Best place to stay in Gramado/RS (Brazil)

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1. Introduction

Establishing new business is an important decision that must be supported by careful evaluation of options. XYZ Hotel chain wants to start business in a new place, and this work evaluates the terrain to help the corporation making the best choice possible.

1.1 Background

Gramado is a city in Rio Grande do Sul, Brazil, known as a good destination for traveling given its cultural events along the whole year, gastronomy, nature, architecture and beatiful people. The city possess an estimated population of 36,232 inhabitants[1].

The majority of economic activities are related to tourism, receiving around one million of visitors per year. For that, the city must maintain an appropriate infrastructure of hotels, restaurants, parks and thematic events.

1.2 Problem

XYZ Hotel is a well established hotel chain that wants to start business in Gramado. This brand is well known by its high quality rooms and a wide range of services like breakfast, convention centers, swimming pool and fitness center, recreation for kids and guided tour services around the cities where they have hotels.

Customers of XYZ Hotel seek this place to rest but don't stay all the time in the hotel. They usually like to know the vicinity, spending their time in coffee and chocolate shops, restaurants and thematic events, but also doing activities in family in open air places.

Given its reputation and knowing well which type of customers they intend to have, XYZ Hotel would like to set down in the most appropriate place in the city, that offers plenty of space for hotel services but is also close enough to places of interest of its customers.

1.3 Interest

Our target audience is XYZ Hotel administrators, that need to make an important decision that needs solid foundation, because it will have direct impact in its future income and brand reputation.

2 Data acquisition and cleaning

We used data available in FourSquare[2] data. We selected places in a radius of 4,000 meters around a central point in the city. For that places, we recovered ratings information of each place.

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1 https://cidades.ibge.gov.br/brasil/rs/gramado/panorama

2 http://www.foursquare.com/

3. Exploratory Data Analysis

We started evaluating data from FourSquare related to vicinity. In Figure 1, we evaluate the distribution of places based on categories, where *Hotel* and *Bed & Breakfast* are the most common categories, followed by *Chocolate Shop* in third. For majority of categories, we have only one place representing it.

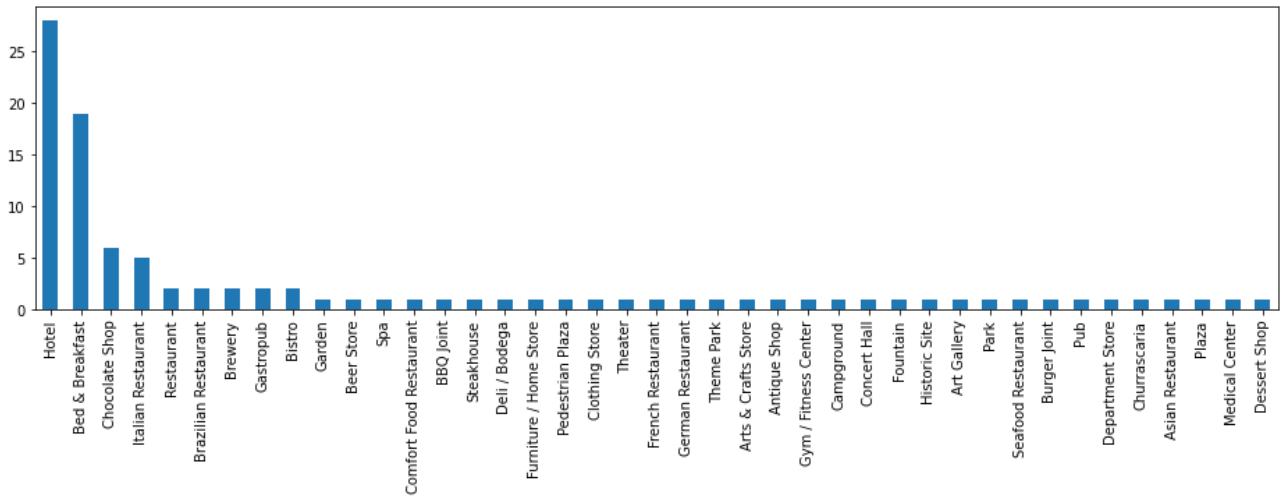

Figure 1: categories distribution of evaluated locations

Next, we evaluate how places are distributed. Figure 2 displays evaluated places on a map of the city, where red dots represent *Hotel* and *Bed & Breakfast* locations, i.e. competitors of our client, and blue dots are other types of places. In this figure we observe that hotels are spread along the city, with some concentration in the middle of map, and remaining places of interest are concentrated also in the middle of map.

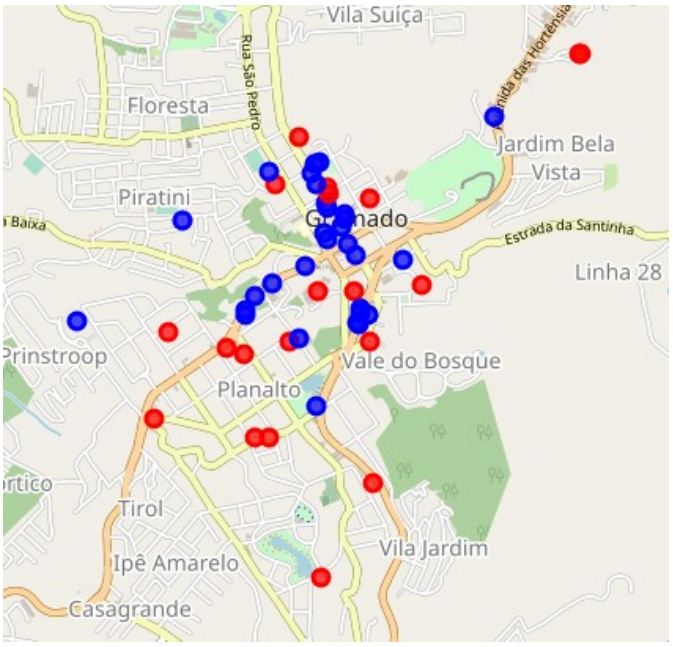

Figure 2: evaluated places distribution on a map of the city, where red dots represent Hotel and Bed & Breakfast locations

With the information available, its natural to suggest to install a new hotel in a location that is close to blue dots concentration. However, we need more concrete information to help our client make the right decision. Given that, we retrieved ratings information for each place to do a qualitative analysis instead of a simple quantitative analysis. We choose to keep only rated places and discard unrated ones. Figure 3 shows the new categories distribution after discarding unrated places. In total, we ended with 50 places in total, including hotels.

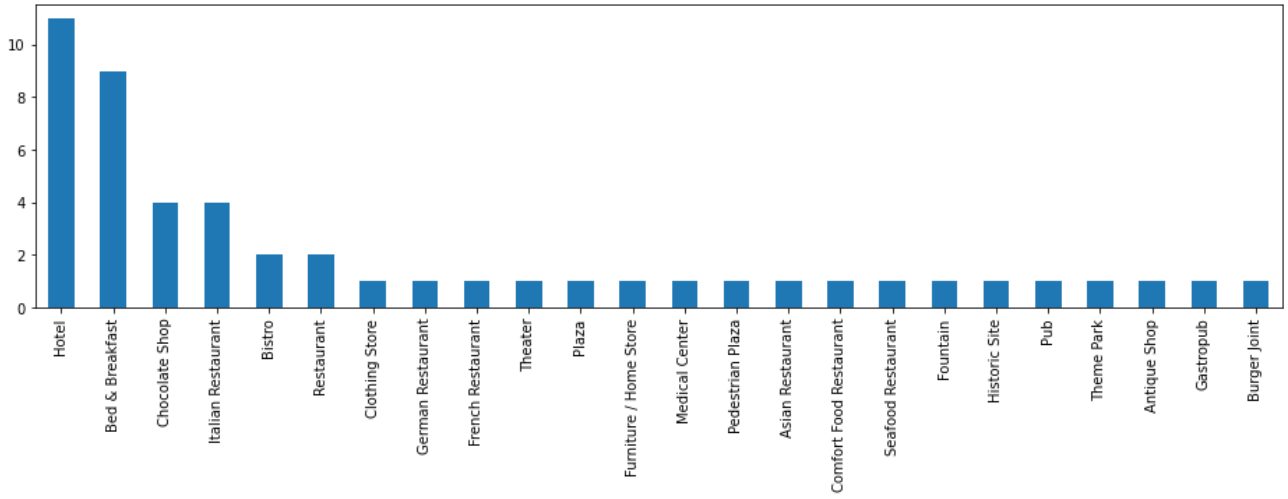

Figure 3: categories distribution of rated locations

Next, we divided places into 4 groups based on proximity (Figure 4) using clustering algorithm K-Means. Information points **i** is the center point for each group (centroid). We observe that most concentration of places is in red group. Table 1 details each group in terms of places categories frequency and average rating.

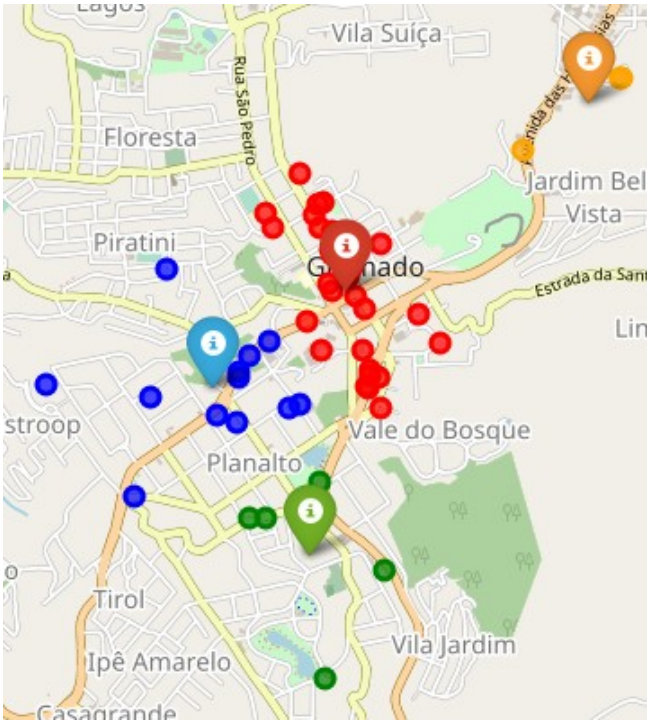

Figure 4: places grouped by proximity

RED GROUP (AVERAGE RATING = 8.74 STD DEV = 0.28)		
Category	**Rating (avg)**	**Number of places**
Antique Shop	8.800	1
Bed & Breakfast	8.840	5
Bistro	8.550	2
Chocolate Shop	8.775	4
Clothing Store	8.000	1
Fountain	8.300	1
Furniture / Home Store	8.900	1
Gastropub	9.300	1
Historic Site	8.700	1
Hotel	8.925	4
Italian Restaurant	8.800	3
Pedestrian Plaza	8.600	1
Plaza	9.000	1
Pub	9.000	1
Restaurant	8.700	1
Seafood Restaurant	8.800	1
Theater	8.700	1
GREEN GROUP (AVERAGE RATING = 8.38 STD DEV = 0.60)		
Category	**Rating (avg)**	**Number of places**
Bed & Breakfast	8.85	2
Comfort Food Restaurant	7.70	1
Hotel	8.60	2
BLUE GROUP (AVERAGE RATING = 8.79 STD DEV = 0.22)		
Category	**Rating (avg)**	**Number of places**
Asian Restaurant	8.4	1
Bed & Breakfast	8.8	2
Burger Joint	9.1	1
German Restaurant	8.8	1
Hotel	9.1	3
Italian Restaurant	8.8	1
Medical Center	8.7	1
Restaurant	8.8	1
Theme Park	8.6	1
ORANGE GROUP (AVERAGE RATING = 8.95 STD DEV = 0.07)		
Category	**Rating (avg)**	**Number of places**
French Restaurant	9.0	1
Hotel	8.9	2

Table 1: groups details given categories frequency and average rating

Analyzing table 1, its clear that red group concentrates most of places and the largest variety of categories. It also includes a total of 9 places that are competitor to our client with an average rating of 8.88 (*Hotel* and *Bed & Breakfast* categories). This area have plaza, shopping options and historical sites to visit.

Green group presents less variety and quantity of closer places, 5 hotels with an average of 8.38. This area is more related to places to stay instead of entertainment and variety of things to do in close range.

Blue group is the second group in terms of quantity and variety of places, with a total of 5 hotels with the highest average rating of all groups: 8.95. Cluster orange is more isolated, least in terms of options, but possess 2 hotels with average rating of 8.9.

4. Results

Evaluating our results, we observe that red group is the most promising location to establish a new hotel due to variety and quality of options in terms of entertainment, gastronomy and shopping. Competition with other hotels is harder is this area, given quantity and high average rating for this category.

Blue group seems to be second best location: its not so far from central area (red group area) of the city and seems to be more quiet. There are options of activities and gastronomy, there are less competition compared to red group, but blue group hotels presents a higher rating average of 8.95 compared to red group area, 8.88.

Green group and orange group are isolated from central area, present less competitors compared to red and blue groups but high average rating too in terms of hotels.

5. Conclusion

In this work, we evaluated options of locations to build a new XYZ Hotel in Gramado. Given available information, we believe that red group and blue group are the most promising locations. Provided information about customers suggest they like to spend time exploring outside the hotel, so establishing a new hotel in red group area seems to be the most promising choice, giving proximity and variety of activities to perform.