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Business Problem

The vacation rental market in Dallas, TX, has been identified as underperforming, with the city ranking among the top 25 for the lowest average occupancy rates in 2022. This project aims to spotlight the top 10 Airbnb properties, thus helping property owners enhance their offerings and assisting potential guests in making informed choices.

Background/History

Despite a low occupancy rate, Dallas hosts a significant number of Airbnb listings. Identifying properties that excel in guest satisfaction could provide valuable insights into improving the market's performance. This project leverages data science to analyze and rank properties, focusing on average ratings and the number of reviews to discover Dallas' most appealing Airbnb.

Data Explanation

Data was sourced from Inside Airbnb, providing a comprehensive listing dataset, and Stevesie.com for up-to-date reviews. These datasets include information on property characteristics, guest reviews, and ratings. Data cleaning involved removing duplicates, handling missing values, and ensuring data consistency across different sources. A pivotal step in the analysis was the decision to include only properties with their first review dated no earlier than 2018. This filtering ensured a level playing field by mitigating potential biases toward longer-established properties, which might naturally accumulate more reviews regardless of quality or guest satisfaction.

Methods

The project employed data cleaning, exploratory data analysis (EDA), and visualization techniques. Key steps included filtering properties based on review dates to ensure relevance and using APIs to fetch recent review data. Analysis tools included Python libraries such as Pandas for data manipulation, Seaborn, and Plotly for visualization.

Analysis

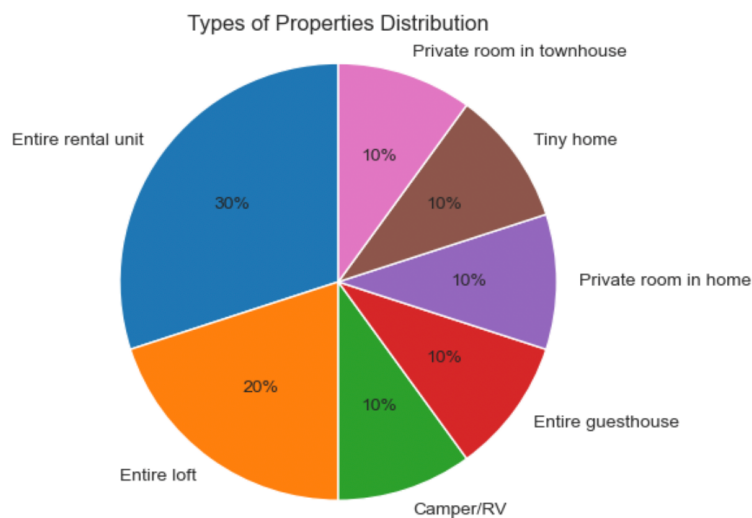
The analysis identified top properties based on the number of reviews and average ratings. Visualization techniques highlighted the distribution of these properties around Dallas and provided insights into pricing and property types. Despite the city's lower occupancy rates, we found properties that are both highly rated and frequently booked, with an average nightly rate of \$95. A notable finding was the affordability of top-rated properties and their proximity to downtown Dallas.

```
count    10.00000
mean      95.10000
std       79.94783
min       35.00000
25%       65.25000
50%       74.50000
75%       80.25000
max      318.00000
Name: price_numeric, dtype: float64
```



Conclusion

The study unveiled Dallas's top 10 Airbnb properties, presenting an affordable range of highly rated accommodations. These properties, predominantly entire homes or condos, demonstrate the potential for high guest satisfaction despite the overall low occupancy rates in the city.



Assumptions

The analysis assumes that the number of reviews and average ratings accurately indicate a property's appeal and success. It also presupposes the data's completeness and reliability from the sources used.

Limitations

The study is limited by the availability and recency of data, potential biases in guest reviews, and the exclusion of newer properties with fewer reviews. The analysis does not account for seasonal variations or specific events affecting occupancy rates.

Challenges

Challenges included data collection and integration across different sources, handling API rate limits and costs, and ensuring the relevance and recency of the data used in the analysis. The project's execution was far from straightforward. The initial stages had difficulties in data collection, primarily due to the unavailability of seamlessly integrating datasets to establish the necessary relationships.

Future Uses/Additional Applications

The methodology and insights from this project can be applied to other cities or regions to identify top-performing vacation rentals. Further research could explore the impact of specific amenities, property types, or host strategies on guest satisfaction and occupancy rates. By looking into how reviews, ratings, and amenities play together, we can offer tips for hosts to up their game and boost occupancy. This study lays the groundwork for future research to untangle further the factors affecting Dallas's Airbnb market.

Recommendations

Property owners should offer competitive pricing, ensure high-quality amenities, and maintain clear, open communication with guests. Properties should be marketed, highlighting their unique features and proximity to key attractions.

Implementation Plan

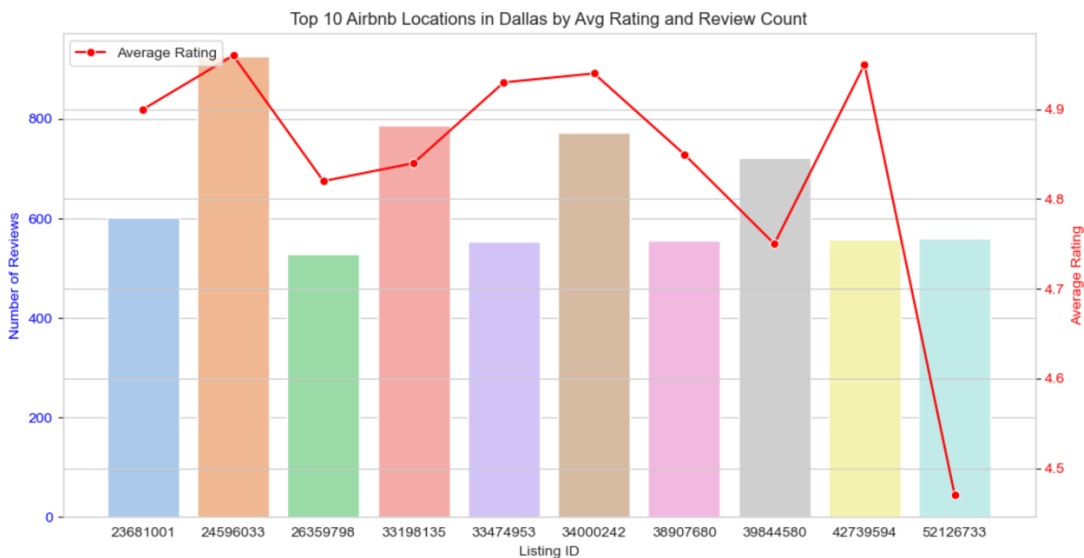
A step-by-step approach to applying the findings includes reviewing property listings for alignment with top-performing characteristics, adjusting pricing strategies, enhancing property

amenities based on guest preferences, and leveraging marketing strategies to highlight unique property features.

Ethical Assessment

The project underscores the importance of ethical considerations in data handling, ensuring privacy and fairness. The analysis respects the anonymity of hosts and guests, focusing on publicly available data to draw insights without infringing on individual privacy.

In summary, this research sheds light on the characteristics of successful Airbnb properties in Dallas. It offers a blueprint for property owners to improve their offerings and for guests to make informed accommodation choices.



GitHub

https://github.com/rozank/dsc680_applied_datascience/tree/main/Project-2

References

Mashvisor. (2024, January 8). What Airbnb Occupancy Rate Can You Expect in the US Market?

<https://www.mashvisor.com/blog/what-airbnb-occupancy-rate-can-you-expect/>

Stevsie.com for API access to the latest Airbnb reviews and ratings

(<https://stevesie.com/cloud/apis/airbnb/reviews>).

Questions

Here is the list of 10 possible questions that the audience might ask.

1. How was Dallas identified as having one of the lowest average occupancy rates?
2. Why were only properties with first reviews from 2018 onwards considered?
3. What methodologies were used to rank the top 10 Airbnb properties in Dallas?
4. What were some key findings regarding the top 10 Airbnb properties?
5. What limitations did the study face?
6. What challenges were encountered during the project?
7. How can the insights from this study be applied to other cities or regions?
8. What recommendations are provided for Airbnb hosts in Dallas?
9. What ethical considerations were made during the analysis?
10. Where can I find the data and code used in this project?