Hotel Booking Data Analysis Report

Introduction
The purpose of this analysis is to examine hotel booking data, identify key patterns and trends, and provide actionable insights for optimizing revenue, minimizing cancellations, and improving customer satisfaction.

Data Overview
The dataset includes 119,390 records with 32 columns, encompassing various booking and customer information. Key attributes include:

Booking Information: Reservation status, lead time, booking channels, and cancellation status.

Customer Information: Number of adults, children, and babies, market segment, and customer type.

Stay Details: Arrival dates, number of weekend and weekday nights, room types, and special requests.

Data Cleaning and Preprocessing

Steps undertaken during data cleaning:

Handling Null Values: Removed columns with excessive missing values, such as `company` and `agent`. Remaining missing values were managed through deletion and imputation.

Date Formatting: Converted `reservation_status_date` to datetime format for time-series analysis.

Outlier Removal: Filtered out extreme ADR values to focus on realistic revenue data.

Exploratory Data Analysis

Booking Status Analysis
Cancellation Rate 37.1% of bookings were canceled, with City Hotels experiencing higher cancellation rates than Resort Hotels.
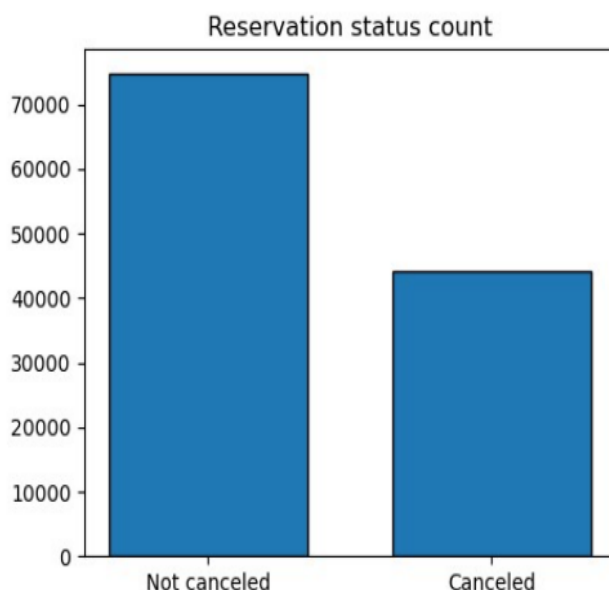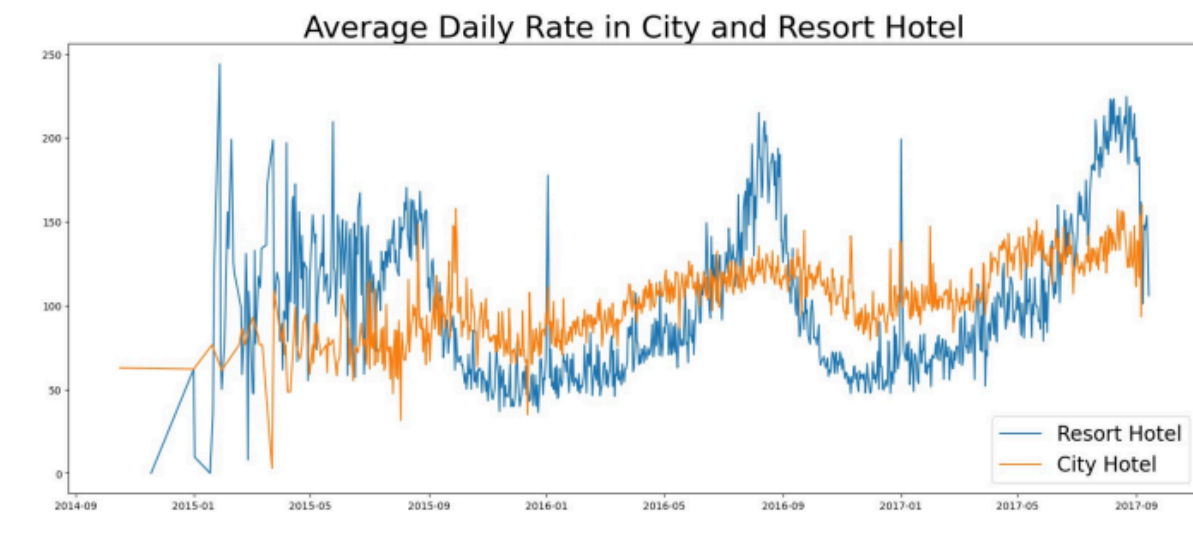
Cancellation by Hotel Type
City Hotel : Higher cancellation rate of 41.7%
Resort Hotel: Lower cancellation rate of 27.9%


Lead Time and Cancellation Rate
- Observed that bookings with longer lead times were more likely to be canceled, especially in City Hotels.


Revenue Analysis: Average Daily Rate (ADR)
Revenue Patterns by Hotel Type: City Hotels have a higher ADR than Resort Hotels, suggesting location or demand-based pricing.
Seasonal ADR Patterns: ADR peaks in summer and early fall.

ADR per month
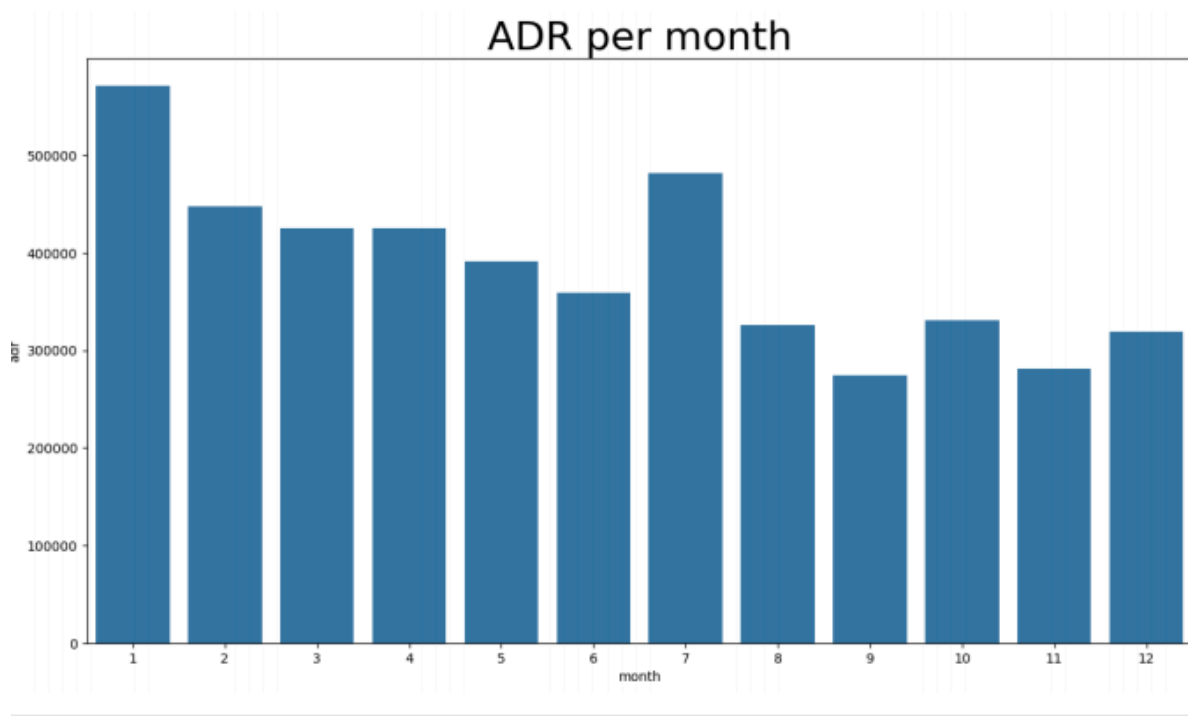
**Reservation Status by Month**
Monthly Cancellation Trends: Higher cancellations in summer months (June to August).

Reservation status per month
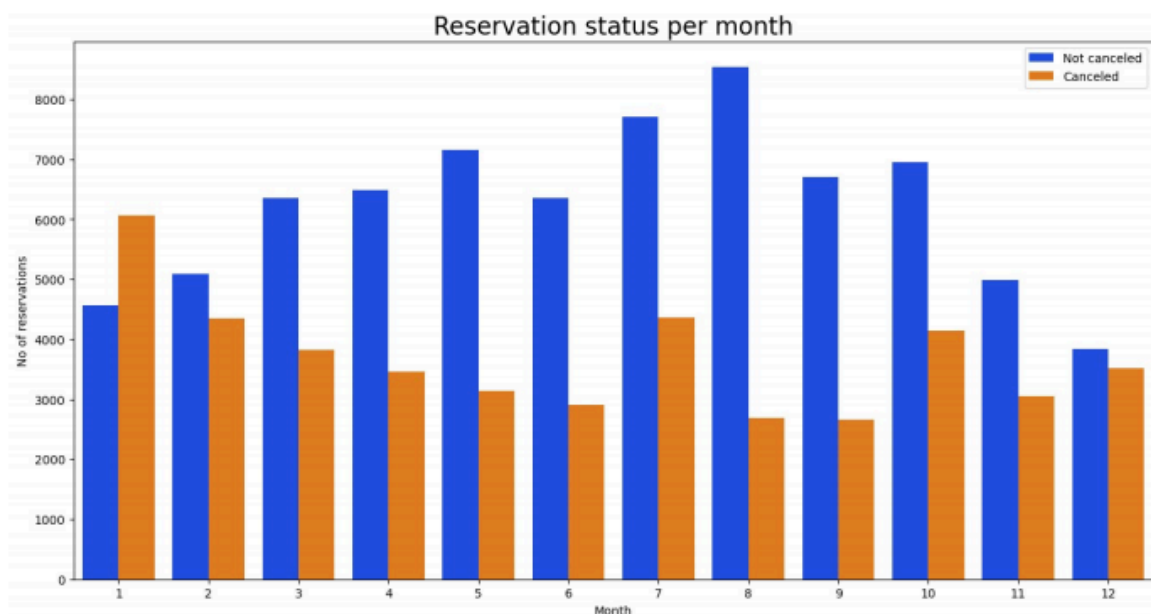
Market Segment Analysis:
Booking Source Trends: Nearly half of bookings originated from Online Travel Agencies (OTAs), which also showed higher cancellation rates.
Cancellation by Segment: Group bookings had the highest cancellation rates, while corporate and direct bookings had the lowest.

Average Daily Rate
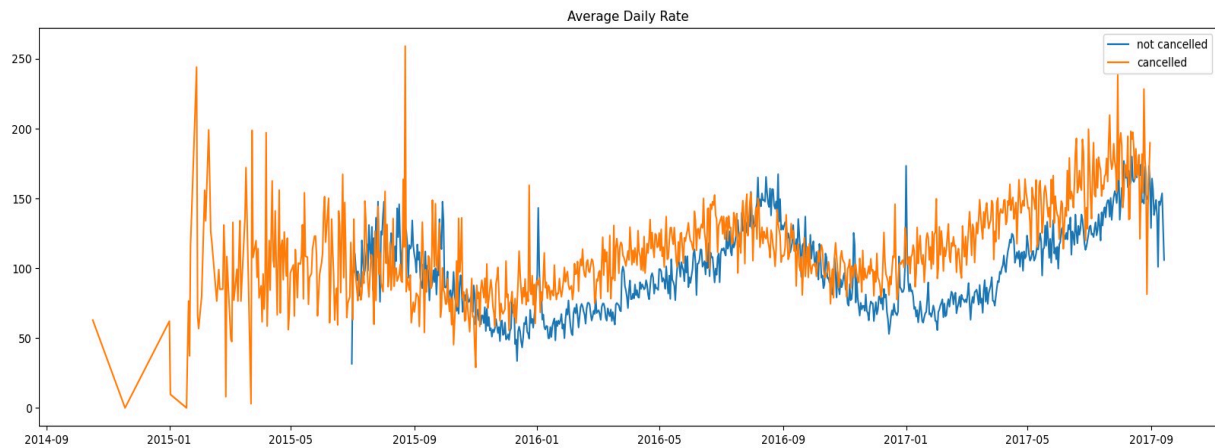
Customer and Room Behavior

Room Type Mismatches: Instances where assigned room type differed from reserved room type.

Special Requests Impact: Customers with special requests showed lower cancellation rates, indicating stronger booking intent.

Top Countries by Cancellation Rates

High cancellation rates were noted in the USA, Portugal, and the UK.

Top 10 countries with reservation cancelled
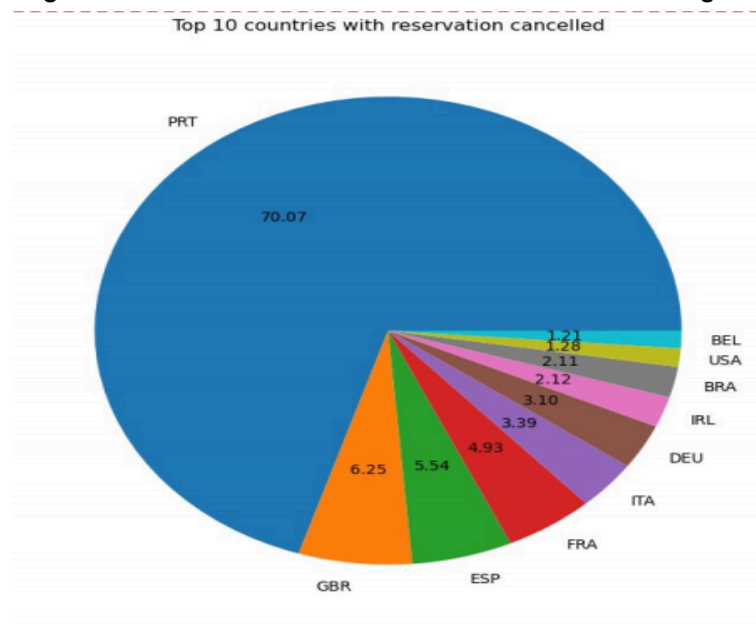
Key Insights and Recommendations

Seasonal Pricing Adjustments: Implement dynamic pricing strategies during peak seasons to maximize ADR.

Reduction in Cancellations: Provide incentives for direct bookings and consider adding cancellation fees for bookings from high-cancellation segments.

Segmented Marketing: Tailor promotional efforts towards segments with stable bookings, such as corporate clients and direct bookings.

Operational Improvements: Enhance room assignment processes to reduce mismatches and improve customer satisfaction.

Targeted Regional Campaigns: Focus on markets with high cancellation rates, offering tailored packages to reduce last-minute cancellations.

Conclusion

This report outlines key patterns in hotel booking behavior, including booking and cancellation trends, market segmentation, and revenue insights. Utilizing these findings can help hotels optimize revenue, reduce cancellations, and improve the overall booking experience.