Hotel Booking Cancellation Analysis

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INTRODUCTION

Hotel cancellations pose a significant challenge for the hospitality industry, leading to revenue losses and inefficient room utilization. This project analyzes booking data to identify key factors influencing cancellations and provides actionable recommendations to enhance revenue and optimize occupancy rates.

1. **Define the Problem Statement** – Identify the key business challenge to be addressed.
2. **Data Collection** – Gather relevant data sources for analysis.
3. **Data Cleaning & Preparation** – Handle missing values, remove duplicates, and ensure data consistency.
4. **Exploratory Data Analysis (EDA)** – Identify patterns, trends, and anomalies in the dataset.
5. **Data Visualization &** Insights – Use graphs and dashboards to present key findings.
6. **Conclusion & Recommendations** – Provide actionable insights to optimize hotel booking strategies.

Business Problem

Both City Hotels and Resort Hotels have been facing high cancellation rates, impacting their revenue and operational efficiency. This study aims to analyze cancellation patterns, uncover key contributing factors, and develop strategic recommendations to reduce cancellations and maximize hotel occupancy..

Assumptions

1. No significant external events between 2015 and 2017 have affected the data.
2. The dataset is relevant and can be used to make future hotel booking strategies.
3. Implementing the suggested solutions will not have unexpected negative effects.
4. The hotels are not currently using any of the proposed solutions.
5. Booking cancellations have the most significant impact on hotel revenue.
6. Cancellations lead to unoccupied rooms for the booked duration.
7. Clients cancel bookings within the same year of reservation.

Research Questions

1. What are the key factors influencing hotel reservation cancellations?
2. What strategies can be implemented to reduce cancellation rates?
3. How can hotels leverage data insights to optimize pricing and promotional strategies?

Hypothesis

1. Higher room rates are positively correlated with increased cancellations.
2. Longer waiting periods between booking and check-in result in higher cancellation rates.
3. Most clients book through offline travel agents.

Data Collection & Cleaning

- **Dataset:** Kaggle - Hotel Booking Dataset
- **Data Features:** Includes booking details, customer demographics, cancellation status, pricing, and source of booking.
- **Cleaning Process:**
    - Removed duplicate entries.
    - Handled missing values.
    - Converted data types for consistency.
    - Filtered out irrelevant columns.
    - Standardized categorical values.
    - Identified and treated outliers.
    - Fixed inconsistencies in data formatting.

Analysis and Findings

1. What factors contribute to hotel reservation cancellations?

i). Cancellation And Not Cancellation Graph.
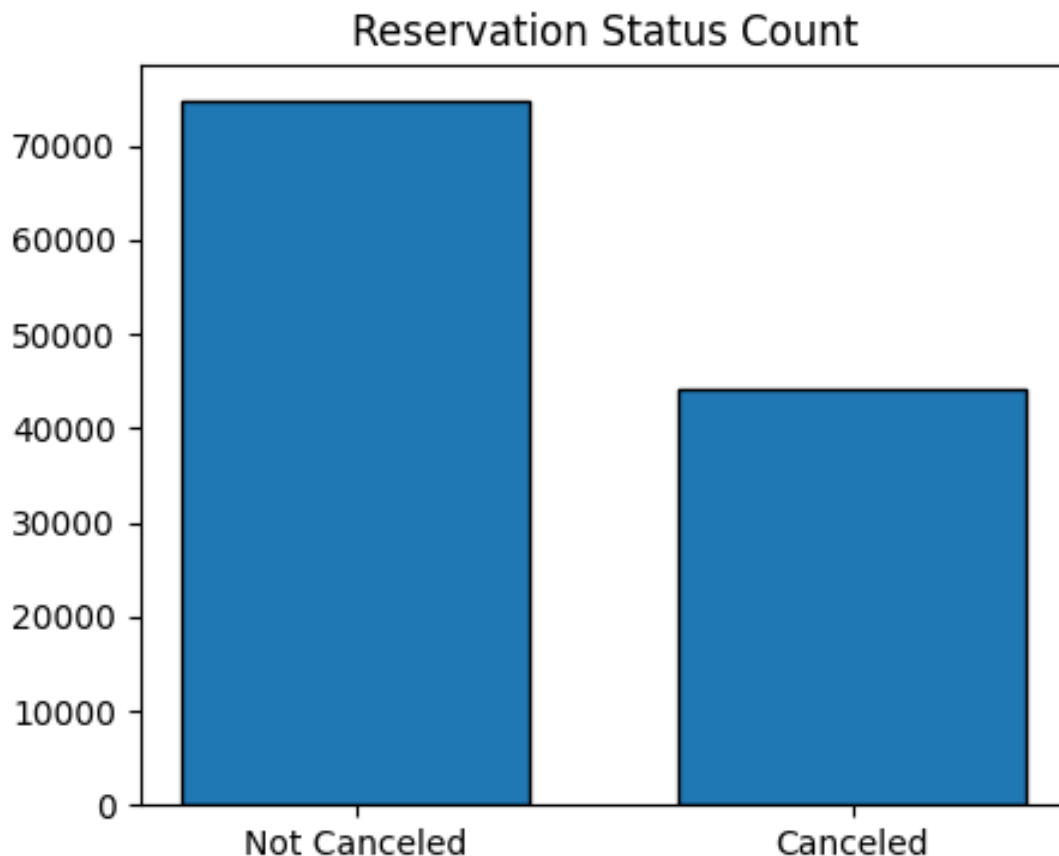
Insights :

        The bar graph indicates that while a majority of reservations remain confirmed, approximately 37% of bookings are canceled. This substantial cancellation rate significantly impacts hotel revenue and highlights the need for proactive strategies to minimize booking cancellations.
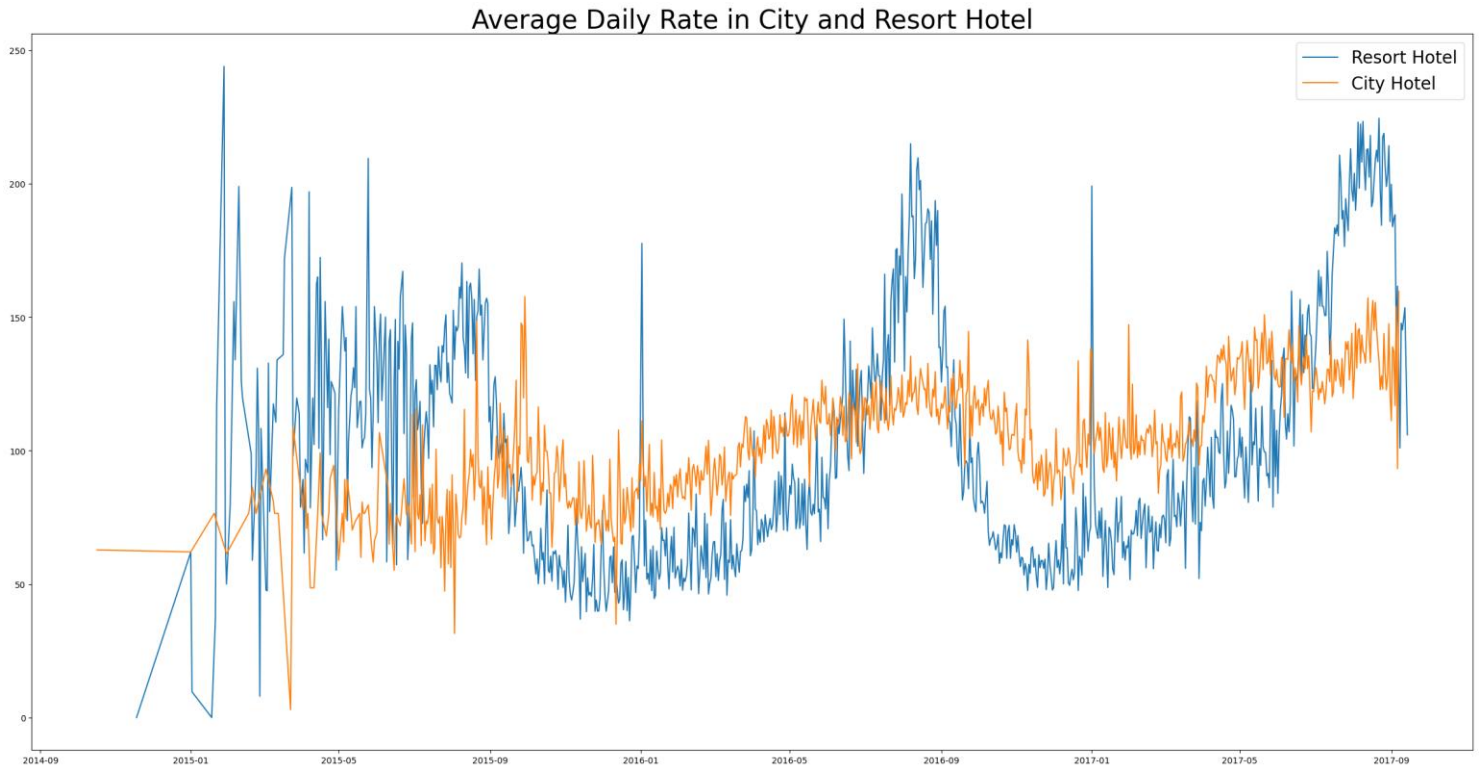
ii). Reservation Status in Different Hotels.
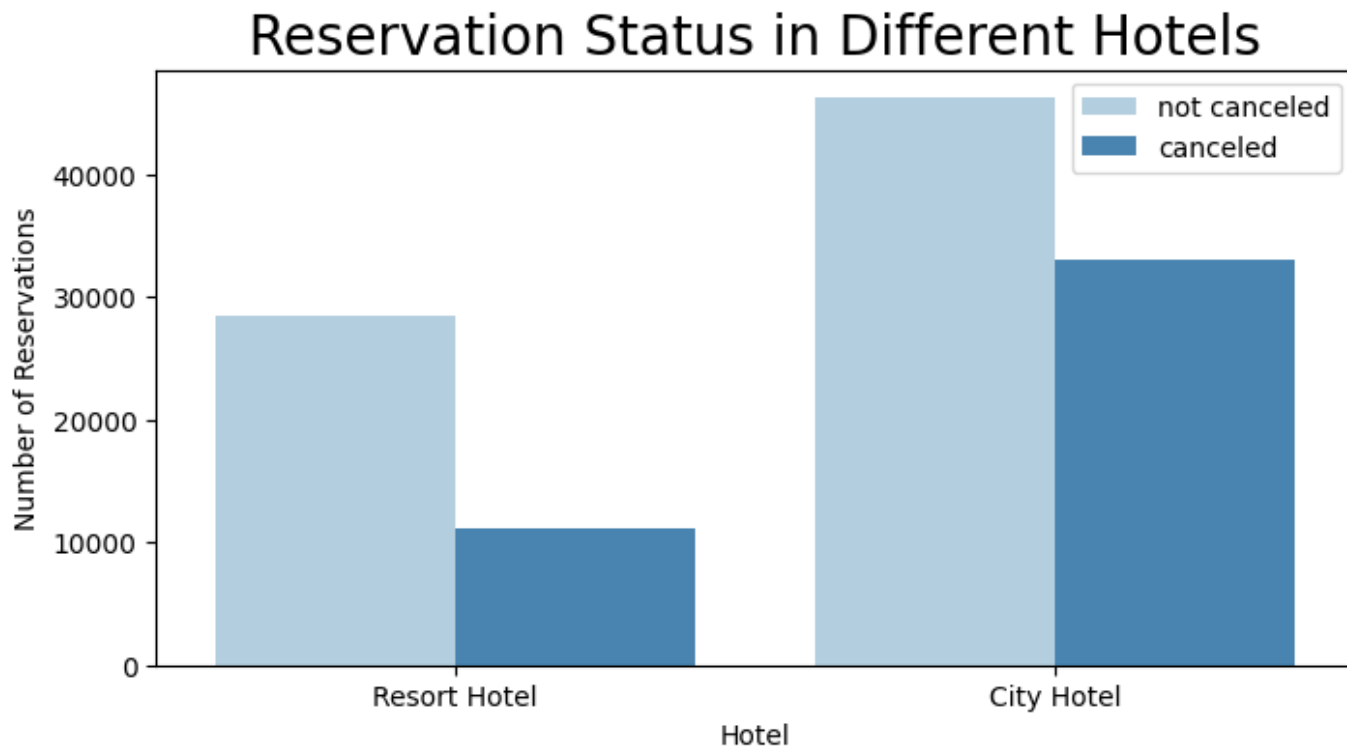
Insights :

City hotels consistently receive a higher number of bookings compared to resort hotels. This trend could be attributed to lower pricing, convenient locations, and the business-oriented nature of city hotels, making them a preferred choice for travelers.

iii). Average Daily Rate in City and Resort Hotel

Average Daily Rate in City and Resort Hotel

Insights :

The line graph shows above that on some days, city hotels have a lower average daily rate than resort hotels. On other days, the difference is even bigger. Resort hotel rates often increase on weekends and holidays.

iv). Reservation Status per month

Reservation Status per month
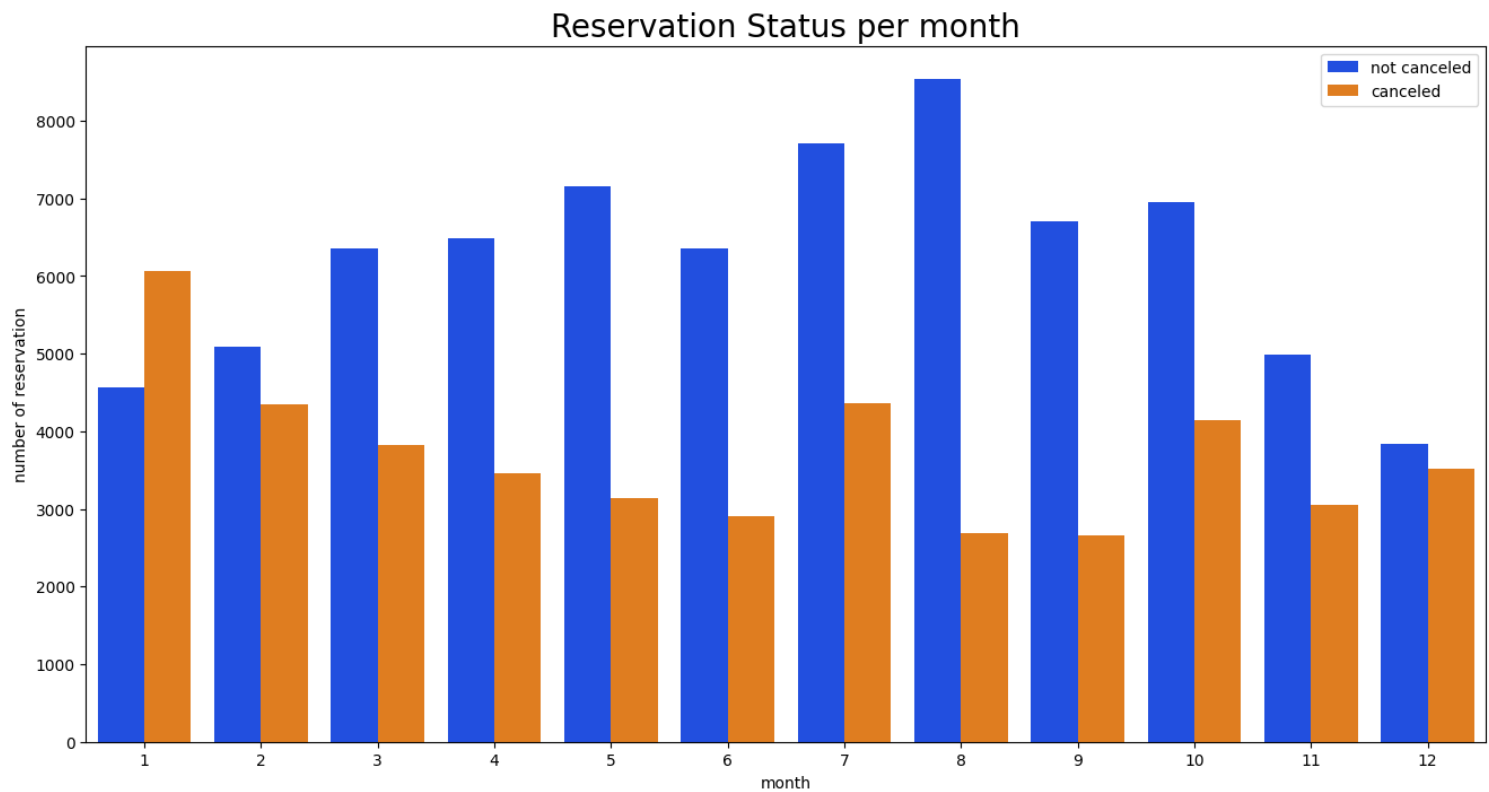
Insights :
    We created a grouped bar graph to analyze the months with the highest and lowest reservation levels based on reservation status. The graph shows that both confirmed and canceled reservations are highest in August. However, January has the highest number of canceled reservations.

V). Average Daily Rate per month(ADR).
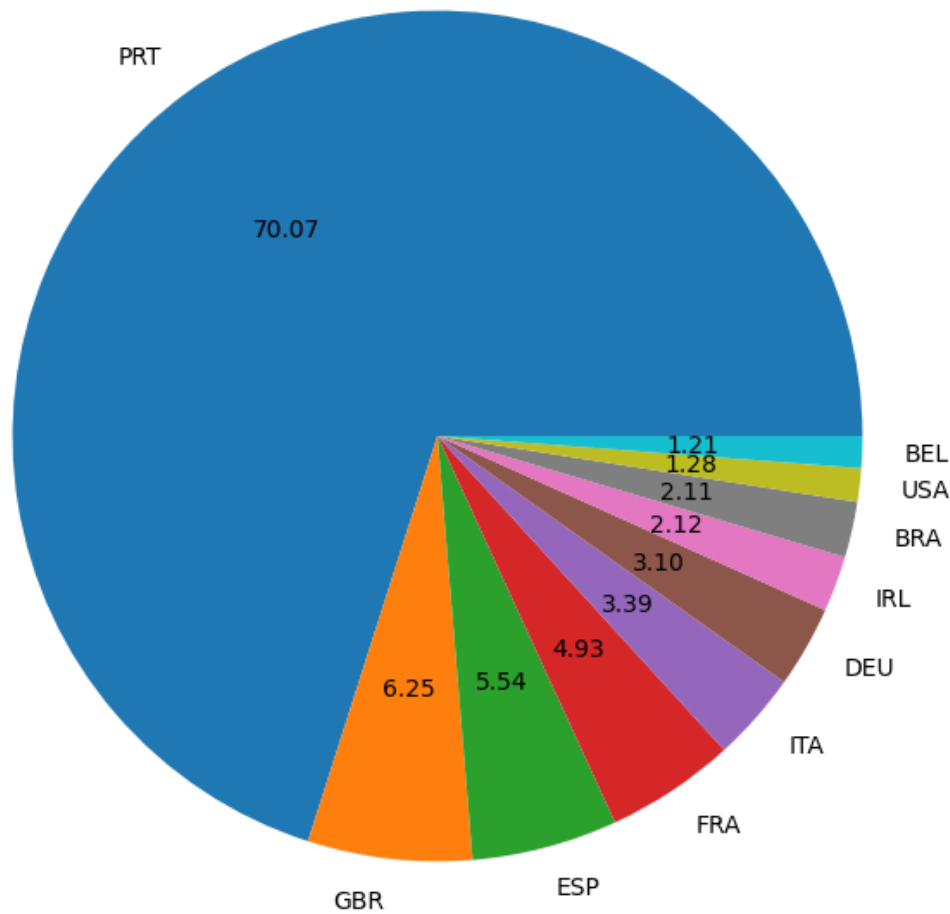

ADR per month
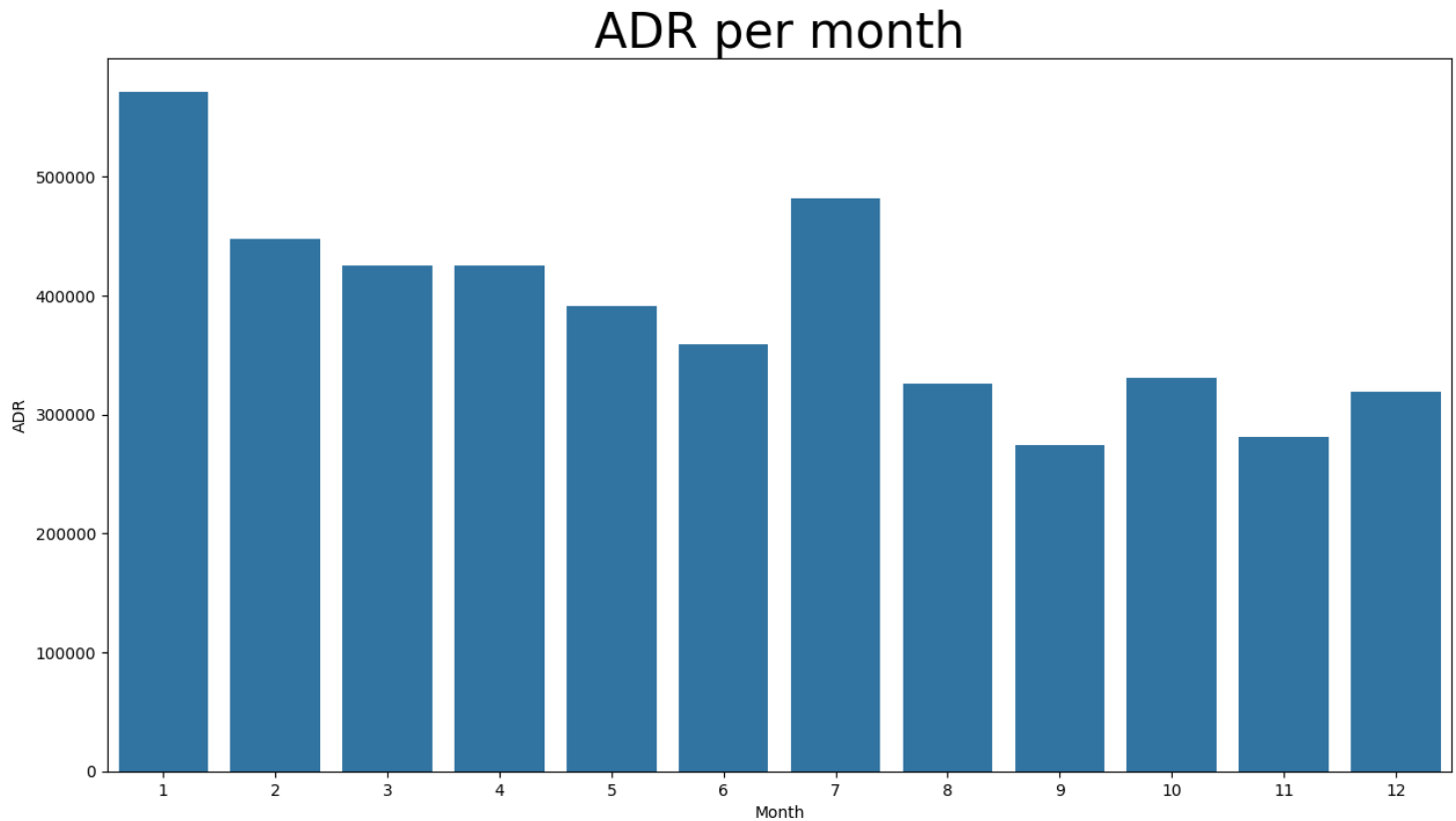
Insights :

The bar graph shows that cancellations are highest when accommodation prices are high and lowest when prices are low. This suggests that price is the main reason for cancellations.

vi). Top 10 Country with Reservation Canceled.

Top 10 Country with reservation canceled

Insights :

Portugal records the highest cancellation rate, with approximately 70.07% of reservations being canceled. This may be influenced by factors such as travel restrictions, pricing fluctuations, or customer booking behaviors in the region.

## vii). How are hotel guests making their reservations?

Findings :

Hotel guests make their reservations through different channels. The data shows that:

- **46%** of guests book through online travel agencies.
- **27%** of guests book as part of a group.
- Only **4%** of guests book directly by visiting the hotel.

This highlights that online travel agencies are the most popular booking method.

Distribution of Hotel Reservations by Booking Source

Viii). Which market segment has the most hotel reservations?

Distribution of Hotel Reservations by Booking Source
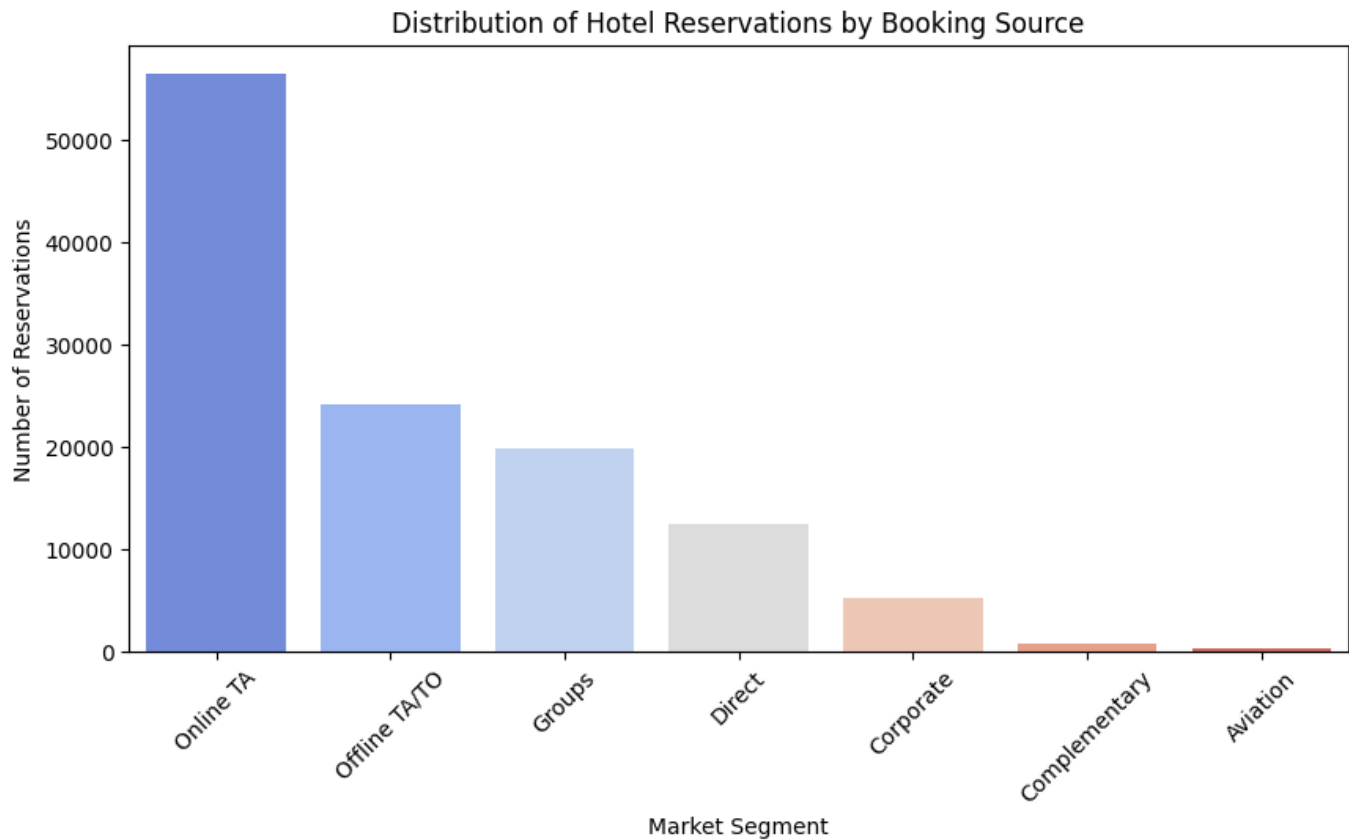
Insights : The graph shows that Online Travel Agencies (OTA) drive the most bookings, followed by Groups and Direct bookings. This highlights third-party platforms as the primary reservation source, suggesting hotels should focus marketing efforts accordingly.

ix) . Does a higher average daily rate lead to more cancellations?
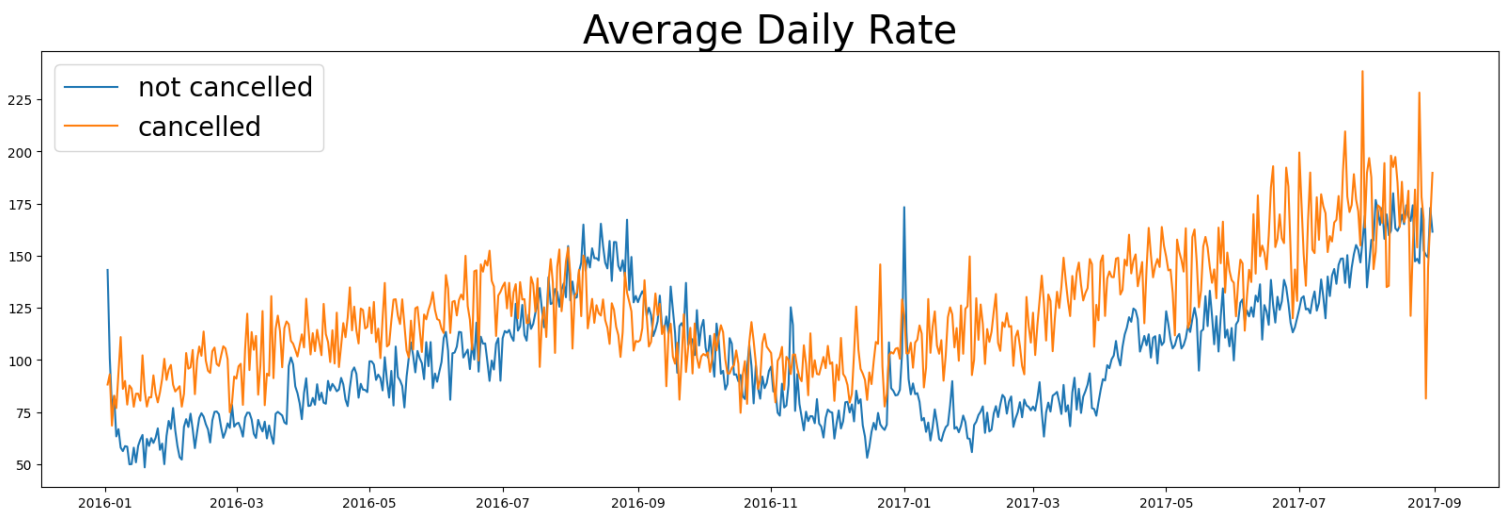
Average Daily Rate

Insights :

      Yes, the graph indicates that more reservations are canceled when the average daily rate is high, confirming that higher prices lead to increased cancellations.

x). Strategies to Reduce Cancellations.

1. Dynamic Pricing Strategy:

- Implement **dynamic pricing models** that adjust rates based on demand, seasonality, and booking trends.
- Offer **early-bird discounts** for advance bookings and **last-minute deals** to fill vacant rooms.

2. Targeted Discounts for Resort Hotels:

- Since resort hotels experience **higher cancellation rates**, introduce **non-refundable booking options** at a lower price.
- Offer **weekend packages** with bundled services like free breakfast, spa access, or excursions to encourage firm bookings.

3. Seasonal Marketing & January Promotions:

- Since **January has the highest cancellations**, launch **winter promotional campaigns** to attract customers.
- Introduce **flexible booking options** or **rebooking incentives** for cancellations made in advance.

4. Enhancing Guest Experience & Reducing No-Shows:

- Improve **customer communication** with automated email reminders, personalized offers, and pre-arrival assistance.
- Strengthen **loyalty programs** to encourage repeat bookings and offer incentives for direct bookings.

5. Optimizing Booking Channels & Policies:

- Encourage **direct bookings** by offering **exclusive perks** such as free room upgrades or discounts on future stays.
- Implement **stricter cancellation policies** for high-demand periods while offering flexible options for loyal customers.

Conclusion

This analysis of hotel booking cancellations provides valuable insights into key factors influencing cancellations, including pricing, seasonality, and booking channels. The findings suggest that hotels can significantly reduce cancellations through strategic pricing, targeted marketing efforts, and enhanced customer engagement. Implementing these recommendations will help hotels optimize revenue, improve operational efficiency, and enhance overall customer satisfaction.

Final Statement

This project has provided valuable insights into hotel booking cancellations, helping to identify key trends and actionable solutions. As a data enthusiast, I am eager to apply these analytical skills to real-world challenges, contributing to data-driven decision-making in the hospitality industry. Thank you for reviewing my work.