HOTEL BOOKING ANALYSIS

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PROBLEM STATEMENT

- Have you ever wondered when the best time of year to book a hotel room is? Or the optimal length of stay in order to get the best daily rate? What if you wanted to predict whether or not a hotel was likely to receive a disproportionately high number of special requests? This hotel booking dataset can help you explore those questions! This data set contains booking information for a city hotel and a resort hotel, and includes information such as when the booking was made, length of stay, the number of adults, children, and/or babies, and the number of available parking spaces, among other things. All personally identifying information has been removed from the data. Explore and analyse the data to discover important factors that govern the bookings.

PROPOSED SOLUTION

- **Enhance Guest Loyalty Programs:** Develop and promote loyalty programs that offer exclusive benefits to repeated guests, such as room upgrades, special discounts, or personalized services. This can further incentivize guests to return and reduce the likelihood of cancellations.

- **Personalized Guest Experience:** Implement personalized services based on guest preferences and past interactions. This could include tailored recommendations, personalized welcome messages, or special amenities based on previous stays.

- **Proactive Communication:** Maintain regular communication with repeated guests before, during, and after their stay. Proactively address any concerns or special requests to ensure a seamless experience and minimize the potential for cancellations.

- **Feedback Mechanism:** Establish a robust feedback mechanism to gather insights from repeated guests about their experiences. Use this feedback to continuously improve service quality and address any issues promptly.

- **Flexible Booking Policies:** Offer flexible booking and cancellation policies specifically tailored to repeated guests, providing them with confidence and convenience when making reservations.

- **Continuous Improvement:** Regularly analyze booking and cancellation patterns to identify trends and adjust strategies accordingly. This proactive approach can help mitigate cancellations and enhance guest satisfaction over time.

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the rental bike prediction system. Here's a suggested structure for this section:

- **System requirements** : windows 11 operating system , 8GB RAM, I3 Processor

- Jupyter Notebook

- Programming Languages:

  - **Python:** Widely used for its extensive libraries in data science, machine learning, and visualization.

    - **Pandas:** Essential for data manipulation and preprocessing.

    - **NumPy:** Provides support for mathematical operations on arrays and matrices.

    - **Matplotlib:** Basic plotting library for creating static, animated, and interactive visualizations.

    - **Seaborn:** Built on top of Matplotlib, it offers a higher-level interface for statistical plotting.

    - **Plotly:** Provides interactive plots and dashboards.

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RESULT

The analysis highlights seasonal booking trends, demographic preferences, and the impact of marketing strategies on booking behaviors. Understanding these dynamics is crucial for optimizing hotel operations and revenue management strategies.
Here's result of several factors based on Dataset:

- **Monthly Arrivals:** The analysis reveals that July and August see the highest number of arrivals for both Resort Hotels and City Hotels, peaking in August. City Hotels consistently attract more guests throughout the year, indicating a preference for urban stays.

- **Yearly Bookings:** 2016 emerged as the peak year for hotel bookings, nearly doubling the numbers from 2015 and 2017, suggesting a significant surge in tourism or hotel demand during that period.


Months of Arrival

Yearly Booking
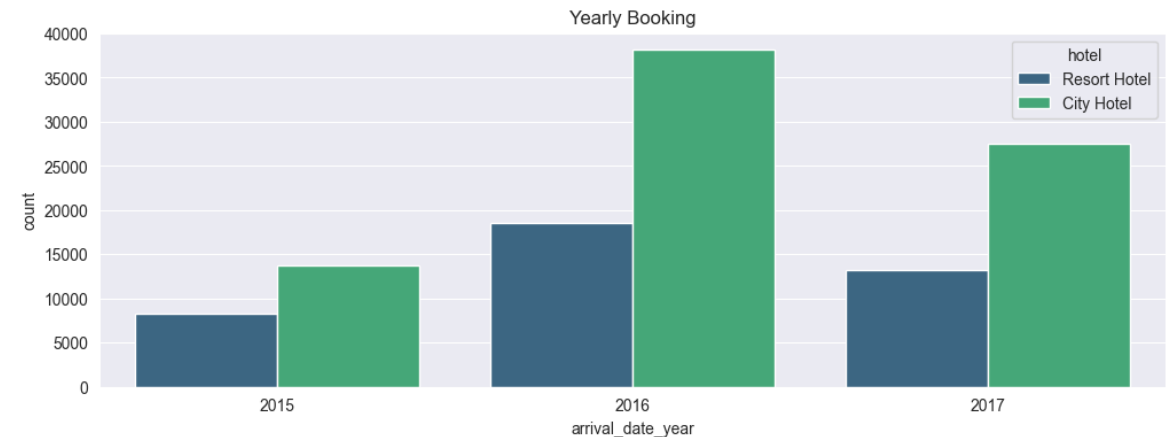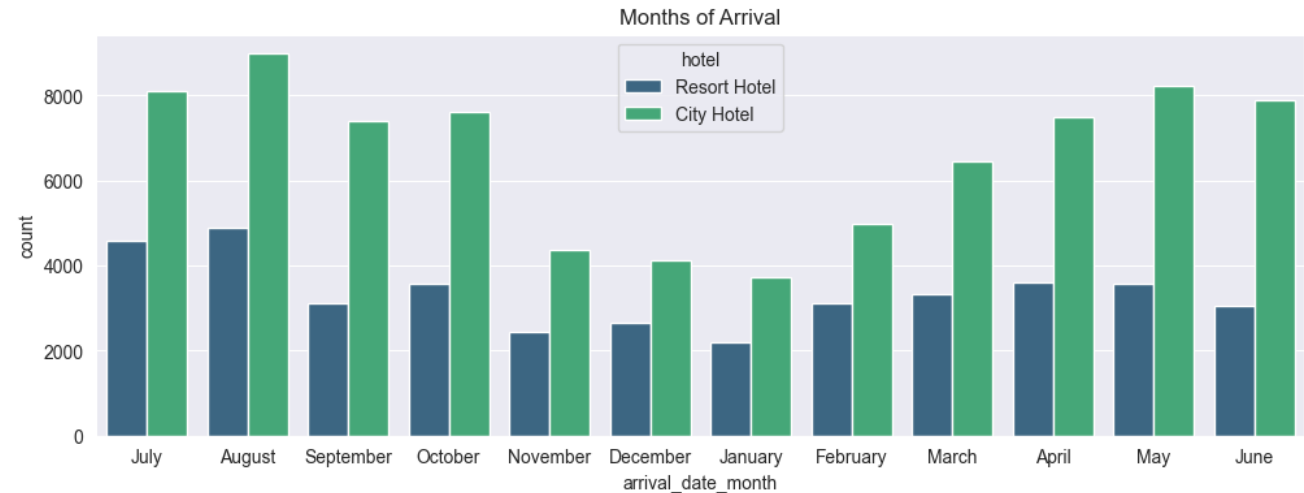
RESULT

■ **Guest Country of Origin:** Portugal stands out as the leading source of hotel guests, with a substantial number of visitors originating from Europe, underscoring a dominant market segment from this region.

■ **Booking Cancellations:** While both hotel types generally experienced more successful bookings than cancellations, City Hotels had a higher total number of bookings but also a higher cancellation rate compared to Resort Hotels.

■ **Market Segment Analysis:** The "Online TA" segment proves to be the most prolific in generating bookings, followed closely by "Offline TA/TO" and "Groups," highlighting the critical role of online travel agencies in hotel reservations.
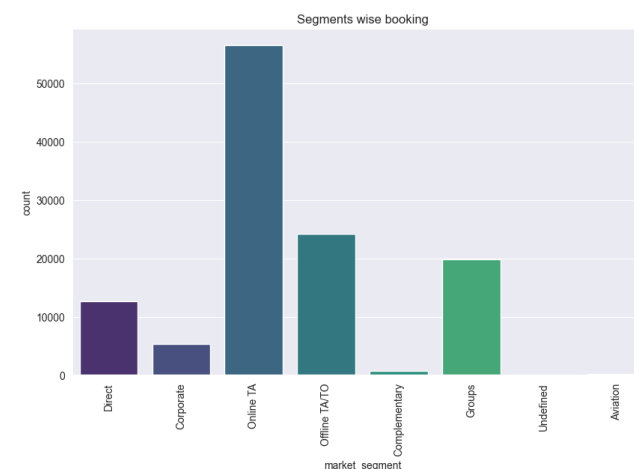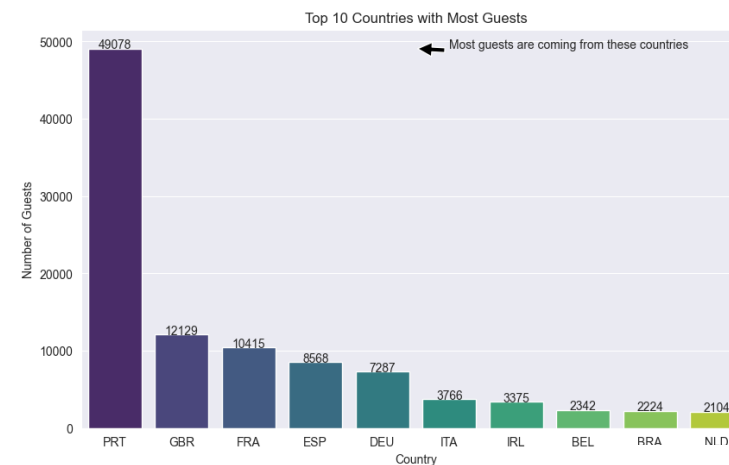
RESULT

Monthly Booking Trends for City and Resort Hotels

- **Monthly Booking Trends:** August emerges as the busiest month for hotel bookings, aligning with peak summer travel, while January and December witness lower booking volumes, indicating seasonal variations in travel patterns.

- **Length of Stay:** City Hotels attract guests with longer stays, particularly 3 to 5 nights, whereas Resort Hotels cater more to shorter stays of 1 to 2 nights.

Hotel wise night stay duration (Top 10)

- **Guest Demographics:** The majority of guests originate from Portugal and the United Kingdom, reflecting a strong European presence in the hotel's guest demographic.
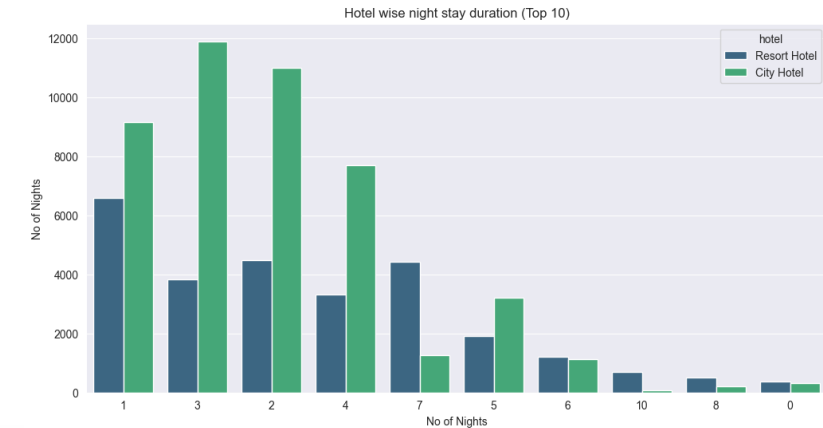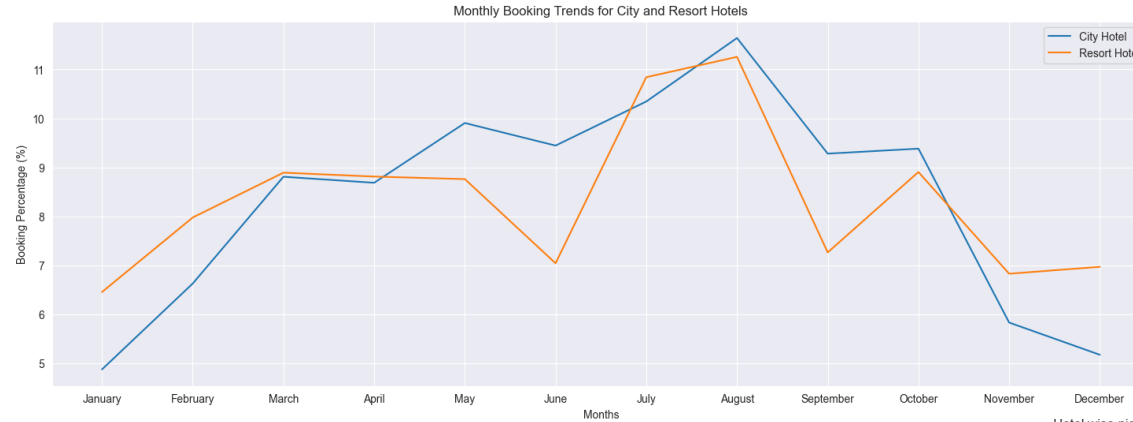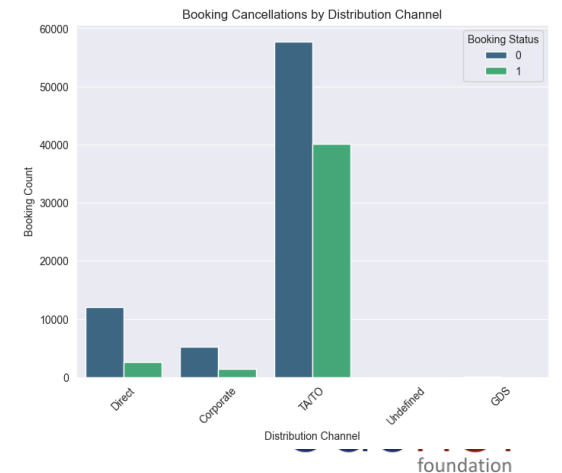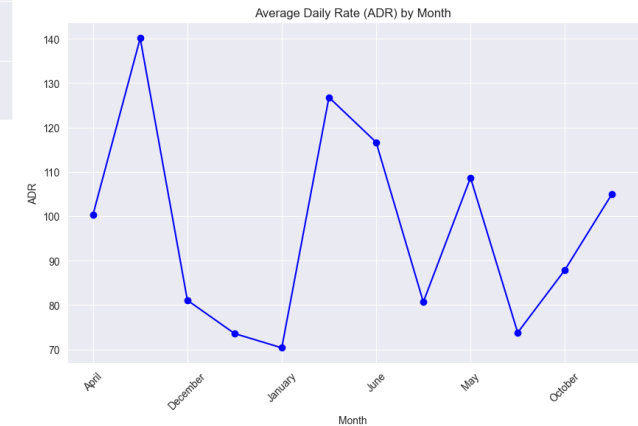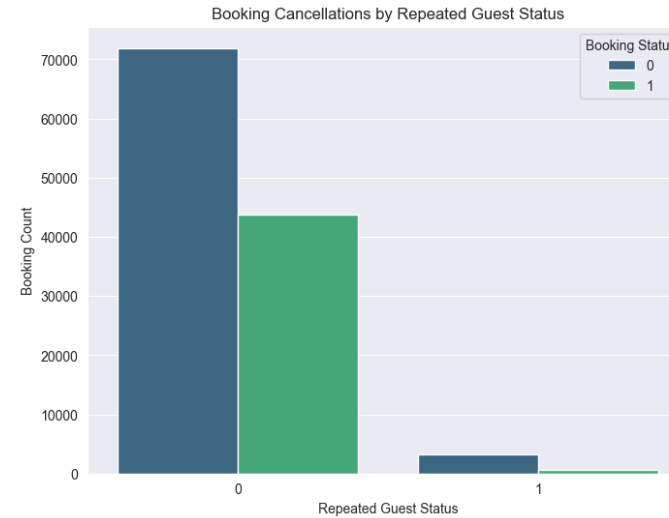

Home Country of Guests

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RESULT

- **Marketing and Promotions:** Repeated guests exhibit a lower cancellation rate, indicating satisfaction with the hotel's services. Online travel agencies (TA) and offline travel organizers (TO) are responsive to promotional efforts, driving significant booking volumes despite notable cancellation rates.

- **Revenue Analysis:** Average Daily Rate (ADR) peaks in December and June, with January experiencing the lowest ADR. Revenue loss due to cancellations underscores the importance of implementing strategies to mitigate cancellations and optimize revenue.
  Total revenue lost due to cancellations: 4641942.67

- **Guest Preferences:** The Bed & Breakfast (BB) meal plan is favored by guests, followed by Half Board (HB) and Self-Catering (SC). Direct and Corporate booking channels, while generating lower volumes, exhibit less cancellation propensity compared to TA/TO channels.

Booking Cancellations by Repeated Guest Status

Average Daily Rate (ADR) by Month

Booking Cancellations by Meal Plan

Booking Cancellations by Distribution Channel

CONCLUSION

- **Seasonal and Monthly Trends:** The hotel booking data indicates strong seasonal trends, with peak bookings in summer (July and August) and a noticeable decline in winter (January and December).

- **Booking Channels:** Online travel agencies play a significant role in generating bookings. The high volume of bookings from these channels, coupled with significant cancellations, suggests a need for targeted marketing and cancellation mitigation strategies.

- **Guest Demographics:** A majority of guests come from European countries, especially Portugal, indicating a key market segment.

- **Revenue Management:** The fluctuation in ADR across months suggests a dynamic pricing strategy. Understanding peak and off-peak seasons can help in better revenue management.

- **Guest Satisfaction:** Repeated guests have low cancellation rates, pointing to the importance of customer satisfaction and loyalty programs.

- **Stay Duration:** City Hotels see longer stays compared to Resort Hotels, which might influence different marketing and service strategies.

FUTURE SCOPE

- **Enhanced Predictive Analytics:**
Developing advanced models for booking and cancellation predictions will directly impact revenue management and operational efficiency.

- **Dynamic Pricing Strategies:**
Implementing real-time pricing algorithms and advanced revenue management systems can maximize revenue during peak periods and optimize occupancy during off-peak times.

- **Cancellation Mitigation:**
Predicting and mitigating cancellations through data-driven strategies can reduce revenue loss and improve guest satisfaction.

- **Enhanced Guest Experience:**
Providing personalized services and enhancing loyalty programs can significantly improve guest retention and lifetime value.

- **Marketing and Promotion Optimization:**
Creating targeted marketing campaigns and measuring ROI for different strategies will optimize marketing spend and increase booking conversions.

REFERENCES

- Kaggle

- GitHub

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