The Best Neighborhood to start your Pet Shop

Torben Castro

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1. Introduction

1.1 Background
   A small inexperienced entrepreneur succeeding in his new business, isn't the most common output in the well established business world. That's why a starting entrepreneur needs all the advantages and head starts he can find to help him establish his new business. In this analysis we will focus on entrepreneurs that want to build a pet store or similar business.

1.2 Problem
   One of the questions that an future pet shop owner need to ask himself before starting their business is "Where should I build my pet store to maximize my chance of success?".Our analysis will try to find the best answers to this question.

1.3 Interest
   The most interested in this project will be the entrepreneurs that want to start a business in the pet field. Investors and pet stores owners may also be interested in why a pet store can present success or failure, dependent on the location.

2. Data Section

2.1 Data Sources
   This project data will be divided in three parts :
   - *Location Data : Will be mainly used to collect pet and park venues location data using Foursquare database.*
   - *Population Data : Will be used to collect Florianópolis neighborhoods population.*
   - *Neighborhoods Data : Will be used to collect the neighborhoods names and location.*

2.2 Data Gathering
   The population and neighborhoods data was collected via web scrapping. The foursquare venues data was collected via API calls. All of the collected data was stored in a panda Data Frame.

2.3 Data Cleaning
   The first problem we encountered within the data, was that the dot of the population values in the web, where the data was collected, meant a thousand separator and when converted to a panda Data Frame it translated into the first decimal place. To solve this problem the population data was multiplied by 1000 and transformed in integers.
   The second problem we encountered within the data, was that we didn't have sufficient data on neighborhoods with less than 1000 people. Therefore, we excluded neighborhoods with less 1000 people from the analysis.

2.4 Feature Selection

    After collecting the data from the foursquare database we gathered 262 pet venues separated in four categories : Pet Cafe, Pet Service, Pet Store and Veterinarian, and, 263 parks separated in 8 categories : Dog Run, Field, Lake, National Park, Other Great Outdoors, Park, Pedestrian Plaza and Playground.

    After analyzing those categories, was decided that each of the four pet categories will be a feature and the 8 parks categories will be merged into one unique category that contains it's total amount per neighborhood.

3. Methodology Section

### 3.1 Exploratory Data analysis

    The first thing that we analyzed was the distribution of the neighborhoods along Florianópolis Territory. We can quickly notice that most dense area in Florianópolis is in the division of the continent and the island, and, the northern and southern areas also have concentration of neighborhoods.

Map of Florianópolis neighborhoods
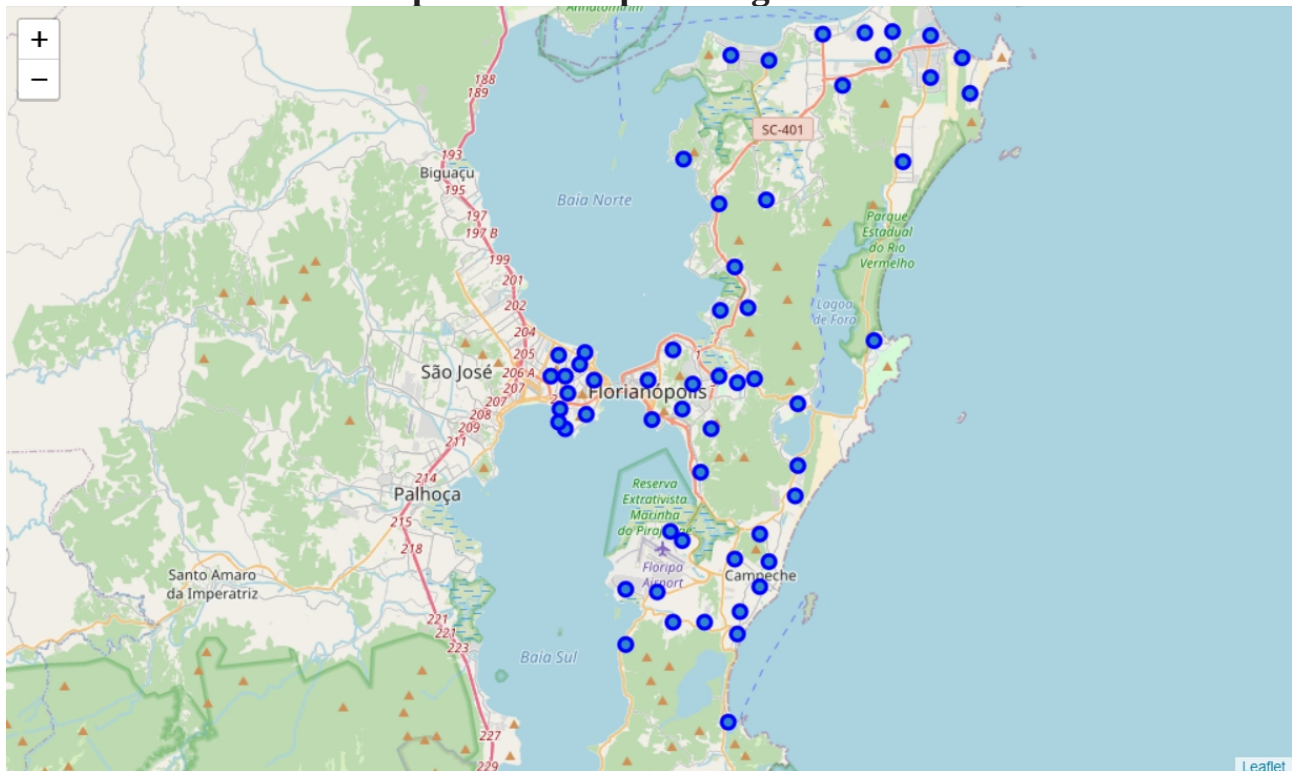
    The second thing we're going to analyze is the concentration of pet venues along Florianópolis neighborhoods. As expected the center of Florianópolis is the most dense area in pet venues too, but, unlike the neighborhoods location analysis the concentration of pet venues in the northern area is substantially bigger than Florianópolis south.
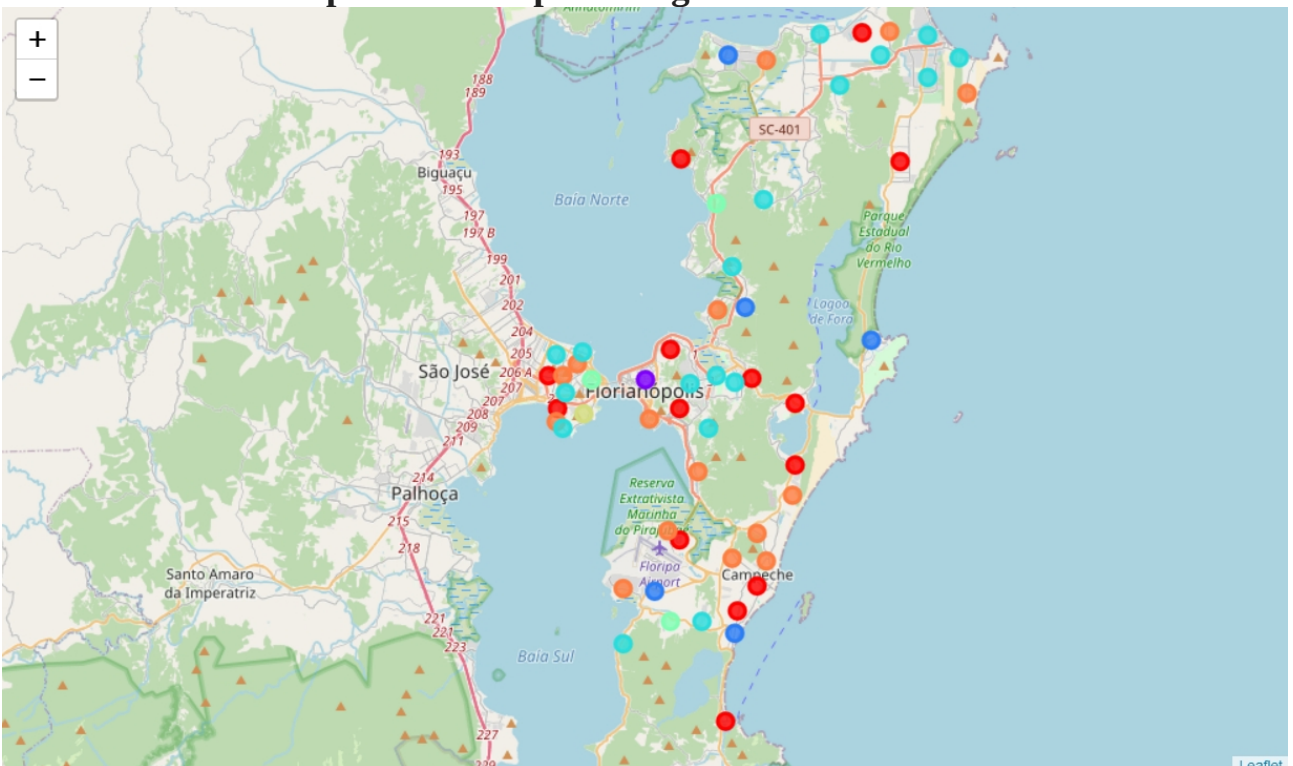
Heat Map of Florianópolis pet venues
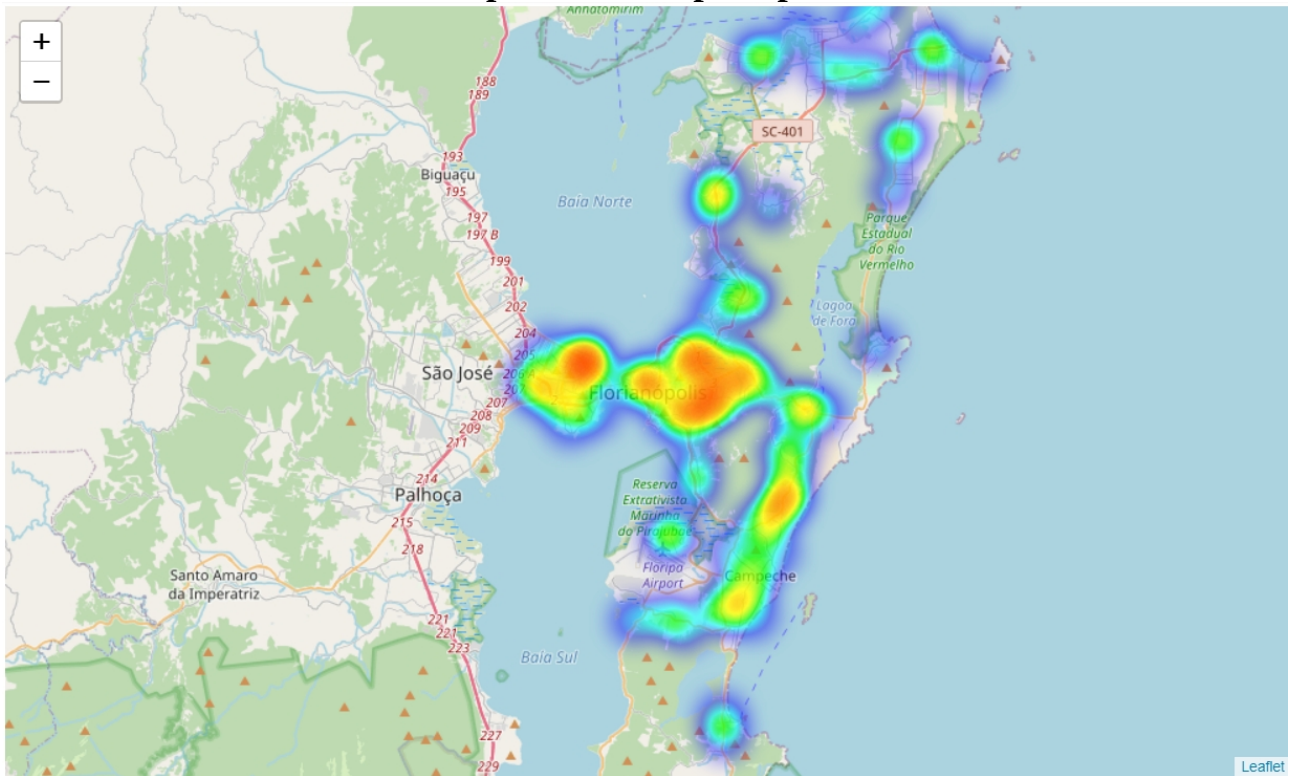
3.2 Modeling

Since we aren't predicting anything, our model will be an unsupervised learning type. We choose a cluster type model, k-means cluster. There will be seven clusters and maps to visualize them.

Map of Florianópolis Neighborhoods Clusters

4. Results and Discussion

In this project we analyzed 59 out of the 85 neighborhoods of Florianópolis:

- Using the IBGE, the Brazilian institute of geography and statistic, database we collected the population and name of each neighborhood.

- Using the foursquare API, we found 263 pet venues and 262 parks in the vicinity of each selected neighborhood.

*After gathering all the data we clustered the neighborhood and selected the most appropriate among our criteria, **(population by pet venues and number of parks)** the selected ones were:*

- **Barra da Lagoa** : photo
    - ❒ Is located near a lagoon
    - ❒ Is very nature friendly

- **Cachoeira do Bom Jesus Leste** : photo
    - ❒ Mostly residential buildings
    - ❒ Neighborhood in current expansion
    - ❒ Is very nature friendly

- **Centro** : photo
    - ❒ Is located in downtown Florianópolis
    - ❒ Have the biggest population amoung Florianópolis neighborhoods
    - ❒ Have the most parks amoung Florianópolis neighborhoods
    - ❒ Is the most urbanized area in Florianópolis
    - ❒ Is one of the most expensive neighborhoods

- **Coqueiros** : photo
    - ❒ Is located close to downtown
    - ❒ Is the biggest neighborhood off the island
    - ❒ Has a lot of restaurants nearby

- **Costeira do Pirajubaé** : photo
    - ❒ Is near a soccer stadium
    - ❒ Has a beautiful sidewalk by the sea
    - ❒ Mostly residential buildings
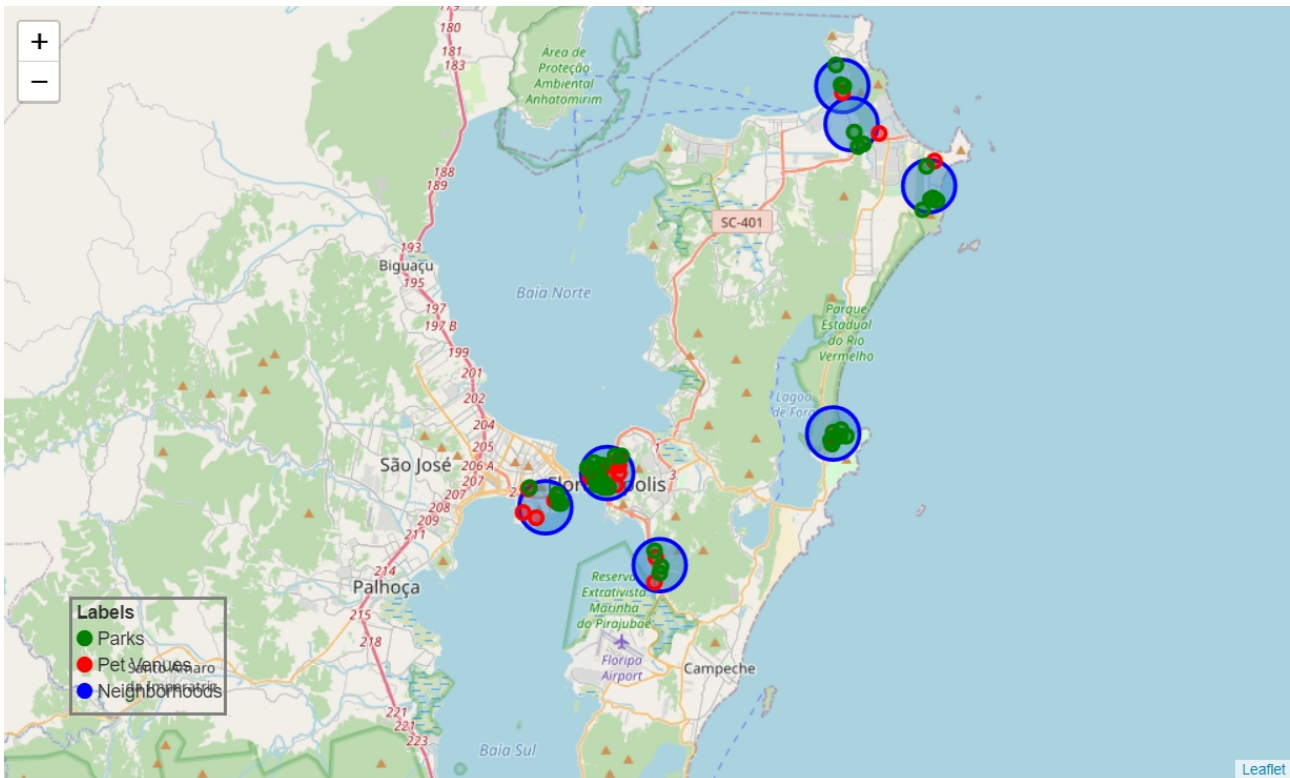
- **Ponta das Canas** : photo
    - ❒ Is located near a beach
    - ❒ Very crowded in the summer

● **Santinho** : photo

❒ Is located near a beach

❒ Very crowded in the summer

❒ Is very nature friendly

❒ Mostly residential buildings

Map of the Selected Neighborhoods

5. Conclusion

In this project, I analyzed Florianópolis neighborhoods, to find out what were the best neighborhoods to start your new pet store. I gathered each neighborhood population, location, parks and pet venues. I made several maps to illustrate the analysis and clustered the neighborhoods based on the collected data, with those clusters, I made more rigorous criteria and chose the selected neighborhoods. Finally I made a final map to illustrate the results and a walk through of each neighborhoods listing their characteristics.