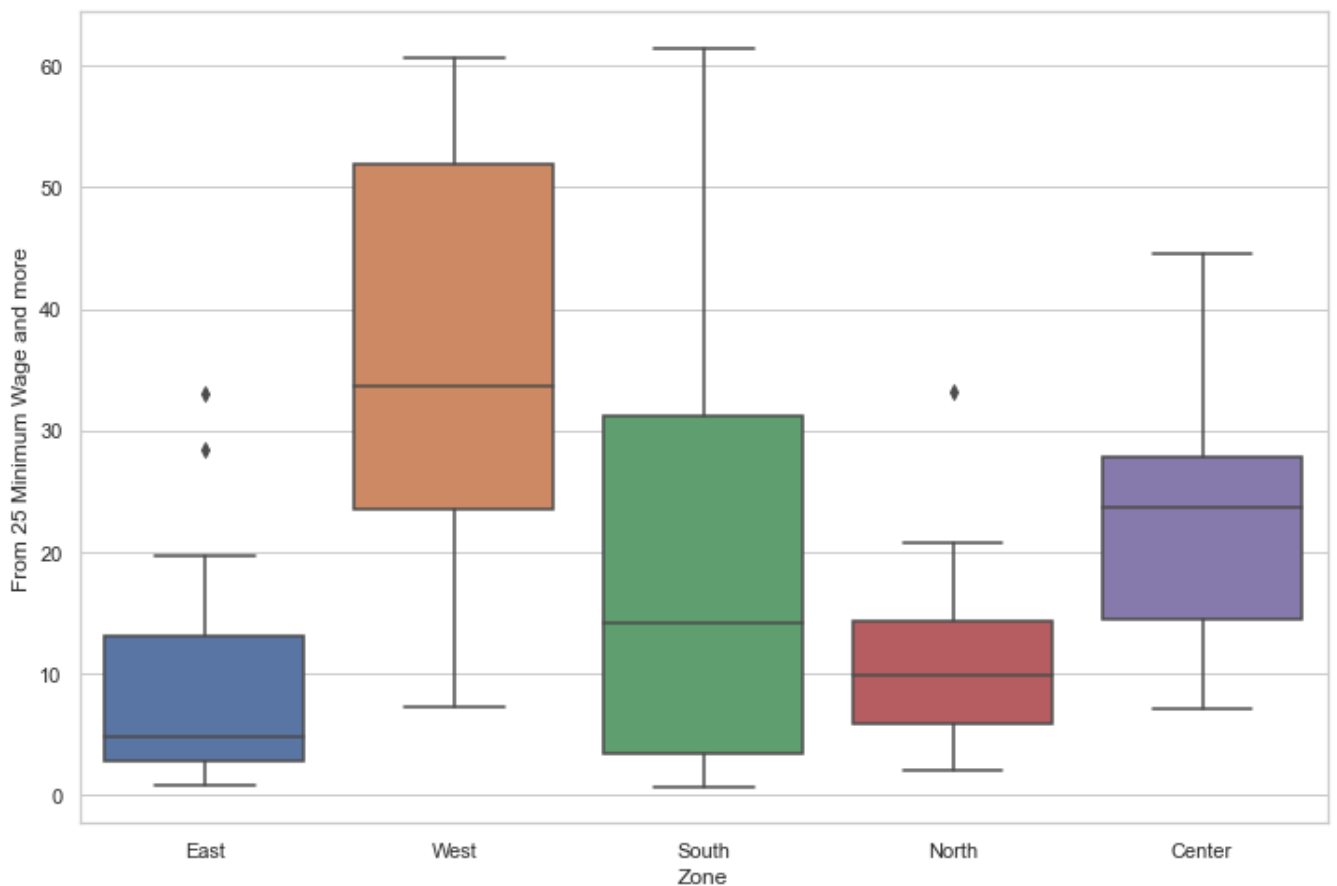
The south zone of the city of São Paulo presents a greater social inequality, where we have many families earning more than 25 minimum wages (Class A) and many that earn less than 2 minimum wages (Class E).

When viewing the map of the city of São Paulo, containing the top 10 neighborhoods with families earning 25 minimum wages or more (Class A) and the top 10 neighborhoods containing families earning less than 2 minimum wages (Class E), we can see that Class A neighborhoods are located on the outskirts of the city, which is characterized by having little or no infrastructure, a higher rate of violence and unemployment.



5. Neighborhoods with higher and lower percentages of minimum wages

In the box plot below, we can see the distribution of Class A families and it is evident that the districts of the South and West zones have a greater distribution in relation to other areas of the city.



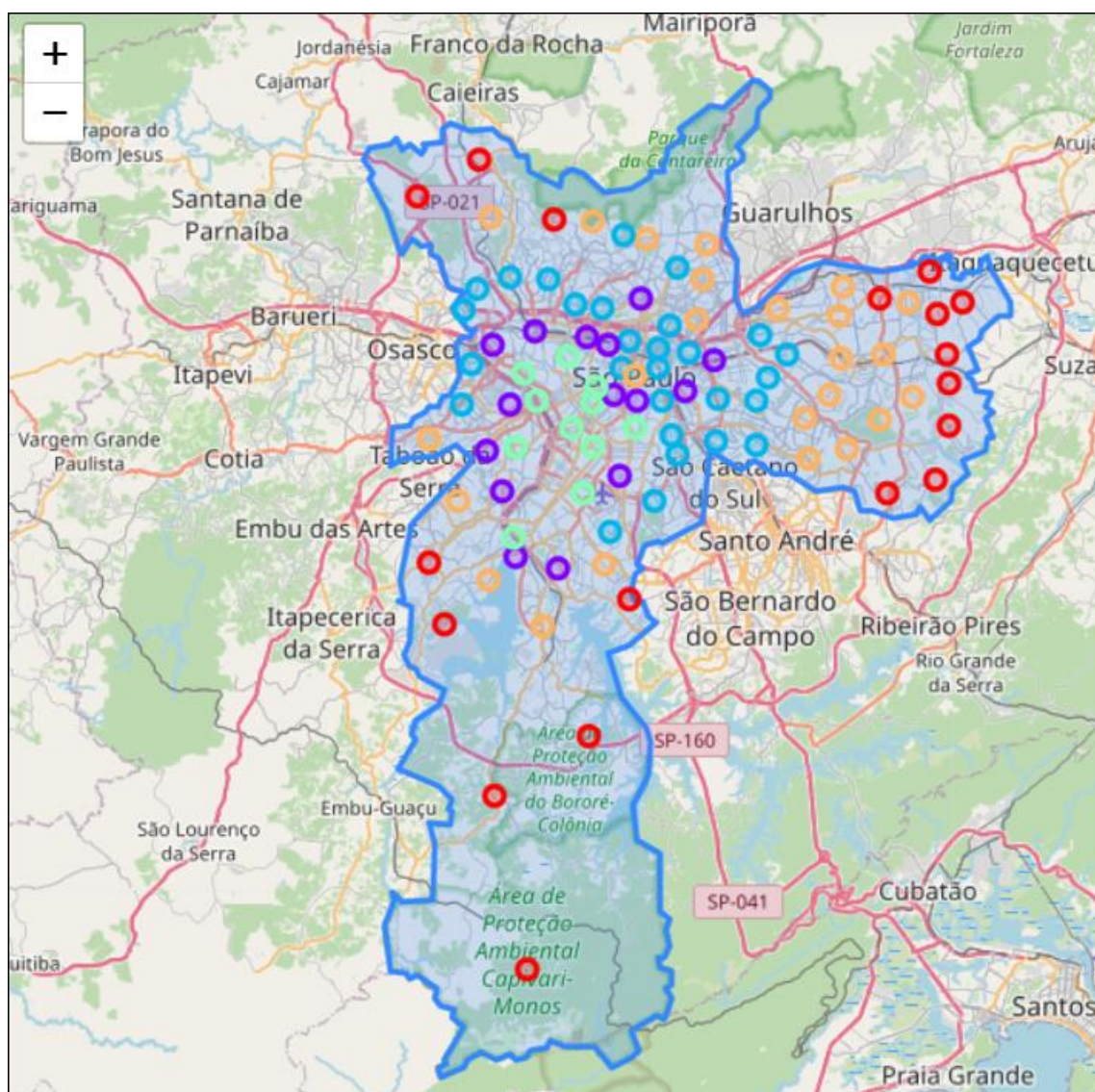
6. Box plot of São Paulo areas earning 25 minimum wages or more.

At the end of this initial analysis of the neighborhoods in the city of São Paulo, we have a good understanding of the distribution of income between the neighborhoods, being very clear that the wealthiest neighborhoods in the city are located mainly in the West and South areas of the city, while the poorer neighborhoods are located on the outskirts. The southern part of the city proved to be an area of extremes, with neighborhoods such as Moema where more than 60% of families belong to Class A, and on the other hand Marsilac where 44.10% of families belong to Class E.

2.2. Clustering

In this stage of the project, we sought to group the neighborhoods of the city of São Paulo with respect to income. As a result of this grouping, 5 clusters were obtained, numbered from 0 to 4.

The map below shows the distribution of clusters in the city, being: **cluster0** - red, **cluster1** - purple, **cluster2** - light blue, **cluster3** - light green, and **cluster4** - orange.



7. Clusters of the neighborhoods of the city of São Paulo.

The table below shows the distribution of the average percentage of neighborhoods by class of wages.

	Cluster0	Cluster1	Cluster2	Cluster3	Cluster4
Less than 2 Minimum Wage – Class E	22,77	6,55	9,77	3,53	14,37
From 2 to Less than 5 Minimum Wage – Class D	35,54	13,57	20,03	6,52	27,76
From 5 to Less than 10 Minimum Wage – Class C	27,81	20,22	26,52	13,33	29,85
From 10 to Less than 15 Minimum Wage – Class B2	7,83	11,95	14,07	9,32	12,36
From 15 to Less than 25 Minimum Wage – Class B1	4,26	16,53	14,62	15,47	9,97
From 25 Minimum Wage and more – Class A	1,79	31,18	14,98	51,83	5,69

8. Percentage distribution over income classes, by cluster

After analyzing the table above, it was observed that in **Cluster0** most families belong to the classes that receive less than 2 minimum wages (Class E) and maximum node 10 minimum wages (Class C). This cluster is characterized by the poorest neighborhoods in the city of São

Paulo, most of which are located on the outskirts of the city, where the infrastructure is precarious, with some of these neighborhoods characterized by the existence of **favelas**, such as **Capão Redondo** and **Brasilândia**.

As for **Cluster1**, we can identify a greater dispersion of income, with the highest percentage of families earning above 25 minimum wages (Class A). This cluster is characterized by neighborhoods with better infrastructure and income distribution in relation to Cluster0, and are distributed between the West and South zones, with some representatives also in the East side of the city.

Analyzing **Cluster2**, we also identified a more homogeneous income distribution among the neighborhoods. In this cluster, there is no income class much more significant than another. We can also identify that the neighborhoods in this cluster are dispersed throughout all areas of the city.

Cluster3 is characterized by the highest percentage of families earning over 25 minimum wages (Class A). It is also in this cluster that the lowest percentage of families that earn less than 2 minimum wages (Class E) is identified. The neighborhoods belonging to this cluster are in the West and South zones, mainly and are considered the wealthiest neighborhoods in the city, with better infrastructure, hospitals, restaurants and luxury hotels, in addition to pet friendly spaces, which accept the presence of pets and have activities for them. Its main representatives are the neighborhoods of Moema and Morumbi.

In **Cluster4**, as well as in cluster0, we verified the predominance of families between classes C, D and E. These are the neighborhoods that are geographically and economically closest to the neighborhoods in cluster0 and are distributed across the 5 areas of the city.

After analyzing each of the clusters and considering the research that points out that 24% of dog owners belong to class A, it was concluded that **Cluster3 has the greatest potential for the installation of the pet shop**, as it concentrates the neighborhoods with the greatest percentage of families in class A, with greater infrastructure, with many parks and open-air spaces, ideal for walking with the pet, in addition to pet friendly establishments.

In the next stage, each of the neighborhoods belonging to cluster3 was then explored using the **Foursquare API**, where the list with the 10 main categories of locations in each neighborhood was obtained.

According to the data frame below, it was observed that the **Pet Store** category is one of the most frequent in the cluster3, appearing among the **10 most common categories in 6 of the 11 explored neighborhoods**. Pet Store is the most common category in the **Santo Amaro** neighborhood, the second most common in the **Perdizes** neighborhood, and the third most common in **Alto de Pinheiros**.

This high frequency of Pet Stores in cluster 3 neighborhoods confirms the position that in these neighborhoods the pet shop activity is promising.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Alto de Pinheiros	Ice Cream Shop	Plaza	Pet Store	Brazilian Restaurant	Flower Shop	Italian Restaurant	Pizza Place	Coffee Shop	Dessert Shop	Bar
1	Campo Belo	Ice Cream Shop	Bar	Brazilian Restaurant	Pizza Place	Pet Store	Chocolate Shop	Vegetarian / Vegan Restaurant	Gym	Burger Joint	Italian Restaurant
2	Consolação	Ice Cream Shop	Pizza Place	Hotel	Brazilian Restaurant	Cultural Center	Restaurant	Café	Italian Restaurant	Bookstore	Art Museum
3	Itaim Bibi	Ice Cream Shop	Italian Restaurant	Restaurant	Pet Store	Gym / Fitness Center	Athletics & Sports	Cycle Studio	Brazilian Restaurant	Café	Salad Place
4	Jardim Paulista	Ice Cream Shop	Bookstore	Brazilian Restaurant	Hotel	Pizza Place	Italian Restaurant	Restaurant	Cultural Center	Café	Pet Store
5	Moema	Ice Cream Shop	Bar	Restaurant	Italian Restaurant	Chocolate Shop	Pizza Place	Art Museum	Athletics & Sports	Cycle Studio	Gym / Fitness Center
6	Morumbi	Gym / Fitness Center	Coffee Shop	Gym	Ice Cream Shop	Shopping Mall	Japanese Restaurant	Hotel	Pharmacy	Butcher	Café
7	Perdizes	Ice Cream Shop	Pet Store	Park	Plaza	Pizza Place	Brazilian Restaurant	Bookstore	Hostel	Northeastern Brazilian Restaurant	Café
8	Pinheiros	Italian Restaurant	Ice Cream Shop	Plaza	French Restaurant	Brazilian Restaurant	Restaurant	Café	Japanese Restaurant	Athletics & Sports	Hostel
9	Santo Amaro	Pet Store	Steakhouse	Gym / Fitness Center	Supermarket	Coffee Shop	Hotel	Bar	Bakery	Gym	Italian Restaurant
10	Vila Mariana	Ice Cream Shop	Restaurant	Dessert Shop	Cultural Center	Burger Joint	Bar	Pizza Place	Park	Brazilian Restaurant	Gym

9. Top 10 venues for each neighborhood

The neighborhoods in which the **Pet Store** category is not among the 10 most common were considered to have the greatest potential for the installation of the pet shop. They are: **Consolação, Jardim Paulista, Moema, Morumbi, Pinheiros** and **Vila Mariana**.

Although they were not among the 10 most common categories in each neighborhood, the Foursquare API was used to list the pet store locations found in each of these neighborhoods, as shown in the table below.

Neighborhood	Number of Pet Stores
Pinheiros	4
Morumbi	6
Moema	15
Vila Mariana	18
Consolação	21

10. Number of pet stores per Neighborhood

We can observe that among the potential neighborhoods for the installation of the pet shop, **Pinheiros** has the least amount of pet stores (4), followed by **Morumbi** (6) and **Moema** (15).

3. Conclusion

After analyzing the neighborhoods in the city of São Paulo, it can be concluded that there are 3 potential neighborhoods to start a pet shop service, they are: **Pinheiros**, **Morumbi**, and **Moema**.

- **1st: Pinheiros:** is known as a neighborhood that receives people from the most diverse backgrounds: students, businessmen, musicians and artists. Likewise, commerce is wide and varied: trendy restaurants, bars, offices of large companies, luxury shopping malls and popular stores. Parks, renowned hospitals, schools and universities of excellence are also nearby. It is a mix of residential and commercial spaces. We can expect low competitiveness for the new pet shop service, since we found only 4 registered pet shops in the neighborhood.
- **2nd: Morumbi:** Neighborhood located in the West Zone of the city of São Paulo, has excellent infrastructure and has hotels, shopping malls, hospitals, restaurants and commercial buildings. Morumbi also has the second highest percentage of residents earning 25 minimum wages or more, and among the neighborhoods above it is the one with the second lowest number of pet shops, only 6. Low competitiveness and high-income residents are good factors to start a pet shop service in the neighborhood.

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- **3rd: Moema:** Neighborhood located in the South Zone of São Paulo. Like the other neighborhoods already mentioned, it has excellent infrastructure and services. Among the neighborhoods where residents earn 25 minimum wages or more, it occupies the eighth position. Potential competitiveness is expected for a pet shop service, since 18 services of this category were registered in the neighborhood.

4. References

- Pet Brazil Institute – [report 1](#)
- Pet Brazil Institute – [report 2](#)
- ABINPET – [report 1](#)
- ABINPET – [report 2](#)
- Estado de Minas – [news](#)