

# Vacationing in Cape Town, an analysis of activities and accommodation rental prices

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## Problem and Background discussion

Living in South Africa, one of the most visited tourist spots is the wider Cape Town area, as a potential visitor to this area one is inundated with a huge amount of options on what to do and where to stay so much so that it can be overwhelming on how to make the most advantageous decision to get the most out of ones vacation to this beautiful area. In approaching this problem there are two questions that I want to focus on:

- What are my options on things that I can do?
- Where should I stay in relation to the activities that I want to perform and what is a reasonable price that I can spend on accommodation.

## Data acquisition and cleaning

### Data sources

At a high level, the data sources that are required as input into the above problem are as follows:

- Neighbourhood data of the wider Cape Town Area
- Latitude and longitude coordinates for each of the respective areas
- Accommodation data for each of the areas
- GeoJson files to reflect the areas under review
- Activity data to show the list of venues and activities for each of the areas.

Each of the sub headings below will provide a narrative of how each of these Data sources were obtained

### Neighbourhood Data

From my understanding there is no available data that provides a list of Neighbourhoods and their respective coordinates, to get over this hurdle I scrapped a [property website](#) to obtain a list of Neighbourhoods that reside within this area. Due to the Website being set up to cater for property sales as well as for the whole of the Western Cape area, I revised the output in two ways:

- All neighbourhoods that reside within the larger Cape Town area were included under Cape Town.
- The list was revised where a person would be able to take a day trip to the specific area all other areas were removed from the list due to their proximity being too far from Cape Town.

### Latitude and longitude coordinates

Once a list of Neighbourhoods was obtained, I used Geopy module to obtain the coordinates for each of the respective Neighbourhoods.

### Accommodation data

The above list of neighbourhoods was used as input into scraping the Air BnB Website to obtain a list of accommodation options

## Area Data

Due to there being no geoJson files that provided the necessary districts to be able to produce a choropleth this had to be constructed, further details around this process can be seen in the next section under data cleaning.

## Activity data

With the Neighbourhood data and their respective coordinates, this was used as input to obtain the activity and venue data from Foursquare utilising their API

## Data cleaning

As mentioned earlier a lot of the information is not readily available, and it was necessary employ additional activities to obtain this information. Activities used were scraping websites and data wrangling activities.

## Website Scraping

As mentioned above websites had to be scrapped to obtain the necessary data, python modules that were utilised were

- **Request:** to log a call to the property website and
- **BeautifulSoup:** to scrape the website and retrieve the data that I required.

## Data Wrangling

This is a very generic term used to encompass all other data transformations that were performed to get the data into a format that could be utilised:

- Pandas: was used to take the scraped data and combine it into a dataframe
- Geopy: to obtain the coordinates of the Neighbourhoods
- Foursquare API: to obtain venues and activities with their respective coordinates.
- [Mapit website](#): was used to provide the source of the Geojson files for the respective neighbourhood areas as these were not readily available. Refinement and consolidation needed to be performed as some of the areas were too small to reflect on a map of the size depicted below, this was achieved by consolidating some of the neighbourhoods together.
- Once all the GeoJson files had been obtained for each of the neighbourhoods they had to be joined into one file, to do this I used the [GeoJson websites](#) functionality to perform this task

## Methodology

|   | Neighborhood   | Latitude   | Longitude |
|---|----------------|------------|-----------|
| 0 | Ceres          | -33.368333 | 19.309167 |
| 1 | Gansbaai       | -34.582778 | 19.352222 |
| 2 | Kleinmond      | -34.338889 | 19.025278 |
| 3 | Langebaan      | -33.090717 | 18.034889 |
| 4 | Malmesbury     | -33.460278 | 18.723611 |
| 5 | Paternoster    | -32.809038 | 17.891695 |
| 6 | Riebeek-Valley | -33.351008 | 18.870026 |
| 7 | Saldanha       | -32.997778 | 17.945556 |

Table 1

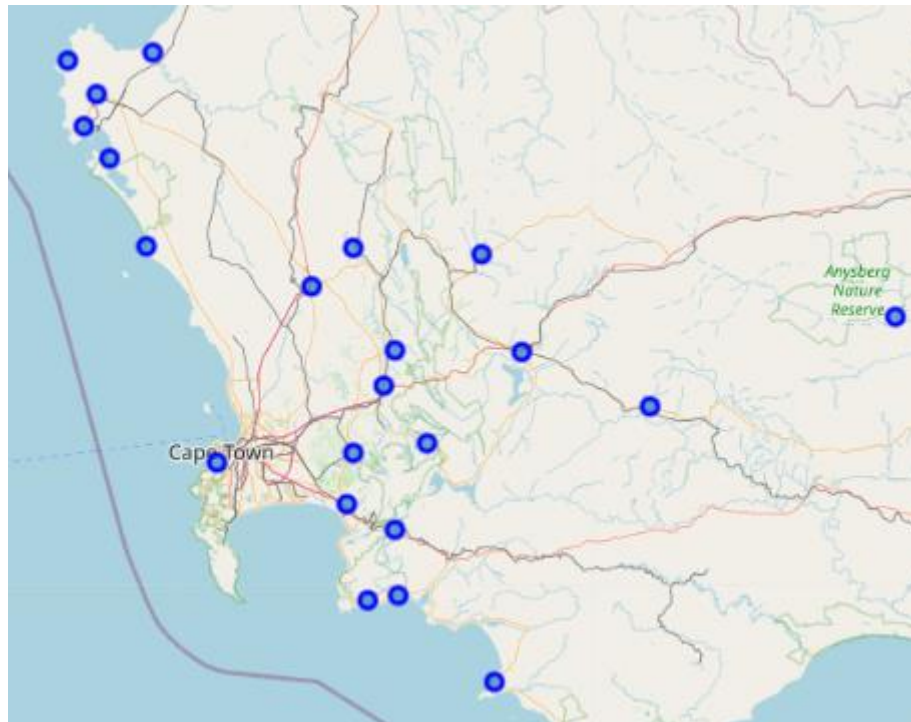


Image 1

As mentioned above I have approached this with two respective data sets that I want to focus on, which are the availability of accommodation in these areas with their related costs and, places of interest that comes from Four square data set, the below deals with obtaining the necessary Data, in the following sequence:

1. Accommodation data
2. Four Square data

### Obtaining Accommodation details

The below field **“Neighbourhood”** in Table 2 was used to obtain a list of accommodation information from the Air BnB website for that respective Neighbourhood. The result was Table 3 a list of items with their respective prices per Neighbourhood.

|   | Grouping     | Neighborhood    | Latitude   | Longitude |
|---|--------------|-----------------|------------|-----------|
| 0 | Ceres        | Ceres           | -33.368333 | 19.309167 |
| 1 | Overstrand   | Gansbaai        | -34.582778 | 19.352222 |
| 2 | Overstrand   | Kleinmond       | -34.338889 | 19.025278 |
| 3 | Saldana Bay  | Langebaan       | -33.090717 | 18.034889 |
| 4 | Swartland    | Malmesbury      | -33.460278 | 18.723611 |
| 5 | Saldana Bay  | Paternoster     | -32.809038 | 17.891695 |
| 6 | Swartland    | Riebeeck-Valley | -33.351008 | 18.870026 |
| 7 | Saldana Bay  | Saldanha        | -32.997778 | 17.945556 |
| 8 | Stellenbosch | Stellenbosch    | -33.934444 | 18.869167 |
| 9 | Strand       | Strand          | -33.546977 | 20.727530 |

Table 2

|   | Neighborhood | Venue                                      | Price | Grouping |
|---|--------------|--|-------|----------|
| 0 | Ceres        | Mosterts Hoek Self Catering Guest House    | 900   | Ceres    |
| 1 | Ceres        | Ceres Cozy Cottage with private courtyard. | 580   | Ceres    |
| 2 | Ceres        | Mountain Spring Cottage close to town      | 900   | Ceres    |
| 3 | Ceres        | Cozy Corner                                | 350   | Ceres    |
| 4 | Ceres        | Koraalboom 1                               | 300   | Ceres    |

Table 3

The total list of places that was obtained was 440 accommodation options across all the areas

### Accommodation Analysis

My next step was to get a feel of how each of the areas compare from an average pricing perspective. The above data set (Table 3) was summarised to provide the average price per area that can be viewed in Table 4, the results can also be seen on Image 2.

|    | Grouping         | Price      |
|----|------------------|------------|
| 0  | Bergrivier       | 863.200000 |
| 1  | Breedvalley      | 951.750000 |
| 2  | Ceres            | 896.950000 |
| 3  | City_of_Capetown | 565.725000 |
| 4  | Drakensfontein   | 721.625000 |
| 5  | Langeberg        | 818.850000 |
| 6  | Overstrand       | 855.566667 |
| 7  | Saldana Bay      | 673.325000 |
| 8  | Stellenbosch     | 757.225000 |
| 9  | Strand           | 868.550000 |
| 10 | Swartland        | 974.150000 |
| 11 | Theewaterskloof  | 653.800000 |

Table 4

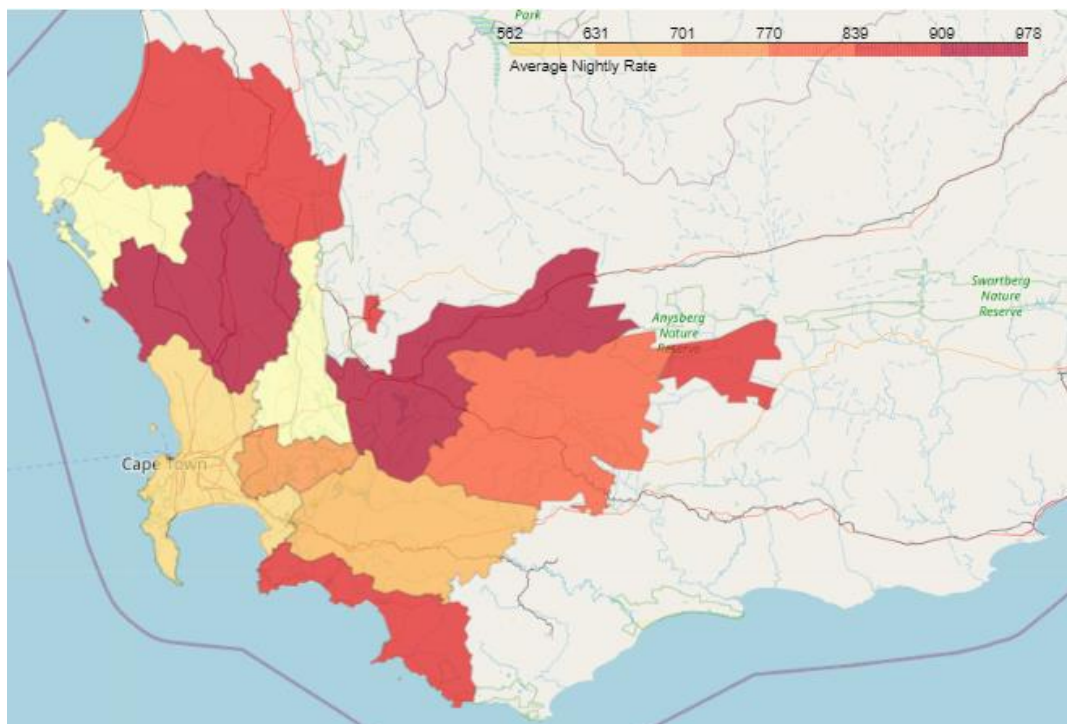


Image 2

As this provides a very high level view, I wanted to get a better understanding of how the pricing was distributed across each of the areas, the below provides a swarm plot of the distribution of the pricing, as can be seen there is quite a bit of variability in the pricing across each of the areas, providing a great choice for different customer requirements, on the assumption that the higher the price the more luxury the accomodation. However looking at each of the different areas we can see that there is increased density of options within the R500-R1000 per night range.



Graph 1

For a more detailed view of each of the groupings please refer to Appendix A , where each area is dealt with in a relative amount of detail.

### Obtaining Four Square details

Now that the Neighbourhood details are in place the next step is to utilise the four-square API to retrieve the top 100 venues in each of the respective neighbourhoods, the results for the data set only returned 231 different venues that consisted of 81 categories, the below Table 5 provides and excerpt of the data received from the Four Square API

|   | Neighborhood | Neighborhood Latitude | Neighborhood Longitude | Venue            | Venue Latitude | Venue Longitude | Venue Category       |
|---|--------------|-----------------------|------------------------|------------------|----------------|-----------------|----------------------|
| 0 | Ceres        | -33.368333            | 19.309167              | Wimpy            | -33.366085     | 19.316542       | Burger Joint         |
| 1 | Ceres        | -33.368333            | 19.309167              | Spar Ceres       | -33.372555     | 19.307444       | Convenience Store    |
| 2 | Ceres        | -33.368333            | 19.309167              | Rocky River Spur | -33.366721     | 19.316228       | Breakfast Spot       |
| 3 | Ceres        | -33.368333            | 19.309167              | Steers           | -33.372059     | 19.305644       | Fast Food Restaurant |
| 4 | Ceres        | -33.368333            | 19.309167              | Pick N Pay Ceres | -33.365802     | 19.316216       | Grocery Store        |

Table 5

With the expectation being that Four Square would return an adequate amount of data, I then performed the next step to understand which of the areas returned venues and how many. In Table 6 below shows how many venues were returned for each Neighbourhood. the 3 areas that returned the most amount of venues was Stellenbosch, Franschhoek and Somerset West, respectively. This analysis also provides a clear lack of options within certain neighbourhoods, to understand this further I performed some research on the trip advisor website to see if indeed this was the case, and found that Trip advisor provided a multitude of options, a lot more than Four Square

| Neighborhood   | Neighborhood Latitude | Neighborhood Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|----------------|-----------------------|------------------------|-------|----------------|-----------------|----------------|
| Bettys Bay     | 8                     | 8                      | 8     | 8              | 8               | 8              |
| Cape Town      | 5                     | 5                      | 5     | 5              | 5               | 5              |
| Ceres          | 5                     | 5                      | 5     | 5              | 5               | 5              |
| Franschhoek    | 36                    | 36                     | 36    | 36             | 36              | 36             |
| Gansbaai       | 8                     | 8                      | 8     | 8              | 8               | 8              |
| Grabouw        | 7                     | 7                      | 7     | 7              | 7               | 7              |
| Kleinmond      | 4                     | 4                      | 4     | 4              | 4               | 4              |
| Langebaan      | 11                    | 11                     | 11    | 11             | 11              | 11             |
| Malmesbury     | 6                     | 6                      | 6     | 6              | 6               | 6              |
| Paarl          | 3                     | 3                      | 3     | 3              | 3               | 3              |
| Paternoster    | 14                    | 14                     | 14    | 14             | 14              | 14             |
| Riebeek Valley | 4                     | 4                      | 4     | 4              | 4               | 4              |
| Robertson      | 11                    | 11                     | 11    | 11             | 11              | 11             |
| Saldanha       | 6                     | 6                      | 6     | 6              | 6               | 6              |
| Somerset West  | 25                    | 25                     | 25    | 25             | 25              | 25             |
| Stellenbosch   | 50                    | 50                     | 50    | 50             | 50              | 50             |
| Veldrif        | 2                     | 2                      | 2     | 2              | 2               | 2              |
| Vredenburg     | 6                     | 6                      | 6     | 6              | 6               | 6              |
| Wellington     | 7                     | 7                      | 7     | 7              | 7               | 7              |
| Worcester      | 9                     | 9                      | 9     | 9              | 9               | 9              |
| Yzerfontein    | 4                     | 4                      | 4     | 4              | 4               | 4              |

Table 6

### Analyse Each Neighbourhood

After obtaining a list of venues for each Neighbourhood the goal was to understand what were the most common venues across each of the respective areas, the below Table 7 provides a view for each of the areas that has been sorted to the 10 most occurring venue categories.

|   | 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 | Bettys Bay   | Coffee Shop           | Inn                   | Campground            | Restaurant            | River                 | Scenic Lookout        | Park                  | Hostel                | Football Stadium         | French Restaurant      |
| 1 | Cape Town    | Scenic Lookout        | Gift Shop             | Café                  | Cable Car             | Wine Shop             | Flea Market           | Department Store      | Diner                 | Discount Store           | Fast Food Restaurant   |
| 2 | Ceres        | Grocery Store         | Breakfast Spot        | Fast Food Restaurant  | Burger Joint          | Convenience Store     | Department Store      | Diner                 | Discount Store        | Fish & Chips Shop        | Flea Market            |
| 3 | Franschhoek  | Hotel                 | French Restaurant     | Coffee Shop           | Restaurant            | Brewery               | African Restaurant    | Burger Joint          | Italian Restaurant    | Mediterranean Restaurant | Chocolate Shop         |
| 4 | Gansbaai     | Seafood Restaurant    | Burger Joint          | Harbor / Marina       | Restaurant            | Bed & Breakfast       | Convenience Store     | Shopping Mall         | Wine Shop             | Department Store         | Diner                  |
| 5 | Grabouw      | Grocery Store         | Convenience Store     | Department Store      | Fried Chicken Joint   | Discount Store        | Shopping Mall         | Flea Market           | Deli / Bodega         | Diner                    | Fast Food Restaurant   |
| 6 | Kleinmond    | Liquor Store          | Gas Station           | Beach                 | Grocery Store         | Gastropub             | Flea Market           | Deli / Bodega         | Department Store      | Diner                    | Discount Store         |
| 7 | Langebaan    | Beach                 | Coffee Shop           | Gastropub             | Auto Workshop         | Pub                   | Hotel                 | Restaurant            | Convenience Store     | Fast Food Restaurant     | Seafood Restaurant     |
| 8 | Malmesbury   | Grocery Store         | Breakfast Spot        | Burger Joint          | Fast Food Restaurant  | Pizza Place           | Gas Station           | Fish & Chips Shop     | Golf Course           | Deli / Bodega            | Department Store       |
| 9 | Paarl        | Restaurant            | Gas Station           | Wine Shop             | Flea Market           | Deli / Bodega         | Department Store      | Diner                 | Discount Store        | Fast Food Restaurant     | Fish & Chips Shop      |

Table 7

## Cluster Neighbourhoods

To understand the different activities better across the different neighbourhoods, I have utilised the unsupervised learning K-means algorithm to cluster the neighbourhoods by the activities that can be performed in each one. A decision was made to use 5 clusters.

Once the clusters were obtained, they were then assigned to each of the Neighbourhoods that can be seen in Table 8 Below

|   | Neighborhood | Latitude   | Longitude | Cluster_Labels | 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 |
|---|--------------|------------|-----------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 0 | Ceres        | -33.368333 | 19.309167 | 3.0            | Grocery Store         | Breakfast Spot        | Fast Food Restaurant  | Burger Joint          | Convenience Store     | Department Store      | Diner                 | Discount Store        |
| 1 | Gansbaai     | -34.582778 | 19.352222 | 0.0            | Seafood Restaurant    | Burger Joint          | Harbor / Marina       | Restaurant            | Bed & Breakfast       | Convenience Store     | Shopping Mall         | Wine Shop             |
| 2 | Kleinmond    | -34.338889 | 19.025278 | 3.0            | Liquor Store          | Gas Station           | Beach                 | Grocery Store         | Gastropub             | Flea Market           | Deli / Bodega         | Department Store      |
| 3 | Langebaan    | -33.090717 | 18.034889 | 2.0            | Beach                 | Coffee Shop           | Gastropub             | Auto Workshop         | Pub                   | Hotel                 | Restaurant            | Convenience Store     |
| 4 | Malmesbury   | -33.460278 | 18.723611 | 3.0            | Grocery Store         | Breakfast Spot        | Burger Joint          | Fast Food Restaurant  | Pizza Place           | Gas Station           | Fish & Chips Shop     | Golf Course           |

Table 8

Utilising the Longitude and Latitude coordinates for each of the regions, the classes were superimposed on to a map of the Western Cape utilising the python folium library, This can be viewed below in Image 3



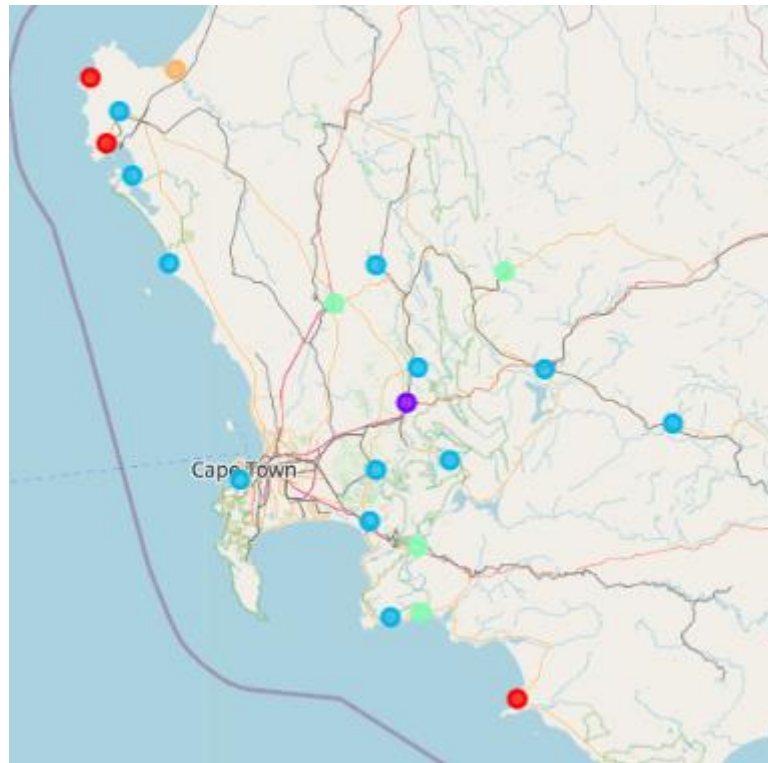


Image 3

## Examining the Clusters

### Cluster 1

|   | Neighborhood | Cluster_Labels | 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 |
|---|--------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 1 | Gansbaai     | 0              | Seafood Restaurant    | Burger Joint          | Harbor / Marina       | Restaurant            | Bed & Breakfast       | Convenience Store          | Shopping Mall         | Wine Shop             | Department Store      | Diner                  |
| 5 | Patemoster   | 0              | Seafood Restaurant    | Restaurant            | Hotel                 | Pizza Place           | Bar                   | Beach                      | Food & Drink Shop     | Fried Chicken Joint   | Gas Station           | French Restaurant      |
| 7 | Saldanha     | 0              | Convenience Store     | Harbor / Marina       | Travel & Transport    | Athletics & Sports    | Seafood Restaurant    | Construction & Landscaping | Flea Market           | Deli / Bodega         | Department Store      | Diner                  |

Table 9

From the results obtained from the clustering algorithm, this was named the Seafood restaurant cluster and is denoted by the colour red per Image 3

### Cluster 2

|    | Neighborhood | Cluster_Labels | 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 |
|----|--------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 14 | Paarl        | 1              | Restaurant            | Gas Station           | Wine Shop             | Flea Market           | Deli / Bodega         | Department Store      | Diner                 | Discount Store        | Fast Food Restaurant  | Fish & Chips Shop      |

Table 10

This was named the Restaurant cluster and is denoted by the colour purple



### Cluster 3

|    | Neighborhood   | Cluster_Labels | 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 |
|----|----------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------------|------------------------|
| 3  | Langebaan      | 2              | Beach                 | Coffee Shop           | Gastropub             | Auto Workshop         | Pub                   | Hotel                 | Restaurant            | Convenience Store     | Fast Food Restaurant     | Seafood Restaurant     |
| 6  | Riebeek Valley | 2              | Wine Shop             | Diner                 | Hotel                 | Shopping Mall         | Food                  | Deli / Bodega         | Department Store      | Discount Store        | Fast Food Restaurant     | Fish & Chips Shop      |
| 8  | Stellenbosch   | 2              | Coffee Shop           | Hotel                 | Bar                   | Restaurant            | Sushi Restaurant      | Gym                   | Café                  | Steakhouse            | Food                     | Juice Bar              |
| 9  | Vredenburg     | 2              | Restaurant            | Locksmith             | Other Repair Shop     | Department Store      | Fast Food Restaurant  | Wine Shop             | Deli / Bodega         | Diner                 | Discount Store           | Fish & Chips Shop      |
| 10 | Wellington     | 2              | Fast Food Restaurant  | Food & Drink Shop     | Gas Station           | Café                  | Burger Joint          | Convenience Store     | Flea Market           | Department Store      | Diner                    | Discount Store         |
| 11 | Worcester      | 2              | Fast Food Restaurant  | Pizza Place           | Steakhouse            | Gas Station           | Hotel                 | Restaurant            | Café                  | Grocery Store         | Bed & Breakfast          | Food & Drink Shop      |
| 12 | Bettys Bay     | 2              | Coffee Shop           | Inn                   | Campground            | Restaurant            | River                 | Scenic Lookout        | Park                  | Hostel                | Football Stadium         | French Restaurant      |
| 15 | Robertson      | 2              | Supermarket           | Breakfast Spot        | Burger Joint          | Pharmacy              | Gas Station           | Hotel                 | Coffee Shop           | Bed & Breakfast       | Fast Food Restaurant     | Café                   |
| 17 | Yzerfontein    | 2              | Beach                 | Deli / Bodega         | Restaurant            | Wine Shop             | Food                  | Department Store      | Diner                 | Discount Store        | Fast Food Restaurant     | Fish & Chips Shop      |
| 18 | Franschhoek    | 2              | Hotel                 | French Restaurant     | Coffee Shop           | Restaurant            | Brewery               | African Restaurant    | Burger Joint          | Italian Restaurant    | Mediterranean Restaurant | Chocolate Shop         |
| 19 | Somerset West  | 2              | Restaurant            | Café                  | Coffee Shop           | Golf Course           | Grocery Store         | Fast Food Restaurant  | Indian Restaurant     | Italian Restaurant    | Mobile Phone Shop        | Nightclub              |
| 20 | Cape Town      | 2              | Scenic Lookout        | Gift Shop             | Café                  | Cable Car             | Wine Shop             | Flea Market           | Department Store      | Diner                 | Discount Store           | Fast Food Restaurant   |

Table 11

The results from Cluster 3 does not seem to have any form of unifying theme to it so it will be classified as general and is denoted by the colour blue

### Cluster 4

|    | Neighborhood | Cluster_Labels | 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  | Ceres        | 3              | Grocery Store         | Breakfast Spot        | Fast Food Restaurant  | Burger Joint          | Convenience Store     | Department Store      | Diner                 | Discount Store        | Fish & Chips Shop     | Flea Market            |
| 2  | Kleinmond    | 3              | Liquor Store          | Gas Station           | Beach                 | Grocery Store         | Gastropub             | Flea Market           | Deli / Bodega         | Department Store      | Diner                 | Discount Store         |
| 4  | Malmesbury   | 3              | Grocery Store         | Breakfast Spot        | Burger Joint          | Fast Food Restaurant  | Pizza Place           | Gas Station           | Fish & Chips Shop     | Golf Course           | Deli / Bodega         | Department Store       |
| 13 | Grabouw      | 3              | Grocery Store         | Convenience Store     | Department Store      | Fried Chicken Joint   | Discount Store        | Shopping Mall         | Flea Market           | Deli / Bodega         | Diner                 | Fast Food Restaurant   |

Table 12

This was named the General retail cluster as the most common items are Grocery stores and liquor stores and is denoted by the colour green

### Cluster 5

|    | Neighborhood | Cluster_Labels | 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 |
|----|--------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 16 | Velddrif     | 4              | Coffee Shop           | Fish & Chips Shop     | Wine Shop             | Convenience Store     | Department Store      | Diner                 | Discount Store        | Fast Food Restaurant  | Flea Market           | Food                   |

Table 13

This was named the Coffee shop cluster as these seem to be the most prevalent venue here and is denoted by the colour orange.

## Results

The final results of the two problem areas that were defined above, where should I stay and what activities am I able to do in relation to where I stay, at a high level can be viewed in the choropleth map (Image 4) below, This is depicted by the coloured dots on the map, their classifications are as follows:

- Seafood restaurant (red)
- Restaurant (purple)
- General (blue)
- General Retail (light green)
- Coffee shops (orange)

From an accommodation perspective the average price per area ranges from R562 to about R978 across the different regions, where the darker being more expensive. However, this provides a very high-level grouping of the accommodation at hand. A further detailed study of the accommodation in each of the areas can be viewed in the appendix below.

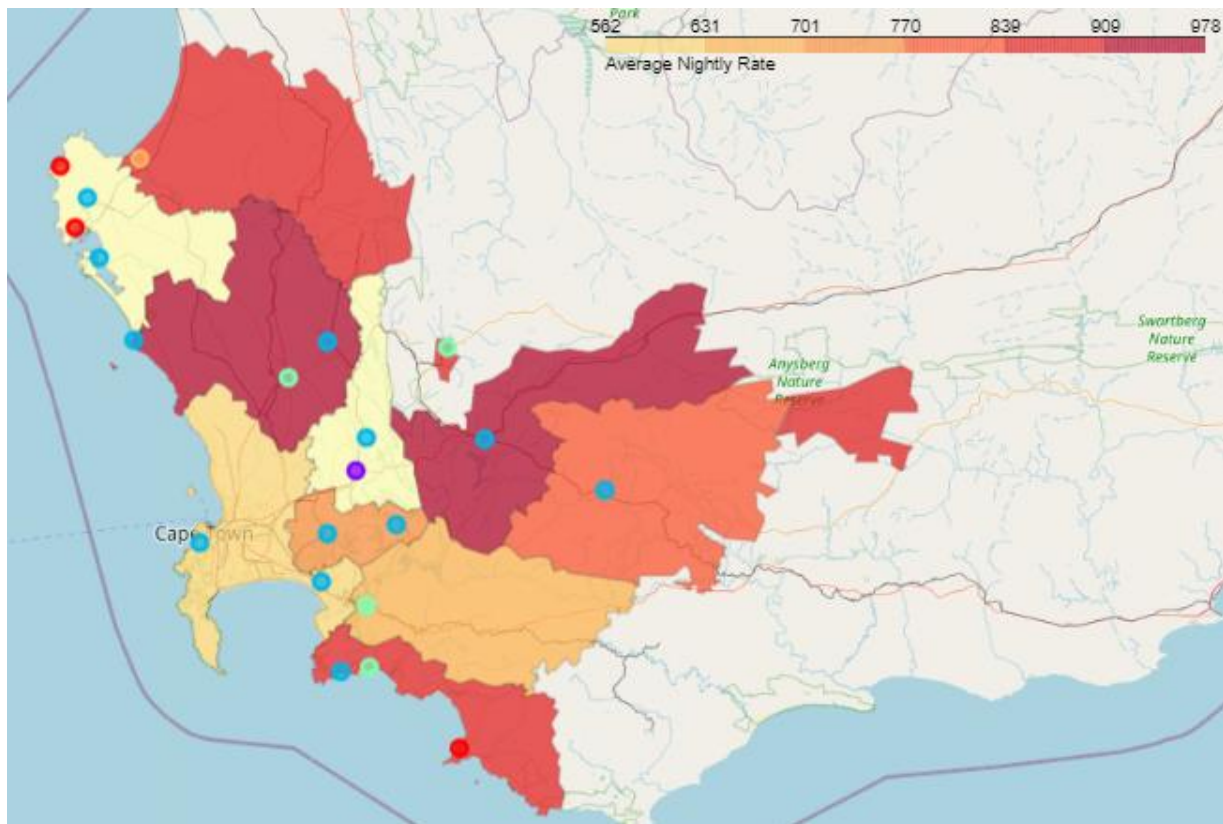


Image 4

## Discussion

The Two questions that I set out to answer when starting this project where the following:

- What are my options on things that I can do?
- Where should I stay in relation to the activities that I want to perform and what is a reasonable price that I can spend on accommodation.

Dealing with the accommodation question first, this area focused on Air Bnb to provide the data, which only caters for people who are prepared utilise their product offering, however the data did provide much insight into the question, and what I found was that much of the pricing does centre in a range of R500 to R1000 range with outliers both above and below. This to me means that there is a large spread of pricing on offer for all people concerned in each of the areas. I also found that the average pricing per area can be distorted by the outliers.

In addition to the above piece of work I performed a further in depth analysis(refer Appendix A) of each of the areas to understand the pricing better and what I found is that in some areas where there is more than one neighbourhood and when analysing each of the neighbourhoods against one another there is often a disparity in

pricing between them, the one area (more well-known) generally has a higher pricing than the other, this provides useful insight in that by performing this additional analysis you may get better value for your money in the less popular areas.

Options on things to do, with having a bit of background to this area, I found that data that was provided by Four Square to be insufficient to adequately have any definitive bearing in providing answers to this question, to support my answer I went and viewed things to do on Trip advisor for one or two of the areas and found a large selection that was not present in Four Square. I was unfortunately unable to obtain the information from Trip advisor. I also found that the data provided by Four Square dealt more with general day to day activities and did not cater much towards potential visitor requirements, as can be seen by the cluster classifications.

As mentioned above this type of study lends itself to additional data requirements and additional data sources to be able to better answer and provide more value to the above questions. To achieve this, I would include the following data sources:

- From personal experience I know that the Western Cape is known as the wine Region within South Africa and there seems to be a distinct lack of data pertaining to this, thus more research on wine farms would need to be performed and included.
- If it is possible the data from Trip advisor would add a lot of content and valuable information to this study.
- As Air Bnb was the only source that I used for accommodation I feel that additional sources would need to be utilised to provide a more rounder view of the accommodation options and pricing, like what hotels are available to stay at, possible place to go camping and additional self-catering options.

## Conclusion

In summary the answers that I achieved to the questions that I outlined in the beginning are as follows:

*What are my options on things that I can do?*

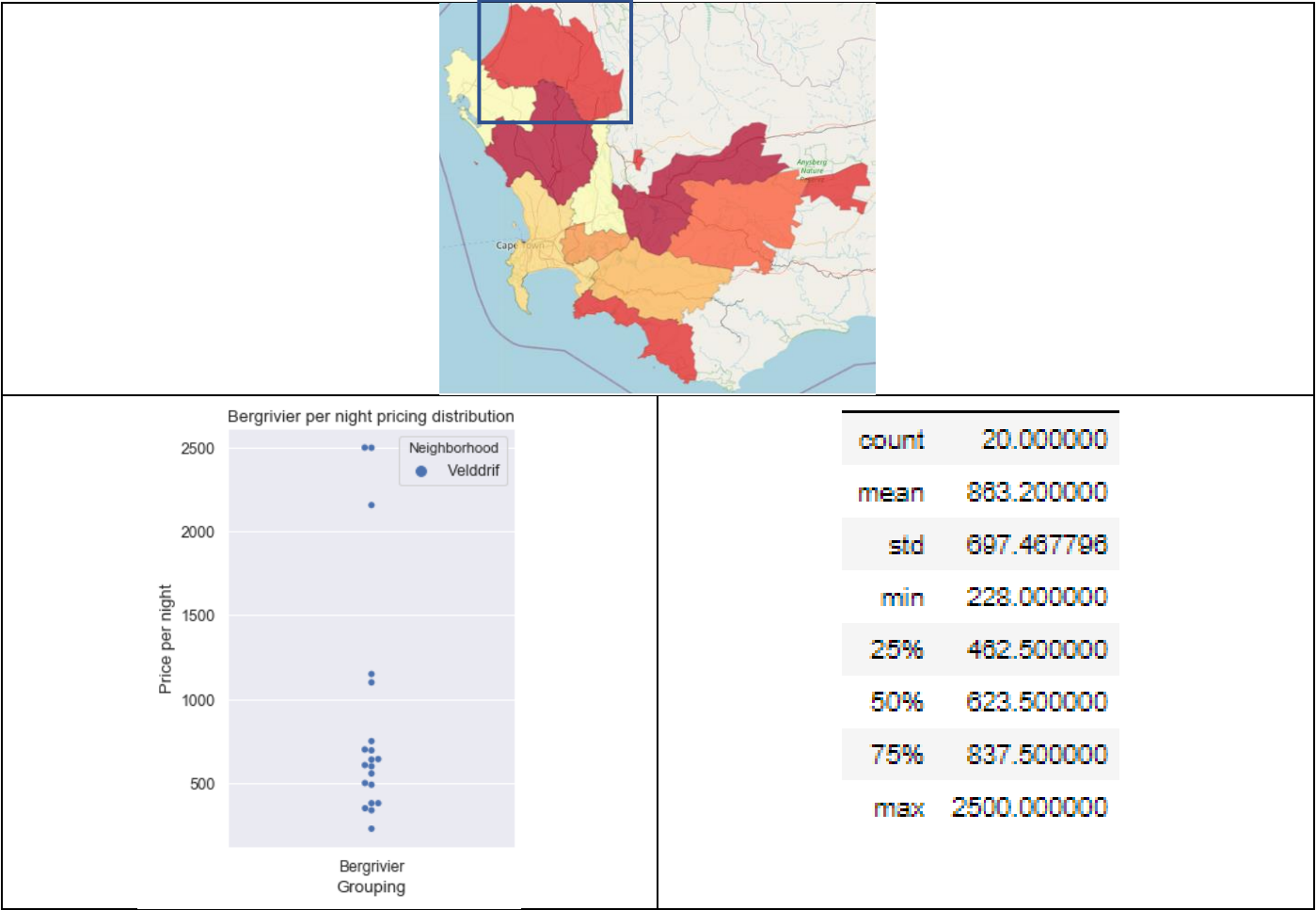
As mentioned above I found the data here was inconclusive, but from the data that was available I was able to obtain 5 classifications across the area under study, which were Seafood restaurants, Restaurants, General, General retail and Coffee shops. More data is required to provide more value-add options in this space.

*Where should I stay in relation to the activities that I want to perform and what is a reasonable price that I can spend on accommodation?*

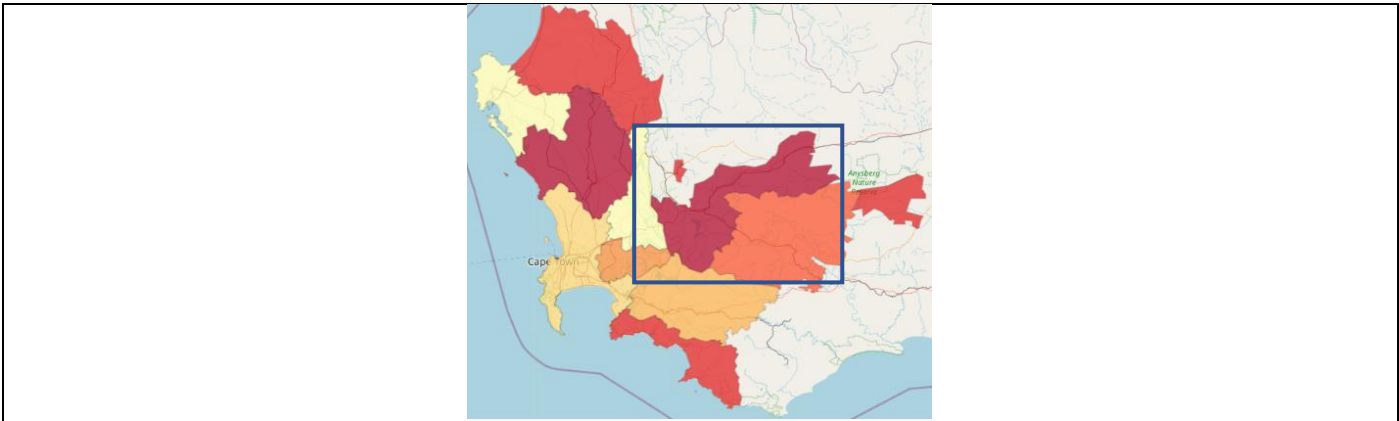
I found this piece of work quite insightful and found that there are areas that differ from an average pricing perspective, however most of the options within each of the areas reside in the R500 to R1000 range. In further analysing each of the areas it was found that there was a price premium on accommodation for the more well-known areas.

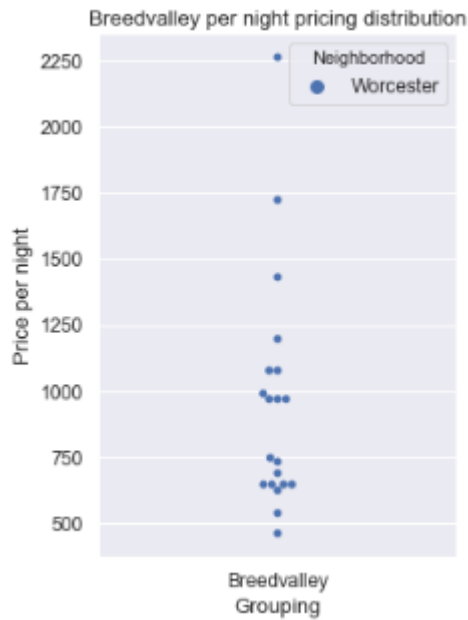
Appendix A

Bergrivier Analysis



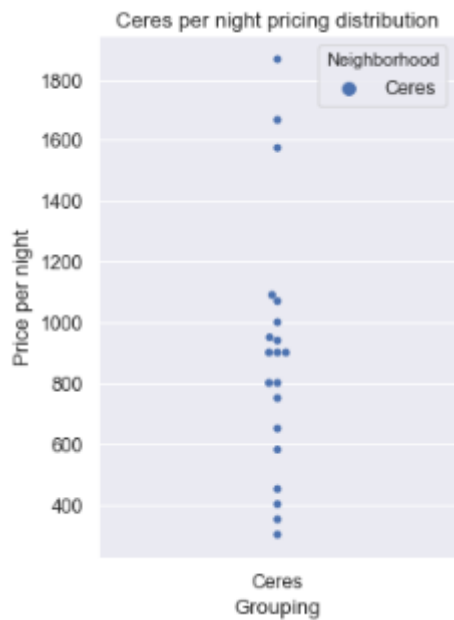
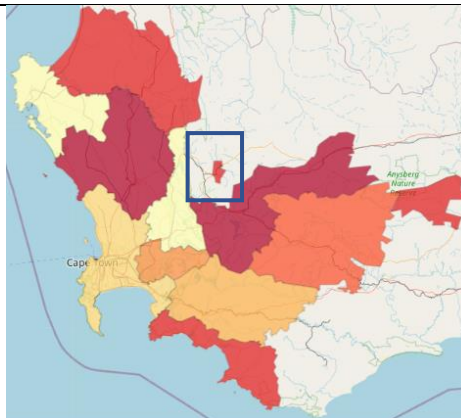
Breedvalley Analysis





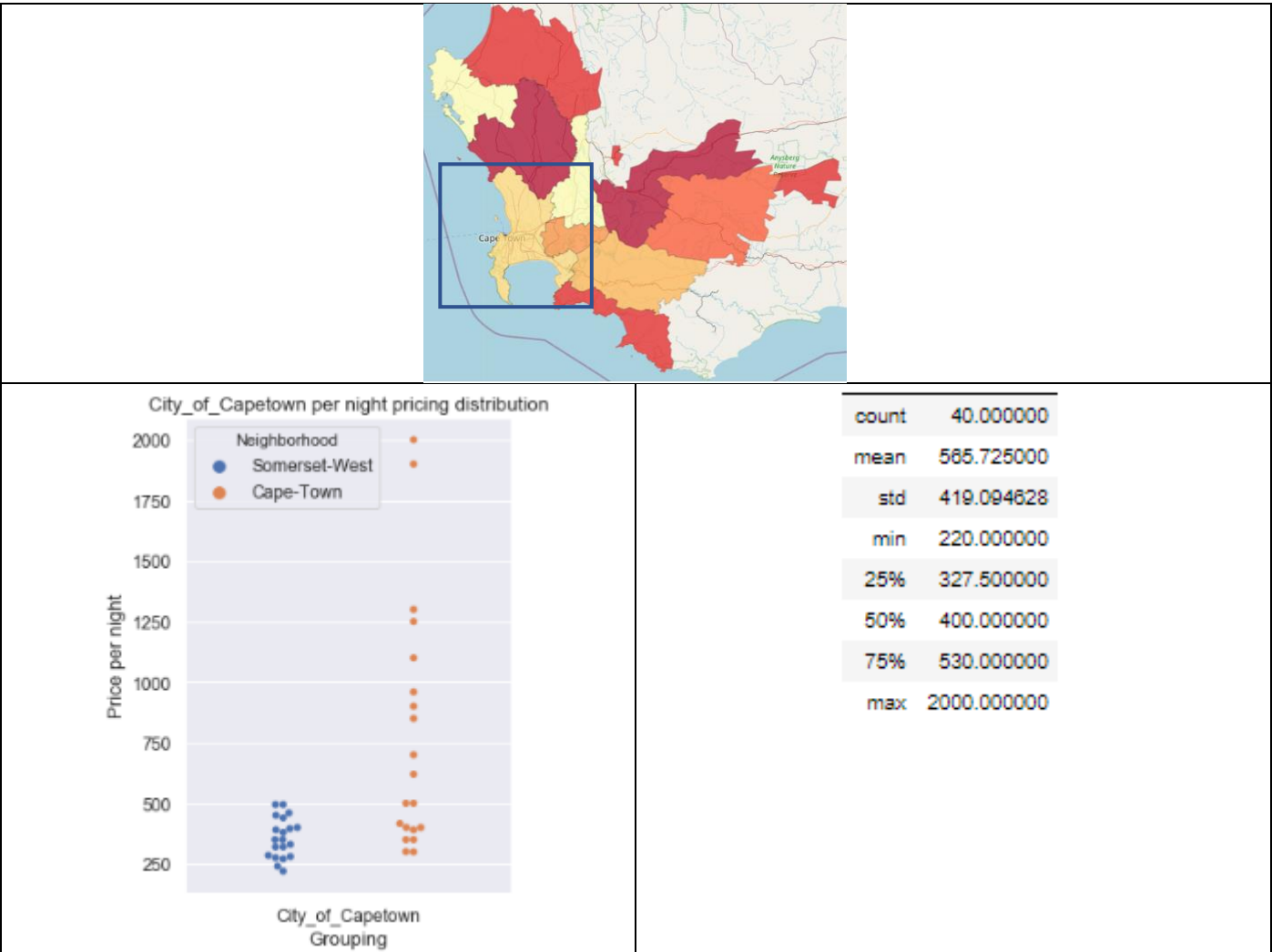
|       |             |
|-------|-------------|
| count | 20.000000   |
| mean  | 951.750000  |
| std   | 440.224808  |
| min   | 461.000000  |
| 25%   | 646.000000  |
| 50%   | 858.000000  |
| 75%   | 1077.000000 |
| max   | 2261.000000 |

### Producing a view for Ceres Grouping



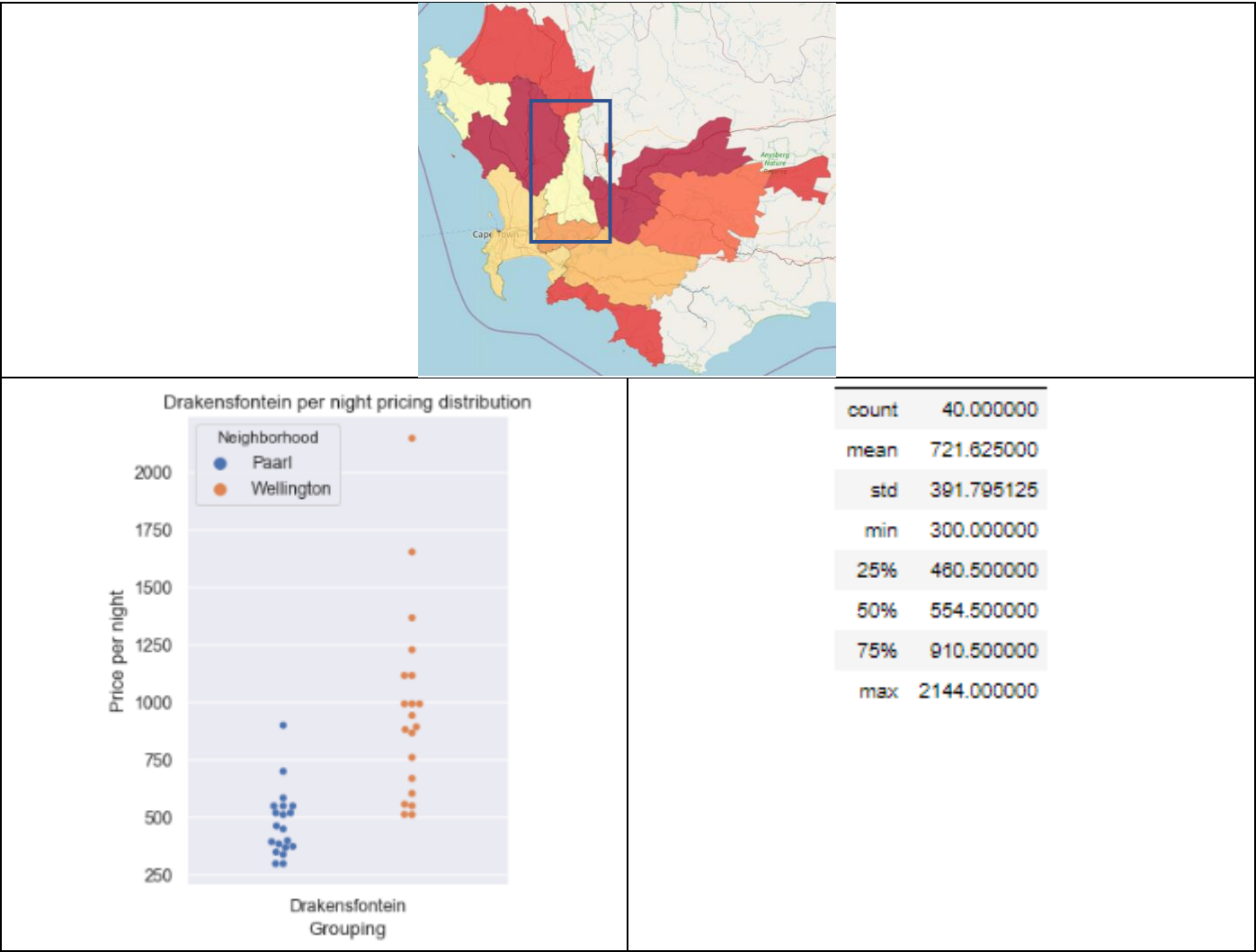
|       |             |
|-------|-------------|
| count | 20.000000   |
| mean  | 896.950000  |
| std   | 421.79547   |
| min   | 300.000000  |
| 25%   | 632.500000  |
| 50%   | 900.000000  |
| 75%   | 1017.500000 |
| max   | 1867.000000 |

Producing a view for City\_of\_Capetown Grouping

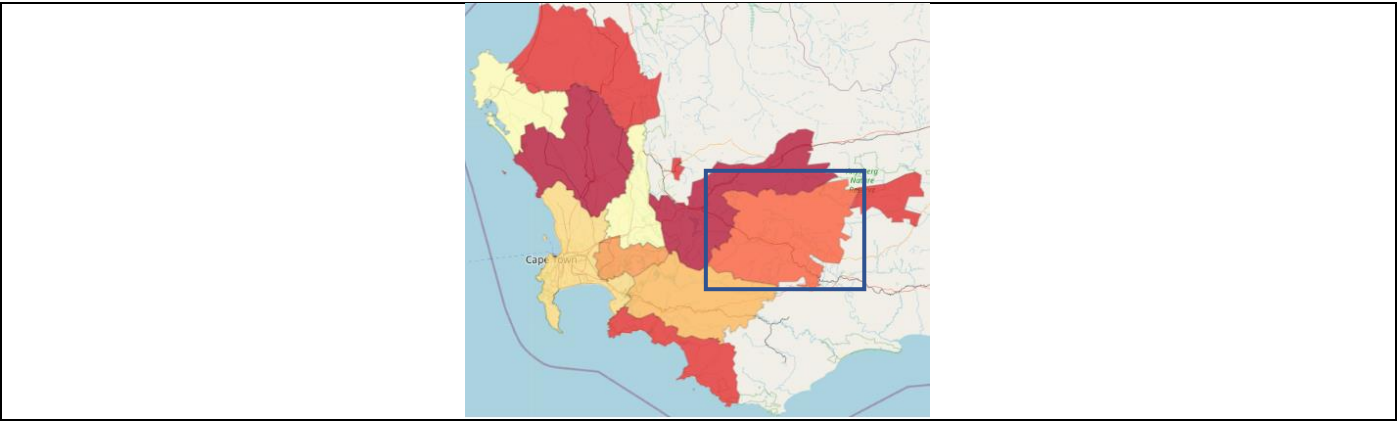


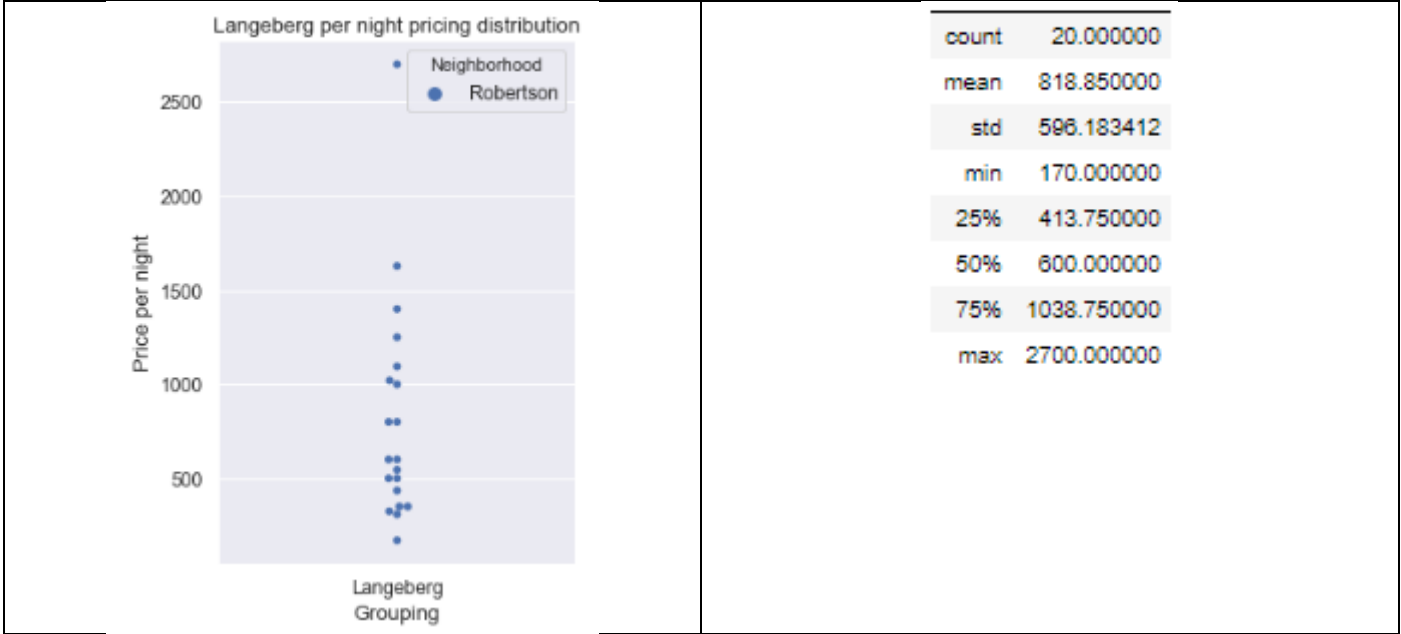


Producing a view for Drakensfontein Grouping

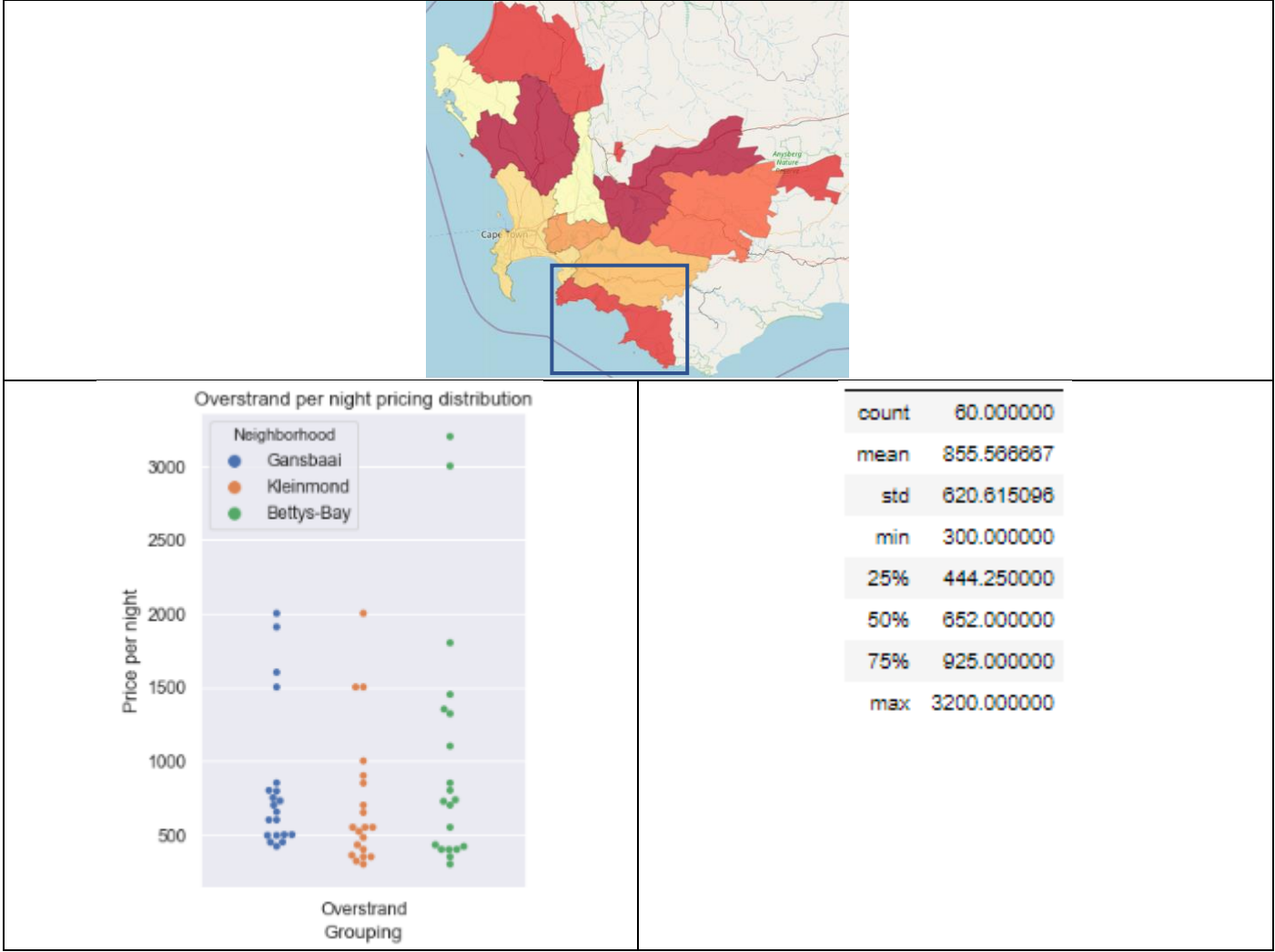


Producing a view for Langeberg Grouping

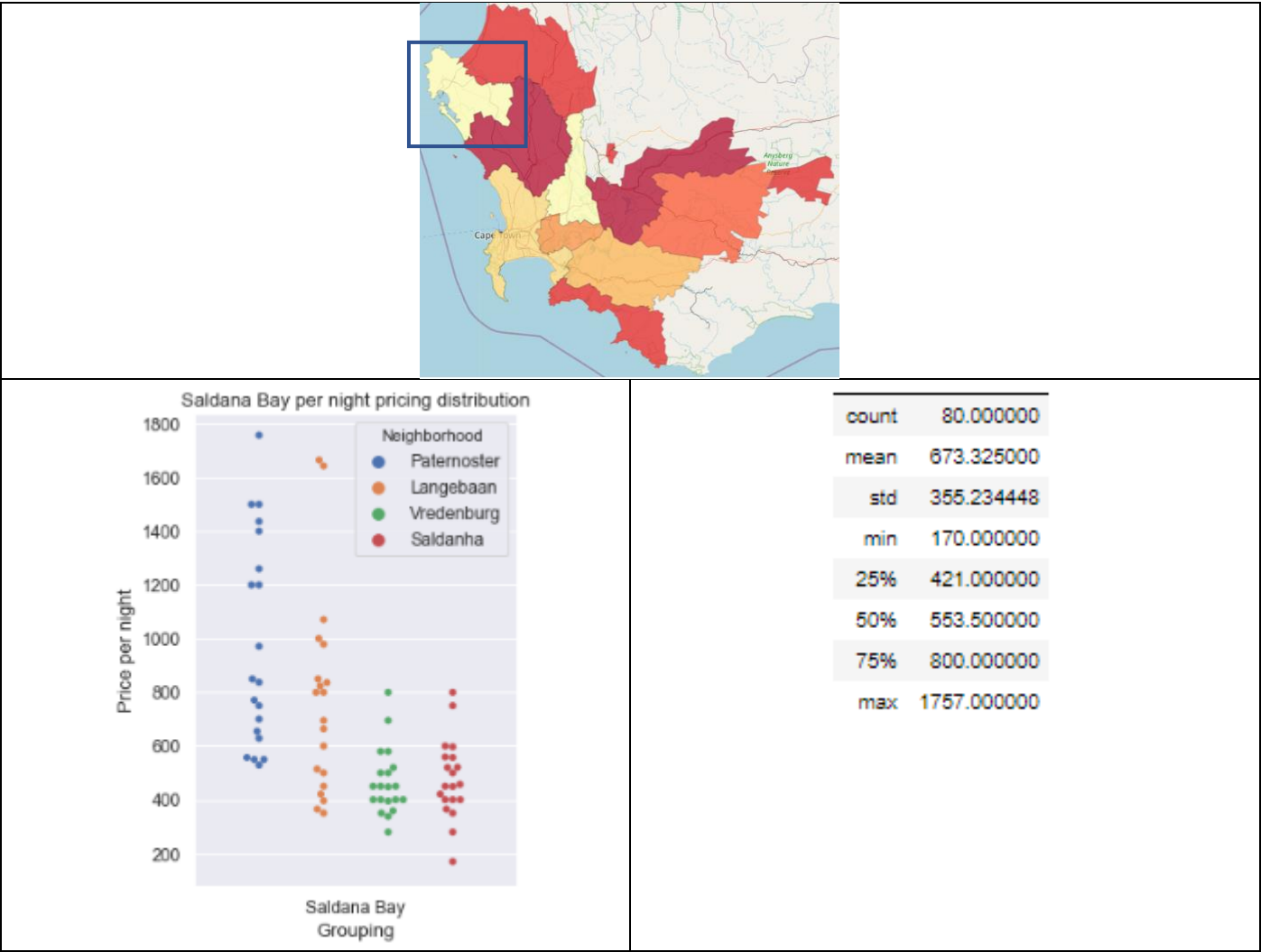




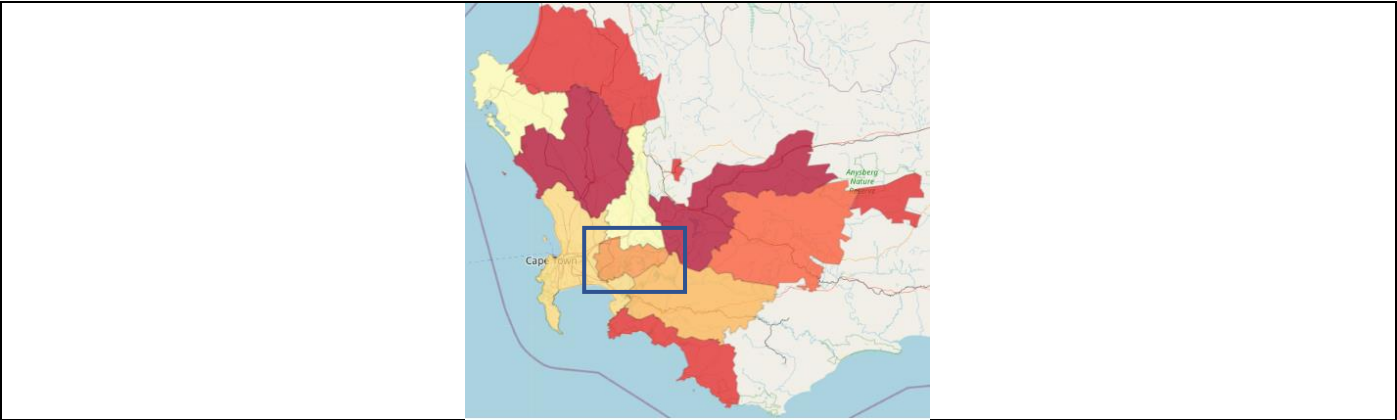
Producing a view for Overstrand Grouping

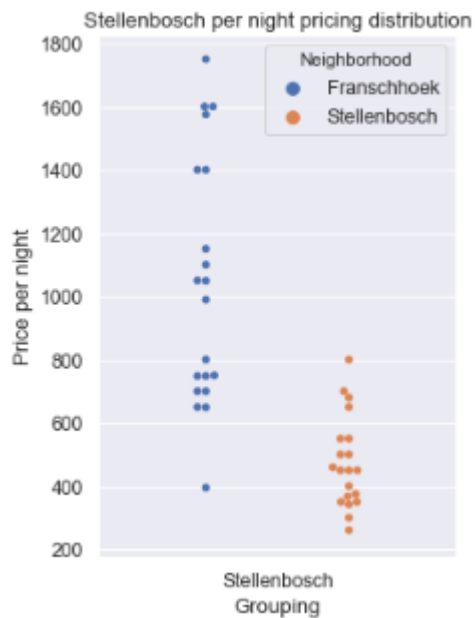


Producing a view for Saldana Bay Grouping



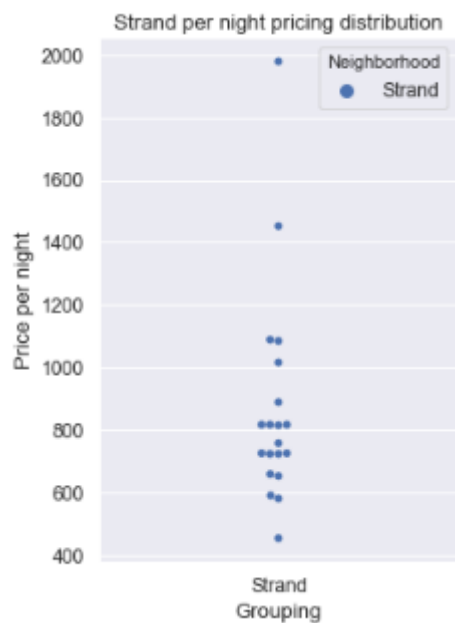
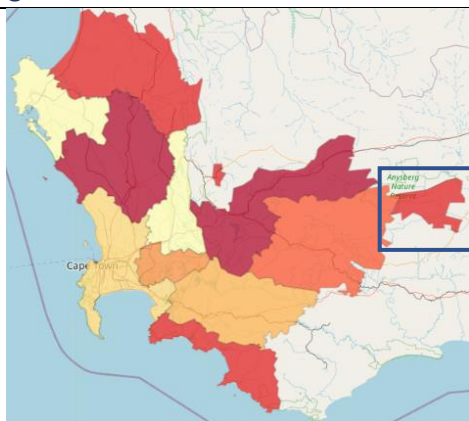
Producing a view for Stellenbosch Grouping





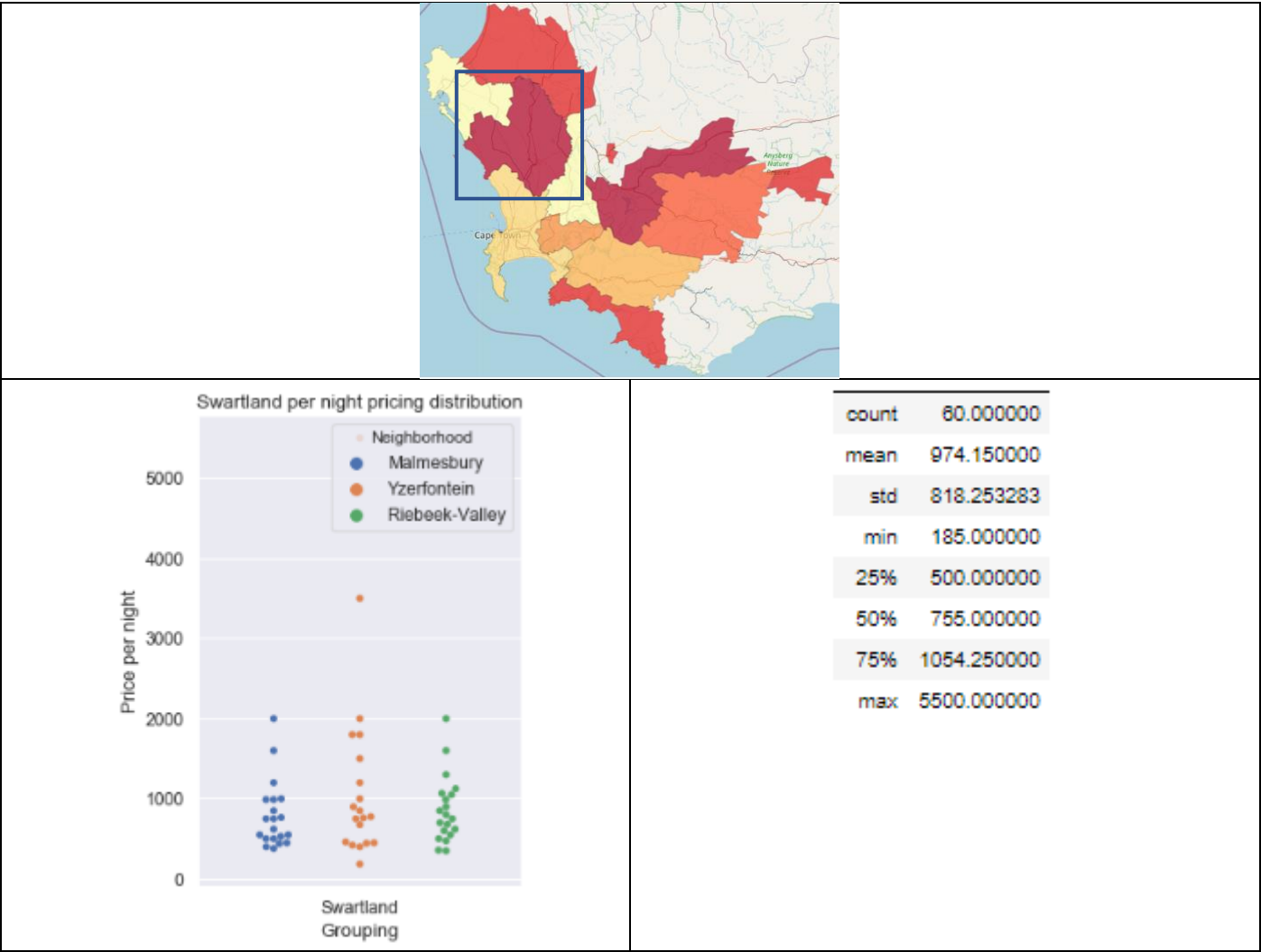
|       |             |
|-------|-------------|
| count | 40.000000   |
| mean  | 757.225000  |
| std   | 410.086638  |
| min   | 261.000000  |
| 25%   | 450.000000  |
| 50%   | 665.000000  |
| 75%   | 1004.750000 |
| max   | 1750.000000 |

### Producing a view for Strand Grouping

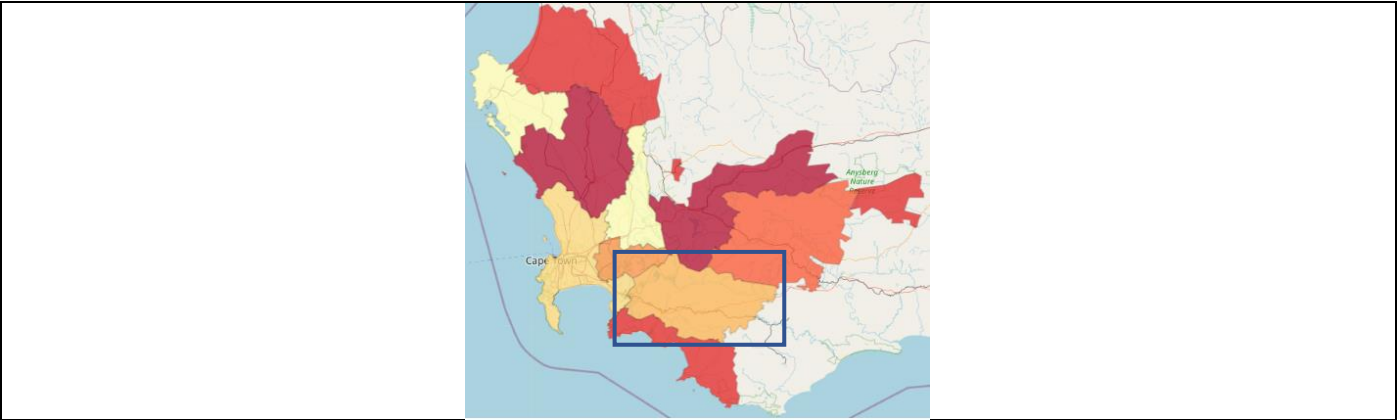


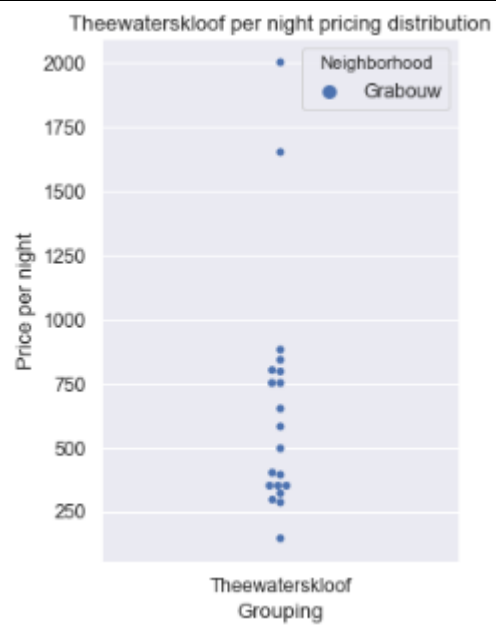
|       |             |
|-------|-------------|
| count | 20.000000   |
| mean  | 868.550000  |
| std   | 341.539622  |
| min   | 454.000000  |
| 25%   | 707.750000  |
| 50%   | 786.500000  |
| 75%   | 920.750000  |
| max   | 1978.000000 |

Producing a view for Swartland Grouping



Producing a view for Theewaterskloof Grouping





|       |             |
|-------|-------------|
| count | 20.000000   |
| mean  | 653.800000  |
| std   | 460.372344  |
| min   | 144.000000  |
| 25%   | 350.000000  |
| 50%   | 537.500000  |
| 75%   | 796.250000  |
| max   | 2000.000000 |