

Assignment 4 - Signature Individual Essay

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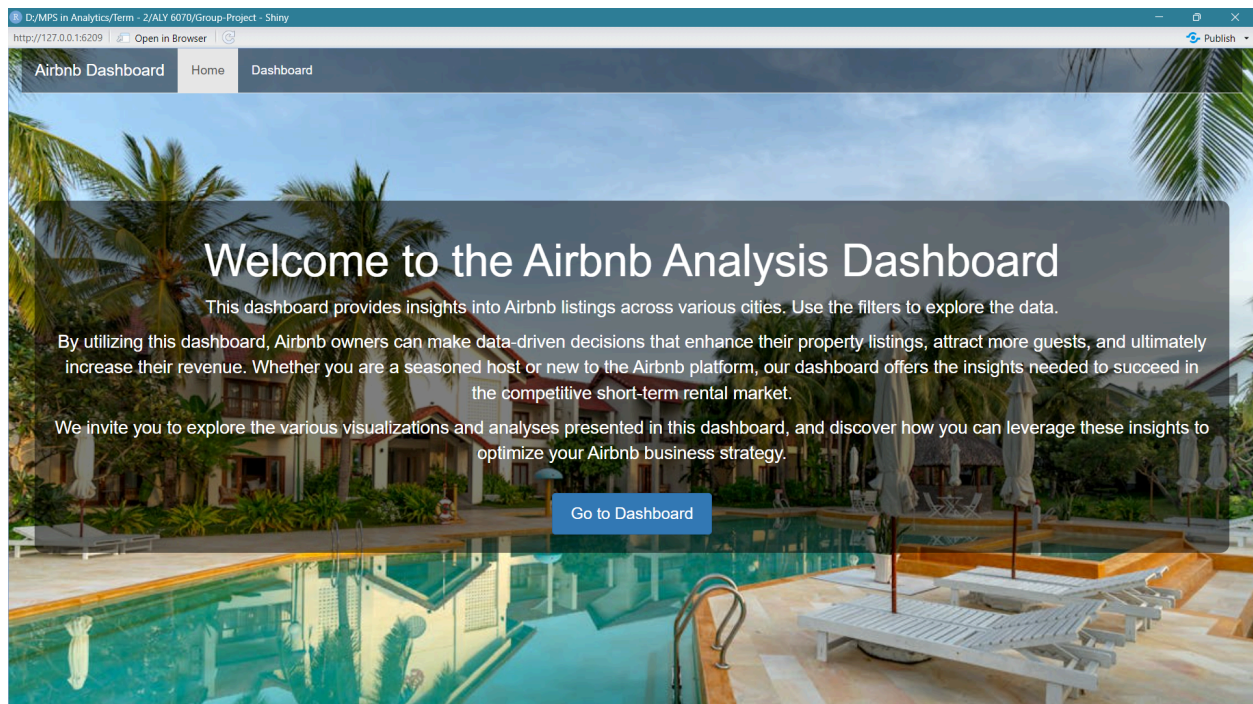
Introduction

In this final project, we have built the Interactive Airbnb Dashboard, designed specifically for Airbnb owners who aim to optimize their property listings and enhance their business strategies. This interactive dashboard provides a detailed analysis of Airbnb listings across six major cities from around the globe: Austin, Istanbul, Melbourne, Paris and Toronto. By leveraging this powerful tool, Airbnb owners can uncover hidden patterns, trends and insights that are crucial for making informed decisions and staying competitive in the dynamic short-term rental market.

For this final project, my contributions were pivotal in enhancing the overall design quality, structure, and interactivity of the dashboard. Initially, I gathered and meticulously combined all necessary datasets into one comprehensive main dataset, ensuring consistency and accuracy. I then designed the dashboard's structure and layout, focusing on creating an intuitive and visually appealing interface for Airbnb business owners. Furthermore, I developed three key visualizations that provide valuable insights into booking trends, occupancy rates, and instant bookable listings, incorporating filtering options to enhance functionality and user experience. My efforts aimed to make the dashboard a powerful tool for Airbnb business owners, enabling them to make informed decisions and optimize their property listings effectively.

Figure 1

First Look or Landing Page Our Airbnb Interactive Dashboard



Visualizations

1. Booking Trends Over the Period of Time (Line Graph)

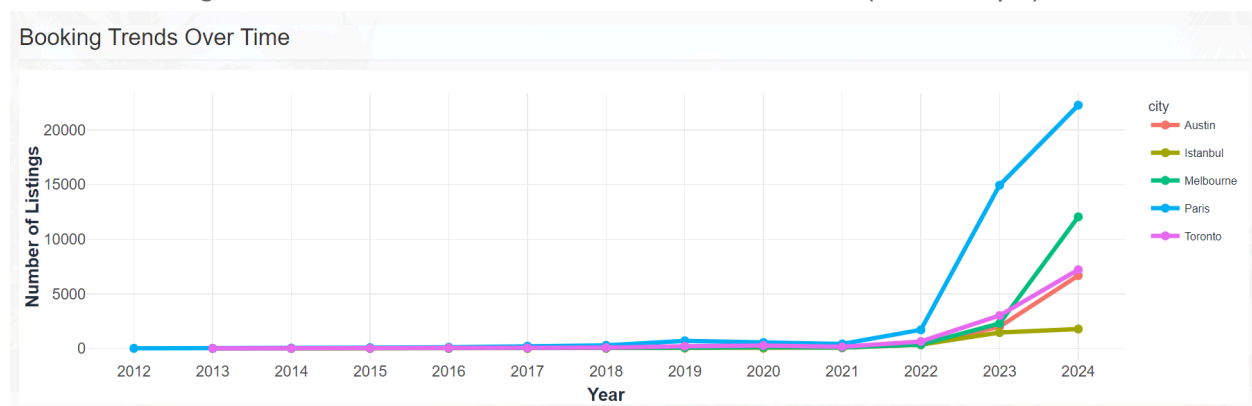
Question: What are the booking trends over the period of time ?

Purpose: The purpose of this graph is to provide Airbnb business owners with a clear visualization of booking trends over time across six major cities: Austin, Istanbul, Melbourne, Paris, and Toronto. By analyzing these trends, business owners can identify patterns in the number of listings and better understand the dynamics of the short-term rental market. This insight is crucial for making informed decisions about property investments, pricing strategies, and marketing efforts to optimize their listings on Airbnb.

Analysis: This line graph tracks the number of Airbnb listings from 2012 to 2024 for each city. The lines represent the growth trajectory of Airbnb listings over the years, highlighting significant increases or decreases in the number of listings. This analysis helps Airbnb owners understand how the market has evolved over time in different cities and enables them to predict future trends.

Figure 2

Booking Trends Over Time for Six Different Countries (Line Graph)



Visual Choices and Reason for Selecting a Line Graph:

- A line graph for showing trends over a continuous period. It allows viewers to see the progression of data points over time clearly.
- With multiple lines representing different cities, the graph effectively compares the booking trends across these cities, making it easier to spot differences and similarities.

- Each city is represented by a distinct color, which helps in quickly differentiating and identifying the trends for each city.
- The legend on the right side provides a clear reference to the colors, ensuring that the graph is easy to read and interpret.
- The x-axis represents the years from 2012 to 2024, providing a clear timeline.
- The y-axis shows the number of listings, making it easy to see the magnitude of change over time.

Main Findings:

- Paris shows a dramatic increase in the number of listings starting around 2022, reaching the highest number by 2024. This suggests a booming market and a significant rise in property listings.
- Both Melbourne and Toronto display a steady upward trend beginning around 2022, indicating a growing market and increasing demand for Airbnb listings.
- Austin and Istanbul exhibit a more moderate growth compared to Paris, Melbourne, and Toronto. However, the upward trend still indicates positive market expansion.
- The noticeable rise in listings across all cities starting from 2022 suggests a recovery phase in the global travel and accommodation sector post-COVID-19 pandemic, leading to increased travel and accommodation demands.

2. Listings with Highest Occupancy Rates over the different Periods

Question: Which listings have the highest occupancy rates over different periods (30, 60, 90, 365 days)?

Purpose: The purpose of this dynamic table is to provide Airbnb business owners with a detailed and interactive overview of occupancy rates across different periods (30, 60, 90, and 365 days) for various room types and cities. This table helps owners understand how well different types of listings perform over time, allowing them to make informed decisions about pricing, marketing strategies, and property investments. The inclusion of a download report button allows users to easily export the data for further analysis and record-keeping.

Analysis and Visual Choices:

- The table allows users to search, filter, and sort the data dynamically. This interactivity helps users quickly find specific information, such as the occupancy rates for a particular city or room type.

- With pagination, the table can handle large datasets without overwhelming the user. It provides a manageable view of the data, ensuring that users can easily navigate through the information without performance issues.
- The inclusion of these columns allows users to see the occupancy rates for different combinations of cities and room types, providing a clear segmentation of the data.
- Showing occupancy rates for 30, 60, 90, and 365 days provides a comprehensive view of how bookings trend over different time periods. This granularity helps business owners identify patterns and trends that are specific to short-term and long-term stays.
- The download report button provides users with the ability to export the data for offline analysis or reporting purposes. This feature is particularly useful for business owners who want to incorporate the data into their internal reports or presentations.


Reason for Selecting This Table Format:

- A table format is ideal for displaying detailed numerical data, such as occupancy rates, across multiple dimensions (cities and room types). It allows for easy comparison and analysis of specific metrics.
- The dynamic nature of the table, with features like search, sorting, and pagination, ensures that users can interact with the data efficiently. This format makes it easier for users to find the information they need quickly and accurately.
- The ability to download the report adds flexibility for users who may want to perform additional analysis outside of the dashboard or share the data with our airbnb business owners.

Figure 3

Listings with Highest Occupancy Rates across Six Different Cities

Listings with Highest Occupancy Rates					
Show	10	entries	Search: <input type="text"/>		
	city	room_type	occupancy_30	occupancy_60	occupancy_90
1	Austin	Entire home/apt	12.55	32.28	54.98
2	Austin	Private room	15.08	35.94	58.98
3	Austin	Shared room	12.68	30.11	48.98
4	Istanbul	Entire home/apt	16.59	36.94	59.98
5	Istanbul	Hotel room	22.88	42.62	72.15
6	Istanbul	Private room	20.73	44.36	69.98

 Download Report

Main Findings:

- Listings in Austin show varied occupancy rates across different room types. Private rooms have the highest short-term occupancy rate (15.08% over 30 days), while Entire home/apts have the highest long-term occupancy rate (54.98% over 90 days).
- Hotel rooms in Istanbul have the highest short-term occupancy rate (22.88% over 30 days) and maintain a strong occupancy rate over longer periods (72.15% over 90 days). This suggests a high demand for hotel-like accommodations in Istanbul.
- The varied occupancy rates across different cities and room types provide a clear indication of where business owners can optimize their listings to match market demand.

3. Proportion of Instant Bookable Listings (Pie Chart)

Question: How many listings are instant bookable in each city ?

Purpose: The purpose of these visualizations is to provide Airbnb business owners with a clear understanding of the proportion of instant bookable listings versus non instant bookable listings in various cities and across different room types. The pie chart offers a high-level overview, while the detailed table provides in-depth insights, allowing owners to see specific data points and make data-driven decisions about enabling instant booking for their properties.

Analysis and Visual Choices:

1. Pie Chart:

- The pie chart is selected for its effectiveness in showing proportions and overall distribution. It quickly communicates the relative size of instant bookable listings compared to non instant bookable listings.
- The color-coding (blue for Non Instant Bookable and orange for Instant Bookable) and the percentage labels make it easy for users to grasp the data at a glance.

2. Detailed Analysis Table:

- The table is dynamic, allowing users to search, filter, and sort the data. This interactivity helps users find specific information relevant to their needs.
- The table breaks down the data by city and room type, providing granular insights into which types of listings are more likely to be instant bookable in different locations.
- Pagination helps manage large datasets without overwhelming the viewer, making the table more user-friendly and navigable.

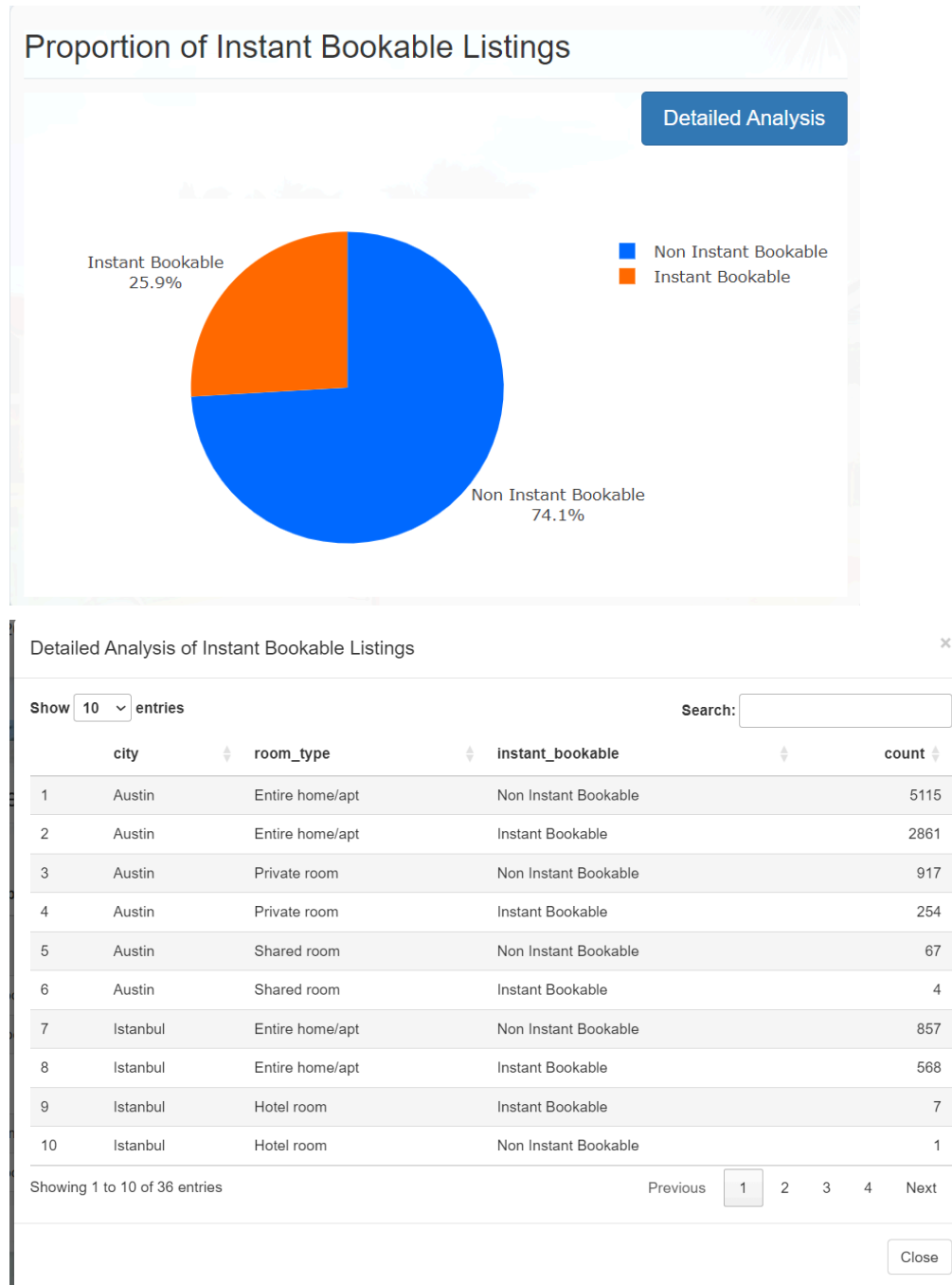
Reason For Selecting These Visualizations:

- The combination of a high-level pie chart and a detailed table provides a comprehensive view of the data. The pie chart offers a quick snapshot, while the table allows for deeper analysis.
- The interactive nature of the table encourages user engagement, enabling Airbnb owners to explore the data relevant to their specific needs and interests.

- These visualizations support data-driven decision-making by offering both a broad overview and detailed specifics, helping owners decide whether to enable instant booking for their listings based on market trends.

Figure 4

Proportion of Instant Bookable Listings and It's Detailed Analysis by Room Type and Each City



Main Findings:

- The pie chart reveals that 74.1% of the listings are non-instant bookable, while 25.9% are instant bookable. This indicates that the majority of hosts prefer to have control over guest bookings.
- The detailed table shows that in Austin, Entire home/apts have a substantial number of both instant bookable and non instant bookable listings, with 5115 non instant bookable and 2861 instant bookable.
- Private rooms and Shared rooms in Austin also show a mix, with non instant bookable listings being more prevalent.
- In Istanbul, Entire home/apts and Hotel rooms show a significant number of both instant bookable and non instant bookable listings, reflecting a diverse market preference.

Conclusion

In conclusion, this project has successfully developed an interactive and user-friendly dashboard designed specifically for Airbnb business owners. Through meticulous data collection and integration, we created a comprehensive dataset that forms the backbone of our analysis. The dashboard's structure and layout were carefully crafted to provide an intuitive and visually appealing user experience, facilitating seamless navigation and interaction. The inclusion of key visualizations, such as booking trends, occupancy rates, and instant bookable listings, along with customizable filtering options, ensures that users can easily access and analyze relevant data. These insights empower Airbnb owners to make informed decisions, optimize their property listings, and enhance their business strategies. Our dashboard stands as a powerful tool that not only answers critical business questions but also uncovers hidden patterns and trends, ultimately driving better performance and success in the competitive short-term rental market.