

# **Hotel Booking Data Analysis Project**

## **Part 1 & Part 2**

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# Introduction:

In this presentation, we will explore the trends and patterns in hotel bookings, focusing specifically on factors influencing cancellations. Utilizing a comprehensive dataset, we aim to identify key insights that can enhance our understanding of customer behavior and improve hotel management strategies.

## Key Objectives:

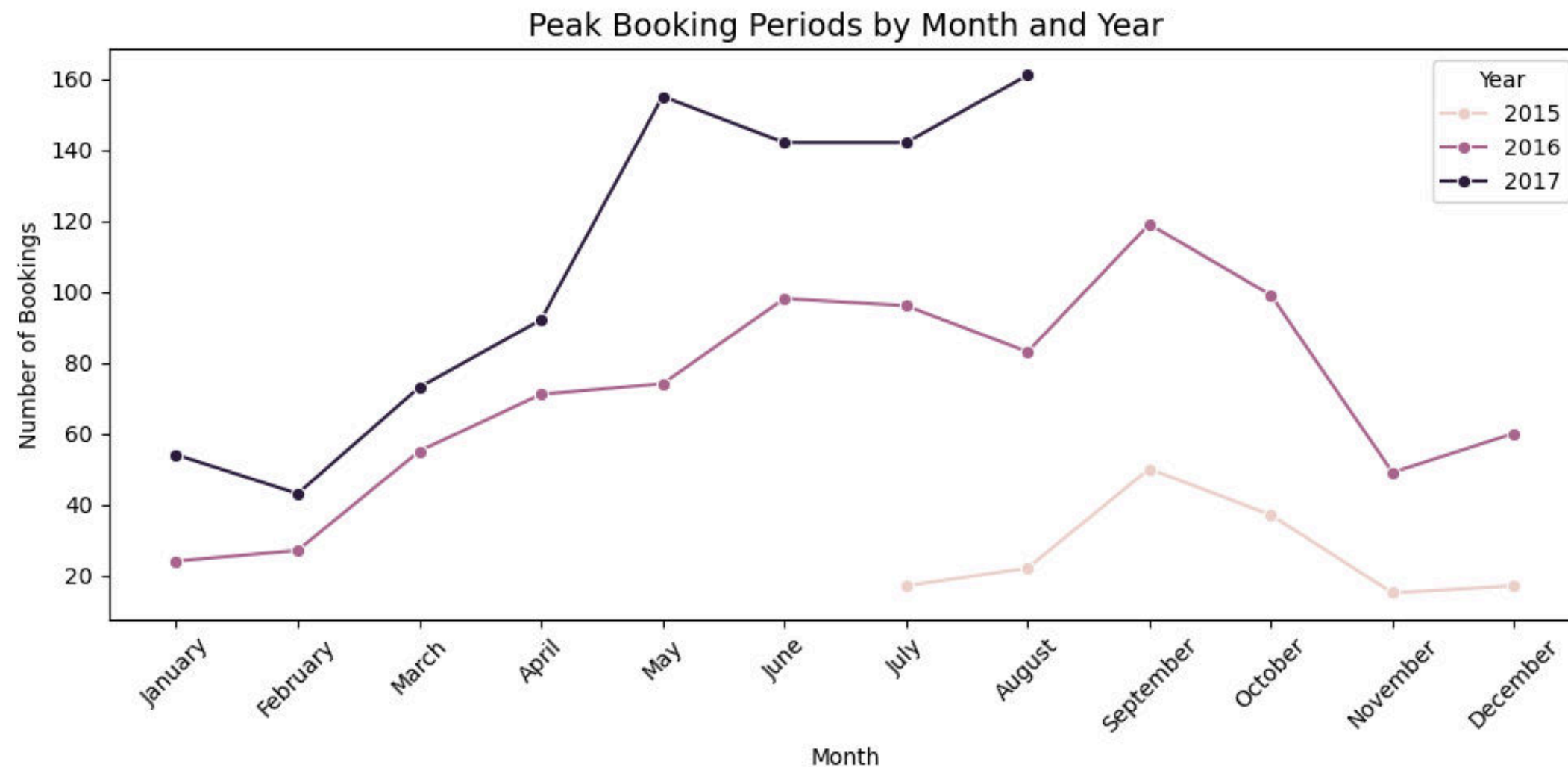
- To analyze booking trends based on various parameters such as lead time, guest demographics, and seasonal influences.
- To examine the factors contributing to booking cancellations and their implications for hotel operations.
- To provide actionable recommendations for improving booking retention and customer satisfaction.

# Part 1

## Booking Pattern Analysis

### Task-2(I)

**What is the peak booking period for the hotel**



### Interpretation:

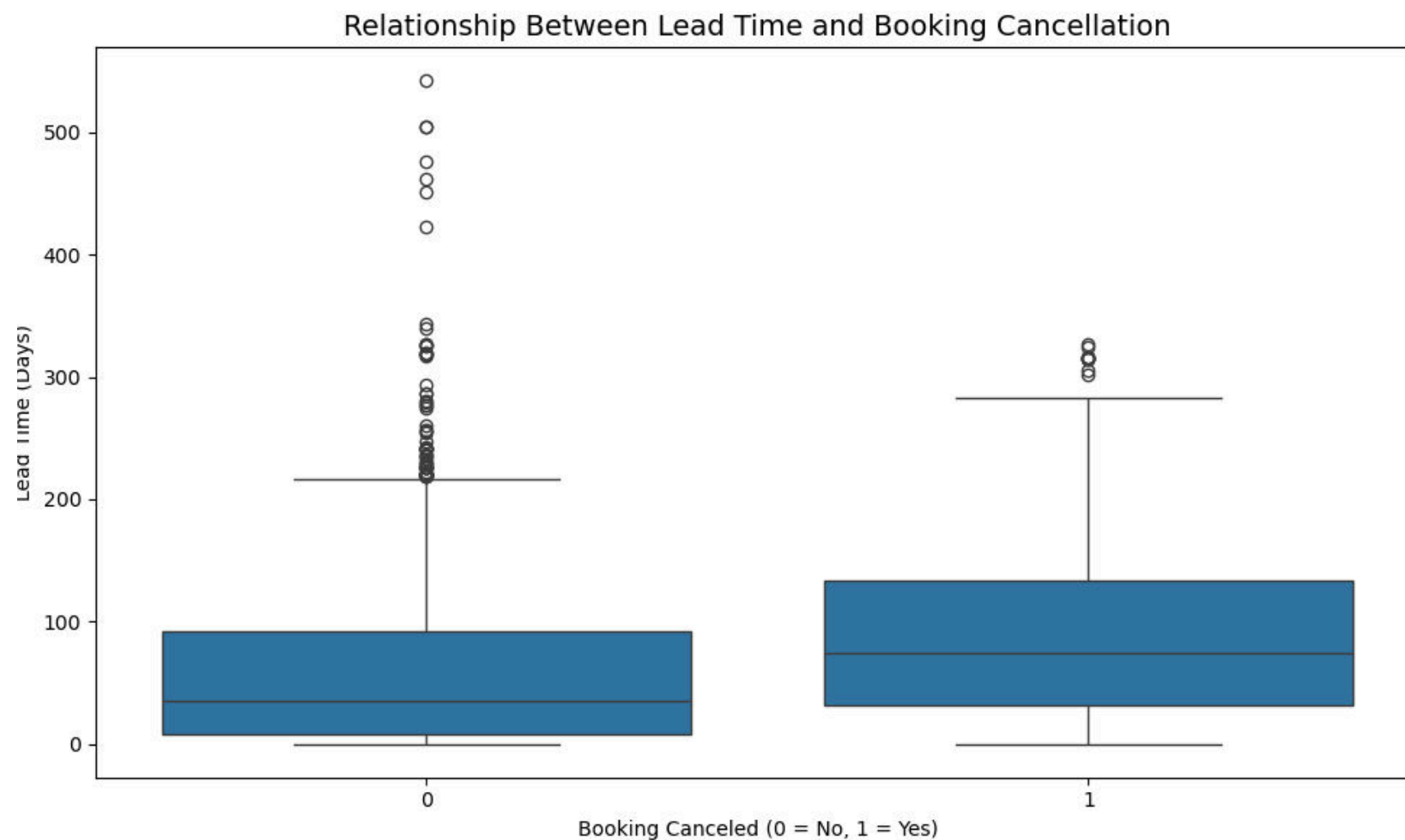
In this task first I analysed the booking columns like arrival\_date\_year and arrival\_date\_month to find peak booking periods. Furthermore sorted the month to visualize and then I used advanced lineplot for visualization. Peak booking period at the year of 2015 was in the month of September, at the year of 2016 peak booking period was in the month of September and finally at the year of 2017 peak booking period was in the month of May.

# Part 1

## Booking Pattern Analysis

### Task-2(II)

**Is there relationship between leadtime and the likelihood of the booking being cancelled?**



### Interpretation:

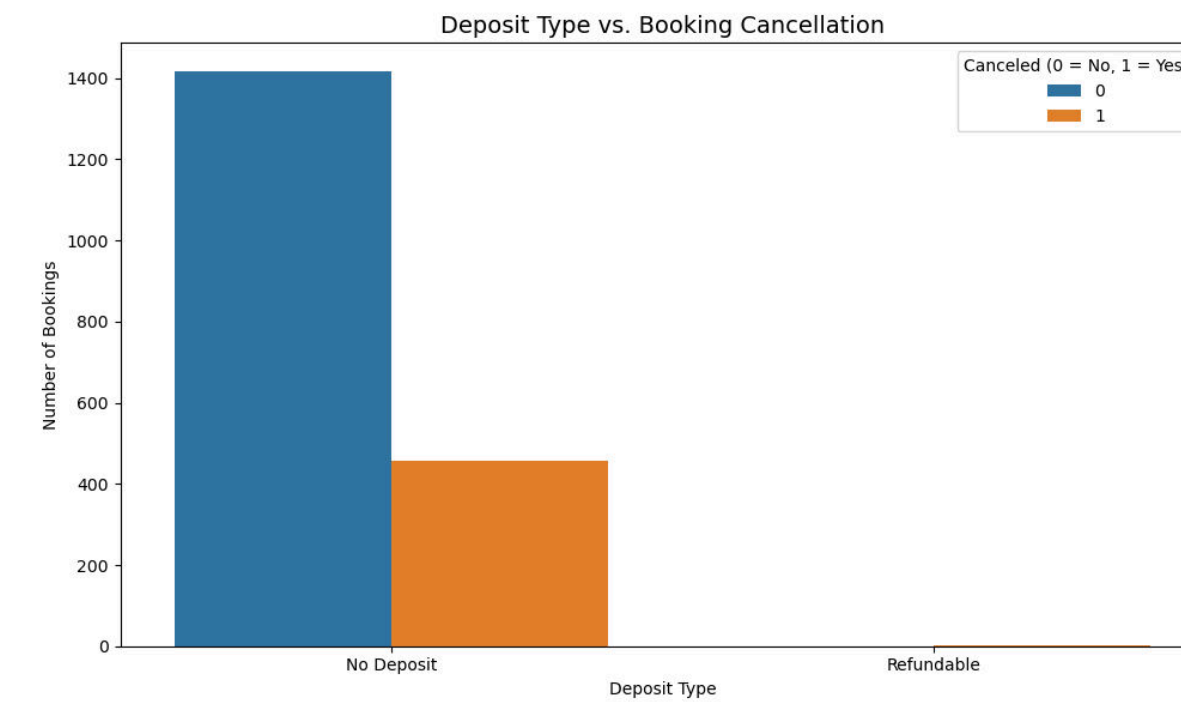
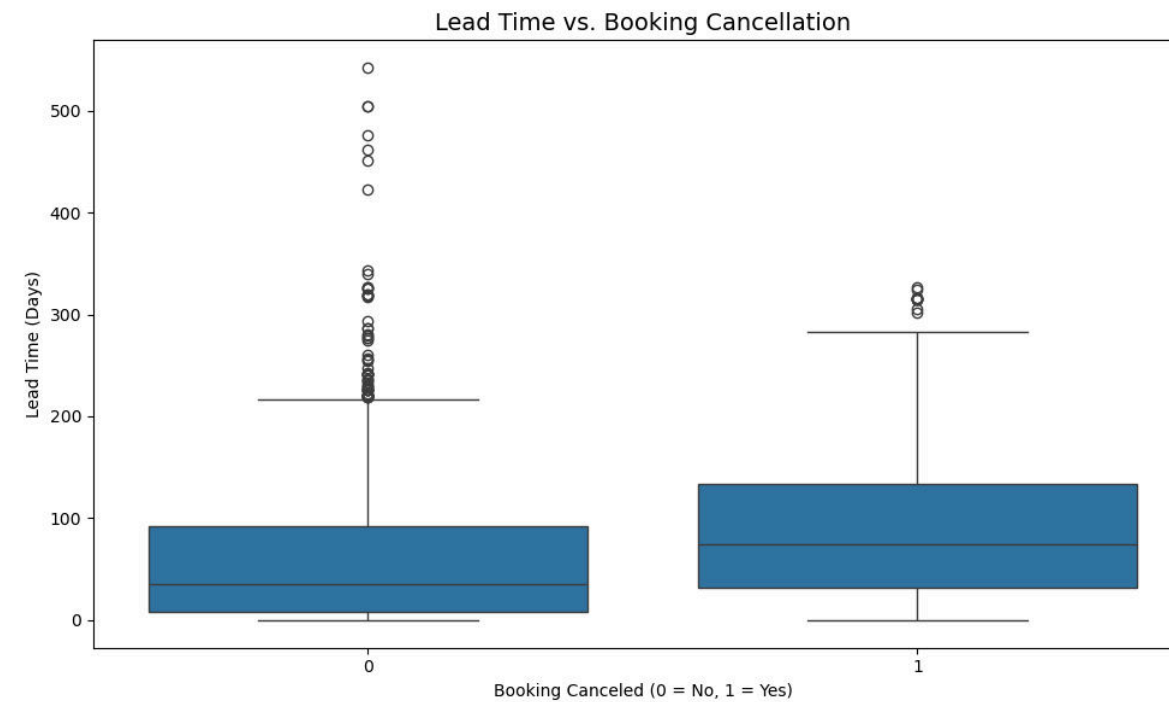
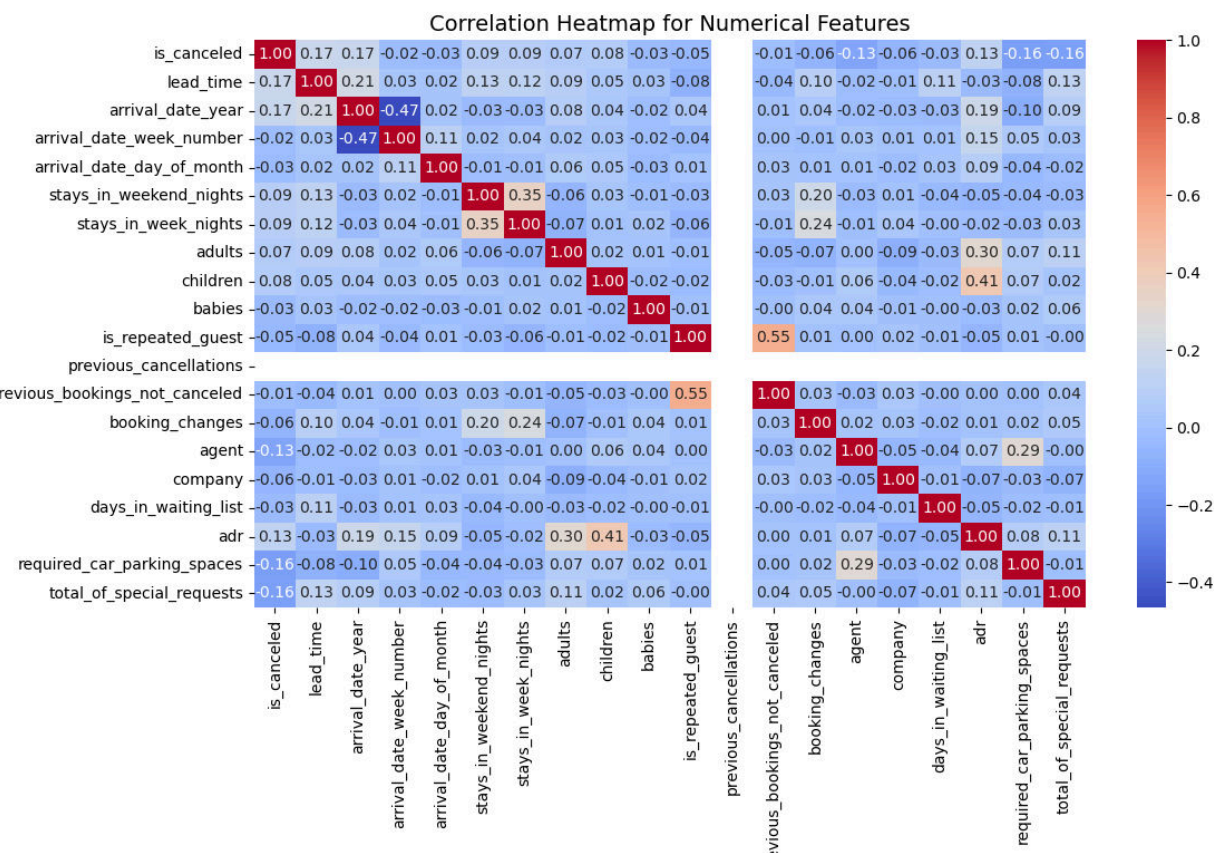
In this task to find the relationship between leadtime and likelihood first I has used both columns and then I has used corr function to find the relationship and visualized using boxplot.

# Part 1

## Booking Cancellation Analysis

### Task-3(I)

# What factors influence booking cancellation?



## Interpretation:

- In this task using heatmap it shows positive relationship with booking cancellation.
- Using boxplot longer lead times are associated with a higher likelihood of cancellations.
- Using countplot most cancellations occur with bookings that have no deposit.

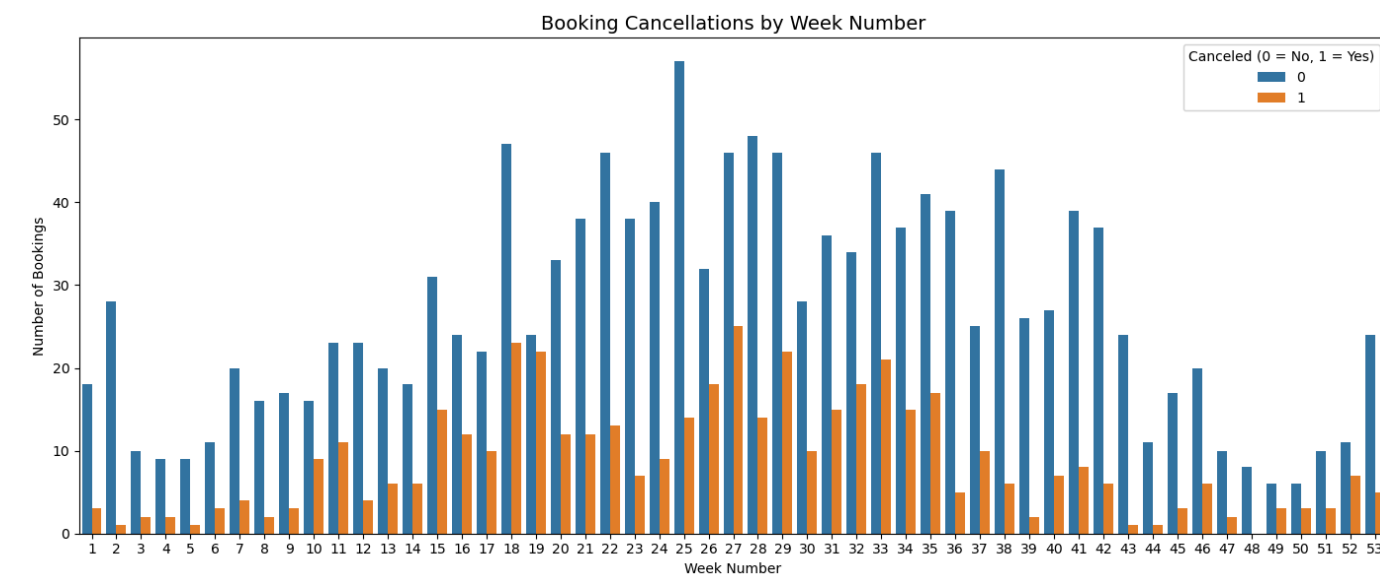
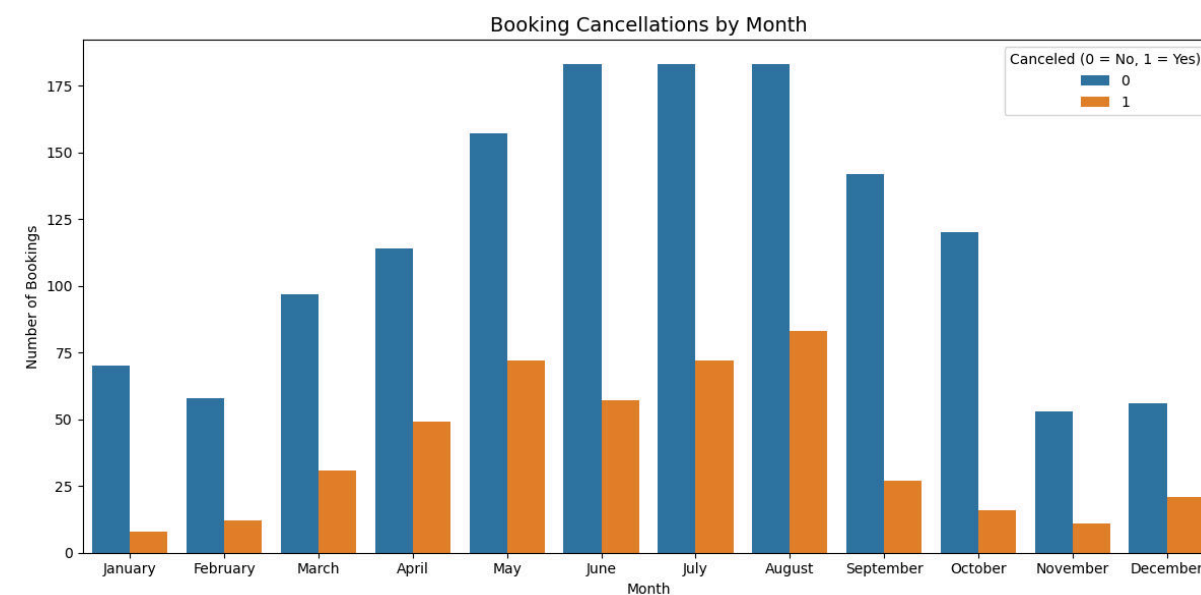
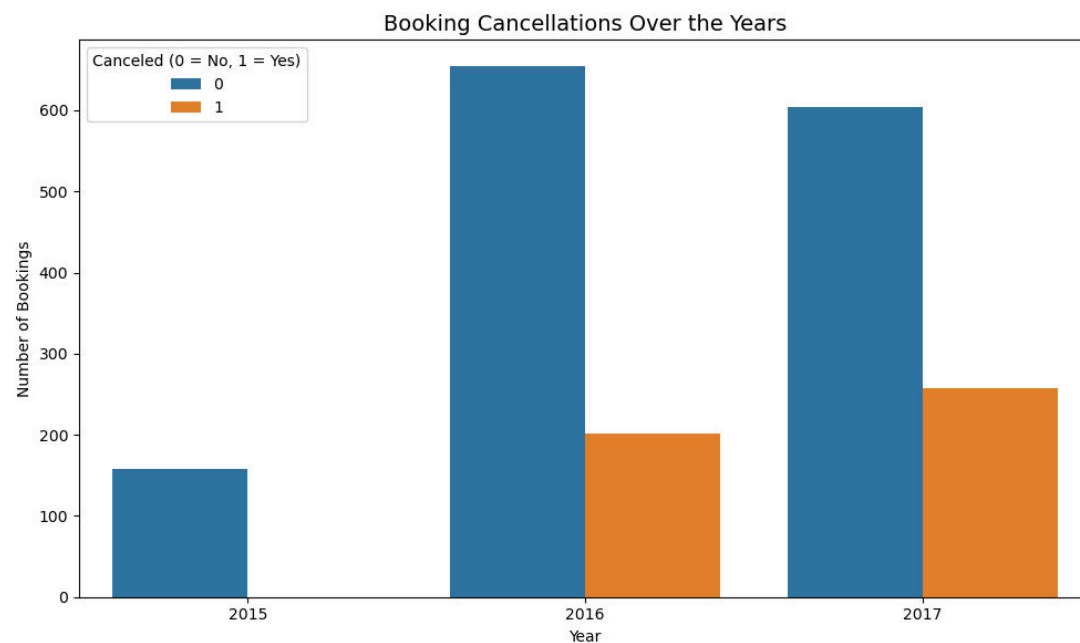


# Part 1

## Booking Cancellation Analysis

### Task-3(II)

**Are there specific trends or patterns in cancellation over time?**



## Interpretation:

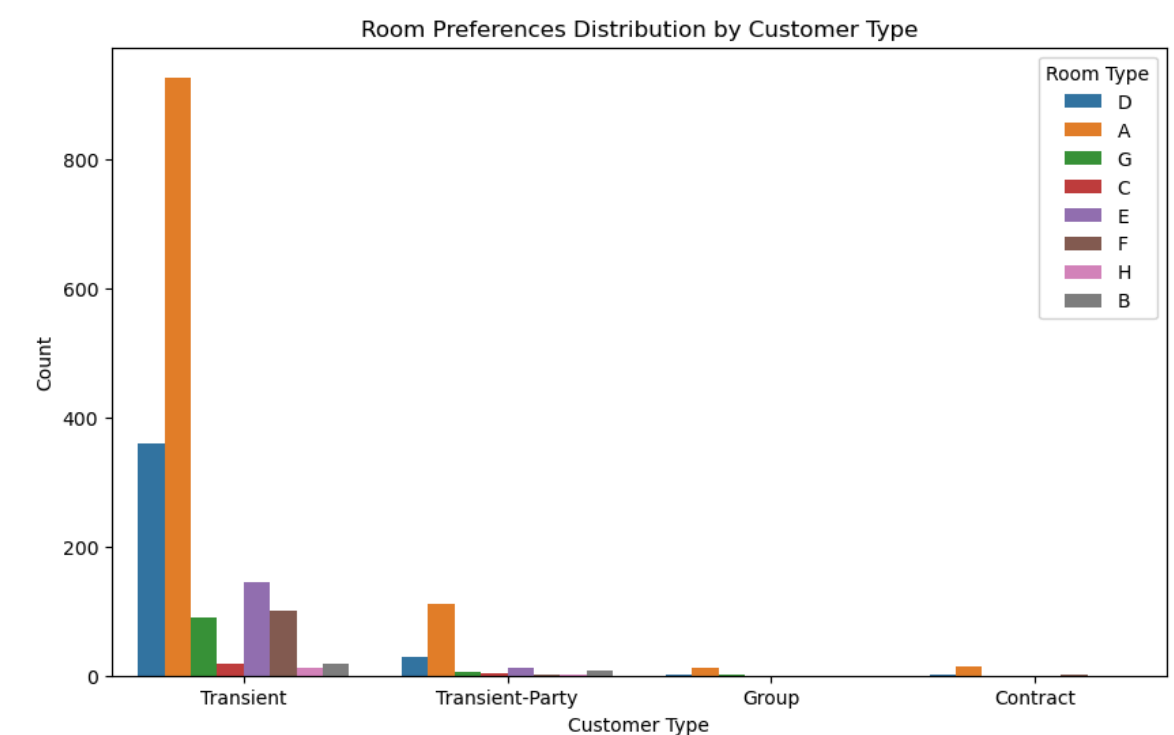
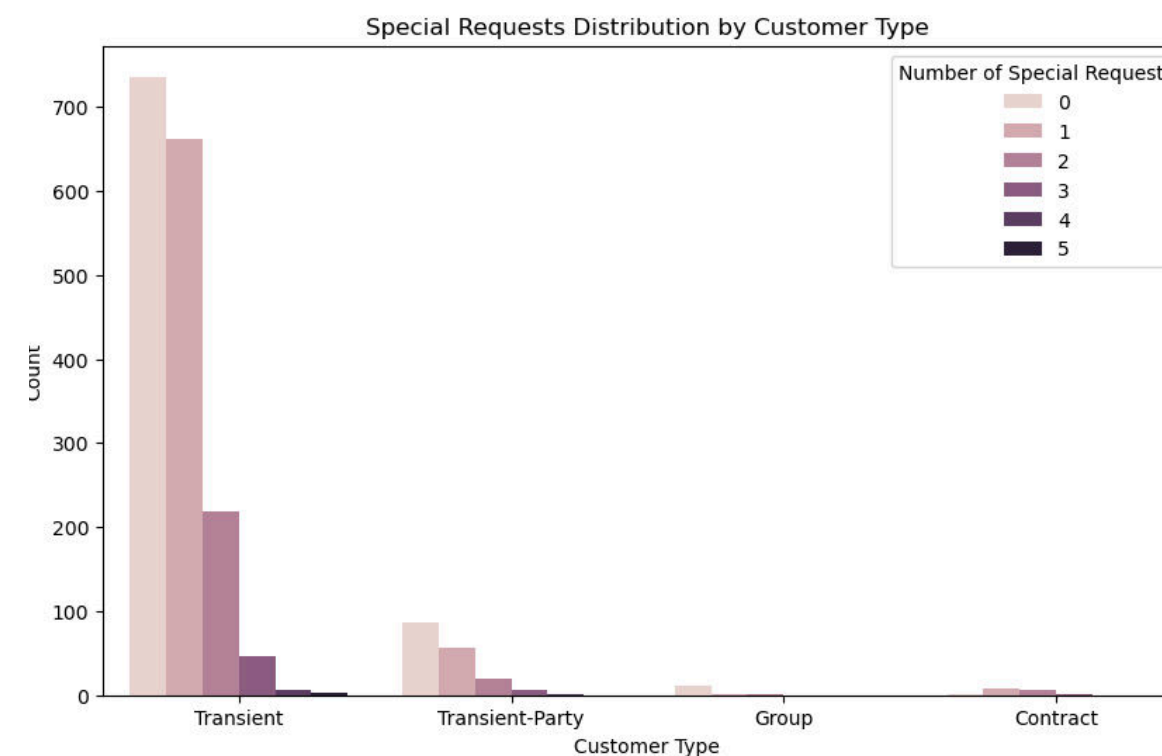
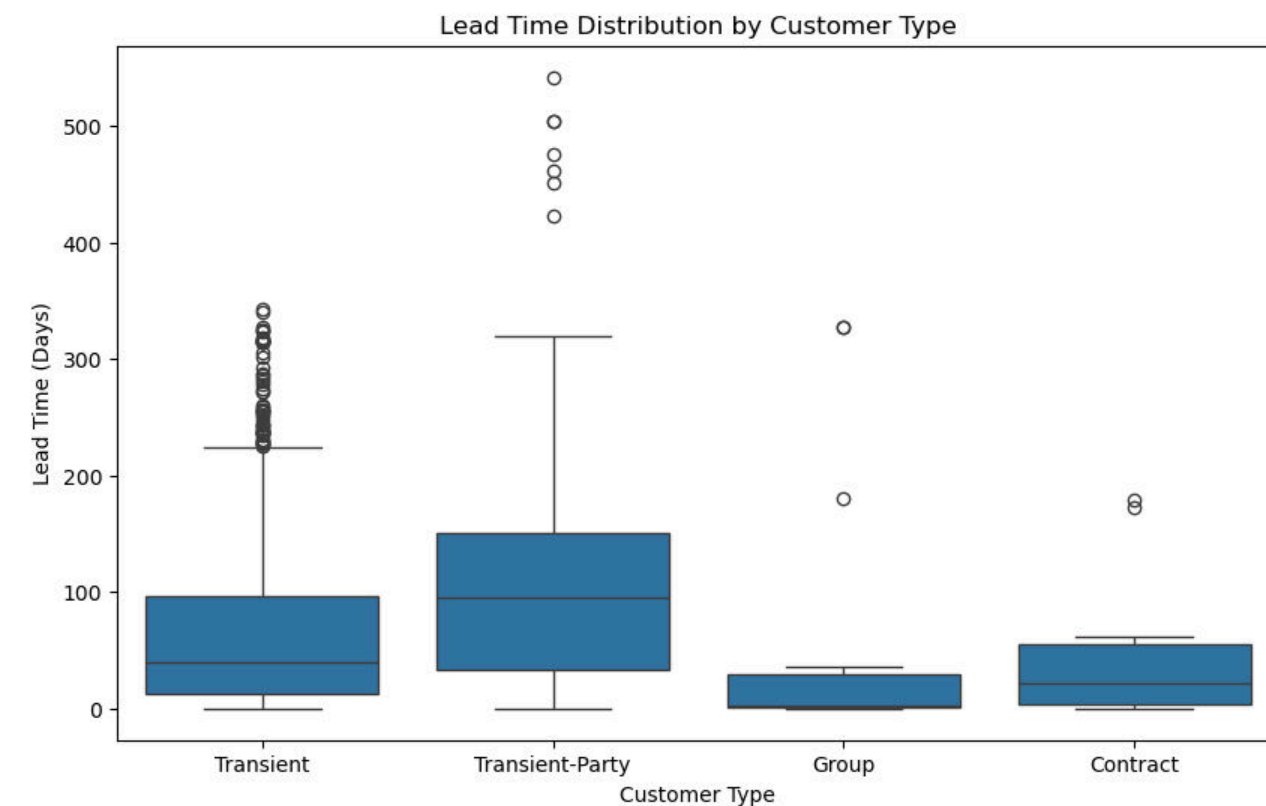
- In this task to find specific trends using countplot I has identified that the year 2016 is in peak.
- Using countplot by specfic trend in month August is in peak.Using week 25th week is in peak.

# Part 1

## Customer Behavioral Segmentation

### Task-4(I)

**Are there distinct pattern in the leadtime ,special request or room preferences for different customer segments?**



## Interpretation:

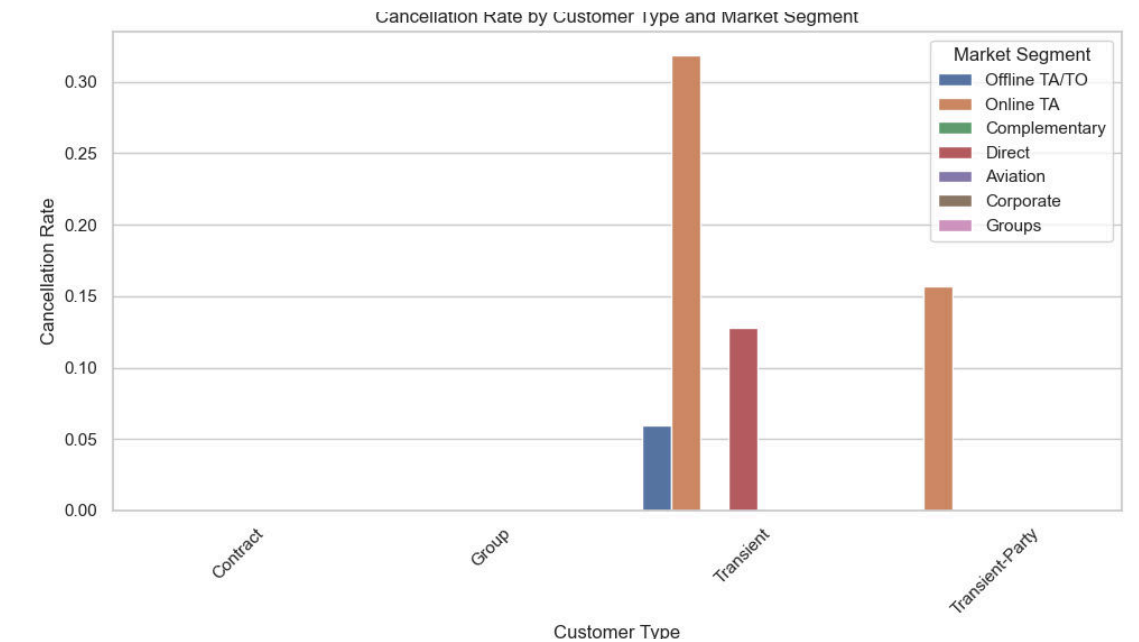
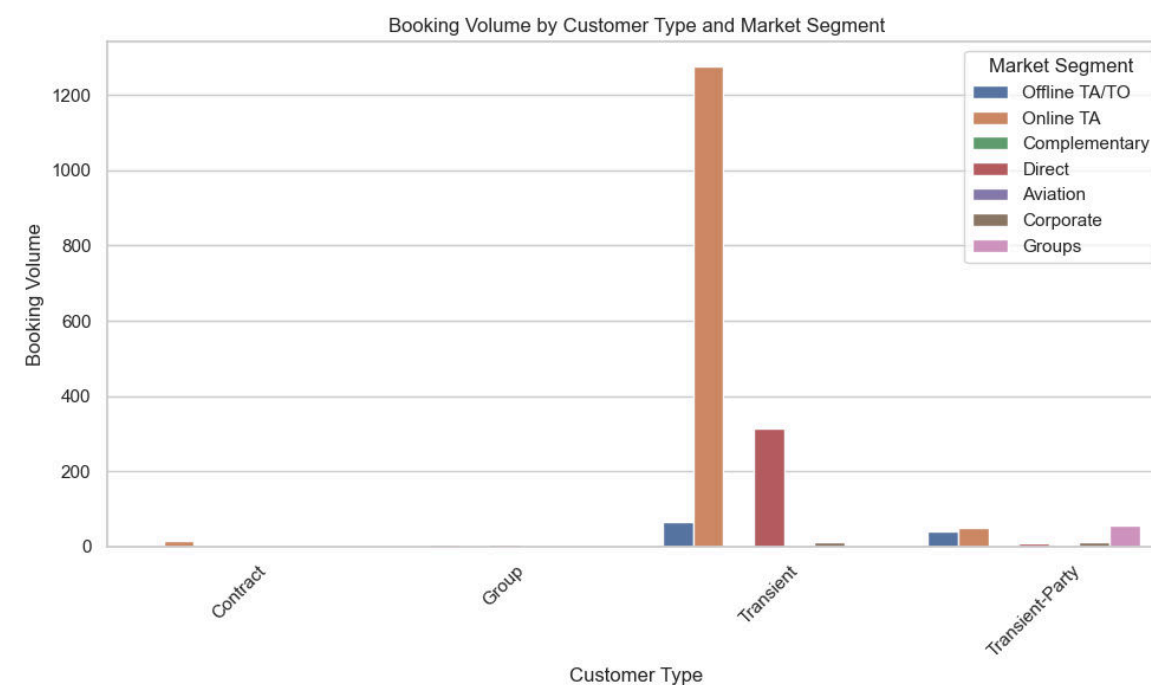
In this task using boxplot for leadtime I identified customer type Transient-party book for longer. Using countplot with special request Transient customer type is longer for booking. Using countplot for room preference I has identified that Transient customer type is give more preference.

# Part 1

## Customer Behavioral Segmentation

### Task-4(II)

**Which marketing channels are the most effective for reaching specific customer segments?**



## Interpretation:

In this method to find the market channels to find the most effective for specific customer segment I used barplot to visualize the Booking Volume by Customer Type and Market Segment, average ADR by Customer Type and Market Segment and Cancellation Rate by Customer Type and Market Segment. So finally Online TA is the highest in market segment

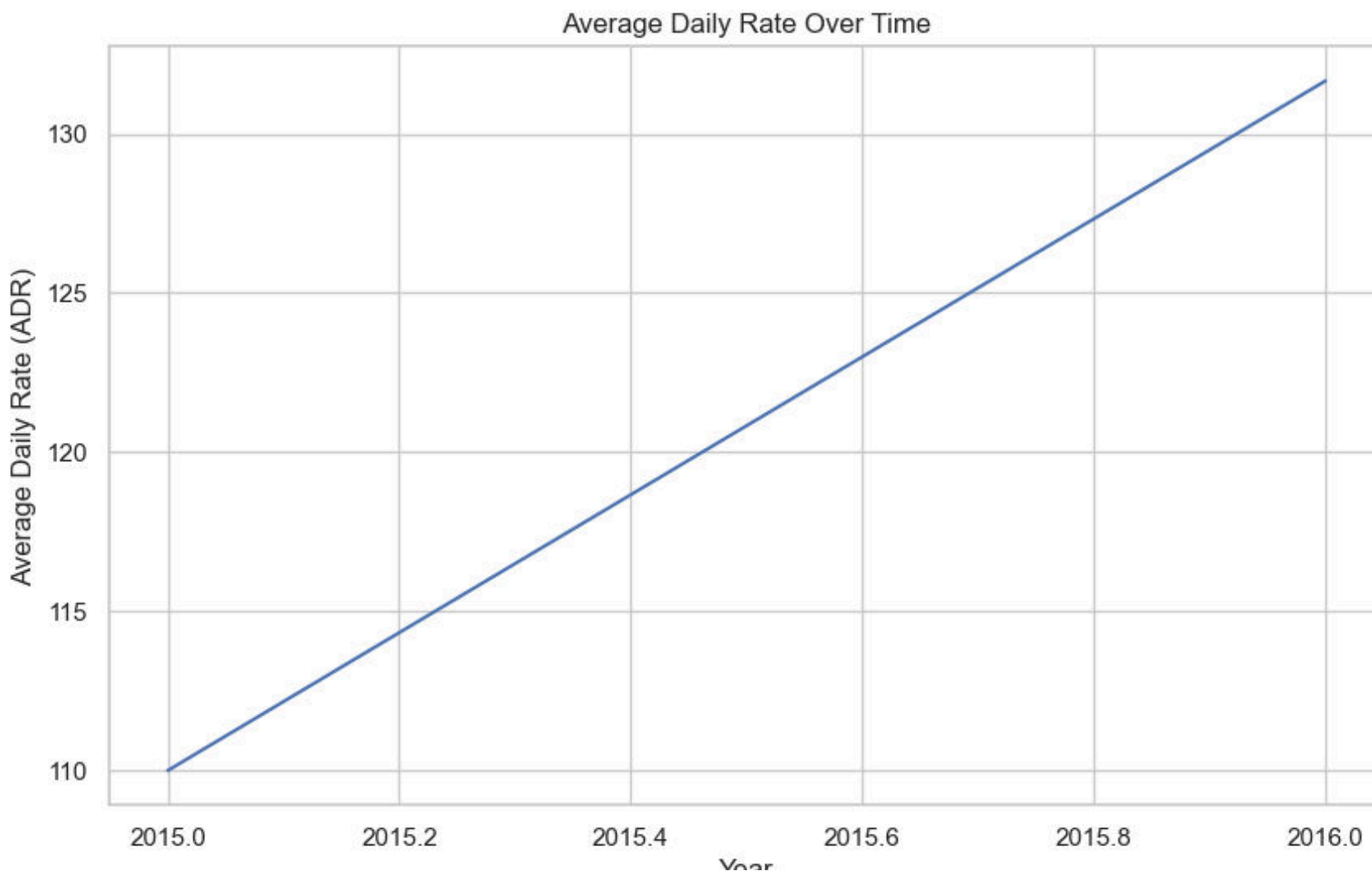


# Part 1

## Revenue Management

### Task-5(I)

**How does the Average daily rate(ADR) vary over time?**



### Interpretation:

The line chart shows the Average Daily Rate (ADR) over time from 2015 to 2016. The ADR has steadily increased over this period, starting at around 110 in 2015 and reaching approximately 130 in 2016. This indicates a general upward trend in the average daily rate charged by the business or industry represented in the chart.

# Part 1

## Revenue Management

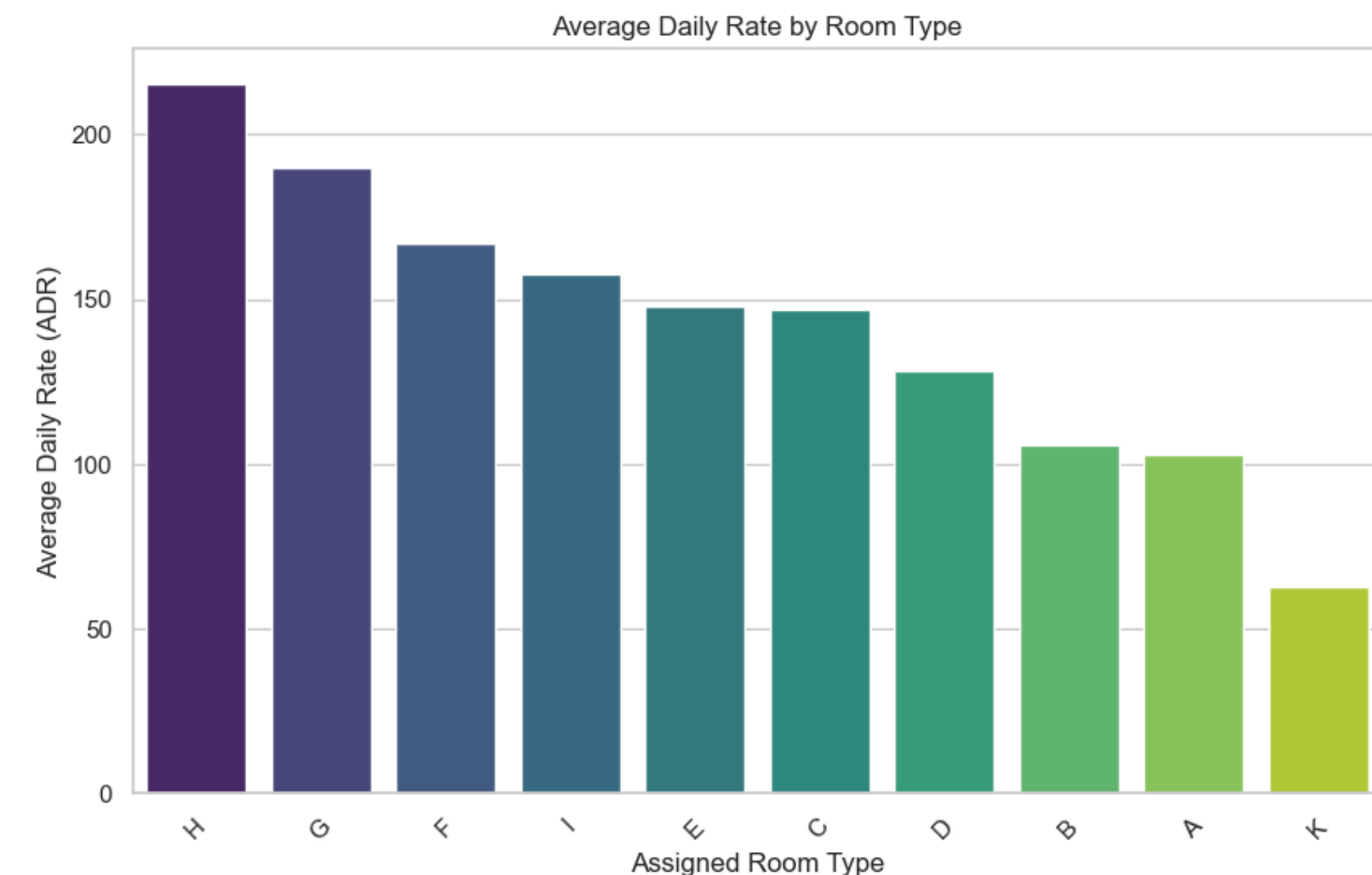
### Task-5(III)

**Are there specific room type associated with higher ADR?**

### Interpretation:

The bar chart shows the Average Daily Rate (ADR) for different room types. The x-axis represents the assigned room types (H, G, F, I, E, C, D, B, A, K) and the y-axis represents the ADR.

The highest ADR is for room type H, followed by G and F. The lowest ADR is for room type K. Overall, the ADR varies significantly among different room types, suggesting that different room types are priced differently based on factors such as size, amenities, or views.



# Part 1

## Customer Behavioral Segmentation

### Task-6(I)

## What is the effectiveness of different booking distribution channels?

## Interpretation:

### Number of Bookings by Distribution Channel:

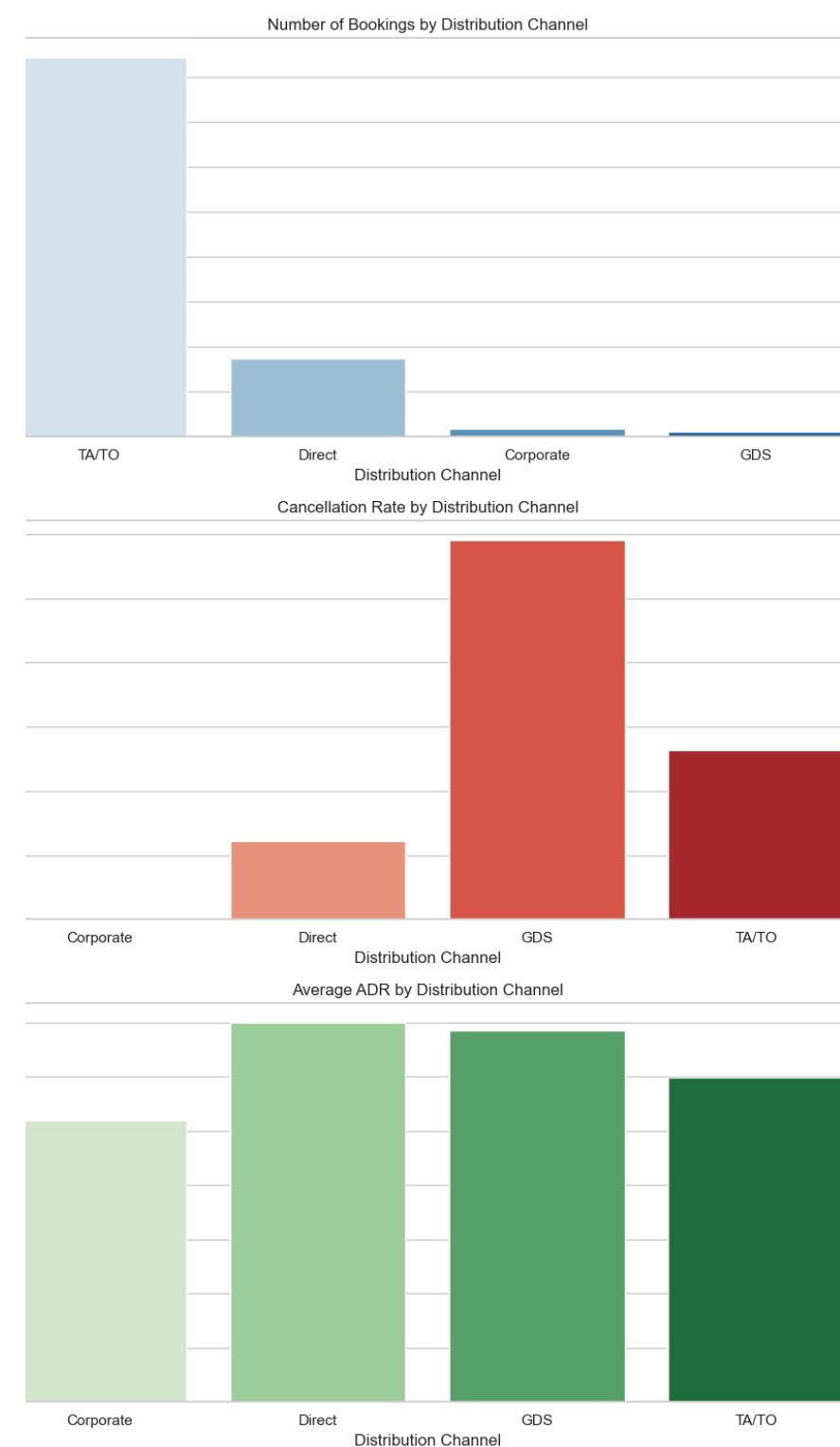
- TA/TO (Travel Agencies/Tour Operators) has the highest number of bookings, followed by Direct bookings.
- Corporate and GDS (Global Distribution Systems) have significantly fewer bookings compared to TA/TO and Direct.

### Cancellation Rate by Distribution Channel:

- Corporate bookings have the highest cancellation rate, followed by Direct bookings.
- GDS and TA/TO have lower cancellation rates.
- Average ADR by Distribution Channel:
- GDS bookings have the highest average daily rate (ADR), followed by Direct bookings.
- Corporate and TA/TO have lower ADRs.

### Overall Analysis:

- TA/TO is the most popular distribution channel in terms of the number of bookings, but it has a lower ADR compared to GDS and Direct.
- Direct bookings are also significant and have a relatively high ADR.
- Corporate bookings have the highest cancellation rate and lower ADR, indicating that corporate clients may be more price-sensitive or have different booking patterns.
- GDS has the highest ADR but fewer bookings, suggesting that it might be used for specific market segments or luxury bookings.
- Based on these insights, the business can focus on strategies to increase direct bookings and improve the ADR for corporate and TA/TO channels. Additionally, they can explore ways to reduce the cancellation rate for corporate bookings.



# Part 1

## Loyalty programs and repeate business

### Task-7(I)

What is the behaviour of repeated guests with respect to their nature of stay?

## Interpretation:

### Average Stay Duration by Guest Type:

- New Guests stay for a longer duration, with an average of 2.5 nights in total. They spend more time on weekends (1.5 nights) compared to weekdays (1 night).
- Repeated Guests stay for a shorter duration, with an average of 1.5 nights in total. They spend more time on weekdays (1 night) compared to weekends (0.5 night)

### .Average ADR by Guest Type:

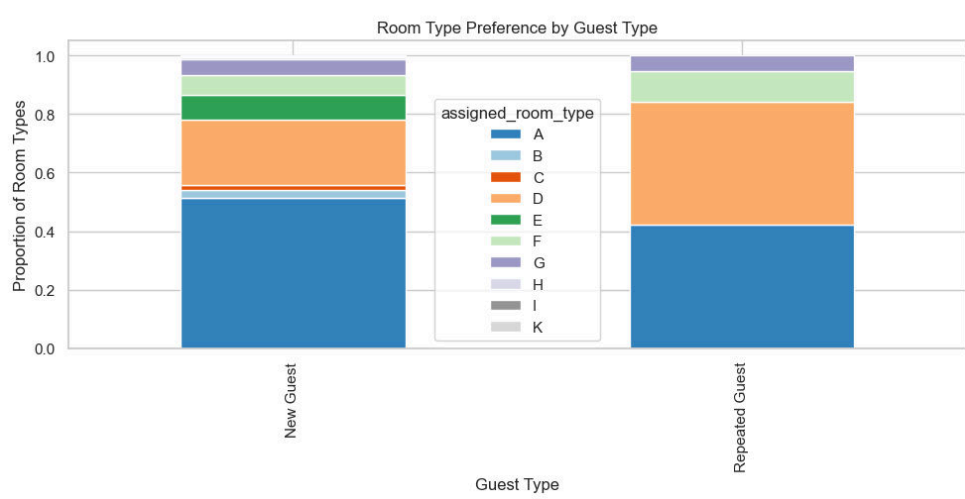
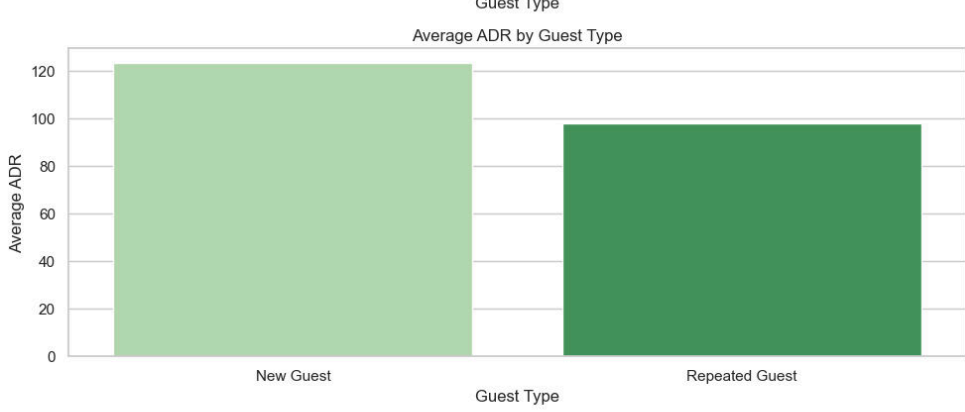
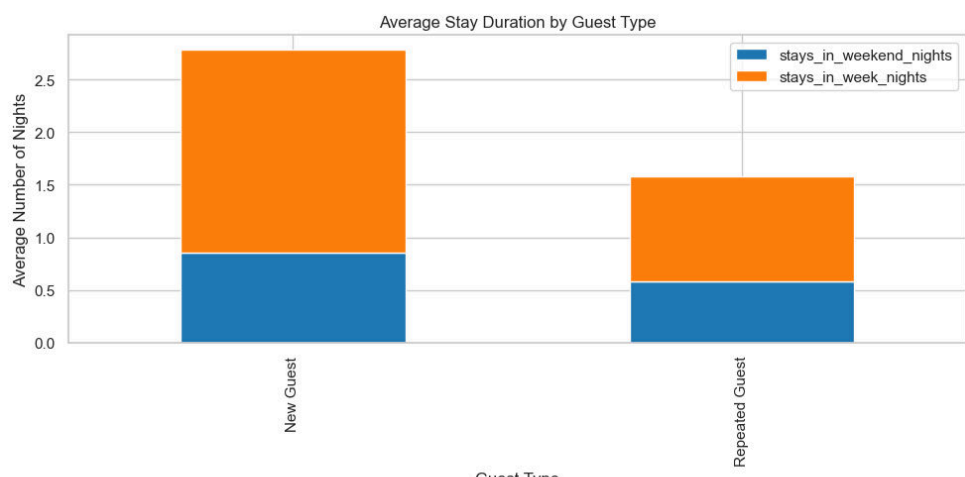
- Repeated Guests have a higher average daily rate (ADR) compared to New Guests.

### Room Type Preference by Guest Type:

- New Guests have a wider range of room type preferences, with a higher proportion of bookings in room types A, B, C, and D.
- Repeated Guests tend to prefer room types E, F, G, and H, which might indicate that they have specific preferences or loyalty to certain room types.

### Overall Analysis:

- New Guests stay longer, especially on weekends, but have a lower ADR compared to Repeated Guests. This might suggest that they are more price-sensitive or are exploring the property for the first time.
- Repeated Guests stay for a shorter duration but have a higher ADR, indicating that they are willing to pay more for their preferred room types or might be using the property for specific purposes.
- The room type preferences of both guest types differ, suggesting that the property can tailor its offerings to attract different segments of guests. Based on these insights, the property can implement strategies to encourage longer stays, especially for New Guests. They can also offer promotions or packages to attract Repeated Guests and incentivize them to book higher-priced room types. Additionally, the property can analyze the factors driving room type preferences to optimize their inventory and pricing.

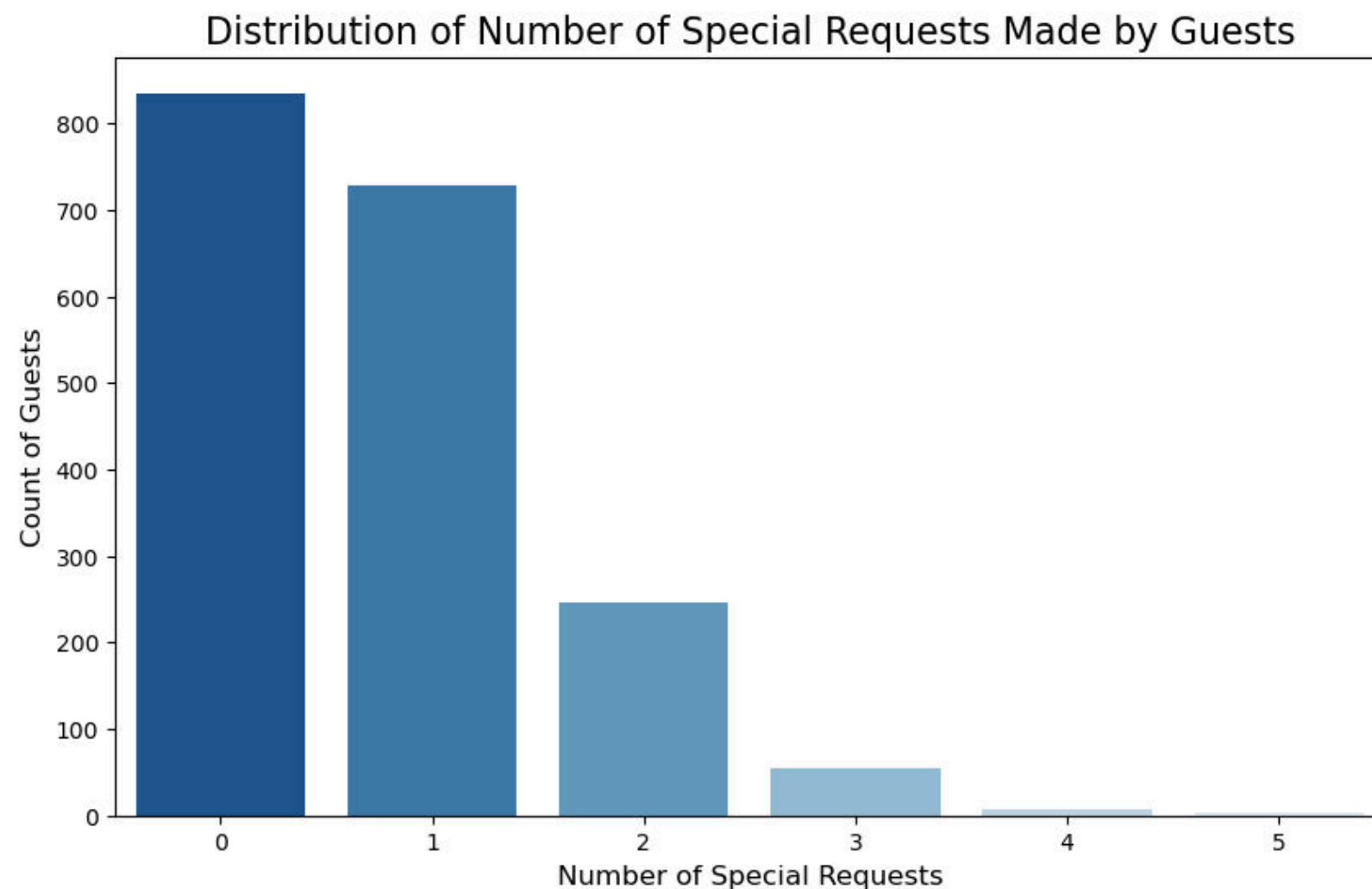


# Part 2

## Customer Satisfaction

### Task-1(I)

**What is the distribution of number and types of special request made by guests?**



### Interpretation:

The bar chart shows the distribution of the number of special requests made by guests. The x-axis represents the number of special requests, and the y-axis represents the count of guests who made that number of requests. The chart shows that most guests (around 800) made no special requests, followed by 700 guests who made 1 request. The number of guests making 2 or more requests decreases significantly, with only a small number of guests making 4 or 5 requests. Overall, the chart indicates that a majority of guests do not require special requests, while a smaller proportion of guests have specific needs or preferences. This information can be valuable for the hotel or business in understanding guest expectations and allocating resources accordingly.

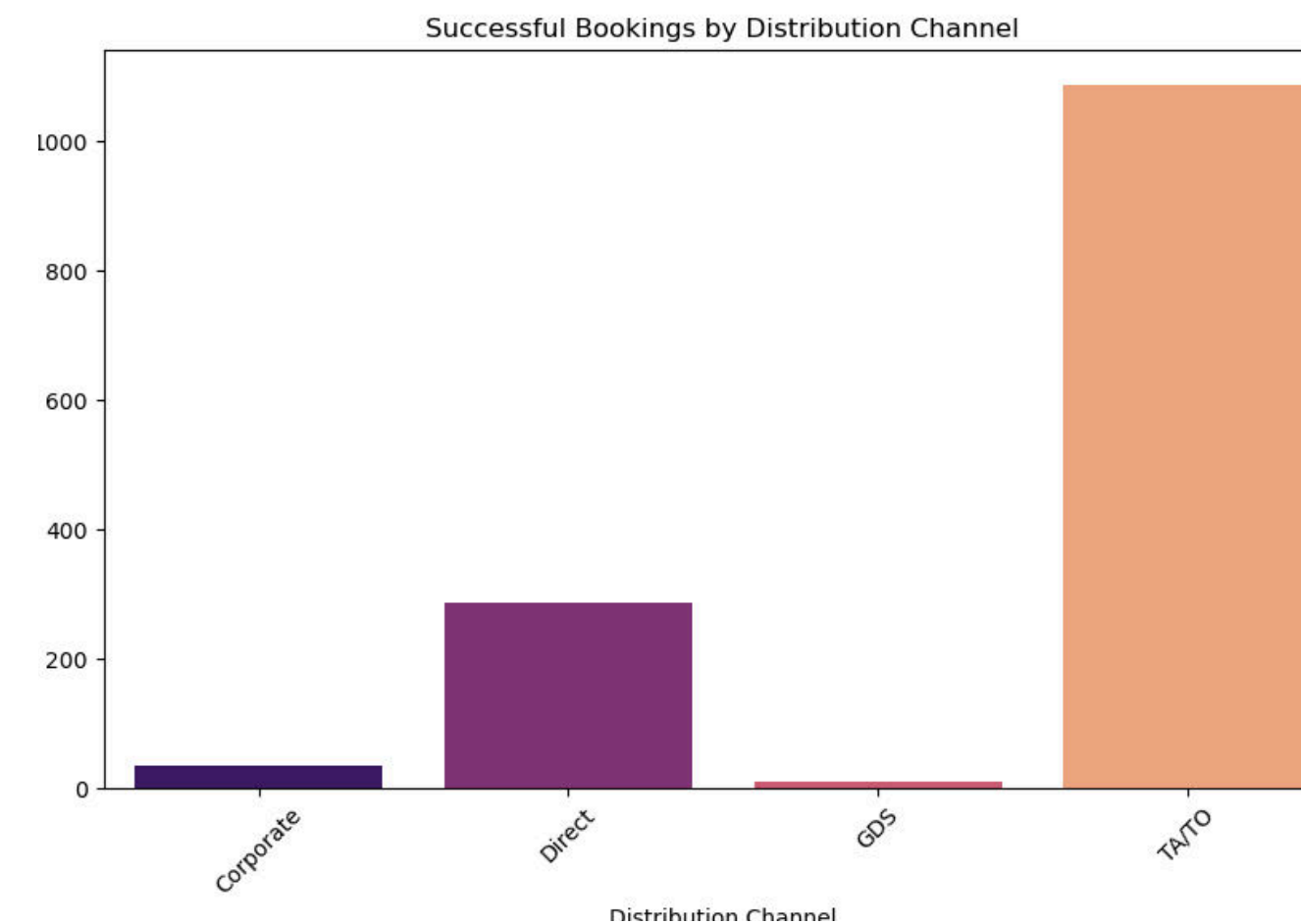
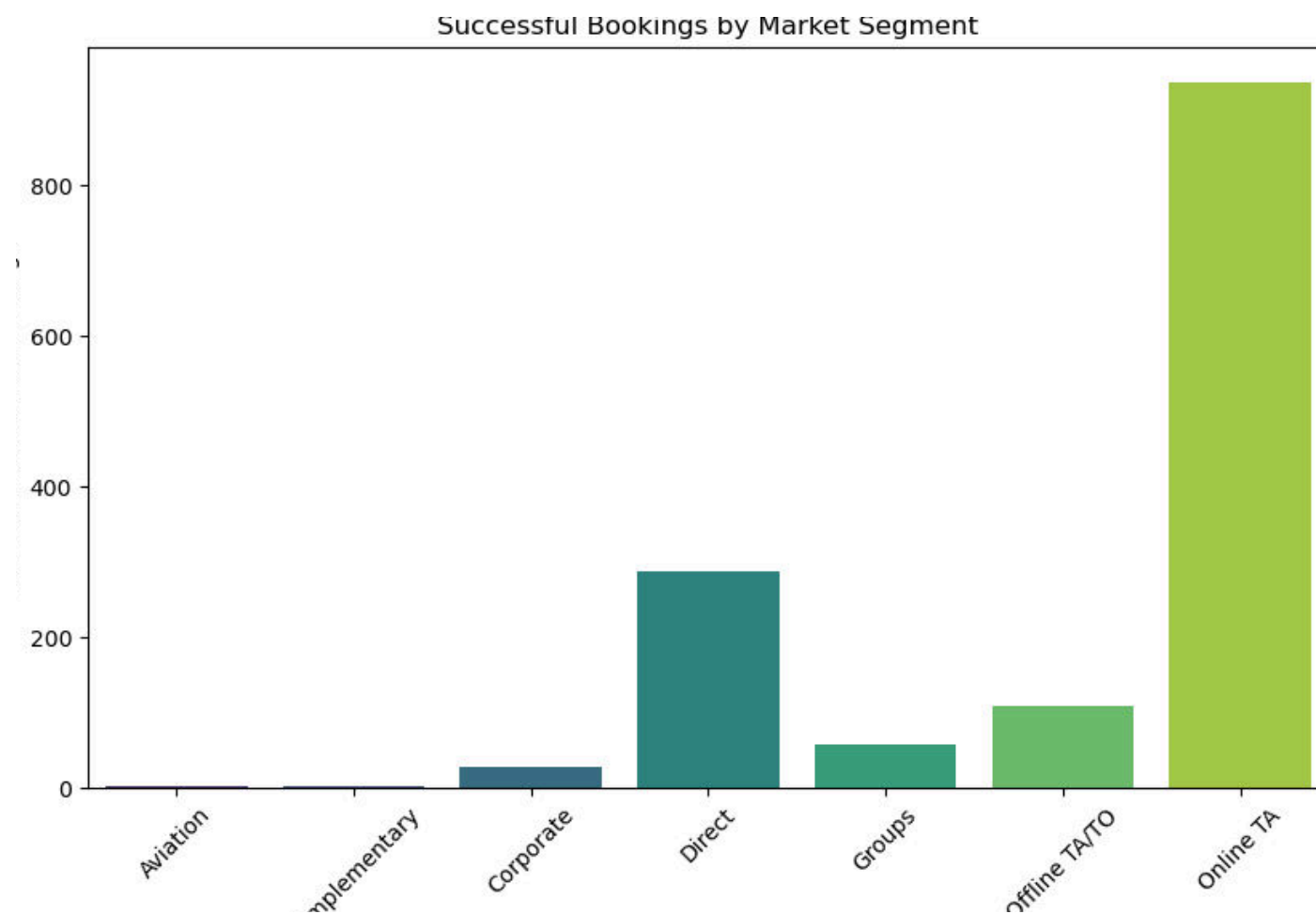


## Part 2

# Marketing and Sales Optimization

### Task-2(I)

**Which market channels and market segments contribute the most to successful bookings?**



## Interpretation:

- The bar chart shows that TA/TO (Travel Agencies/Tour Operators) is the most successful distribution channel for bookings, followed by Direct bookings, while Corporate and GDS (Global Distribution Systems) have significantly fewer bookings.
- The bar chart shows that the Online TA (Online Travel Agency) market segment has the highest number of successful bookings, followed by Direct bookings, while Aviation, Complementary, Corporate, Groups, and Offline TA/TO have significantly fewer bookings.

# Conclusion:

In conclusion, our analysis of hotel booking trends and cancellation patterns reveals several

## **key insights:**

**Booking Behavior:** We observed distinct trends in booking behavior influenced by factors such as lead time, customer demographics, and seasonal variations. Understanding these trends allows hotels to tailor their marketing strategies and improve occupancy rates.

## **Cancellation Insights:**

The data highlighted specific factors contributing to cancellations, such as booking channels and customer profiles. By addressing these factors, hotels can implement proactive measures to reduce cancellation rates and enhance overall profitability.

## **Recommendations: Based on our findings, we recommend:**

Developing targeted promotional campaigns during peak booking seasons

.Implementing flexible cancellation policies to encourage customer confidence.

Utilizing data-driven insights to optimize pricing strategies and improve guest experiences.

By leveraging these insights, hotels can enhance their operational strategies, increase customer satisfaction, and ultimately drive revenue growth.

**Thank You.**