Hotel Churn Analyzer

Harshini Ganapathy

Steps

- Analyze the problem statement
- Identify the data
- Explore and clean the data
- Analyze the data to get useful insights
- Presenting insights in terms of reports and dashboards

Business Problem

- In recent times, both City Hotel and Resort Hotel have been experiencing high rates of booking cancellations.
- This issue has led to several challenges, including reduced revenue and underutilized hotel rooms.
- As a result, lowering the cancellation rate has become a key priority for both hotels to improve revenue generation and operational efficiency.

Goal

- The goal of this analysis is to provide valuable business insights to help the hotels tackle this issue.
- The project focuses on exploring the factors contributing to booking cancellations and identifying patterns that impact business performance and annual revenue.

Assumptions

- No significant events between 2015 and 2017 have notably impacted the dataset used for this analysis.
- The data remains relevant and is suitable for evaluating the hotel's potential strategies effectively.
- Implementing any recommended strategies is assumed to have no unforeseen negative consequences for the hotel.
- It is presumed that the hotels have not yet adopted any of the proposed solutions.
- The biggest factor affecting the effectiveness of earning income is booking cancellations.
- Cancellations result in empty rooms with no guests for that day.
- Clients make hotel reservations the same year they cancel it.

Analysis

1.What are the variables affecting hotel reservation cancellations?
2. How can we reduce hotel reservations cancellation better?
3.How will we assist hotel in making better pricing and promotional decisions after analysis?

Hypothesis

1.More cancellations occur when prices are higher.
2. When there is longer waiting list , customers cancel more often.
3.The majority of clients come from offline travel agents to make their reservations.

Data Cleaning Steps

1. Removing Personal Information:
- Dropped columns like name, email, phone-number, and credit card to protect user privacy.

2. Handling Missing and Incorrect Data:
   - Removing or imputing missing values.
   - Correcting data types (e.g., converting dates to datetime format).
   - Fixing inconsistent entries (e.g., standardizing hotel names).

3. Filtering Data:
- You filtered out canceled bookings in some analyses to focus on completed reservations.

4. Aggregating Data:
- Grouped data by month and is_canceled for aggregated visualizations like ADR (Average Daily Rate) per month.

Exploratory Data Analysis (EDA)

1. Reservation Status Analysis:
   - Created count plots to show the percentage of canceled vs not canceled reservations.
   - Identified that 37% of bookings were canceled, significantly impacting hotel revenue.
2. Seasonality Analysis:
   - Used grouped bar plots to explore reservations across months.
   - Discovered that August had the highest bookings, while January had the most cancellations.
3. ADR (Average Daily Rate) Analysis:
   - Plotted ADR trends across months.
   - Identified a link between higher ADR and increased cancellations.

4.Geographic Analysis:
- Analyzed cancellations by country.
- Found that Portugal had the highest number of canceled bookings.

5. Booking Channels:
- Explored booking sources (Direct, Groups, Online Travel Agents).
- Discovered that 46% of bookings came from online agencies, while only 4% were made directly.
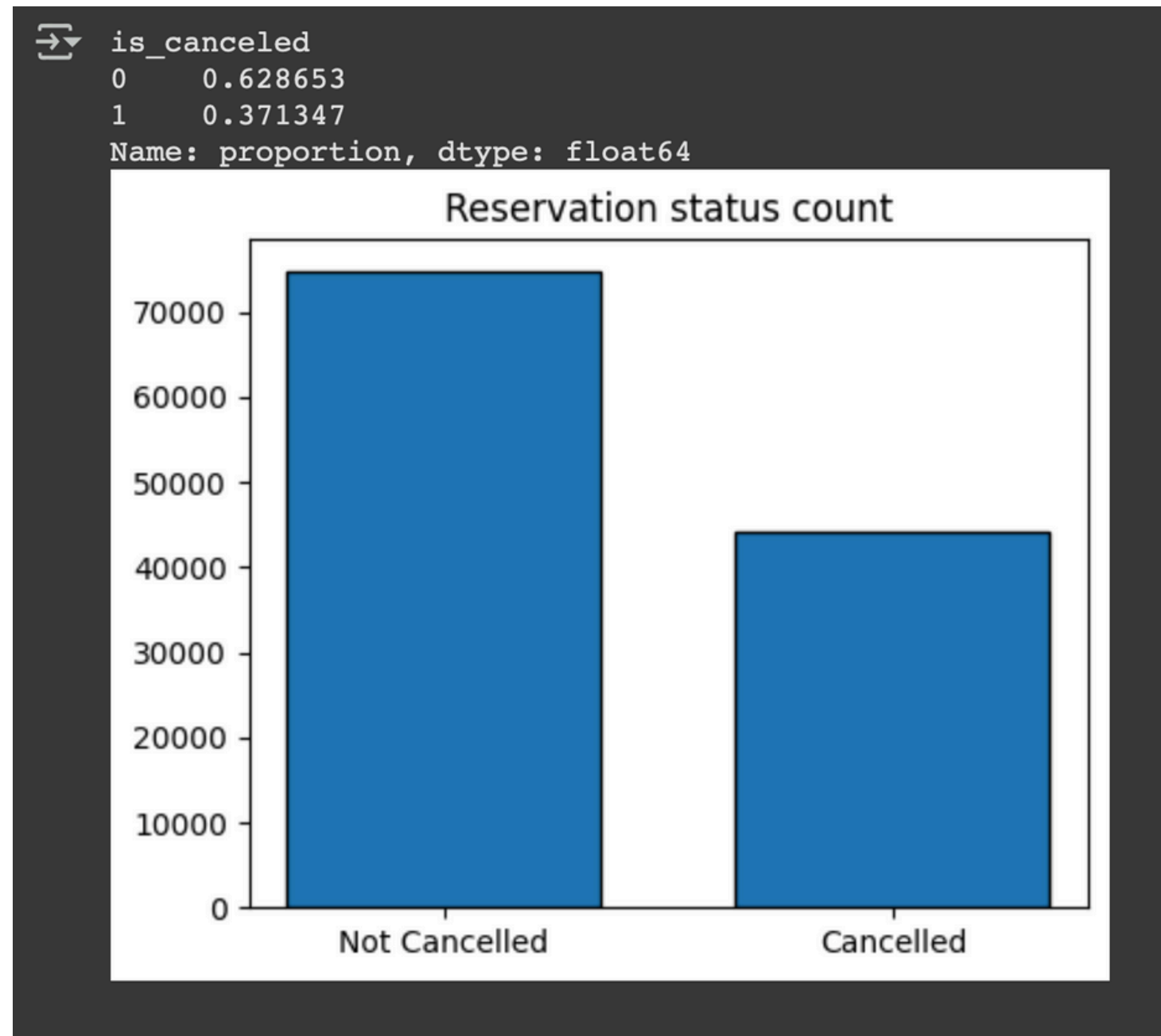
6. Price Sensitivity & Cancellation:
- Identified that cancellations were higher when prices were elevated, suggesting a price sensitivity among customers.

7. Recommendations:
- Suggested pricing strategies, discounts during specific months, and quality improvements to reduce cancellations.

Analysis and Findings


```
is_canceled
0    0.628653
1    0.371347
Name: proportion, dtype: float64
```
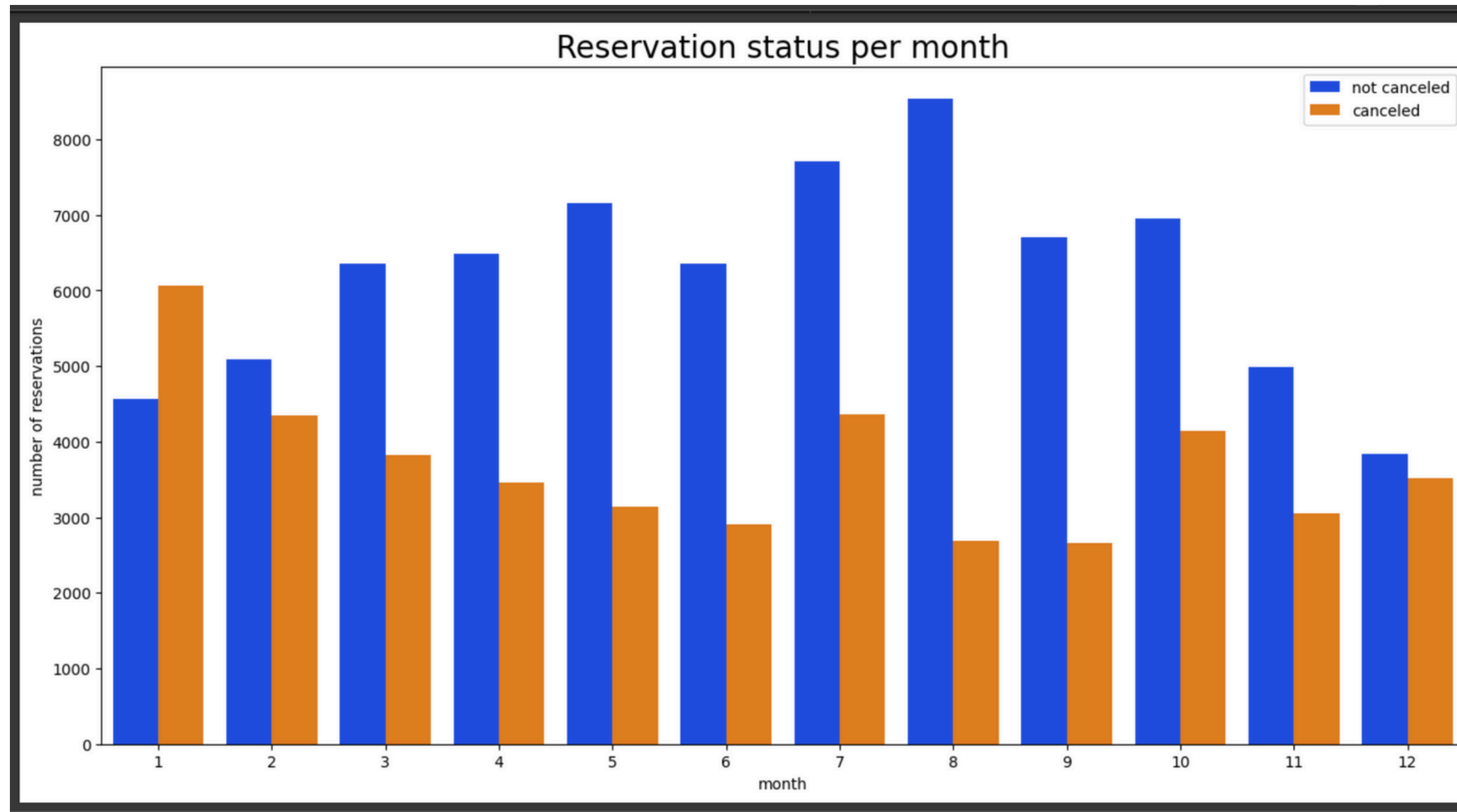
Reservation status count

The bar graph illustrates the proportion of reservations that were canceled compared to those that were not. It is clear that a considerable number of bookings remain active without cancellations. However, 37% of customers have canceled their reservations, which significantly affects the hotel's overall revenue.

Reservation status in different hotels
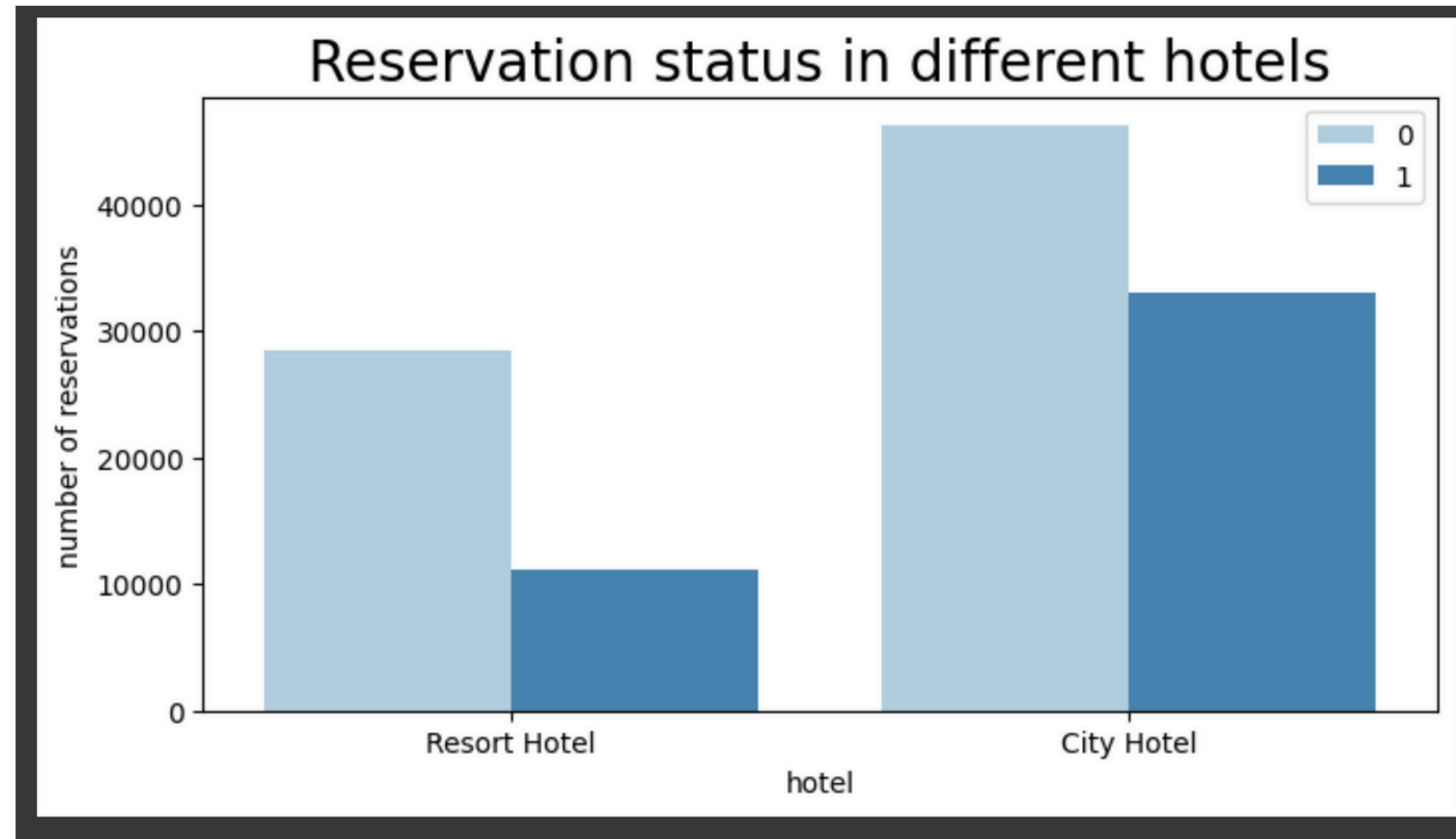
- In comparision to resort hotels , city hotels have more bookings.
- Its possible that resort hotels are more expensive than those in cities.

Average Daily Rate in City and Resort Hotel
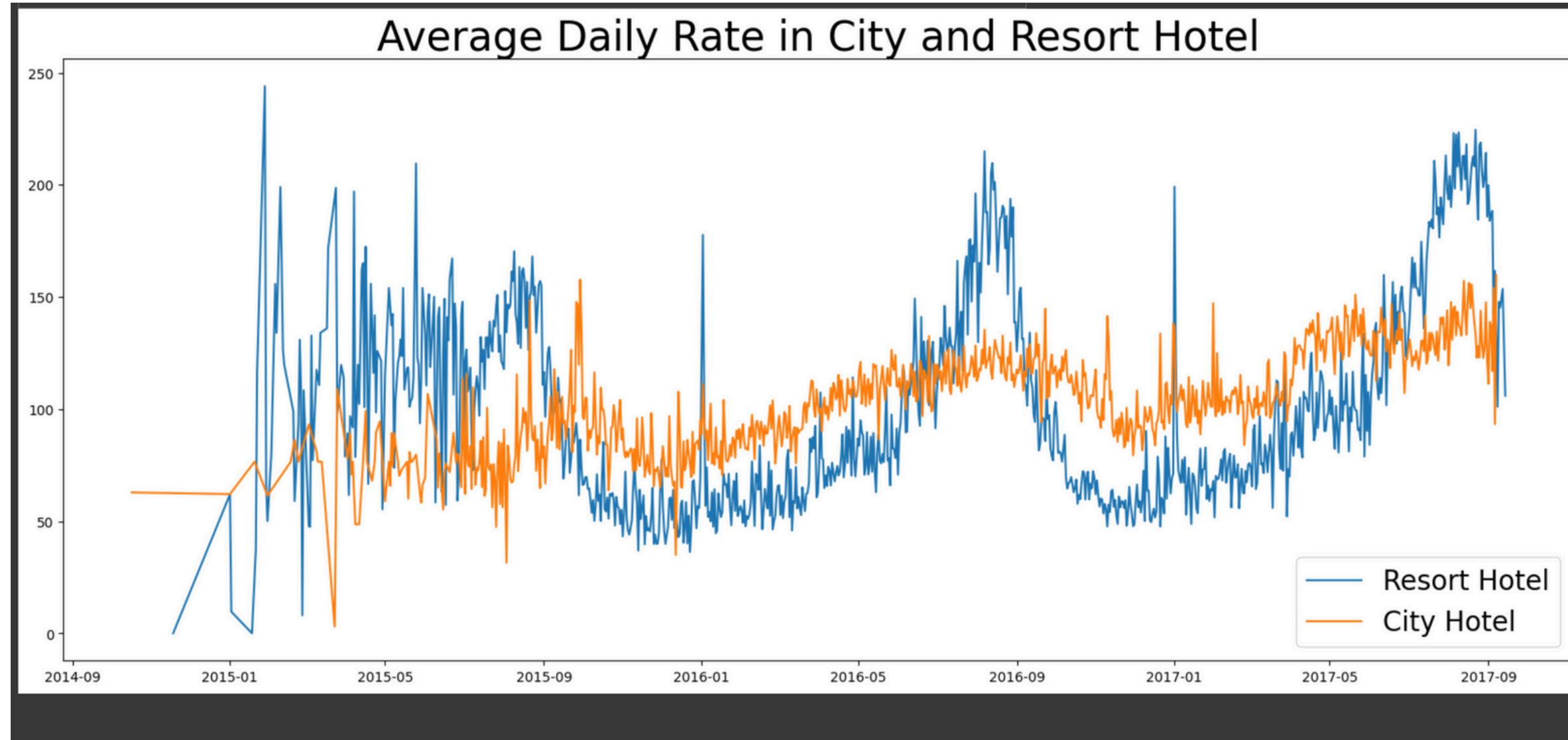
- Line graph shows that on certain days the average daily rate for a city hotel is less than that of resort hotel , and on other days it is even less.
- It goes without saying that weekends and holidays may see a rise in resort hotel rates.

Reservation status per month

- Created a grouped bar chart to evaluate the months with the highest and lowest reservation counts based on their status.
- The graph reveals that August has the highest number of confirmed and canceled bookings, while January records the most cancellations overall.

ADR per month
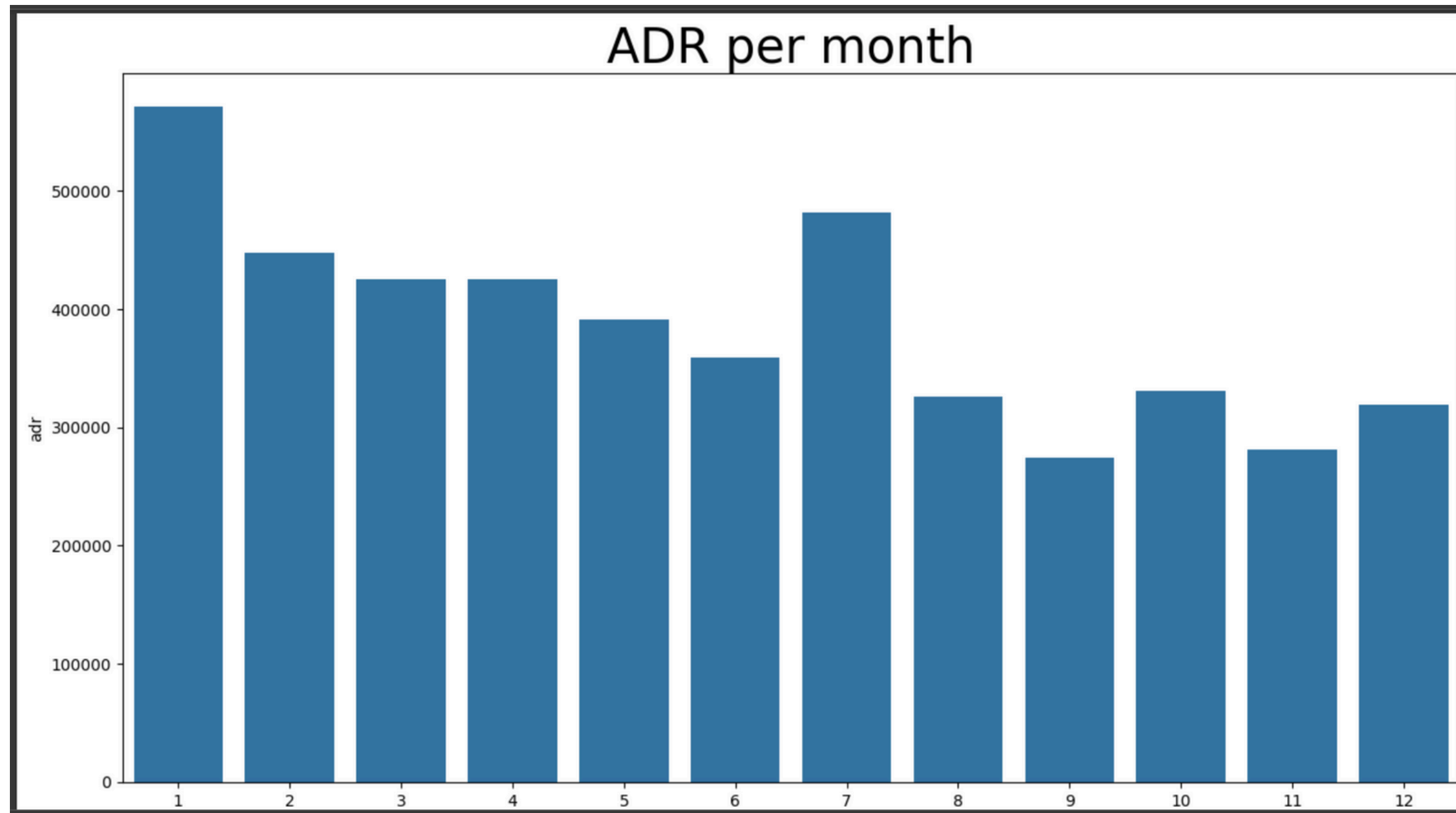
- This bar chart highlights that cancellations are most frequent when prices are at their highest and least frequent when prices are lower.
- This suggests that the cost of accommodation plays a key role in reservation cancellations.

Top 10 countries with reservation canceled
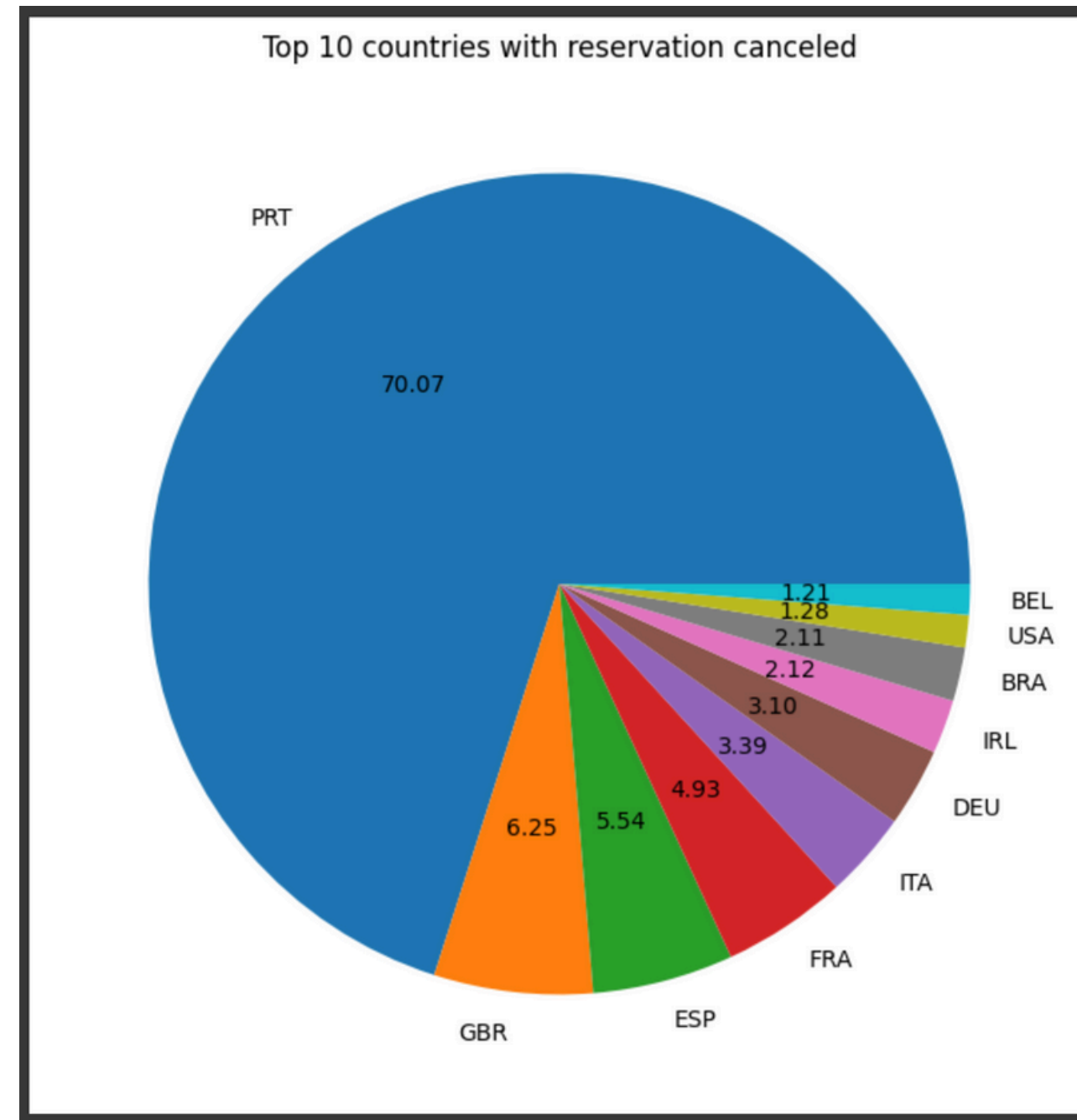
- Additionally, the chart reveals that Portugal ranks as the country with the highest number of canceled bookings.
- Hence KPI here will be price.

Approximately 46% of reservations are made via online travel agencies, while 27% come from group bookings. Only 4% of guests make direct reservations by visiting the hotels themselves.
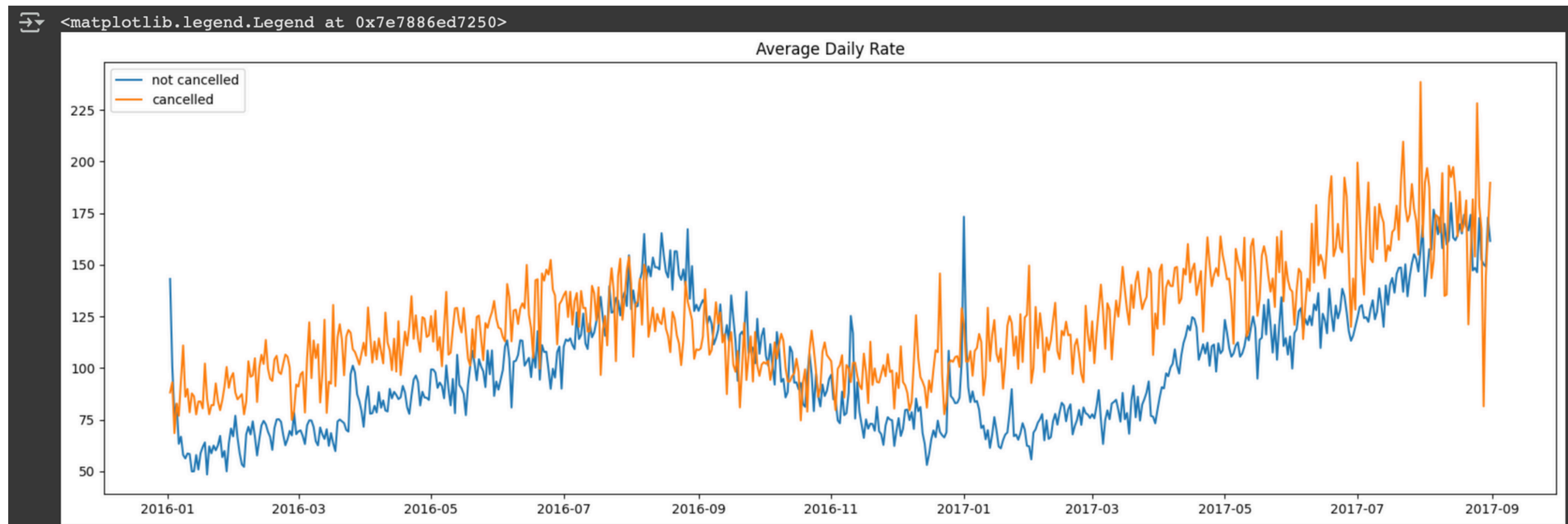
As seen in graph , reservations are cancelled when the average daily rate is higher than when it is not cancelled.It clearly proves all the above analysis, that higher price leads to cancellation.

Suggestions

1. Higher prices tend to lead to increased cancellation rates. To reduce cancellations, hotels should adjust their pricing strategies, offering lower rates for specific locations and providing discounts to attract more customers.

2. Since resort hotels experience a higher cancellation-to-confirmation ratio compared to city hotels, they should consider offering discounts on room rates during weekends and holidays to encourage more bookings.

3. As January sees the highest number of cancellations, hotels can launch targeted marketing campaigns or promotions during this month to boost revenue and attract more guests.

4. Enhancing the quality of hotels and improving services, particularly in Portugal, could help lower the cancellation rates and improve customer satisfaction.