

Capstone Project



Hotel Booking Analysis

By

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Problem Statement



Have you ever wondered when the best time of year to book a hotel room is? Or the optimal length of stay in order to get the best daily rate? What if you wanted to predict whether or not a hotel was likely to receive a disproportionately high number of special requests? This hotel booking dataset can help you explore those questions!

This data set contains booking information for a city hotel and a resort hotel, and includes information such as when the booking was made, length of stay, the number of adults, children, and/or babies, and the number of available parking spaces, among other things. All personally identifying information has been removed from the data.

Explore and analyze the data to discover important factors that govern the bookings.

Data Description



The file contains the different attributes of hotel booking details. The detailed of some data is given below:

- **Hotel:** Name of hotel (City or Resort)
- **Is_canceled:** Whether the booking is canceled or not (0 for no canceled and 1 for canceled)
- **Lead_time:** time (in days) between booking transaction and actual arrival.
- **no_of_weekend_nights:** Number of weekend nights (Saturday or Sunday) the guest
- **no_of_week_nights:** Number of week nights (Monday to Friday) the guest stayed or booked to stay at the hotel
- **type_of_meal_plan:** Type of meal plan booked by the customer
- **country:** Country of origin of customers (as mentioned by them)

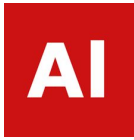
Data Description



- **days_in_waiting_list**: No. of days on waiting list.
- **customer_type**: Type of customer(Transient, Group, etc.)
- **market_segment_type**: Market segment designation.
- **repeated_guest**: Is the customer a repeated guest? (0 - No, 1- Yes)
- **avg_price_per_room**: Average price per day of the reservation; prices of the rooms are dynamic. (in euros)
- **no_of_special_requests**: Total number of special requests made by the customer (e.g. high floor, view from the room, etc)
- **reservation_status**: Whether a customer has checked out or canceled,or not showed

The dataset contains 119390 rows and 32 columns

Insights from Problem Statement



When is the best time for booking a hotel?

The best days to book a hotel room can be major holiday when management is not working.

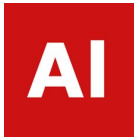
- **Weekdays**
- **Weekends**
- **Month by month**
- **Year by year**

The best days of the week to book a hotel room can be Friday, Saturday, Sunday.

When is the peak seasons to hotel industry ?

- **The months of November through March are often off-peak for hoteliers. The summer season, when attendance is at its peak, runs from June through the end of August.**

Insights from Problem Statement



who are the target audience who book a hotel?

- **Target clients for a hotel could include business travellers, tour groups, small conference groups, and individual tourists, vacationers, business travellers, workers, and event planners are some examples of a hotel.**

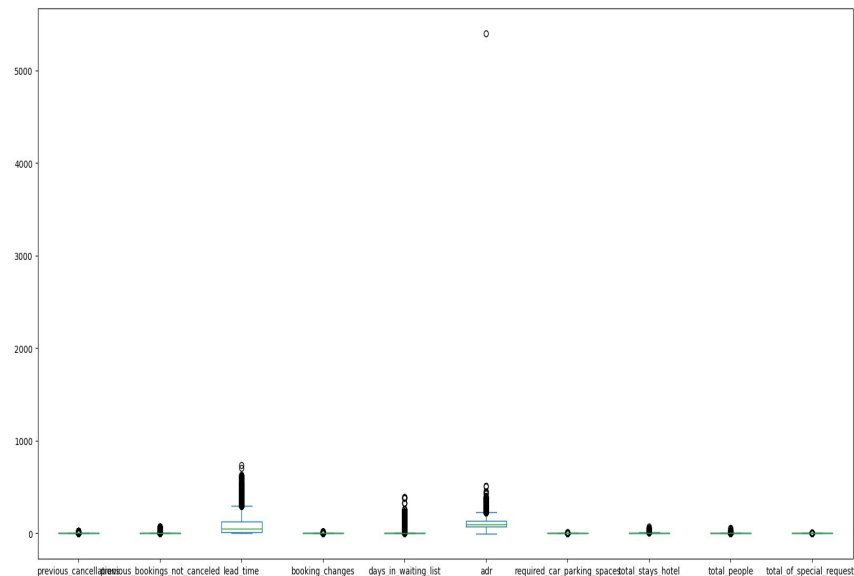
How hotels generate revenue?

- **Hotels generate income by charging guests to stay. Other services like room rents, food and beverage sales etc generate revenue for them.**

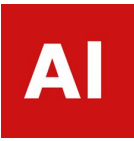
Data Preprocessing



- **Checking for duplicate values and dropping the duplicates.**
- **After dropping the duplicate values and we have handled the null values to get a better result.**
- **Handling Outlier : As we can see from the figure adr column has an outlier, and we have removed the outlier.**

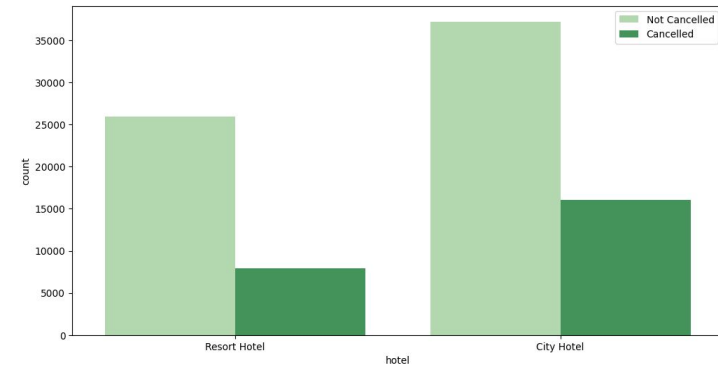
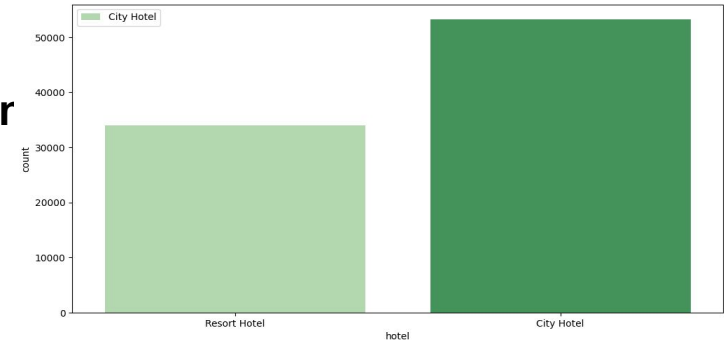


Hotel

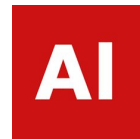


- City hotel has 53000 bookings and Resort hotel has 33000 bookings.
- A city hotel is the best as more customer book and stay at this hotel than compare to resort hotels.
- More cancellations in city hotels than at resort hotels

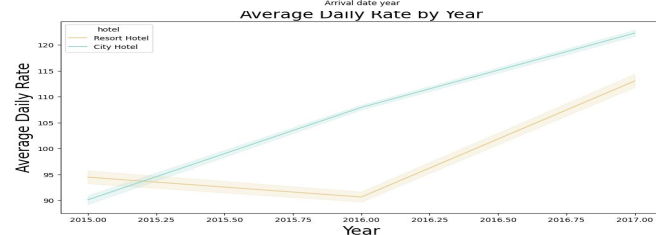
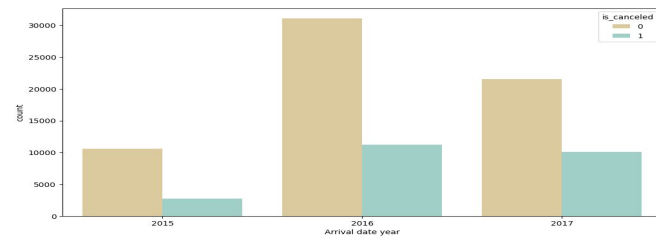
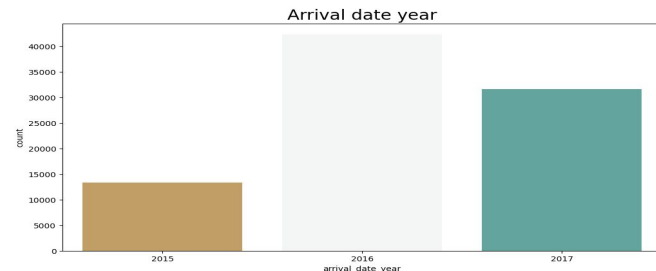
City hotels receive more bookings since they are not considered destinations and are chosen by travellers as a location to spend the night rather than resort hotels, which are seen as a point of distinction and where guests stay for extended periods of time.



Arrival date year



- In 2016, there were more guests booking hotels followed by 2017 and 2015.
- More cancellations of hotels in the year 2016 than compare to other years.
- Year over year, average daily rate of hotels is increasing.

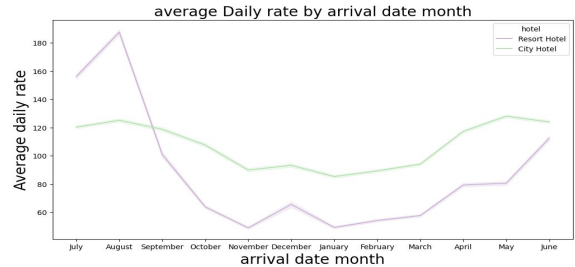
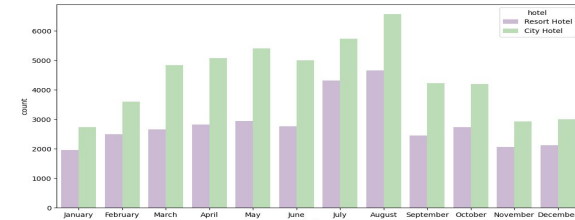
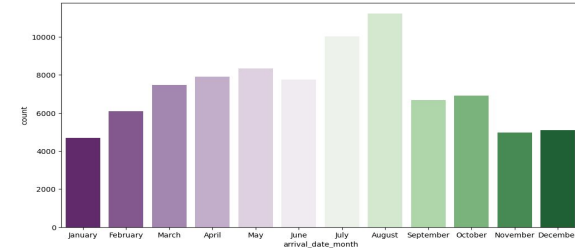


Arrival date month



- The peak booking period is from the month of may to august, when guests are arriving at hotels. The fewest bookings are made during the months of November through February, when most guests arriving into hotels.
- August month is the peak period, where more guest are arriving at city hotel than compare to resort hotel.
- August saw the highest number of average daily rate bookings for resort hotels, while november and january month saw the lowest numbers.

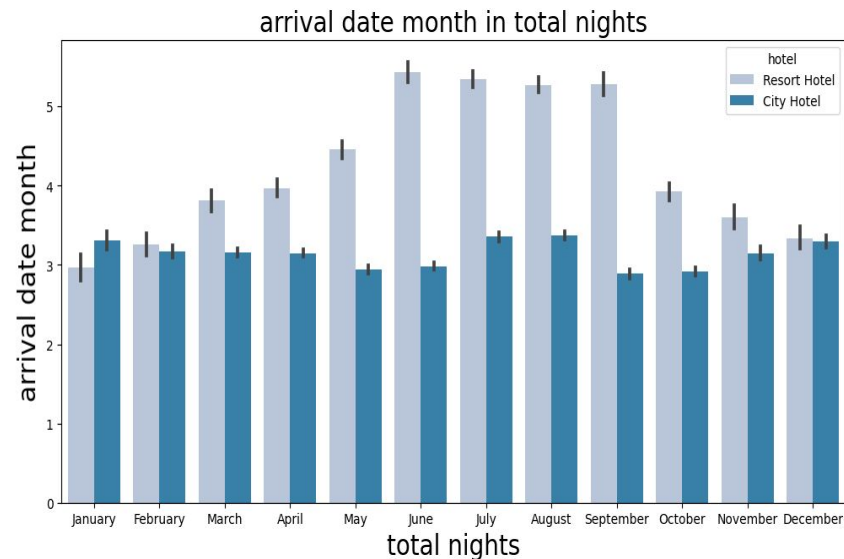
Compared to other times of year, summer is the busiest season for hotels, when the majority of guests stay there.



Total Nights



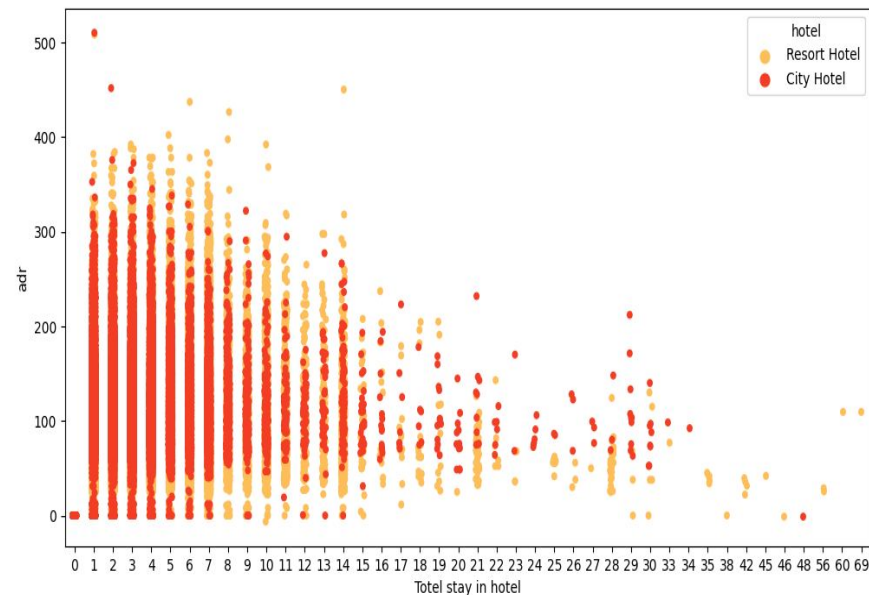
- **Total nights stays are high from June through September at resort hotels.**



Total Stays Hotel



- We can observe from the figure that the average daily rate lowers as the total length of stay increases. This indicates that a better price for the consumer can be reached for a longer stay.

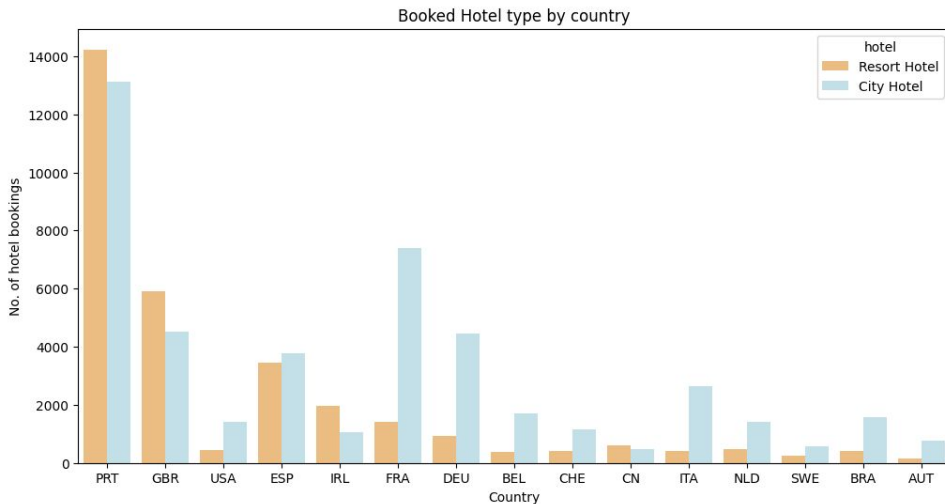


Booking Type by Country



- The majority of reservations are made by PRT country, customer from the GBR country, the second-highest booking nation for hotels.

Western Europe country, specifically Portugal, France, Great Britain, and Spain, has more visitors than any other region.

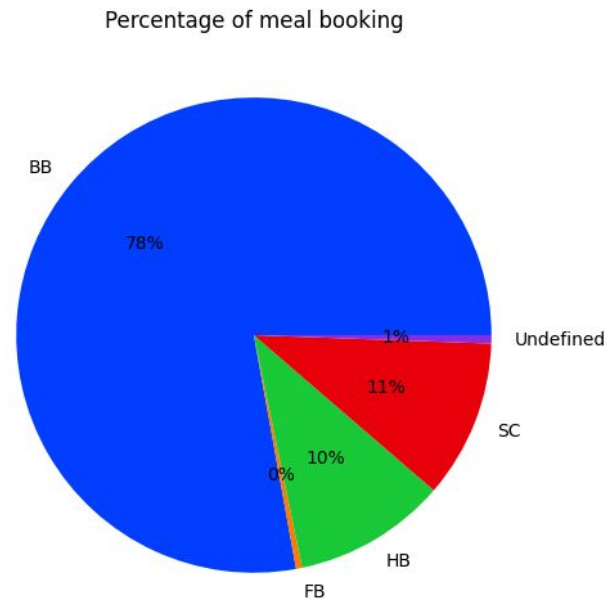


Meal Type



- The most popular meal is BB (Bed & Breakfast), which accounts for about 77.2% of all orders, followed by HB (Half Board), SC (no meal package), Undefined, and FB (Full Board).

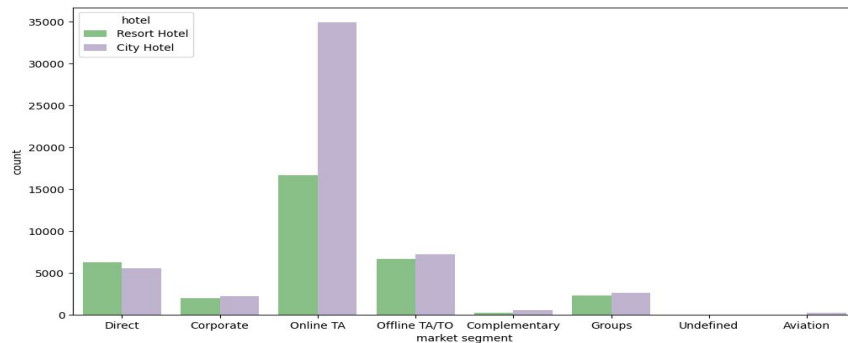
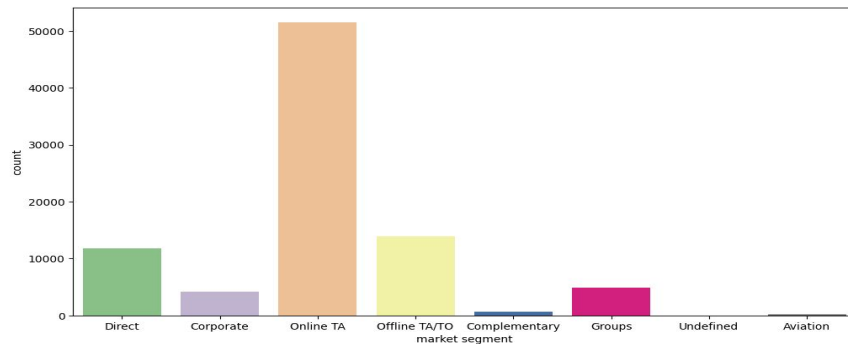
Many people had bed and breakfast as they stayed in hotel at night which means more bookings are from city hotels.



Market Segment



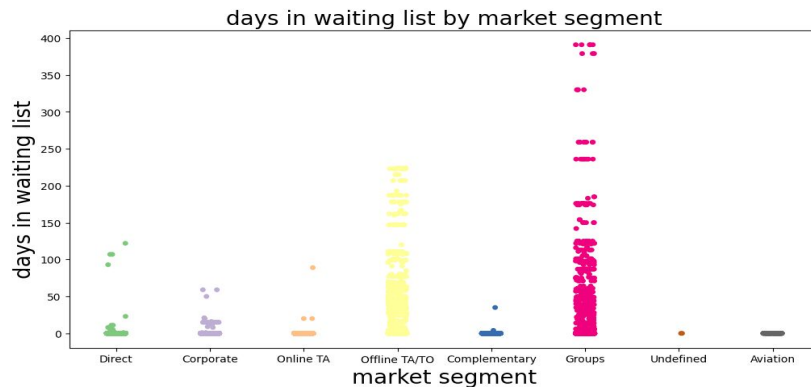
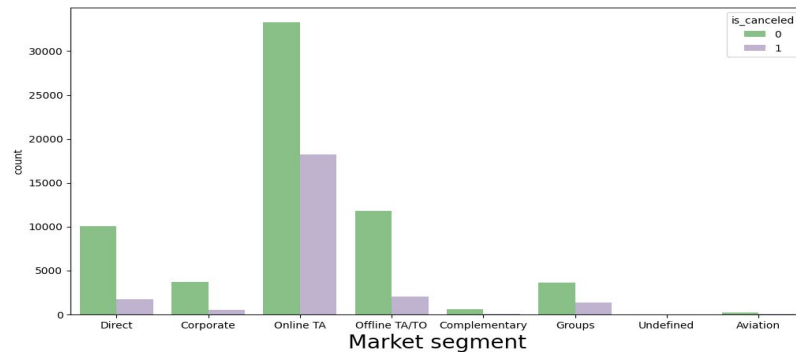
- Online TA/TO(TA: Travel agents,TO: Tour operators) has the most bookings overall and the lowest is complementary ones in the market segment.
- Many people booked hotels through online TA/TO in the market segment.



Market Segment



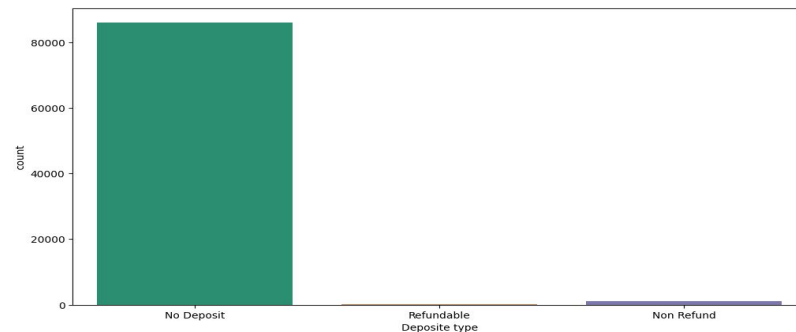
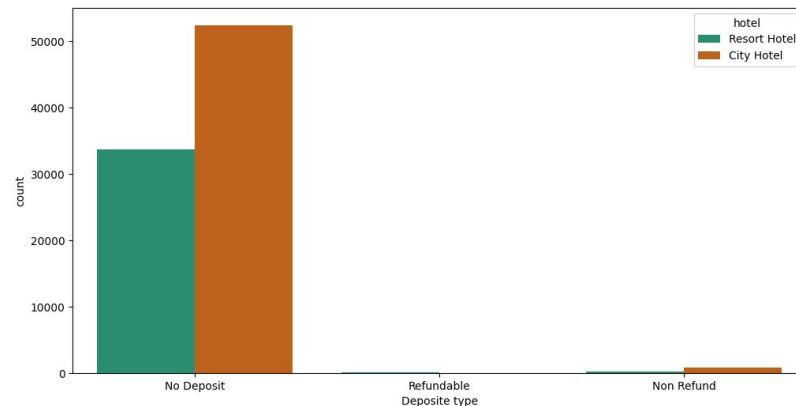
- A hotel experiences a high rate of cancellations on online TA/TO in market segment.
- The shortest waiting list period is for aviation.



Deposit Type



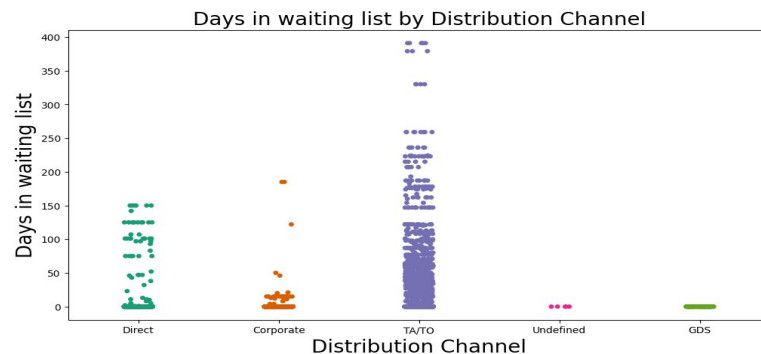
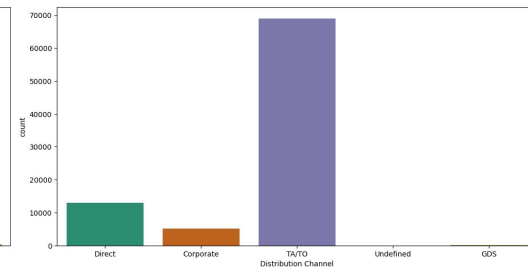
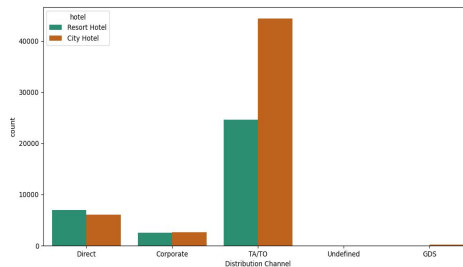
- The majority of hotels accept no deposits (104641), followed by refundable type(14587) and non-refundable type (162).
- City hotels has high number of no deposit type.



Distribution Channel



- More number of bookings came from TA/TO distribution channel
- In distribution channel city hotel has high TA/TO
- High number of waiting list in TA/TO in distribution Channel

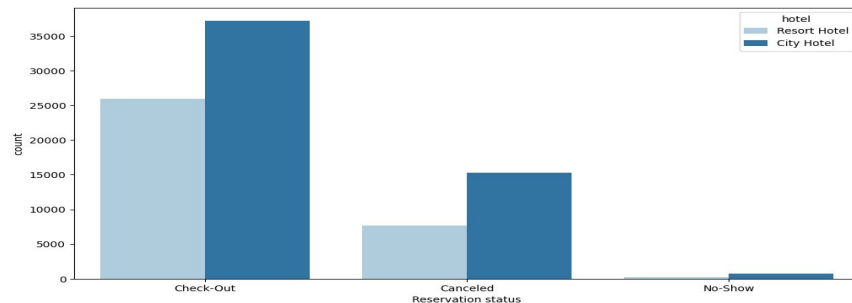
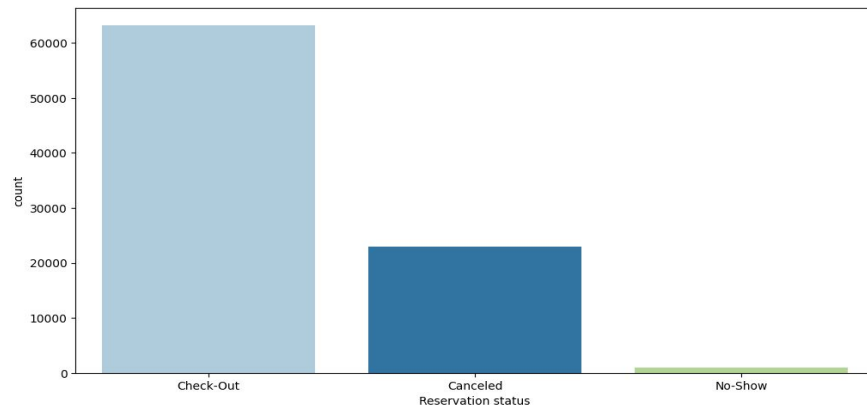


Reservation Status



- **Check-out:** 75166 guests leave the hotel.
- **Canceled:** 43017 reservations have been cancelled.
- **No-Show:** There are 1207 reservations that still need to be cancelled.
- The City Hotel has the most check-outs followed by cancellations, and no-show reservations.

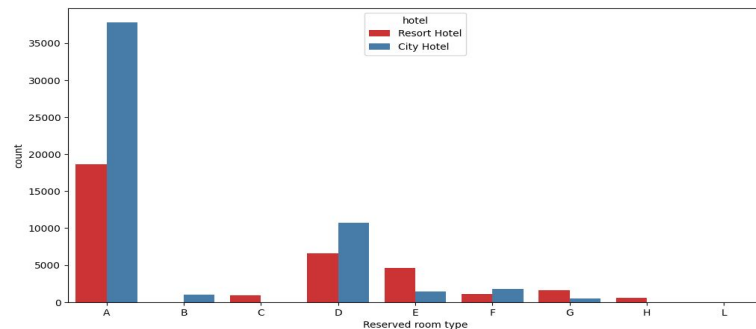
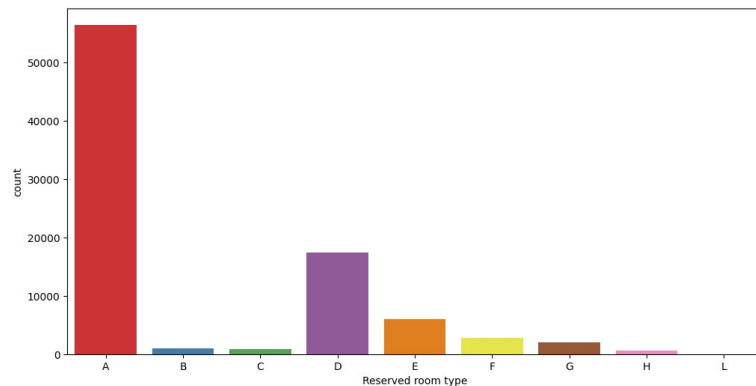
Most people checked-out which means guest left the hotel and few people are still staying in the hotel that needed to be cancelled.



Types of Rooms reserved



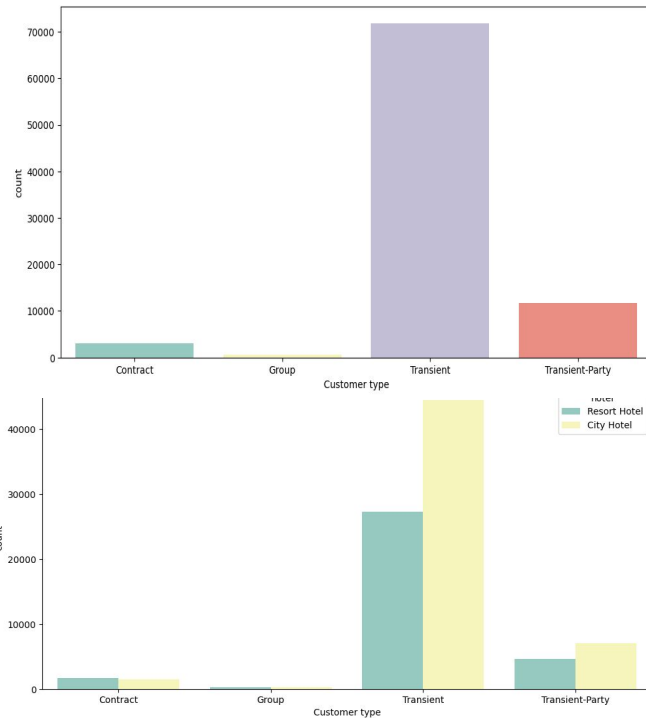
- Highest number of rooms reserved were type A (85994), and the lowest rooms were type L (6).
- City hotel has highest reserved room type A



Customer type



- Transients type booked the hotel are high for short period of time, followed by transient parties, contracts, and groups.
- There have been more cancellations of hotels at transient than others

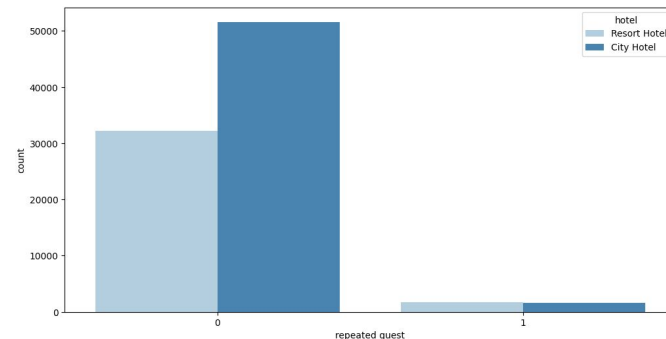
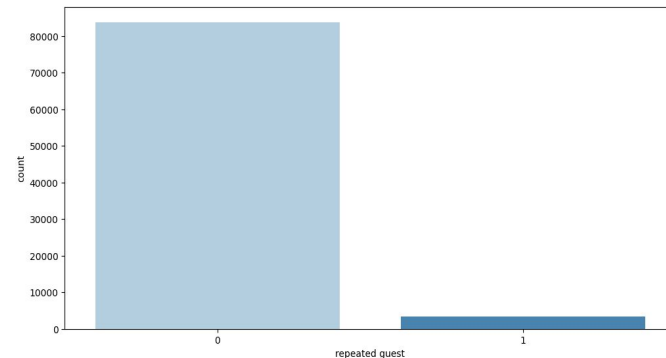


Repeated Guest



- 82865 guests have not been repeated while 3364 have
- City hotels have a high percentage of one-time guests

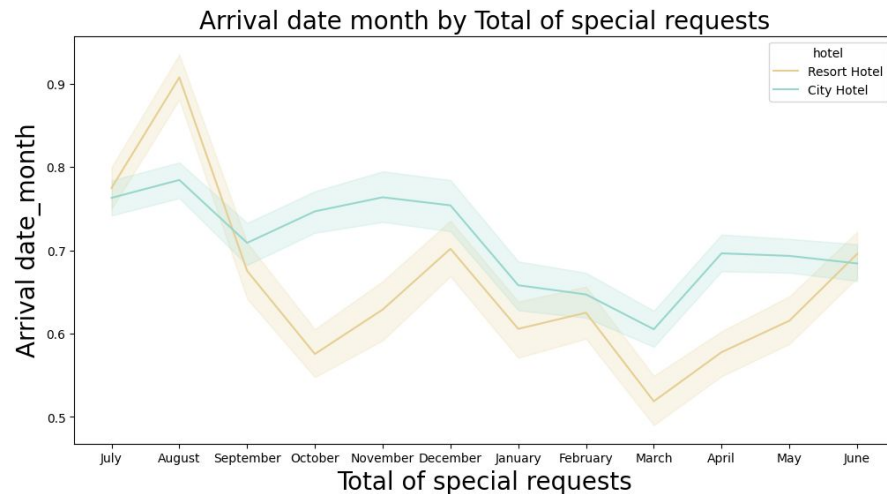
Repeated guest come at hotels again because they enjoy the amenities and parks provided by hotel.



Special Requests



- The above plot indicates a lot of special requests from July through August are high because of summer seasons.



Summary and Conclusions

- **People come from all over the world to stay at a hotel so that they can tour around the place that they are staying. They do not spend their day in the hotel and they only come back to sleep and shower, maybe a meal or two. City hotels are not a destination. Resorts are located in scenic areas but not near a city or anything really. People visit a resort to get away from other people and cities. They stay in the resort and probably don't travel around as they may do when staying at a city hotel. A resort is the destination. City hotels have the majority of bookings compared to resort hotels.**

Summary and Conclusions



- **Hotels saw an increase in bookings in 2016. Compared to resort hotels, the average daily charge for hotels in cities has gone up every year. Guest visit hotels every year, May to August is the busiest booking month. From November to February, the fewest bookings are made. Average daily rates in the month of August saw the most bookings at resort hotels', while the months of November and January saw the least. From June to September, there are more overnights spent overall. As the length of the stay rises, the average daily rate decreases. This suggests that for a longer stay, a better price can be negotiated for the customer. PRT (Portugal) makes the majority of reservations.**

Summary and Conclusions



- **Around 77.2% of all orders are for BB (Bed & Breakfast), which is followed by HB (Half Board), SC (no meal package), Undefined, and FB (Full Board). In the market category, many individuals used internet TA/TO(TA: Travel agents,TO: Tour operators) to make hotel reservations. The aviation waiting list has the shortest wait time. There is a demand for hotel reservations as the waiting period lengthens. The majority of hotels (104641) do not require deposits, which are followed by refundable types (14587) and non-refundable types (162), with a large percentage of city hotels accepting no deposits. There are several temporary customers who have reserved the recently. While 3364 guests have been repeated, 82865 guests have not. There are more one-time visitors and fewer cancellations in city hotels. several special requests in summer season.**



Thank You