

Exploratory Data Analysis of Hotel Booking Dataset

Presentation: First Task

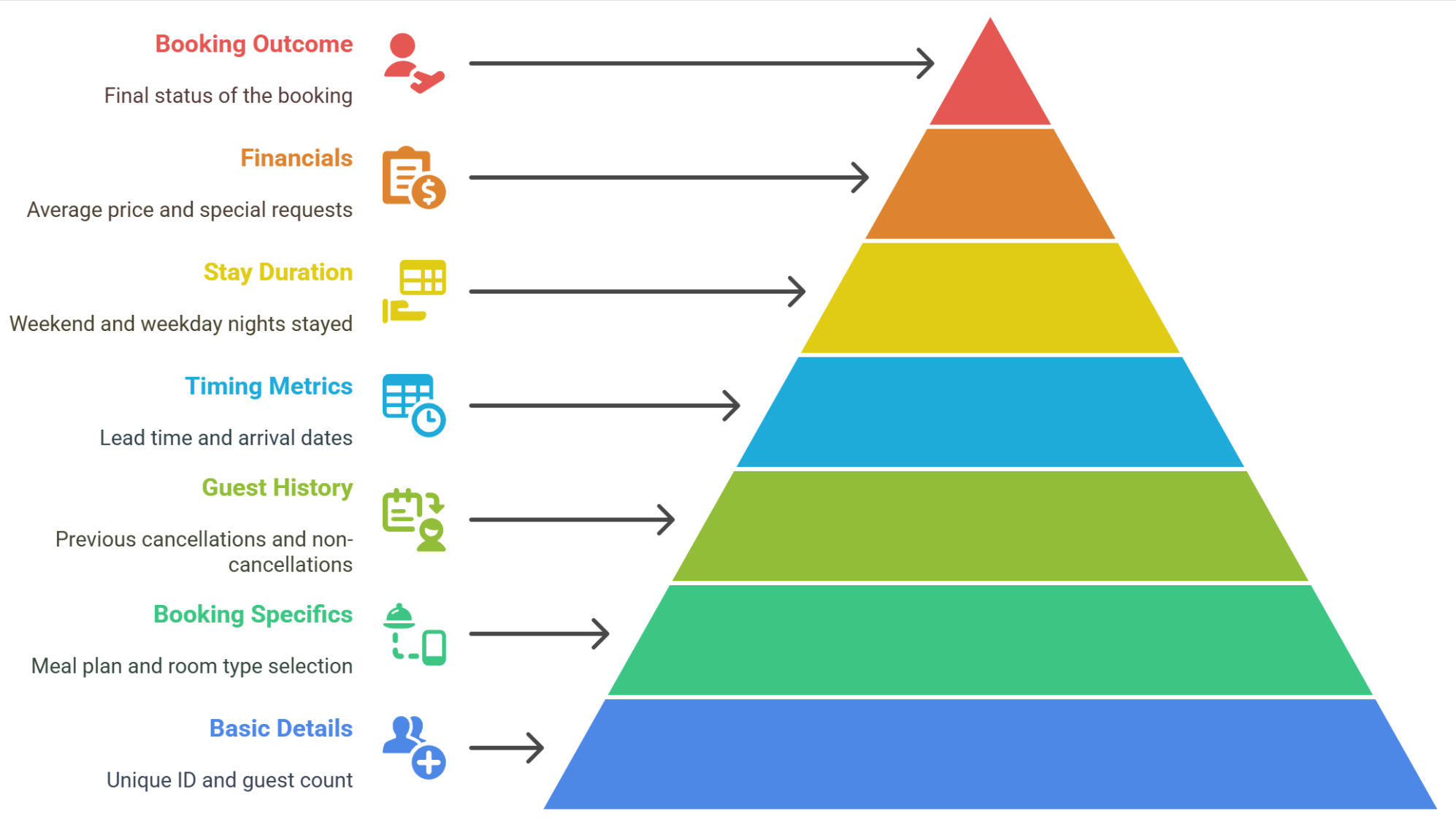
Group : ML_Group2

Submitted By: Dalia Nasser

Overview about the Project

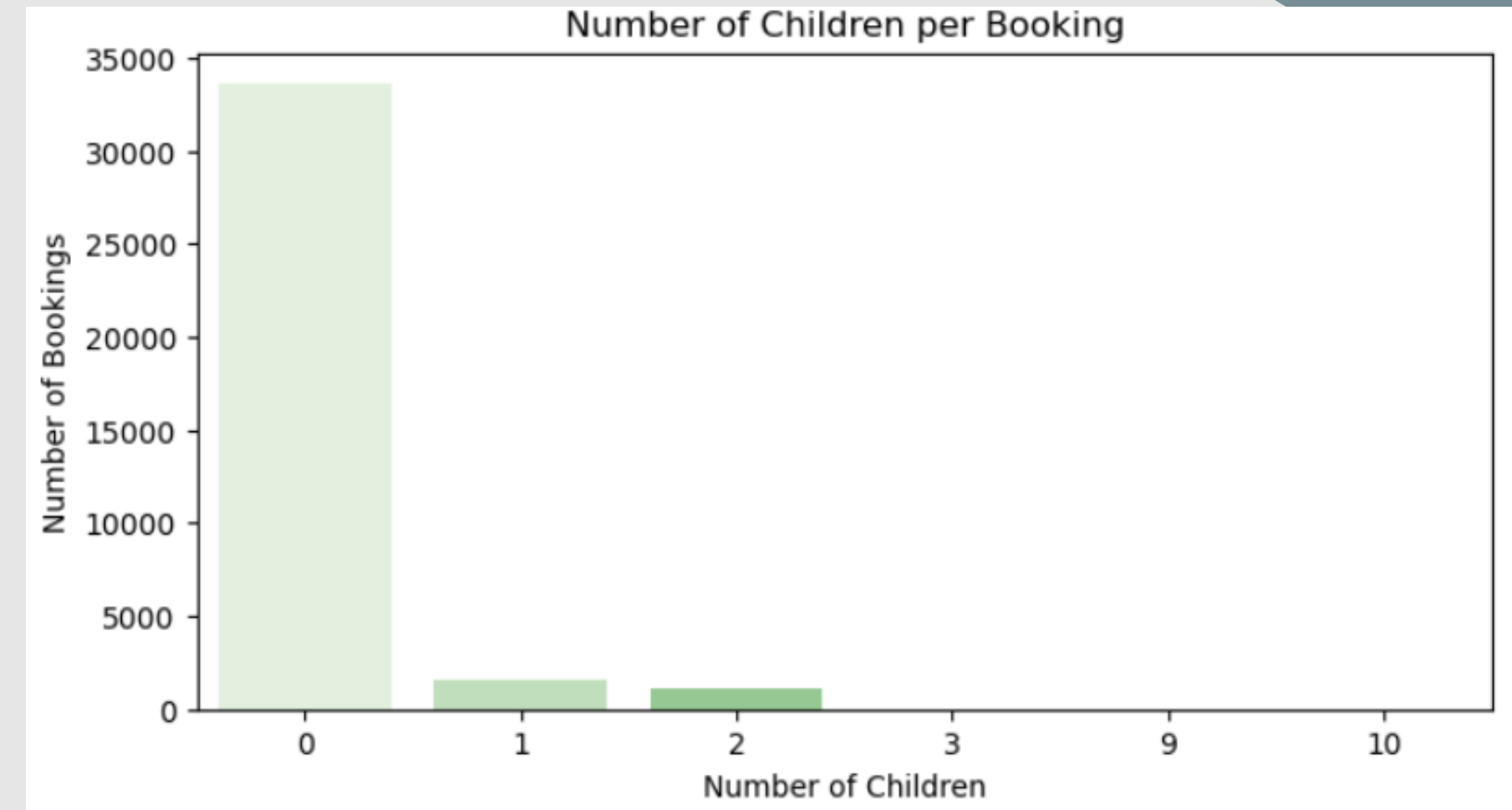
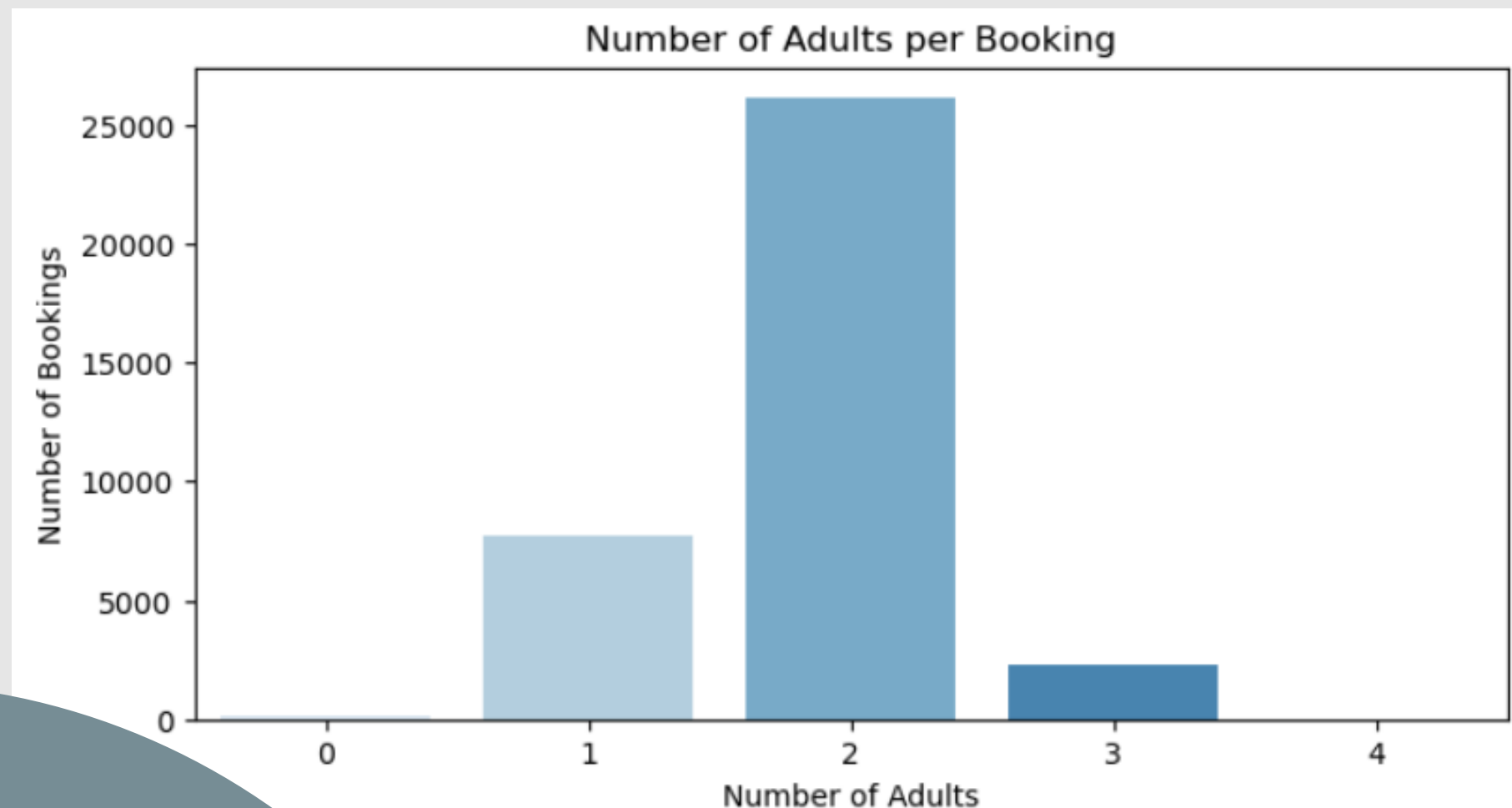
The dataset used in this project consists of **36,285 hotel booking records**, each representing an individual reservation made by a guest. It includes **19 attributes** covering a wide range of booking-related information such as guest composition, stay duration, pricing, preferences, and booking behavior.

Key Features and Their Descriptions



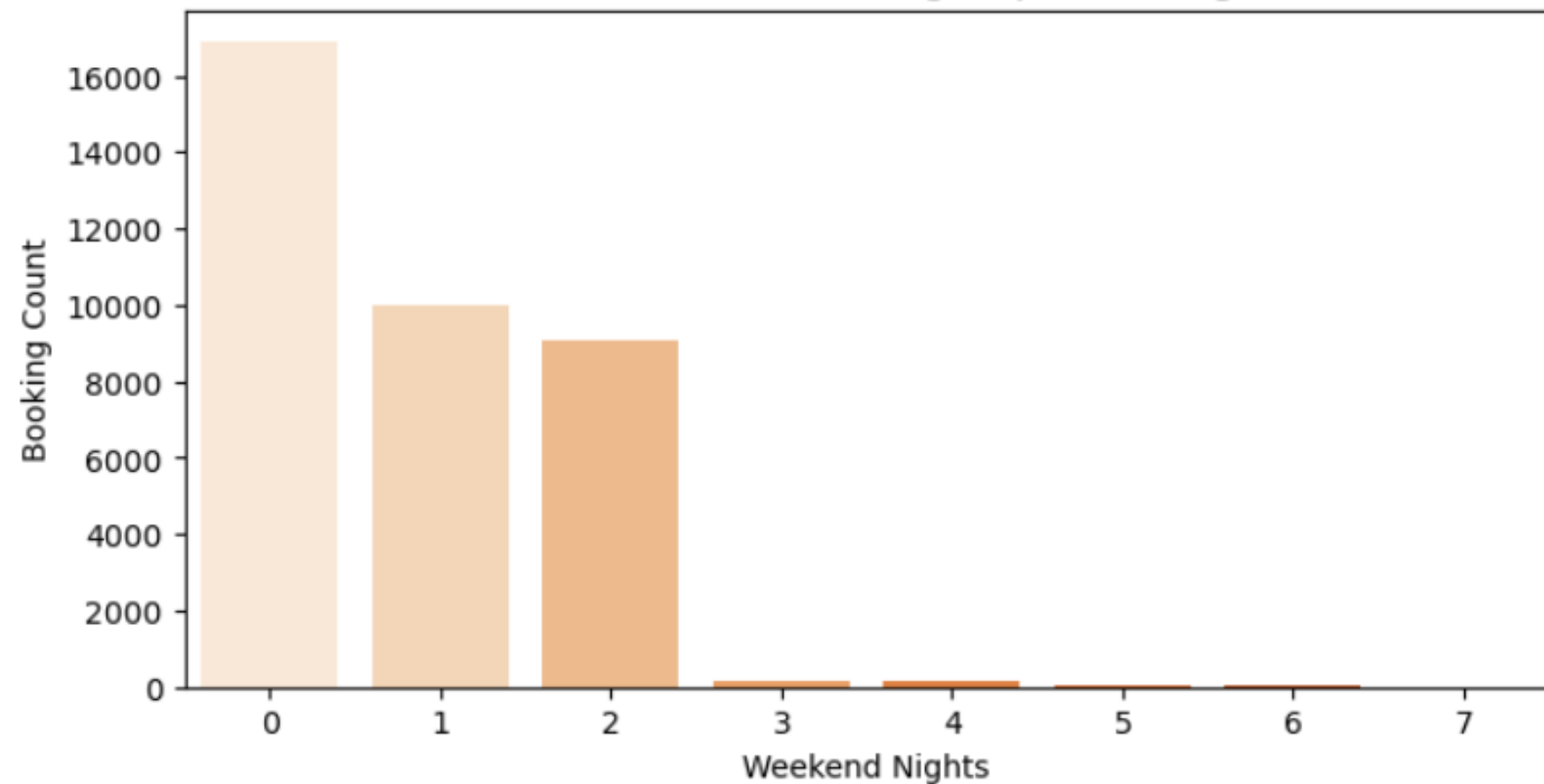
Number of adults Vs. Number of children

Most hotel bookings were made for **2 adults without children**, indicating that the majority of guests are likely **couples or business travelers**, while bookings involving children are relatively **less frequent**.



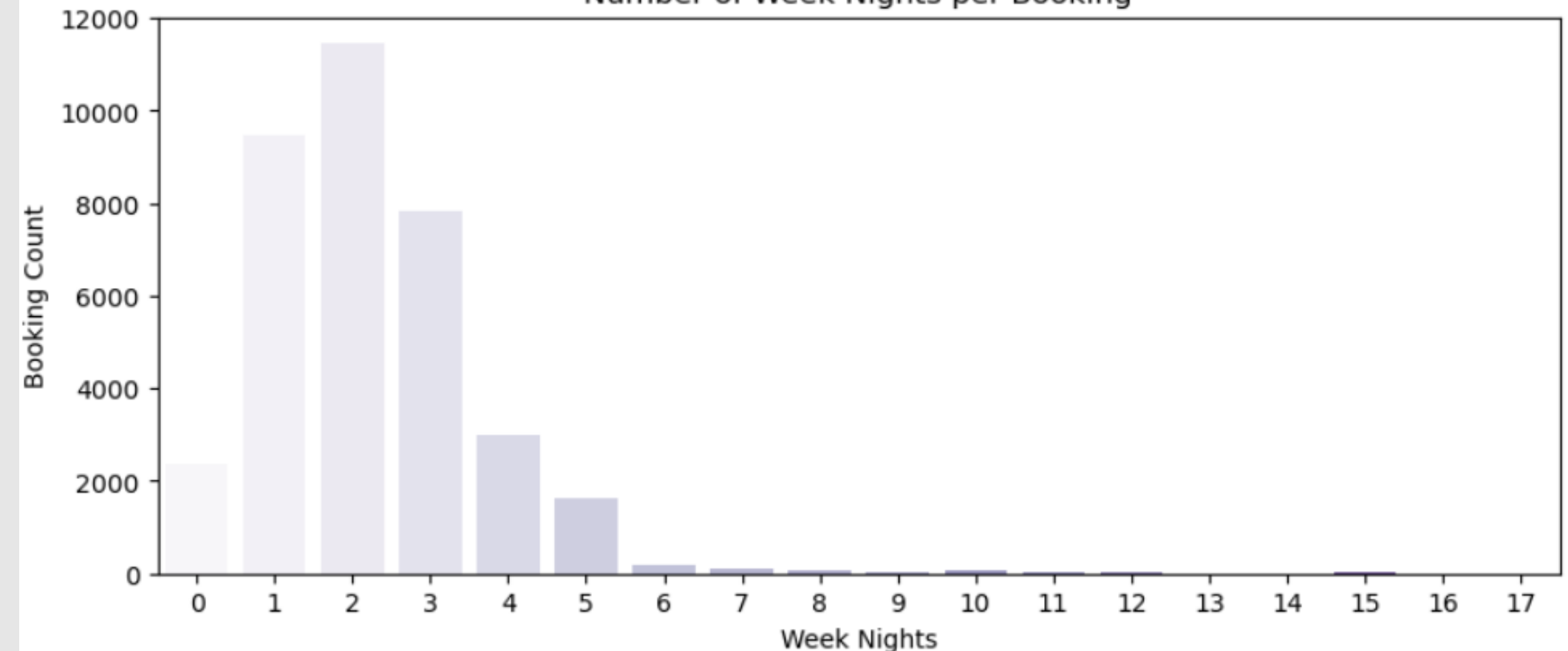
Number of weekend nights Vs. Number of weekdays

Number of Weekend Nights per Booking



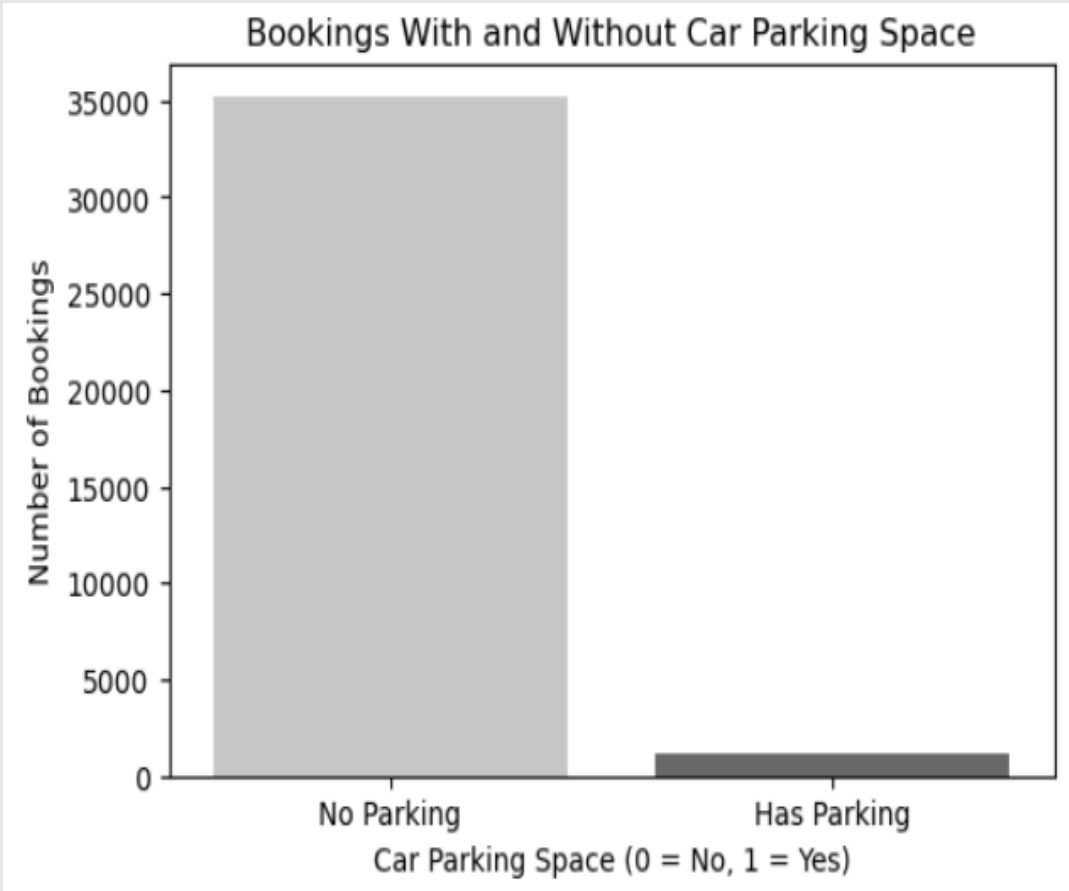
Most guests booked stays that included **0 to 2 weekend nights**. Weekday bookings peaked at **1–3 nights**, suggesting that most visitors plan **short business or midweek leisure trips**. Longer stays (over 5 nights) were **relatively rare** for both weekdays and weekends.

Number of Week Nights per Booking



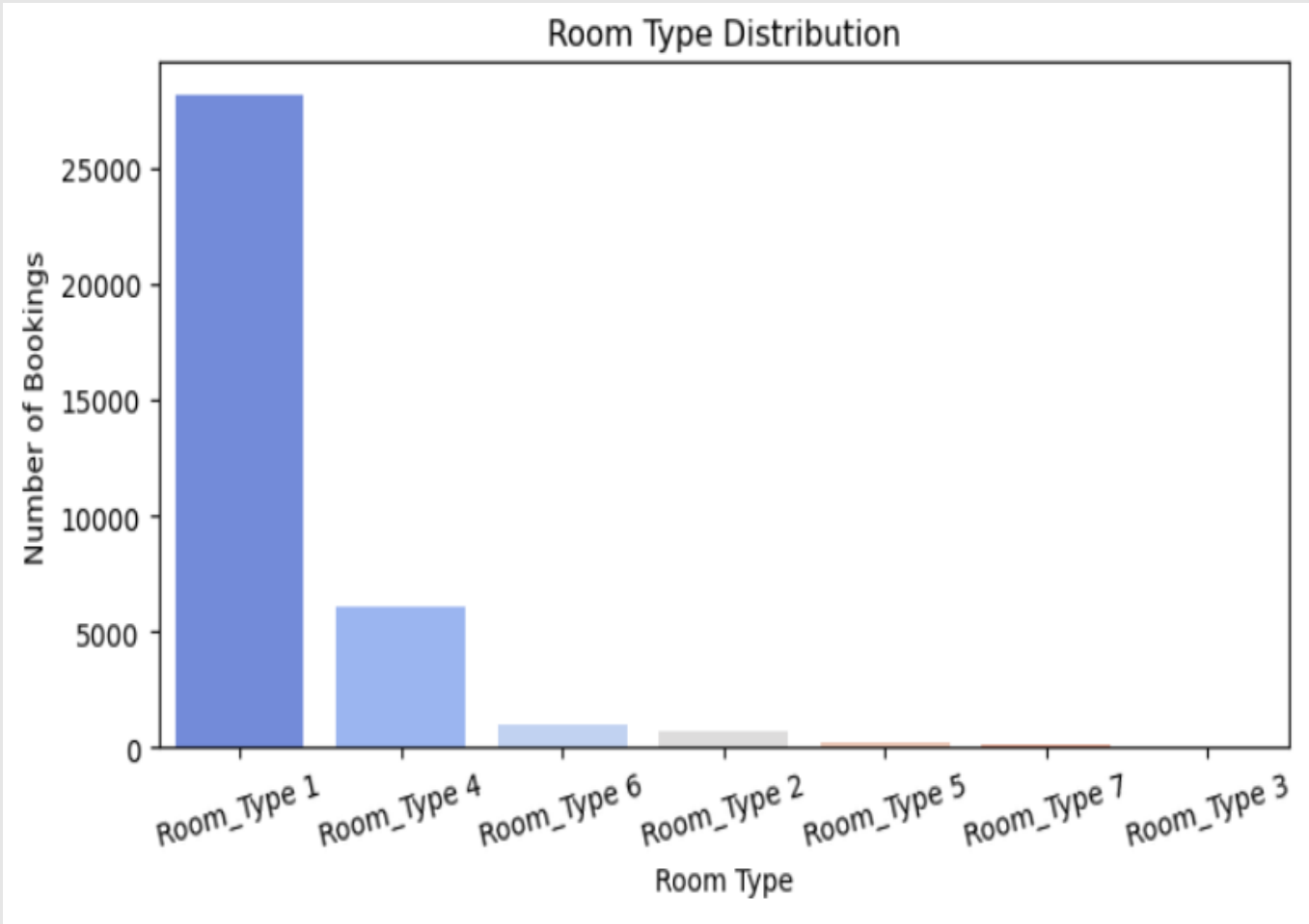
How many Booking include parking space?

Most guests **did not request parking**, suggesting reliance on public transport or walk-ins.



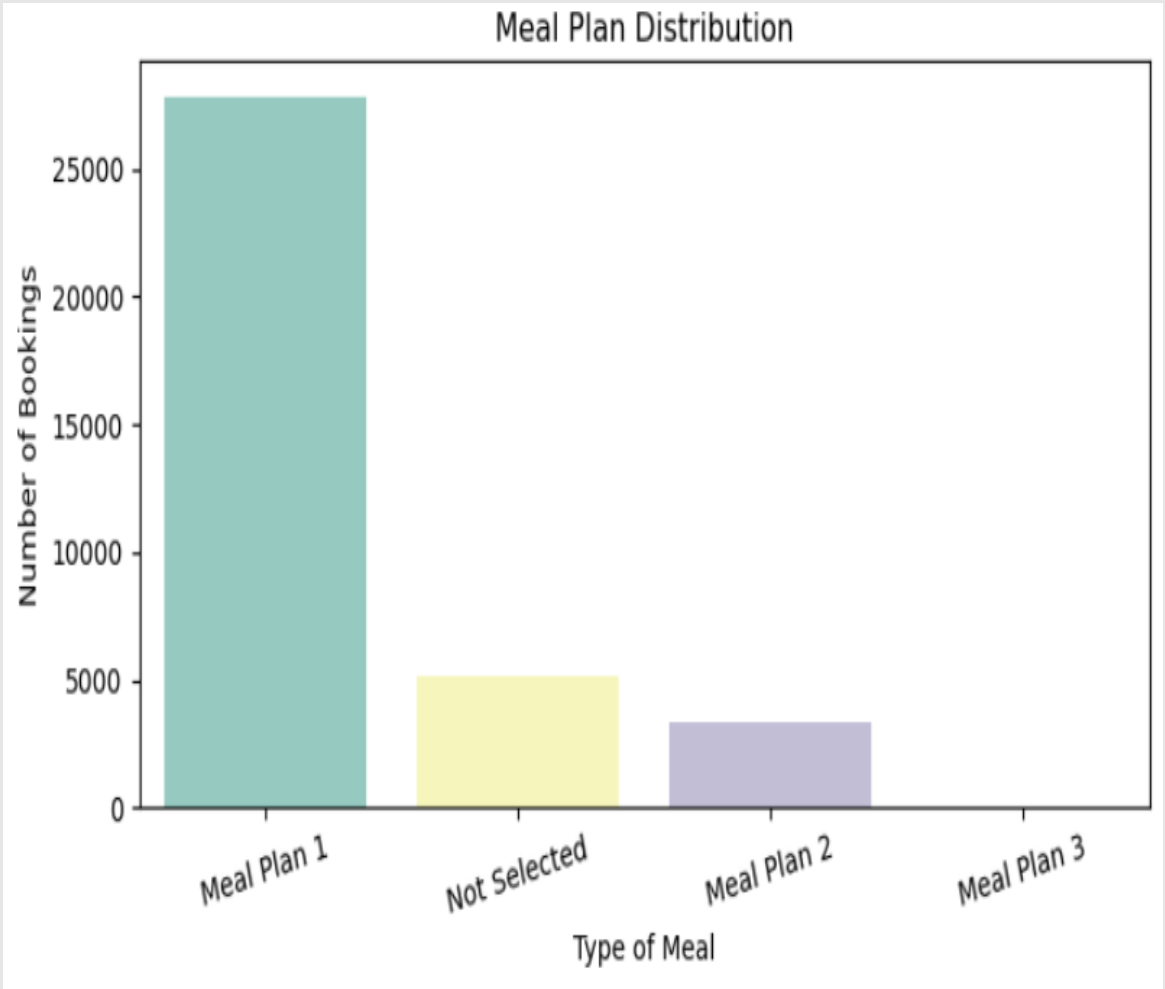
What types of rooms were booked most frequently?

Room Type 1 is the most booked, indicating it fits general customer needs.



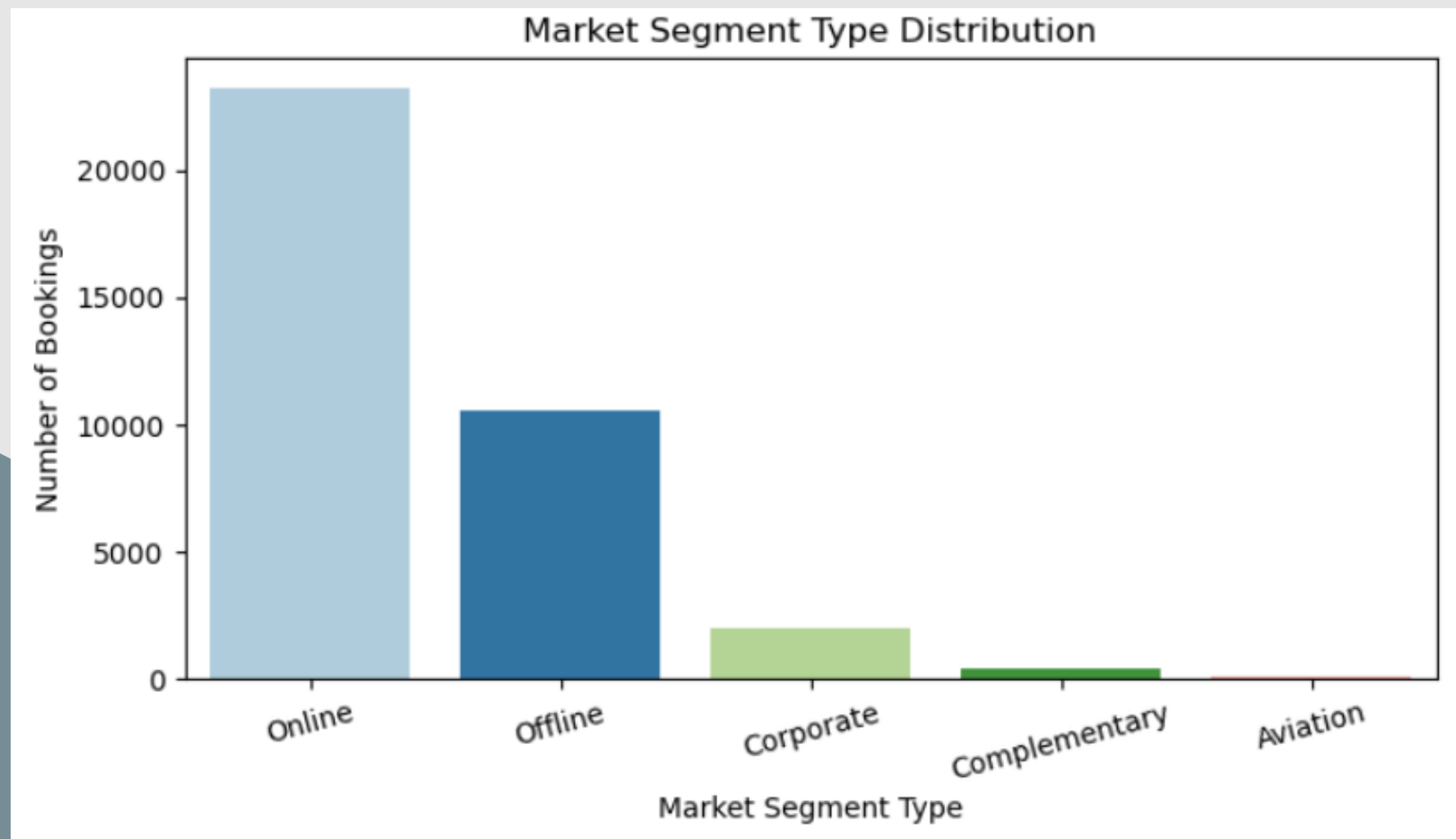
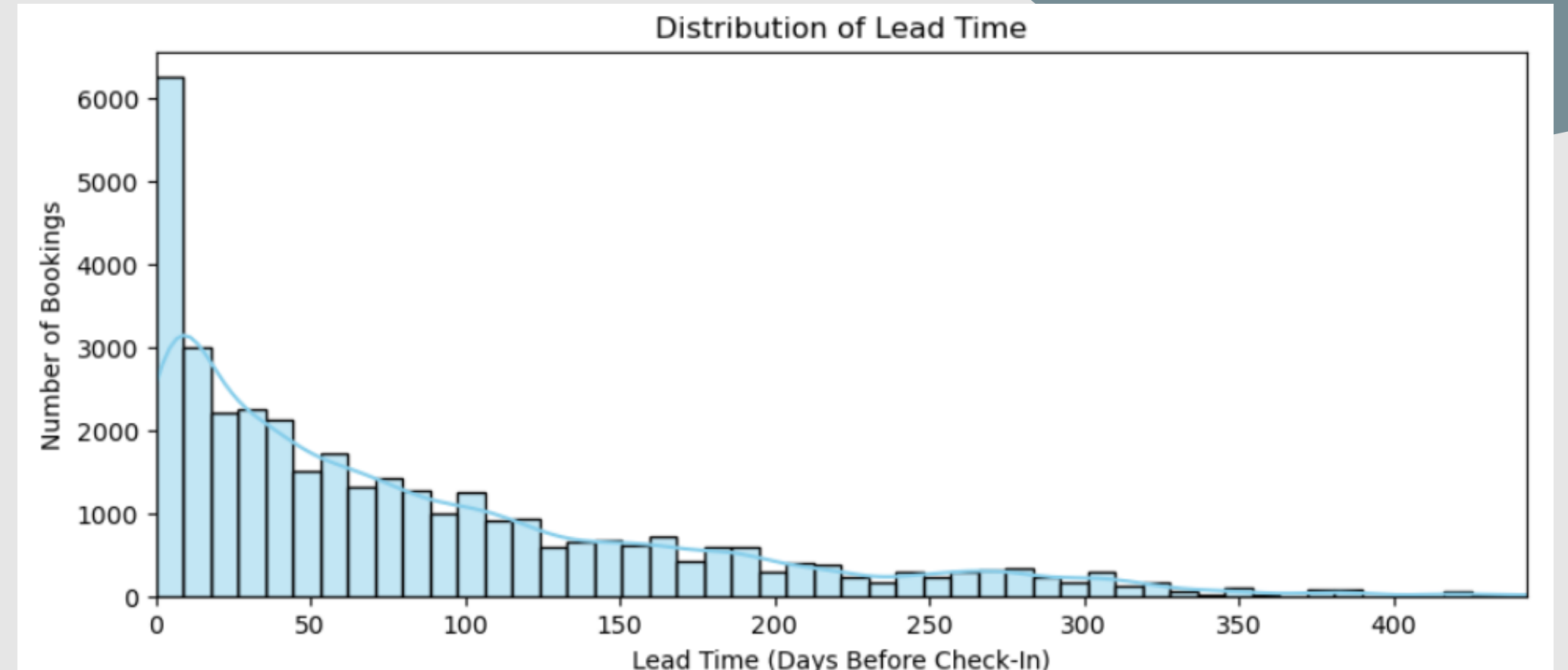
How are meal distributed among bookings?

A specific meal type (**Meal Plan 1**) is most popular, possibly bundled in packages.



What is the distribution of lead time before arrival?

Many bookings are made **close to the stay date**, but there's a long tail of early reservations, showing a mix of planners and last-minute guests.

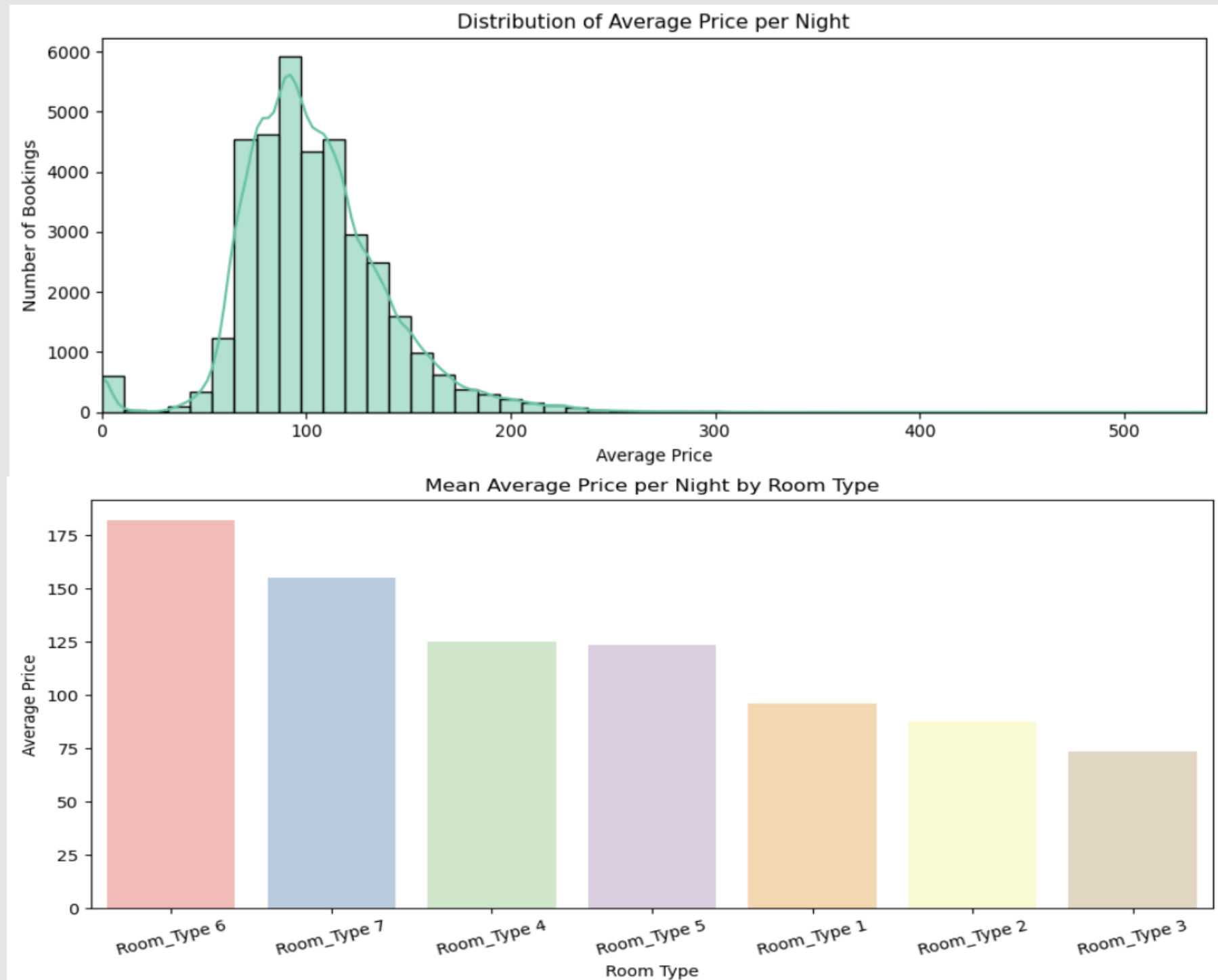


Which market segment contributed most to bookings?

Online bookings dominate, followed by **offline** and **corporate** channels.

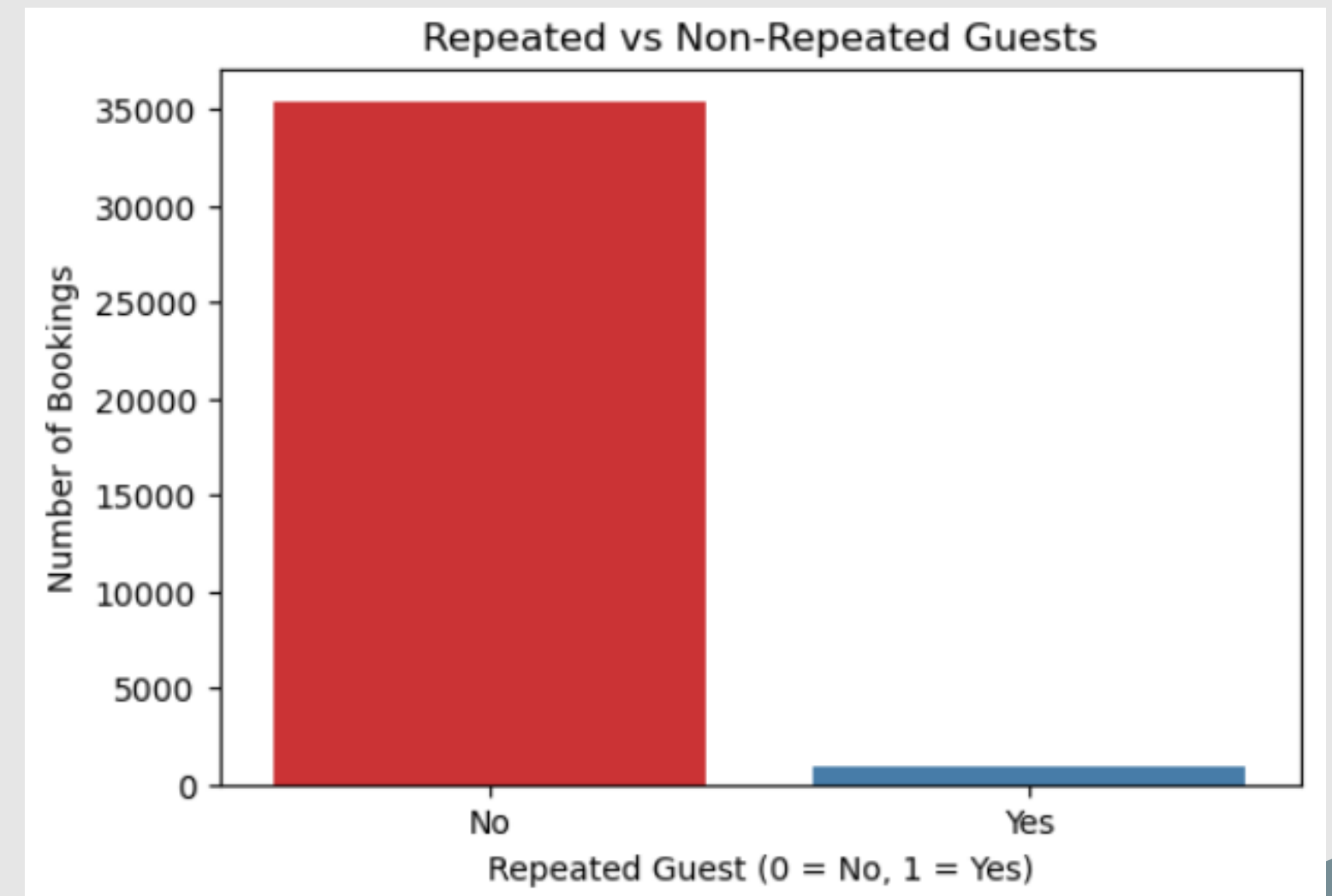
How does average price vary by room type or booking status?

Premium rooms have **higher average prices**, and some bookings with higher prices tend to cancel more often.



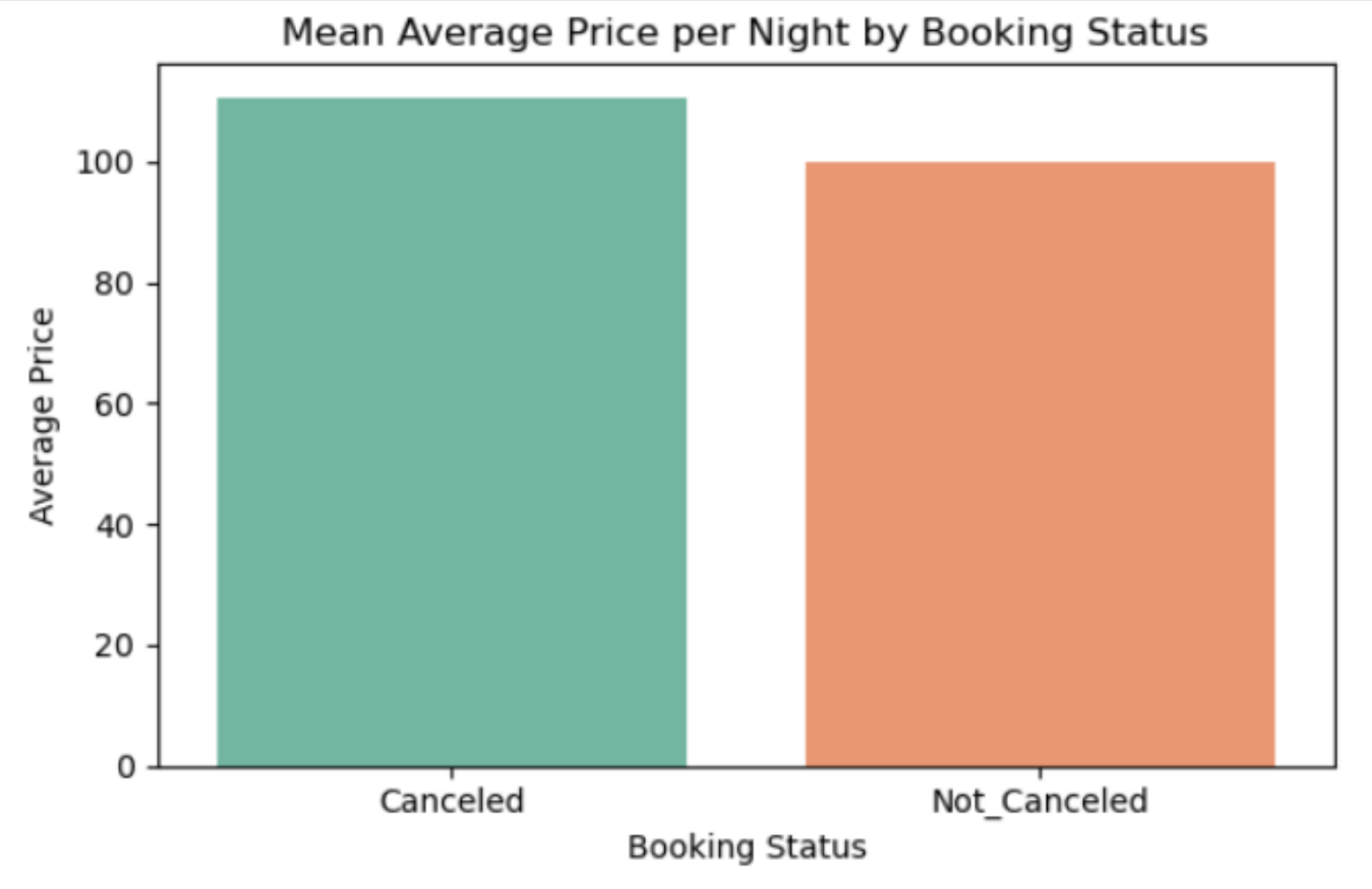
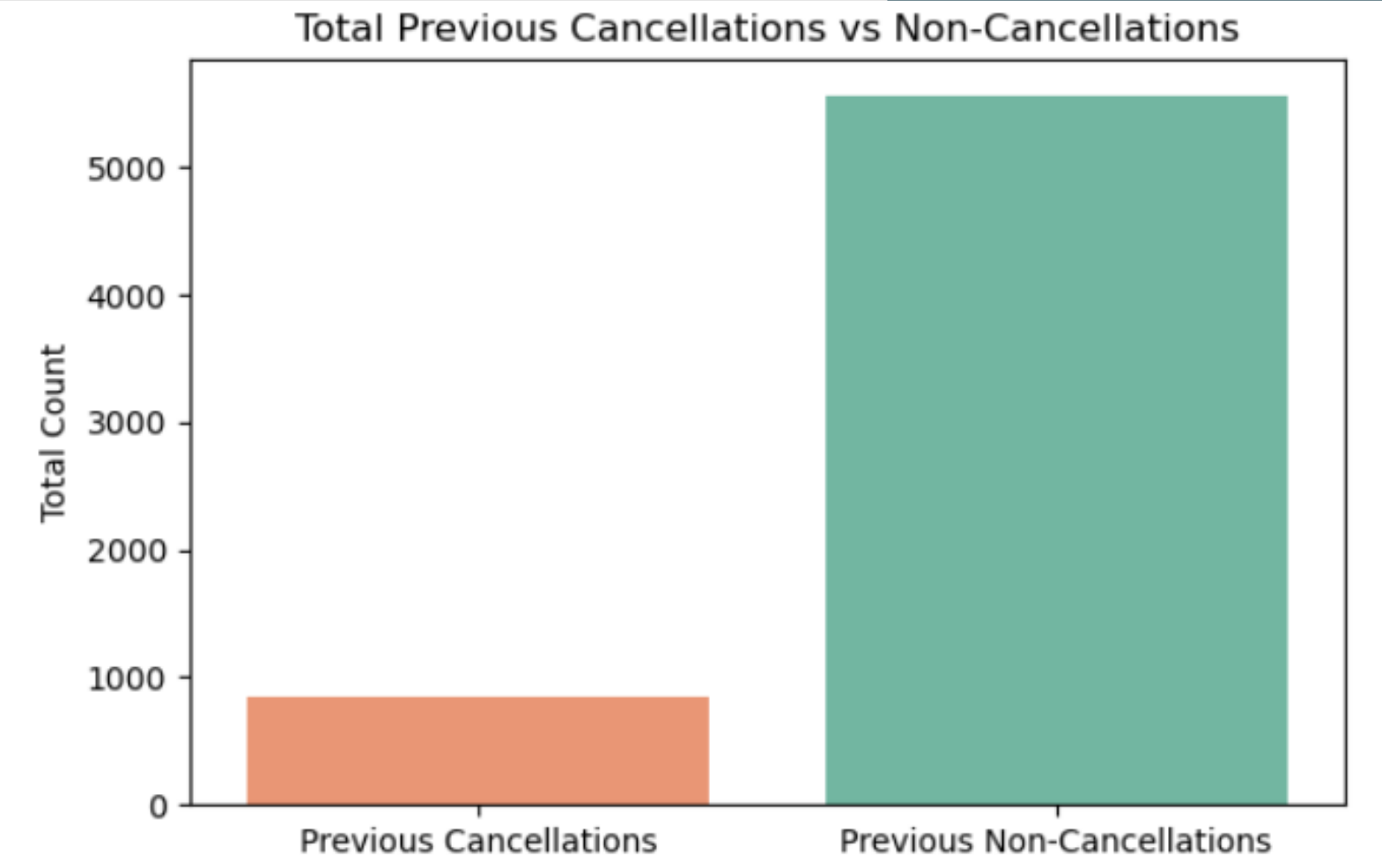
Are there repeat customers?

Majority of guests are **new customers**, with repeat visitors making up a small percentage.



What does the history of previous cancellations tell us about guest behavior?

A large majority of guests have **no prior cancellations**, suggesting that **most customers are reliable** and only a minority show cancellation tendencies.

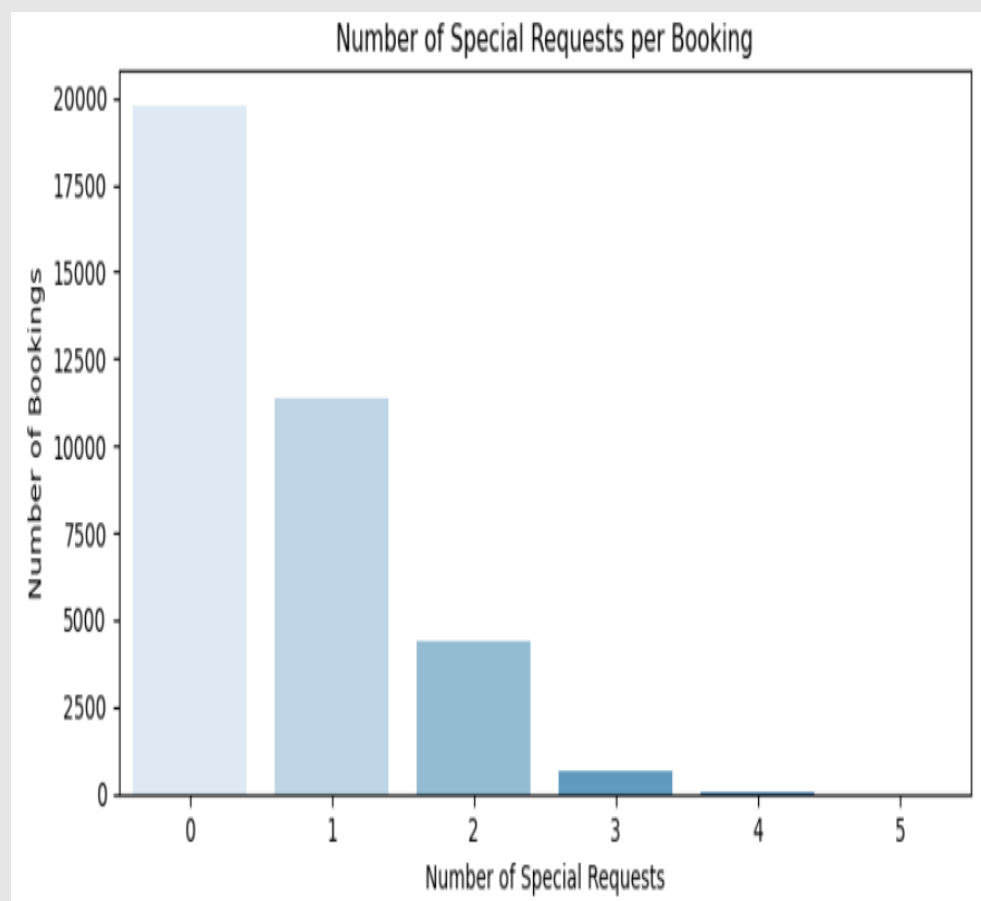


Do price levels affect whether a booking gets canceled?

Bookings that were **canceled** had a slightly **higher average nightly price** than those confirmed, indicating that **higher pricing may influence cancellation decisions**, possibly due to cost reconsideration.

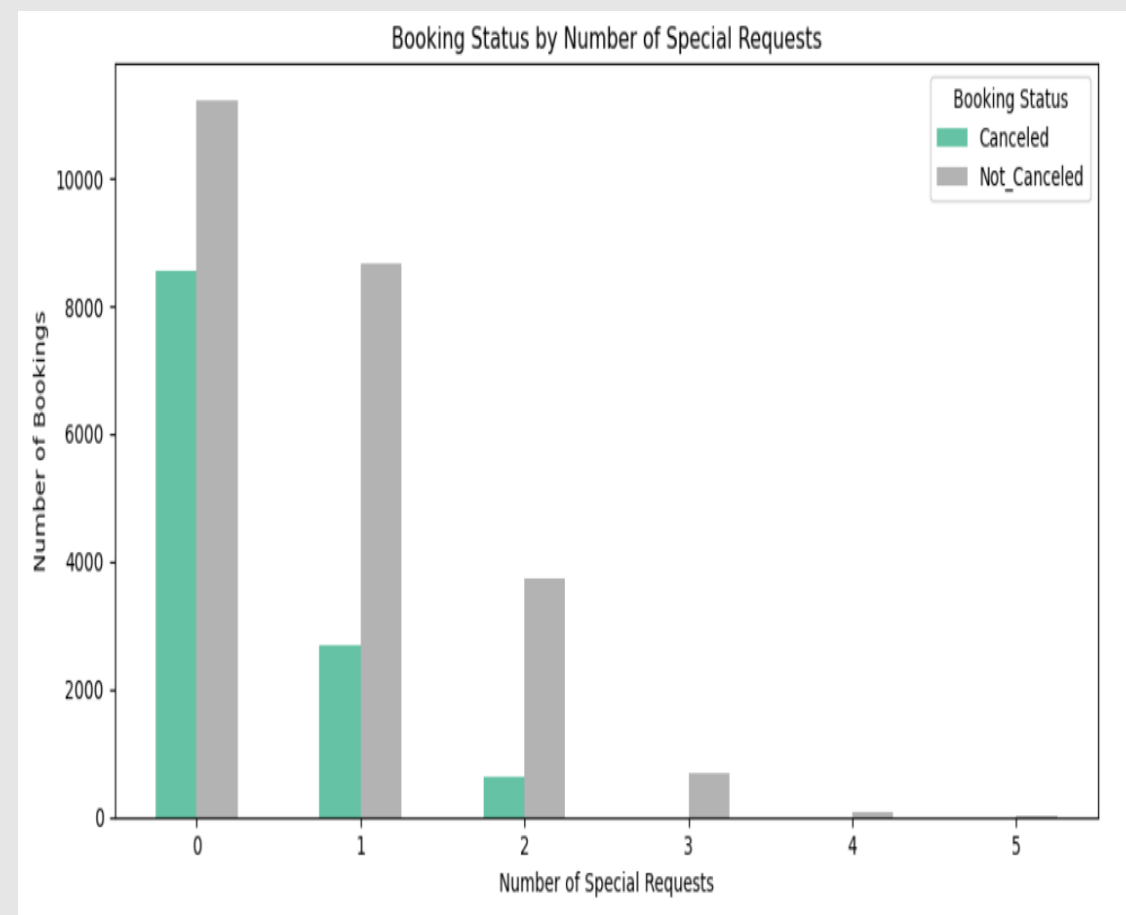
How common are special requests among hotel bookings?

The majority of bookings were made with **no special requests**, and only a small fraction included **2 or more requests**, indicating that **most guests have standard needs**, while only a few seek personalized accommodations.



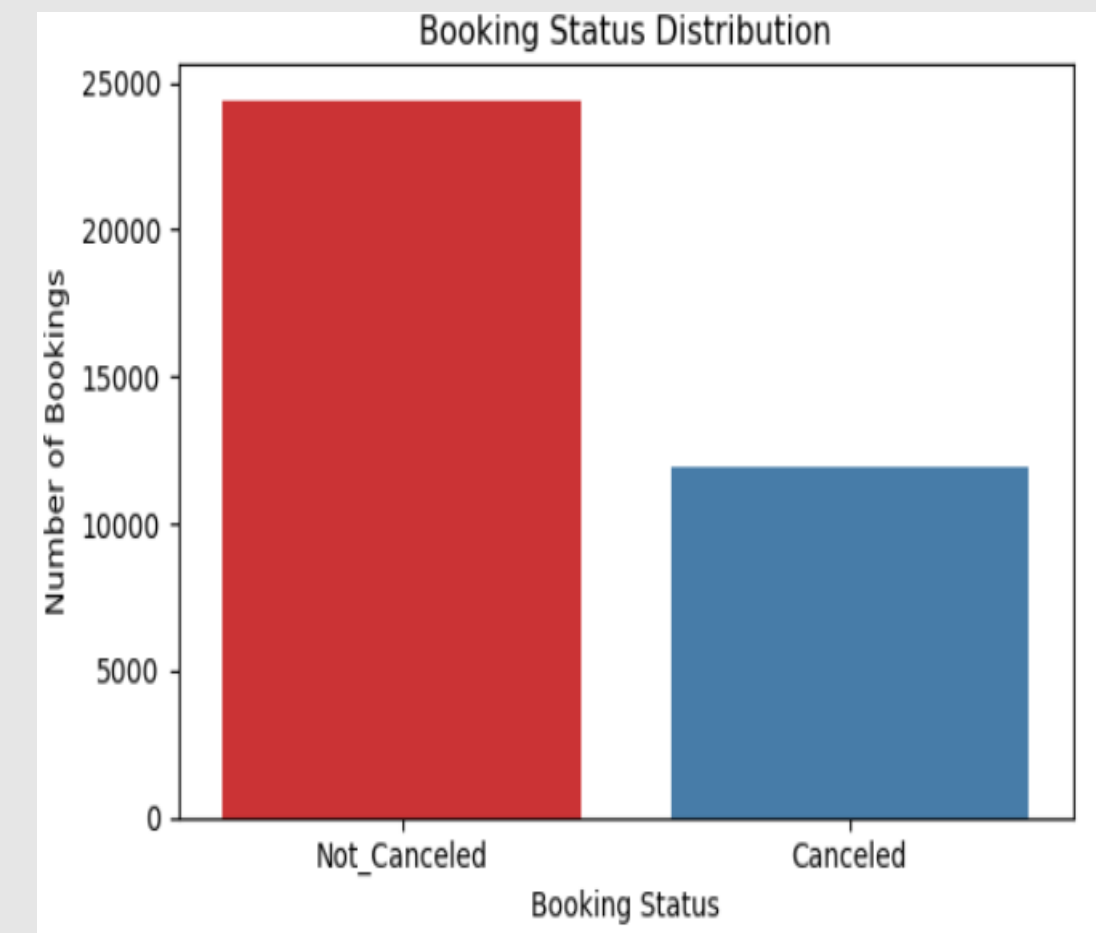
Does the number of special requests influence booking cancellation?

Bookings with **0 or 1 special request** show a higher **cancellation rate**, while bookings with **2 or more requests** are **rarely canceled**, suggesting that guests with specific needs are more likely to **follow through** with their stay.



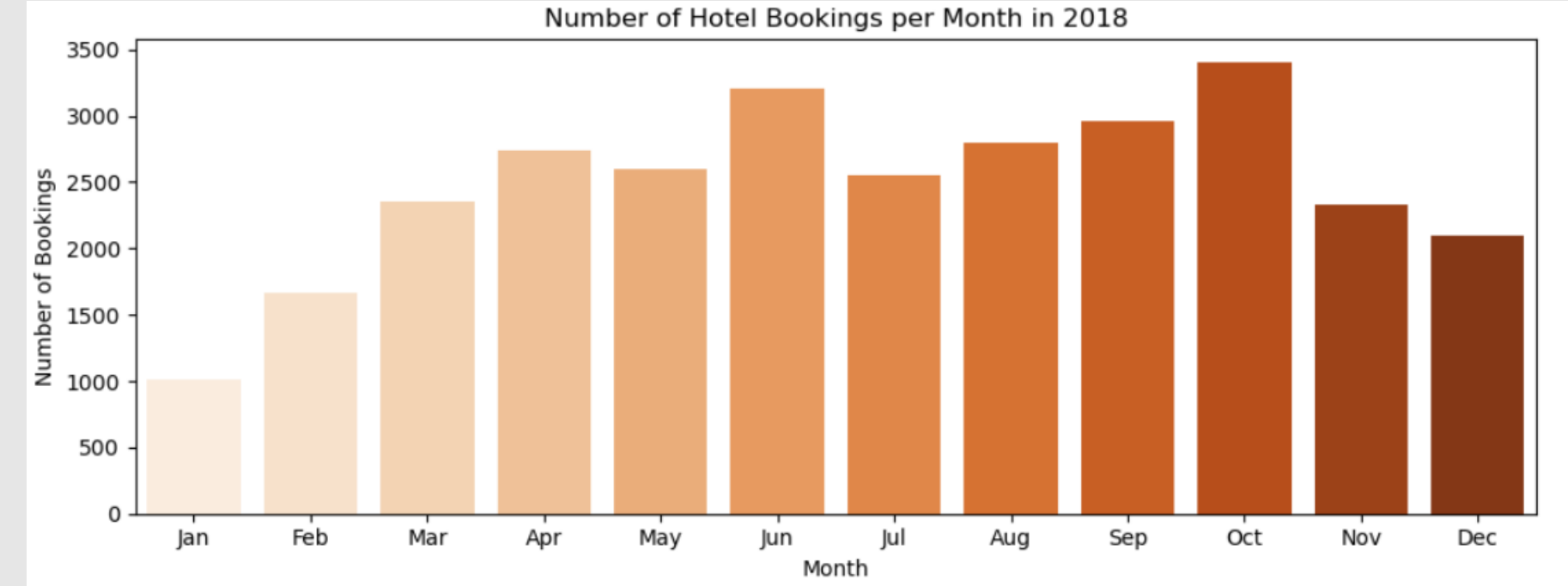
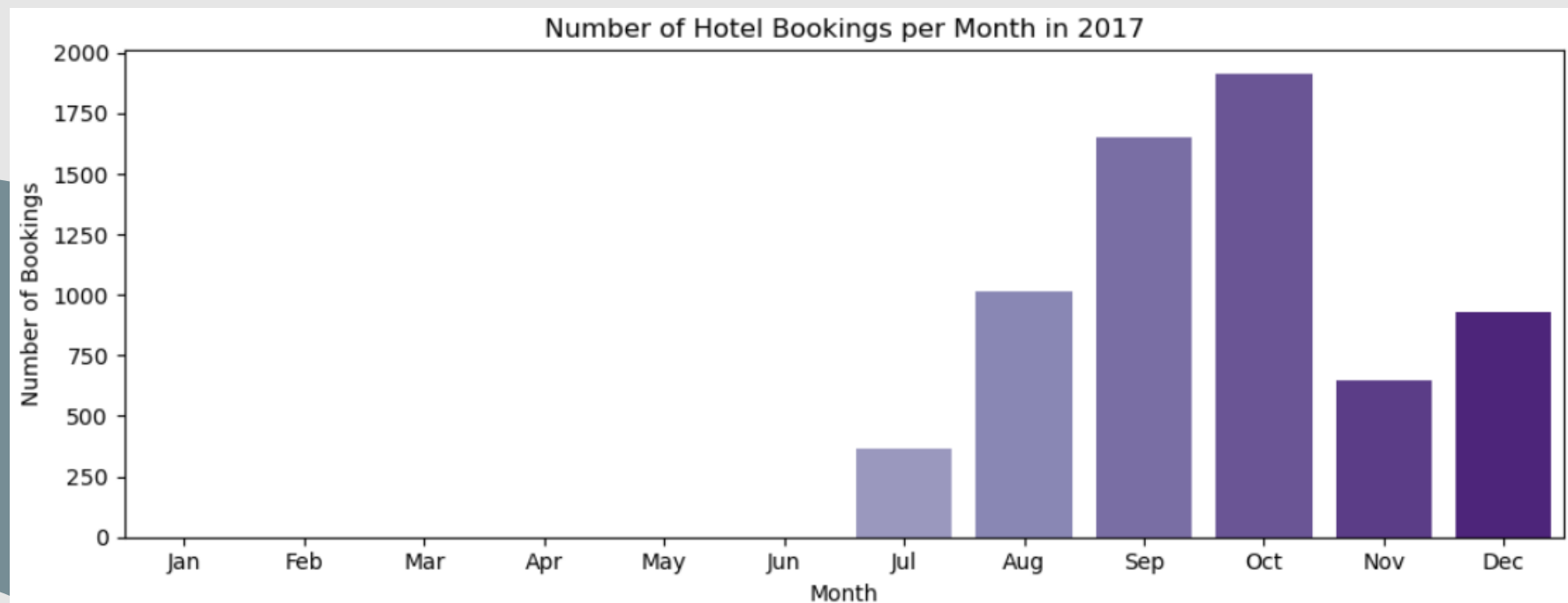
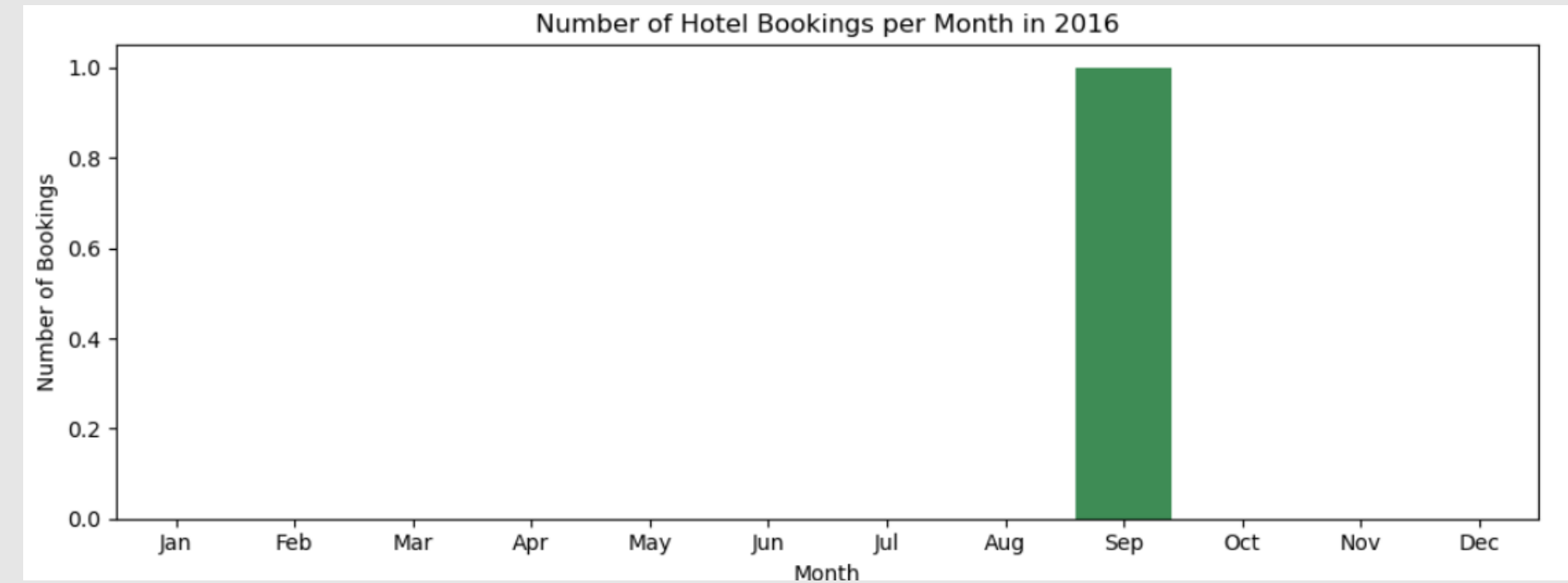
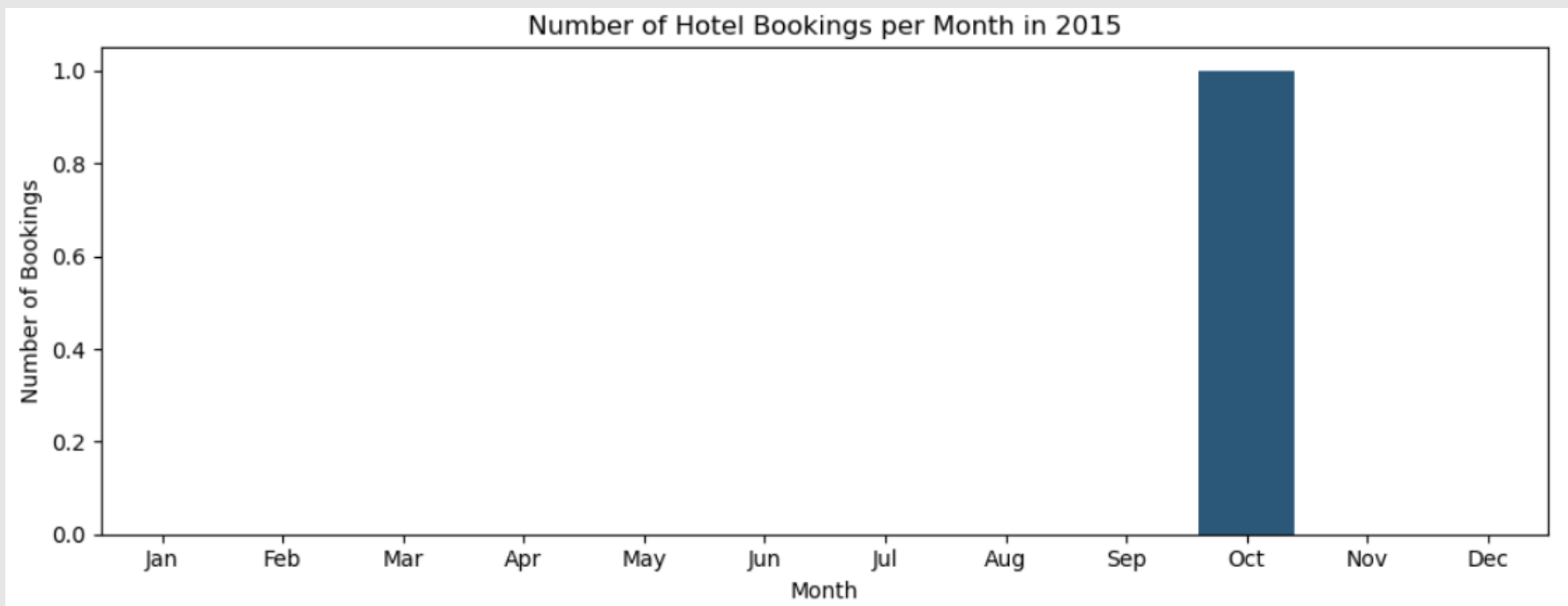
What is the overall cancellation rate of hotel bookings?

The majority of bookings are **not canceled**, indicating strong customer retention. However, with a **significant portion still being canceled**, there's room to explore **factors driving cancellations** (like price, lead time, or lack of special requests).



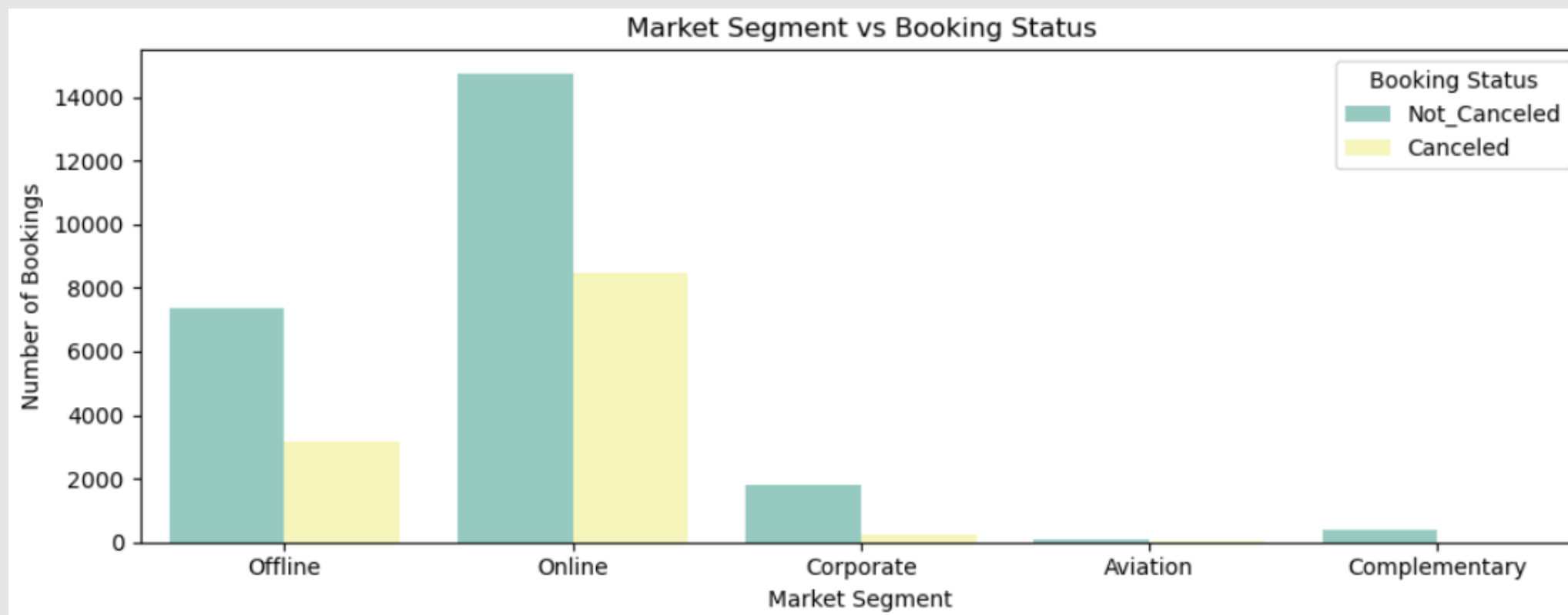
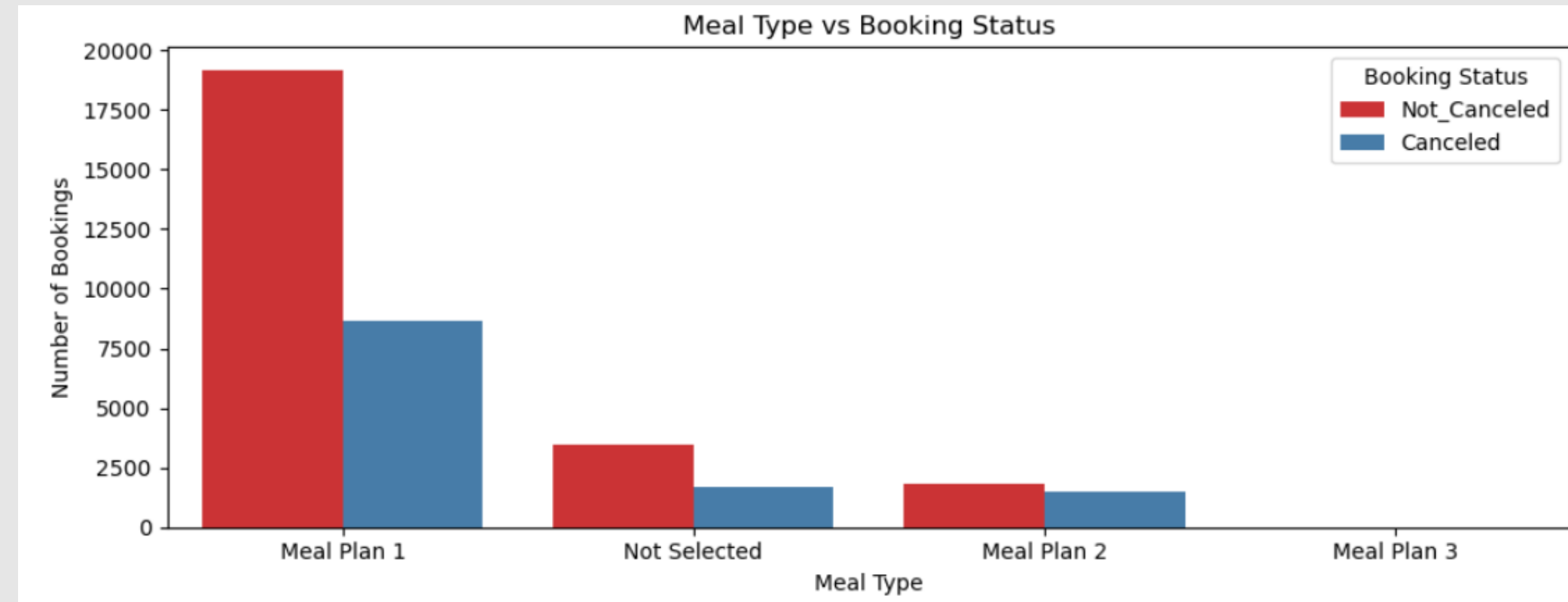
How have hotel bookings evolved across the months from 2015 to 2018?

There is a **clear growth in bookings year over year**, with **2018 showing consistent and strong booking activity throughout the year**, especially in **October and June**. In contrast, **2015 and 2016 had very limited bookings**, possibly due to partial data or low operations. The peak booking months consistently fall between **June and October**, indicating a strong **seasonal demand during the summer and early fall**.



How does the type of meal plan selected influence booking cancellations?

Meal Plan 1 is the most popular and shows the highest number of both **confirmed and canceled bookings**, likely because it's the default or most economical option. Interestingly, **Meal Plan 2 and Not Selected** have **relatively balanced cancellation rates**, suggesting that guests who skip or select alternative meal plans might have higher uncertainty or flexible travel plans. **Meal Plan 3 is nearly unused**, indicating low preference or availability.

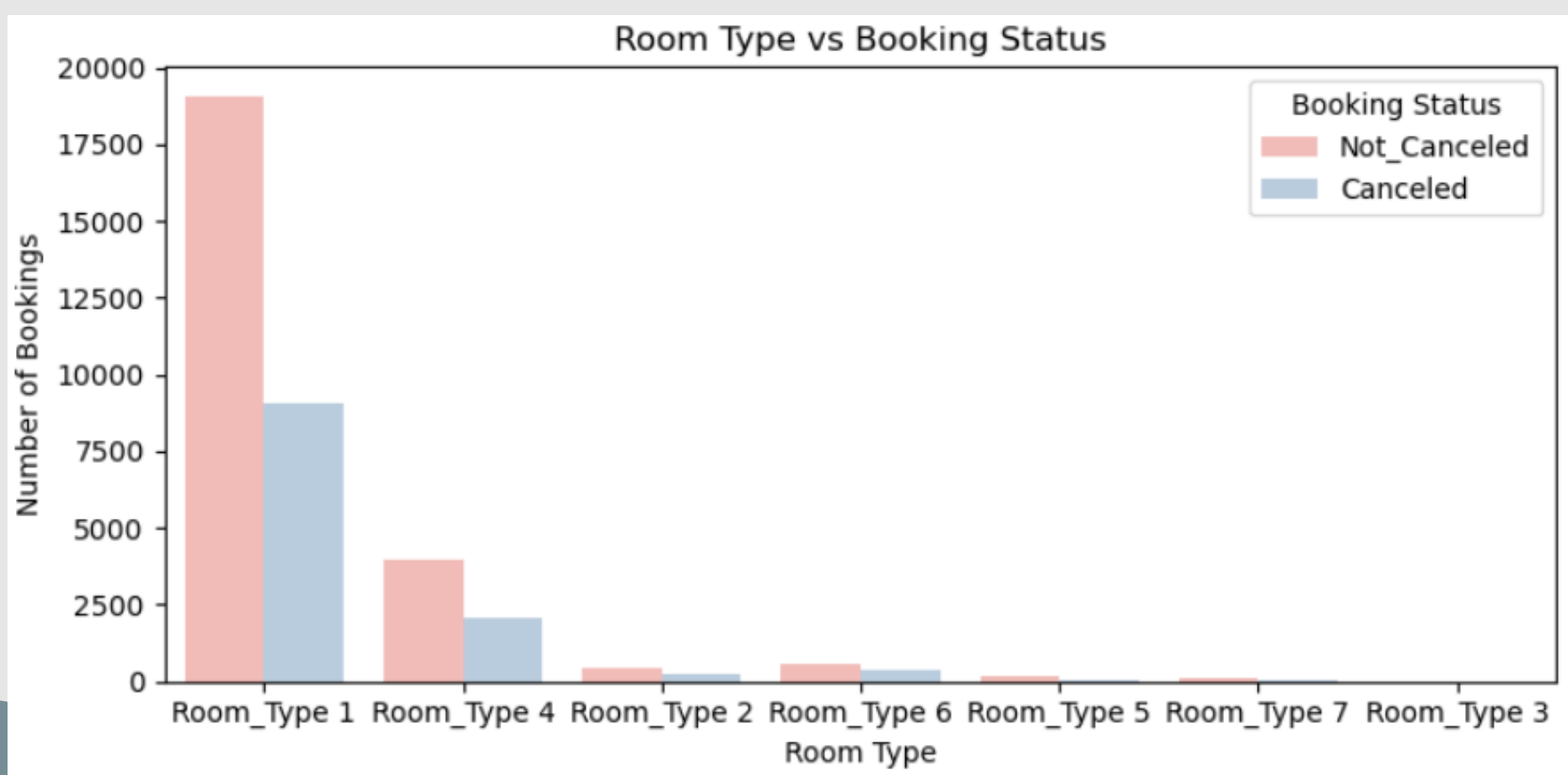


Which market segment contributes most to cancellations, and which shows more reliable bookings?

The **Online segment** has the highest number of both bookings and cancellations, indicating a broad reach but also greater unpredictability. In contrast, **Corporate and Offline segments** show a higher rate of completed bookings with fewer cancellations, suggesting more stable and committed customer groups.

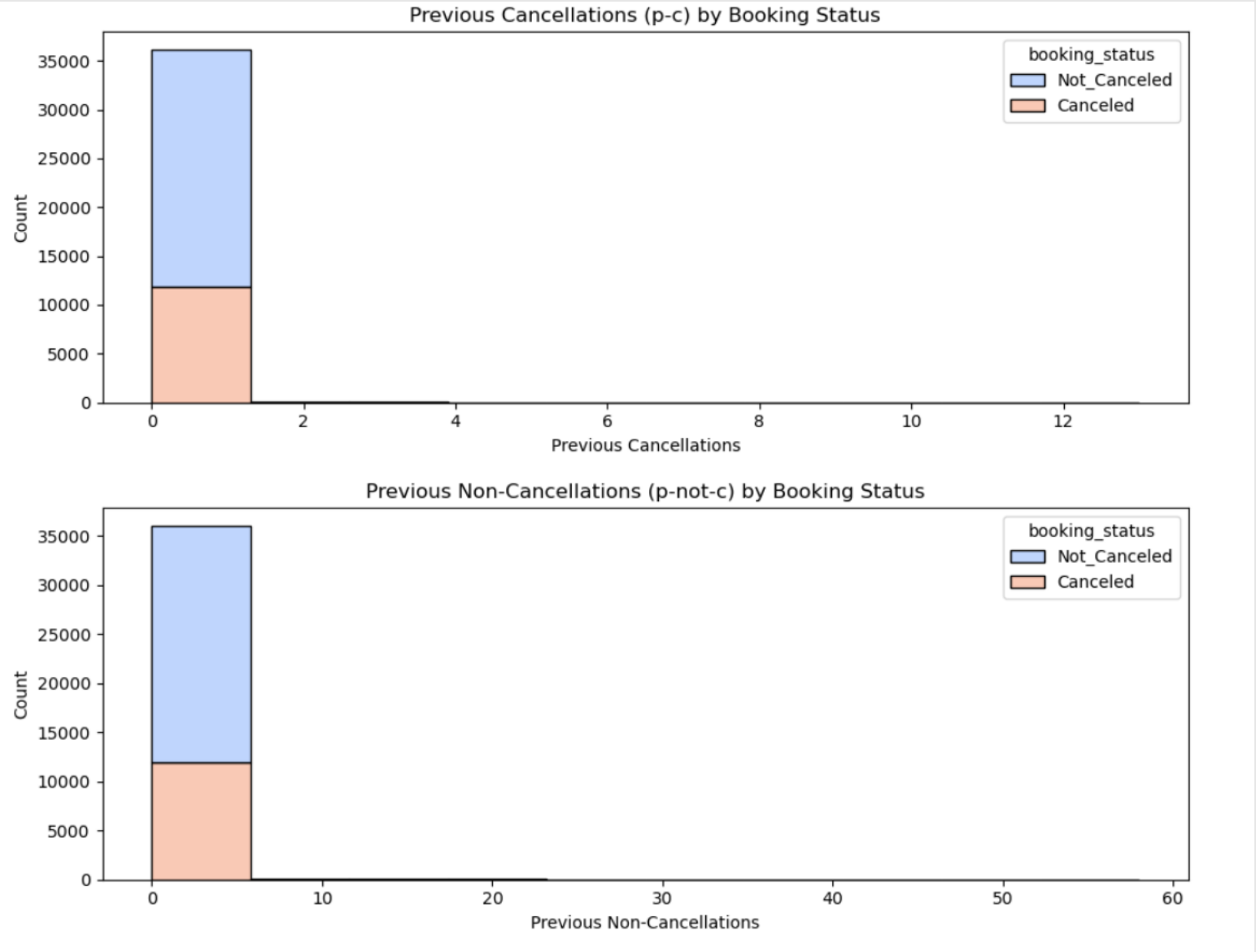
Which room types are most frequently booked and how do they relate to cancellations?

Room_Type 1 dominates in total bookings and also has the highest number of cancellations, likely due to its popularity. However, other room types such as **Room_Type 3 and Room_Type 7** show very low booking and cancellation activity, indicating limited demand or availability



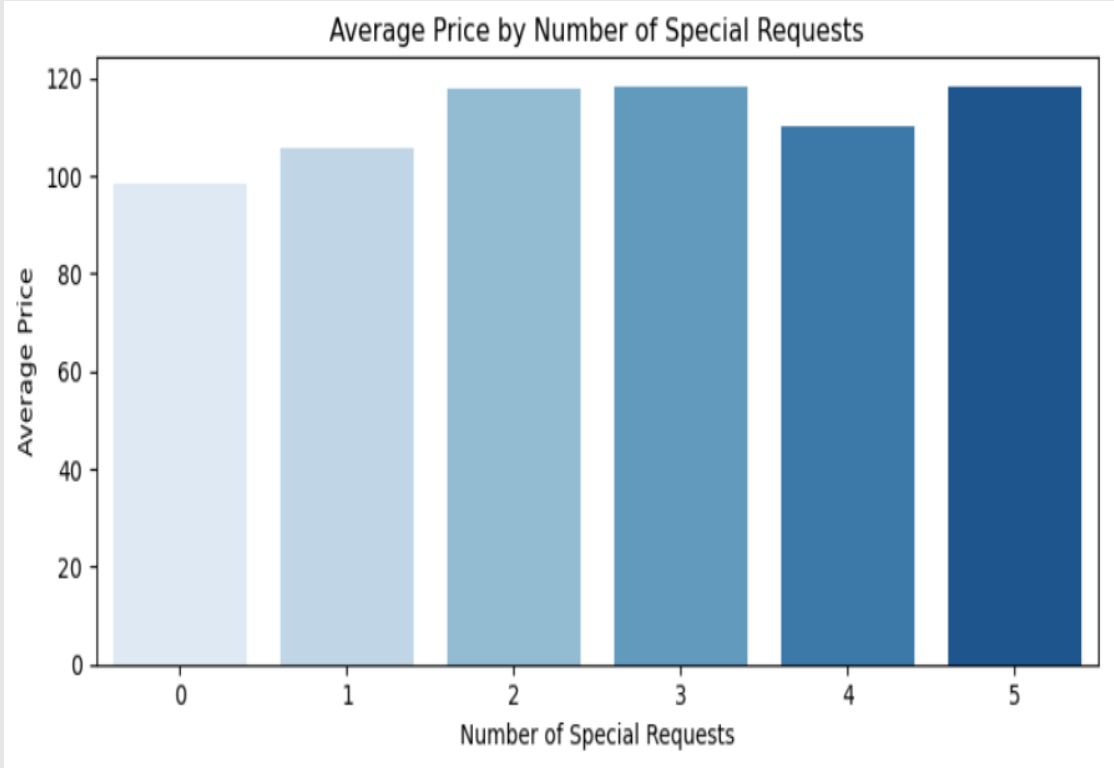
How do a guest's past cancellation and non-cancellation history influence their likelihood to cancel future bookings?

Guests with **no prior booking history** neither cancellations nor non-cancellations—form the majority, yet they still contribute significantly to both current cancellations and confirmations. However, guests with a **history of confirmed bookings (non-cancellations)** are **more likely to keep their reservations**, suggesting that **previous booking behavior is a strong indicator of future reliability.**



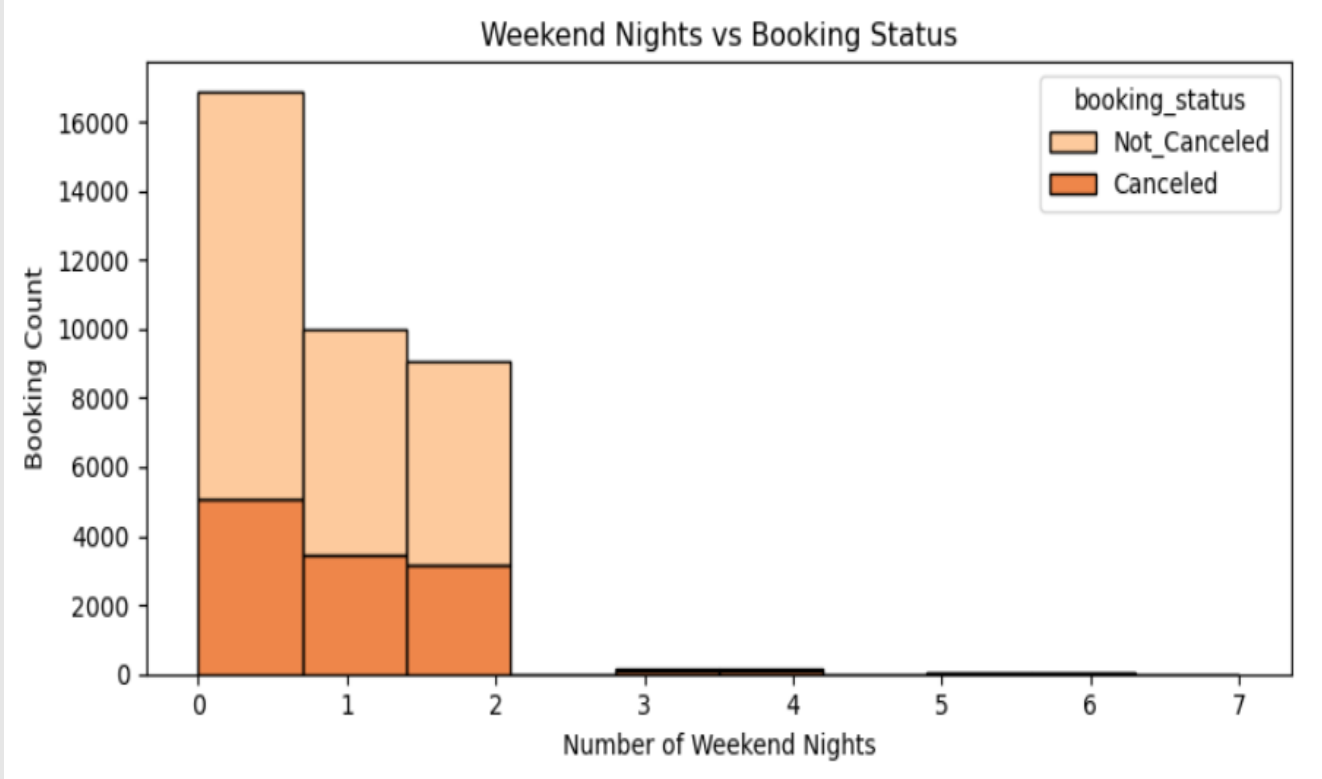
How does the number of special requests impact the average price per night?

As the number of special requests increases, the average price per night also tends to rise—indicating that **guests making more requests often book higher-tier rooms or premium services**. This suggests a link between personalized services and higher revenue per booking.



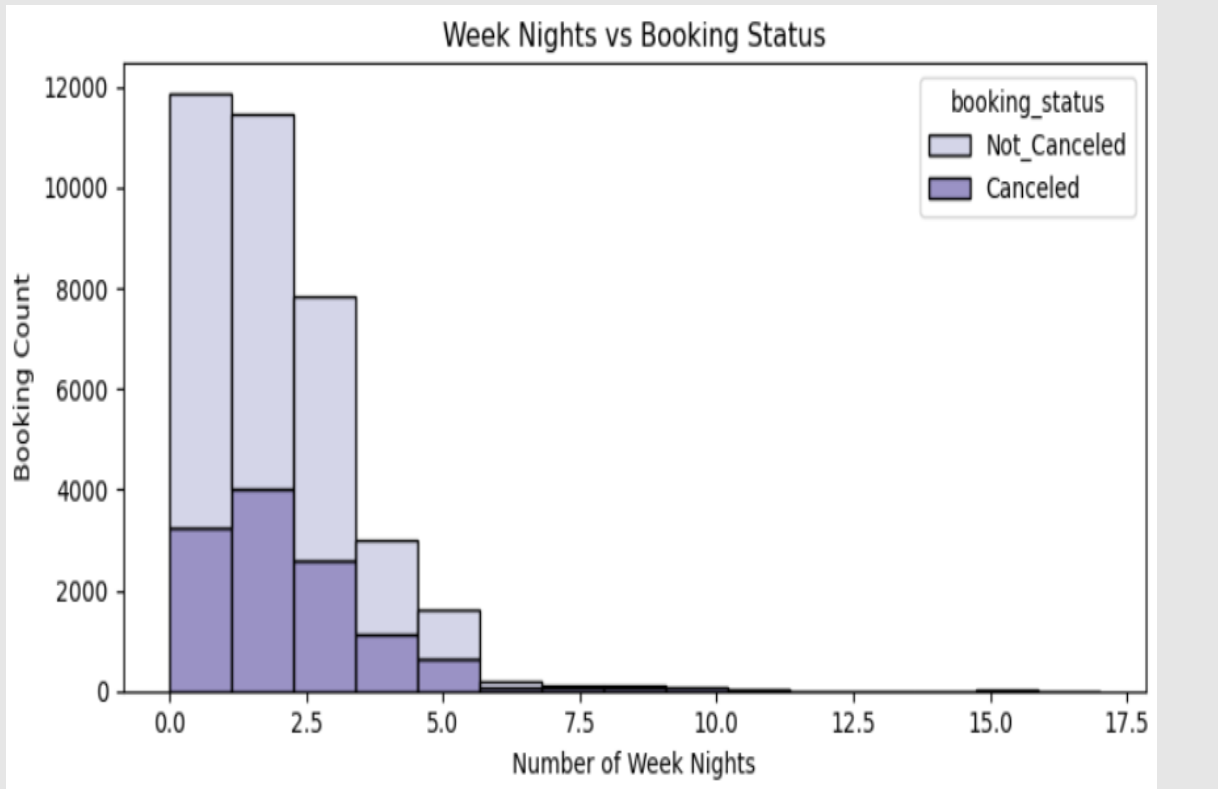
What is the relationship between the number of weekend nights and booking cancellations?

Most bookings involve **0–2 weekend nights**, and within these, non-canceled bookings consistently outnumber canceled ones. This suggests that weekend duration has minimal influence on cancellation, with short stays being the most common and stable.



How does the number of weeknights in a booking affect the cancellation rate?

Bookings with **1 to 3 weeknights** are the most common, and non-cancellations dominate across all durations. However, as the number of weeknights increases, the frequency of bookings and cancellations decreases sharply, indicating that longer stays are less popular and may carry a slightly higher risk of cancellation.





Thank You

