Capstone Project

HOTEL BOOKING ANALYSIS

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Summary

Booking Cancellations are one of the major problem faced by the hotel industry. The hotel has saw many impacts from a booking cancelations. To reduce this uncertainty and maximize the revenues, the hotels can make a predictive model so to predict the cancelations with the help of data science and Machine Learning.
As a first step we have used Hotel Booking Dataset to perform Exploratory data Analysis to understand the data and the trend using analysis techniques.

Dataset Name : Hotel Booking Demand Dataset

Shape : Rows: 119390 Columns:32
This dataset spans over for 3 years; 2015 to 2017.

Data Cleansing (Null Values)

In our dataset, we have four features with null values.

1. Children column contains the count of children, so we will replace all the missing values with the mode value.
2. Country column contains country codes representing different countries. It is a categorical feature so it is replaced with the mode value.
3. Agent column contains the id number of the agent, so missing values are been filled with 0.
4. Company column contains 94% null values, so dropped this column.

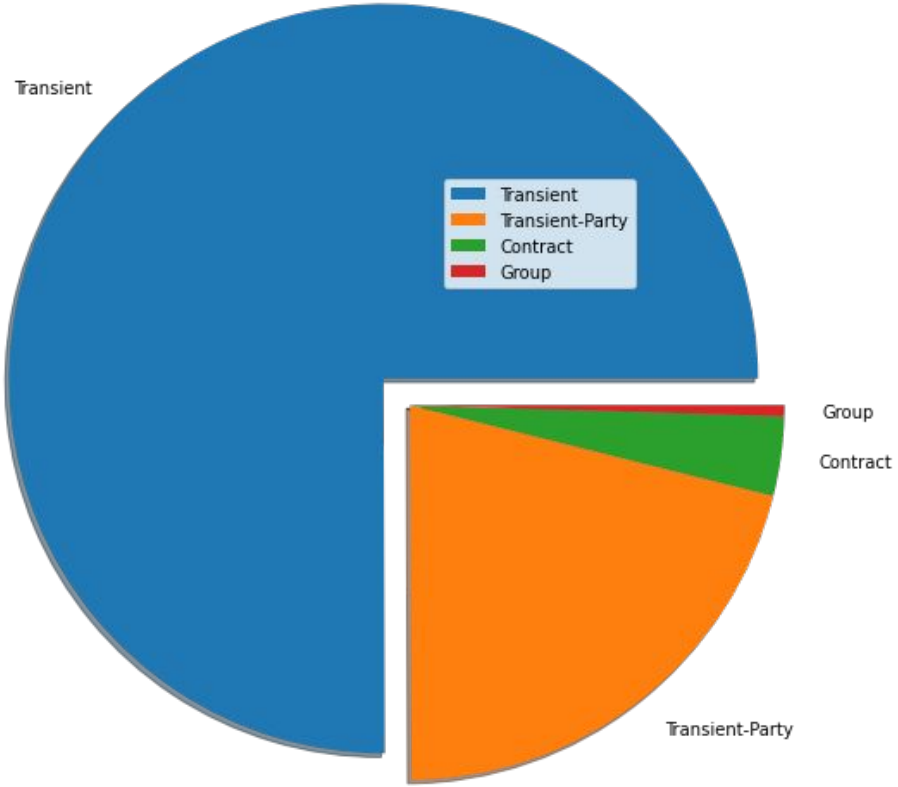
	Column Name	No of Null Values
1	children	4
2	country	488
3	agent	16340
4	company	112593

Exploratory Data Analysis:

- Customers' Preferences
- Booking Factors
- Cancellations Insights

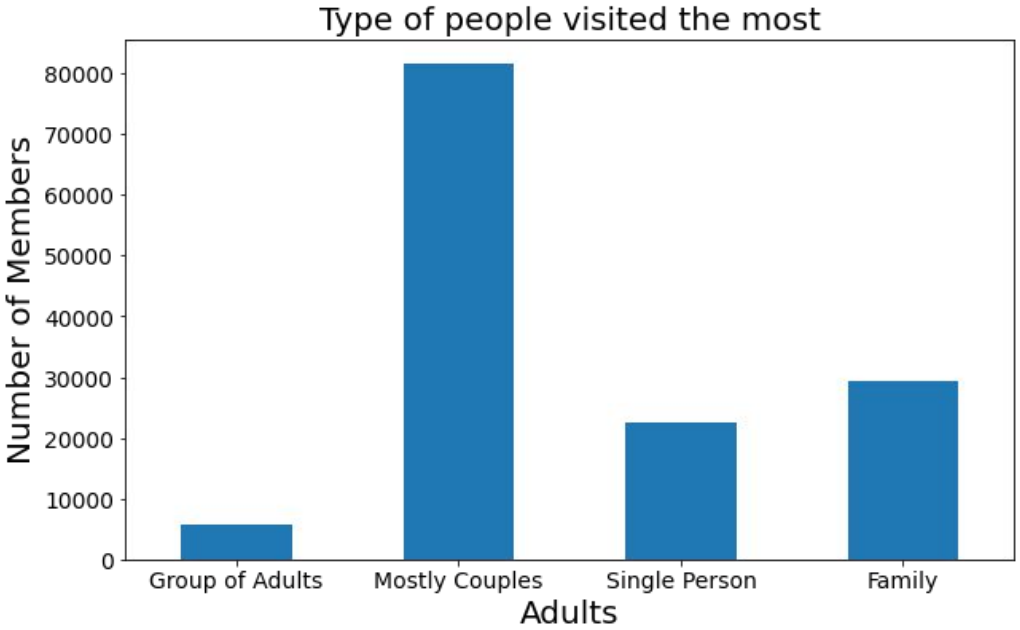
Customers' Preference

1.Analysis based on Customer Type



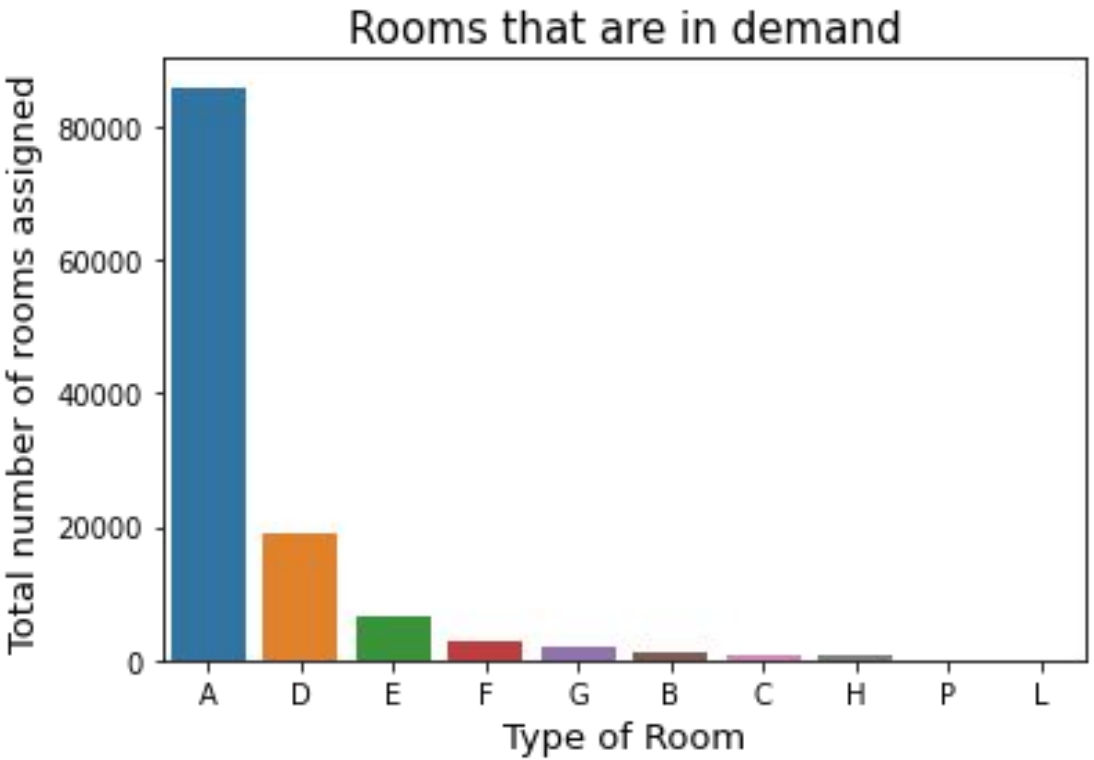
Transient type of customer are the most frequent visitors.

2.Analysis based on Type of People



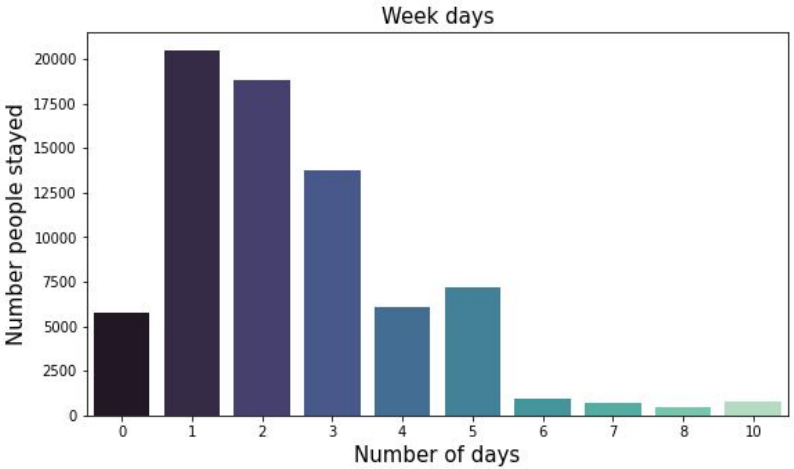
Couples(or two persons) visits the hotel most

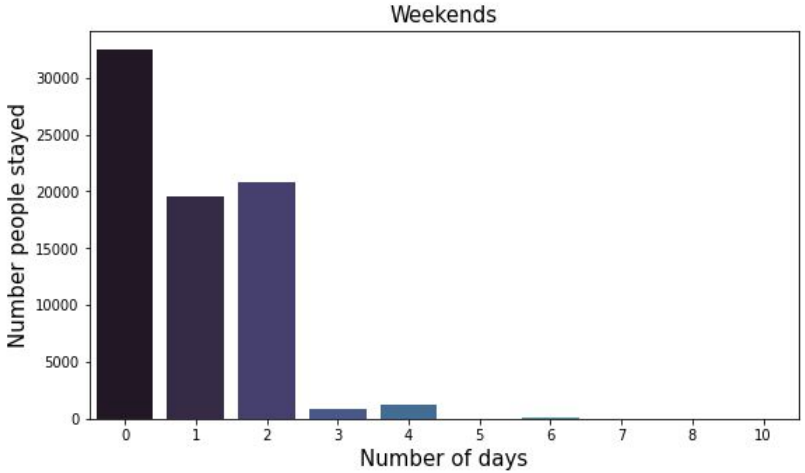
3.Analysis based on Room Type



Specific room type is not mentioned in the dataset but we can say only one type of room is most people book and that is type **A**

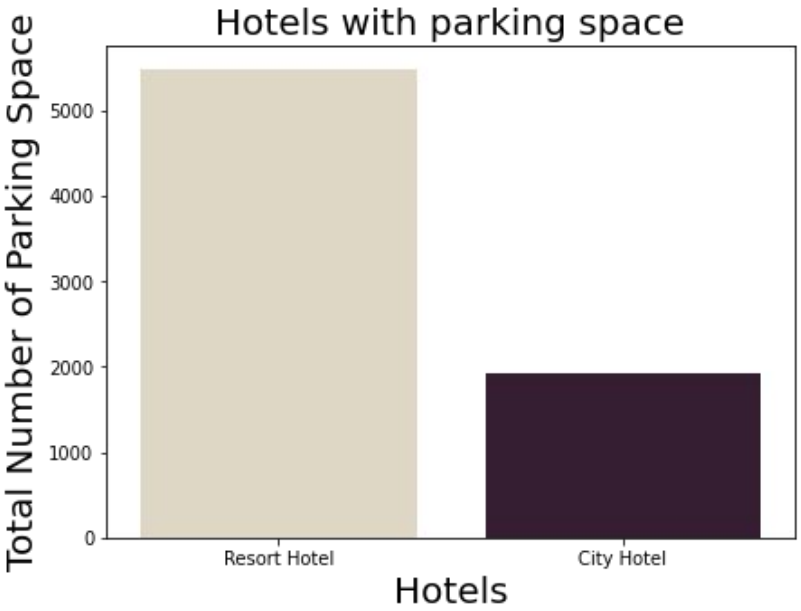
4.Analysis based on preferred days

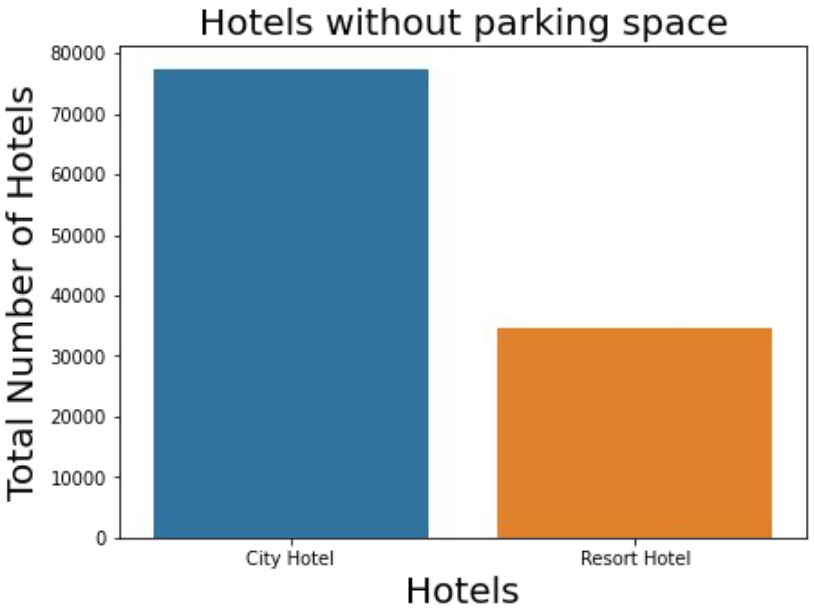




Number of days with **0** count means guest stayed for **few hours** and not a whole day and we can see weekends are more busy and weekdays.

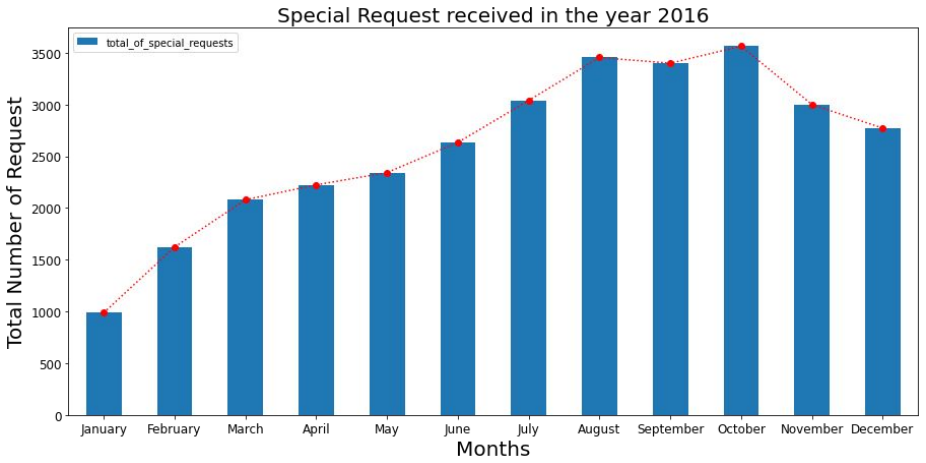
5.Analysis based on Parking Facility

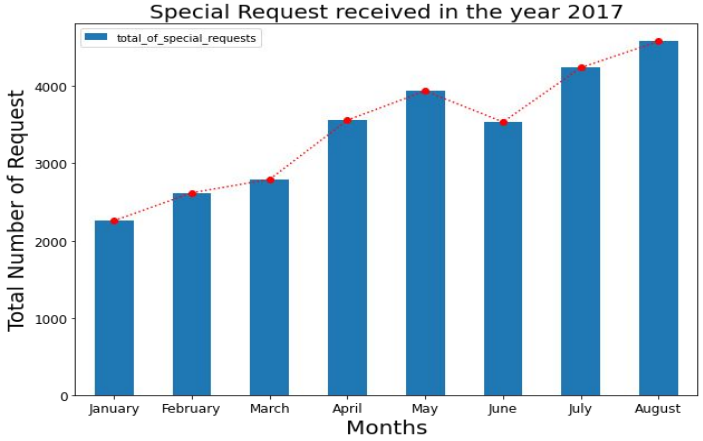




By analyzing both the graphs, we can see that **hotels without parking space** has more number of customers.

6.Analysis based on Special Request by Customer



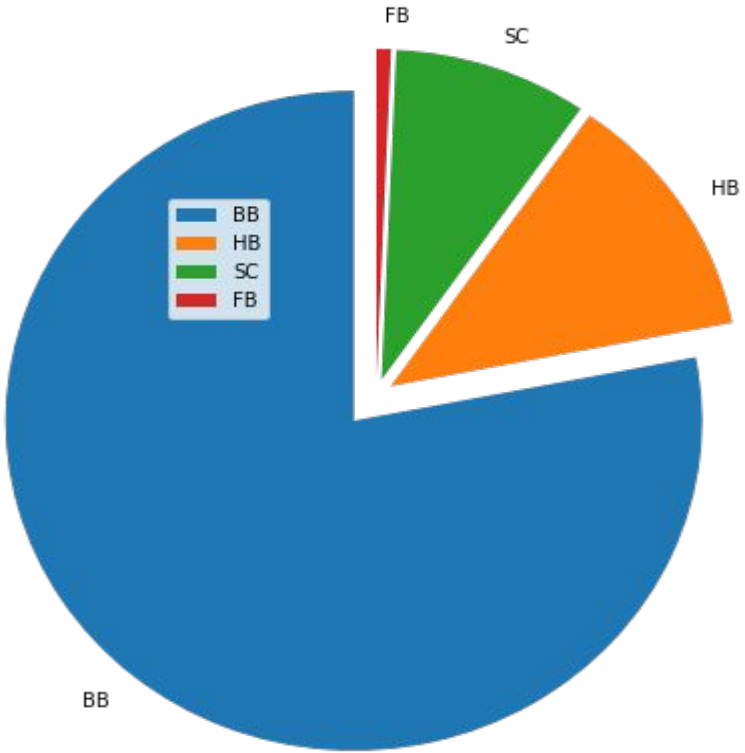


Hotel receives special request more during the months of August, September & October.

<u>Types of special requests:</u>

Marriage ceremony, Birthday party, DJ night, Meeting arrangements, etc.

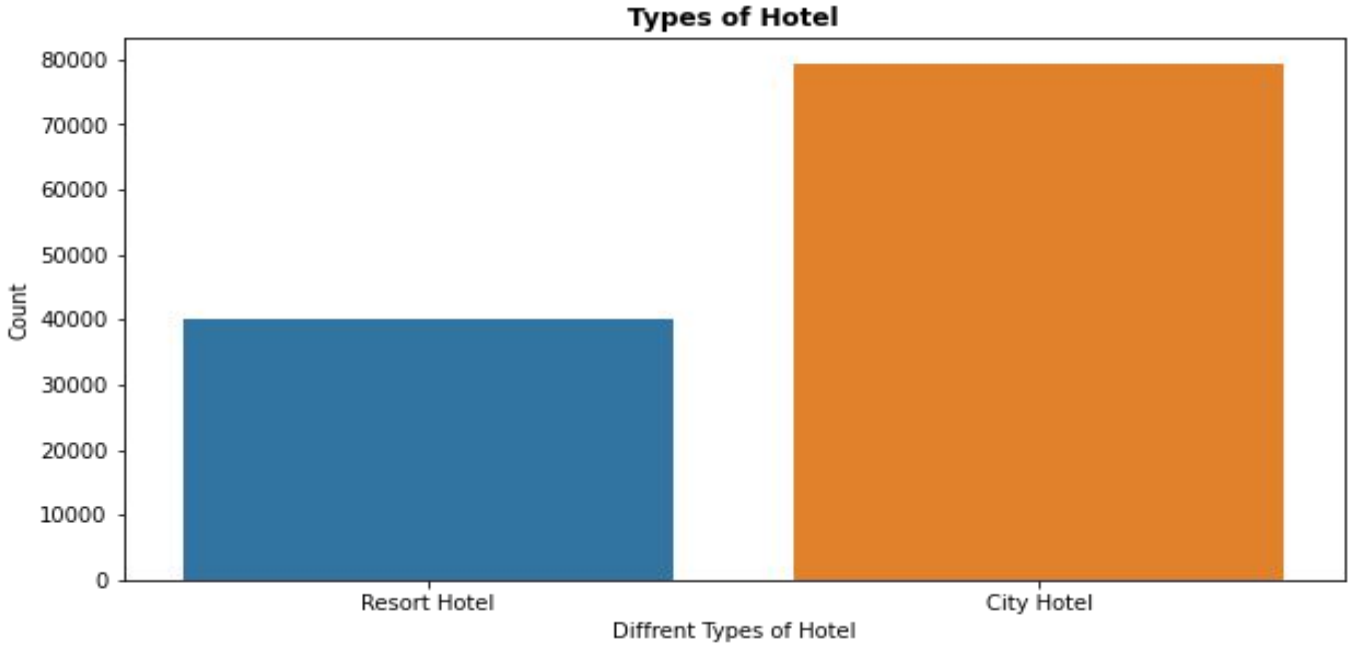
7.Analysis based on Preferred Meal



- **BB (Bed and Breakfast):** There is a breakfast included in the price of the hotel.
- **HB (Half Board):** In addition to sleeping, the price also includes breakfast and dinner.
- **FB (Full Board):** Breakfasts, lunches and dinners included in the price.
- **SC (Self Catering):** Self-catering. The meals aren't included in the price.

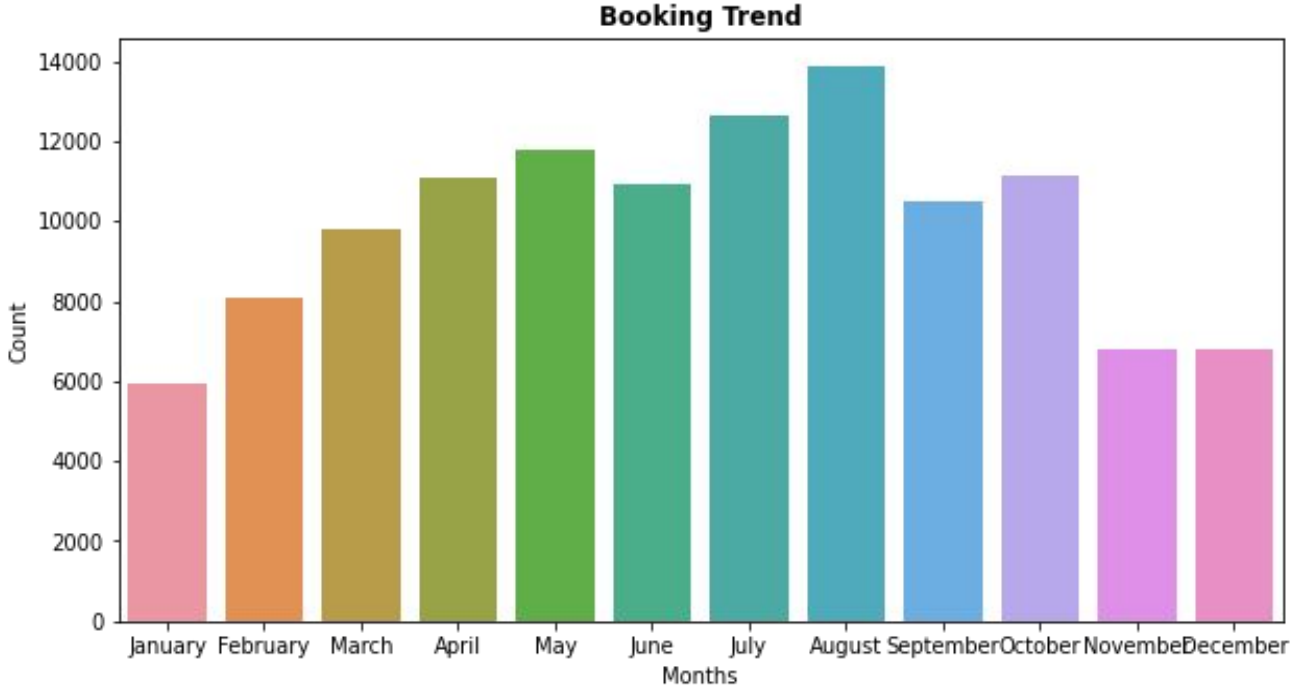
Booking Factors

1.To check the trend on which hotels type is preferred.



It's clear from the graph that city hotel was more occupied than the resort hotel.

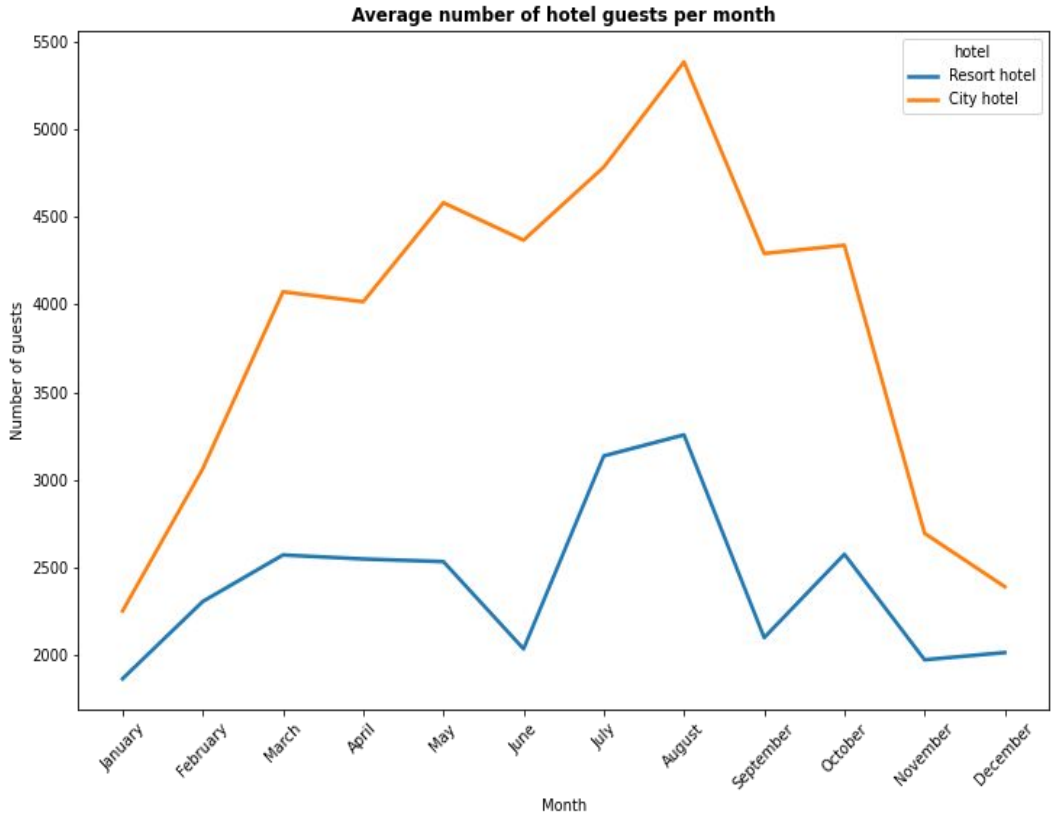
2.Which is the busiest month?



It can be depicted from the graph that the busiest month are July and August whereas January and December are off seasons.

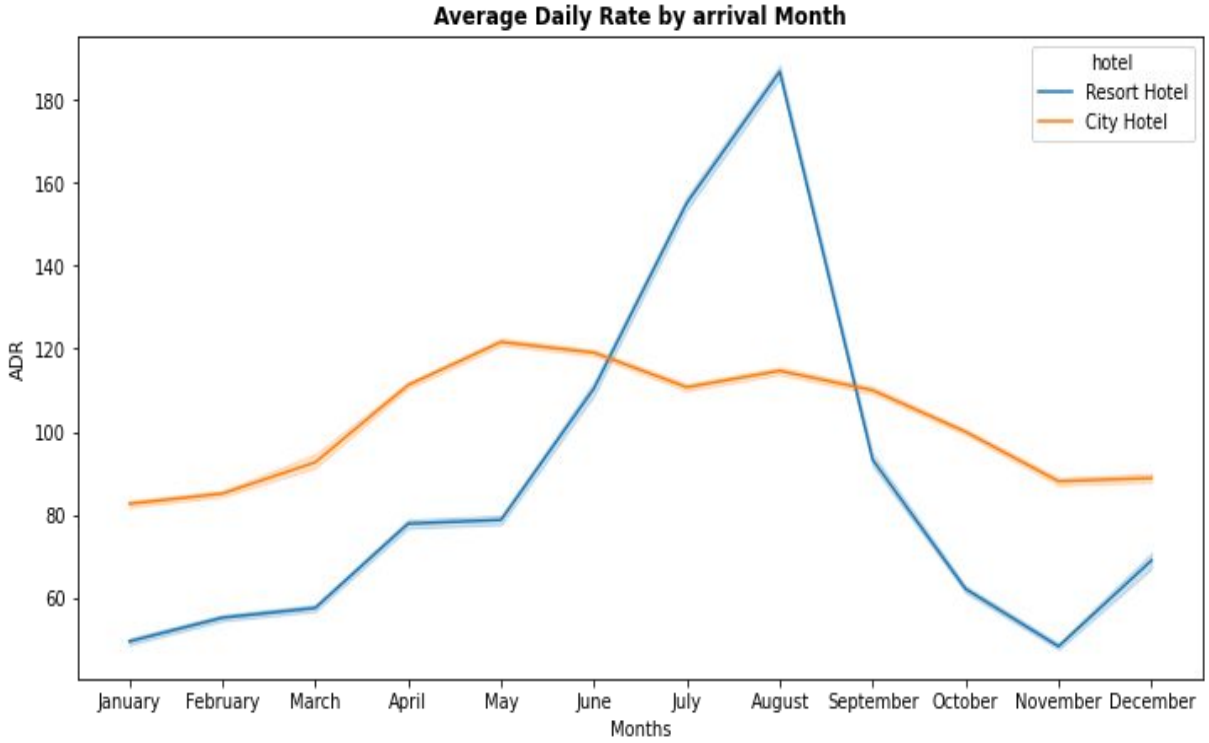
4.Check the booking trend for both types of hotels:

The booking trend for Resort hotel and city hotel, August is the most occupied month with 11.65% bookings and January is the least occupied month with 4.94% bookings.

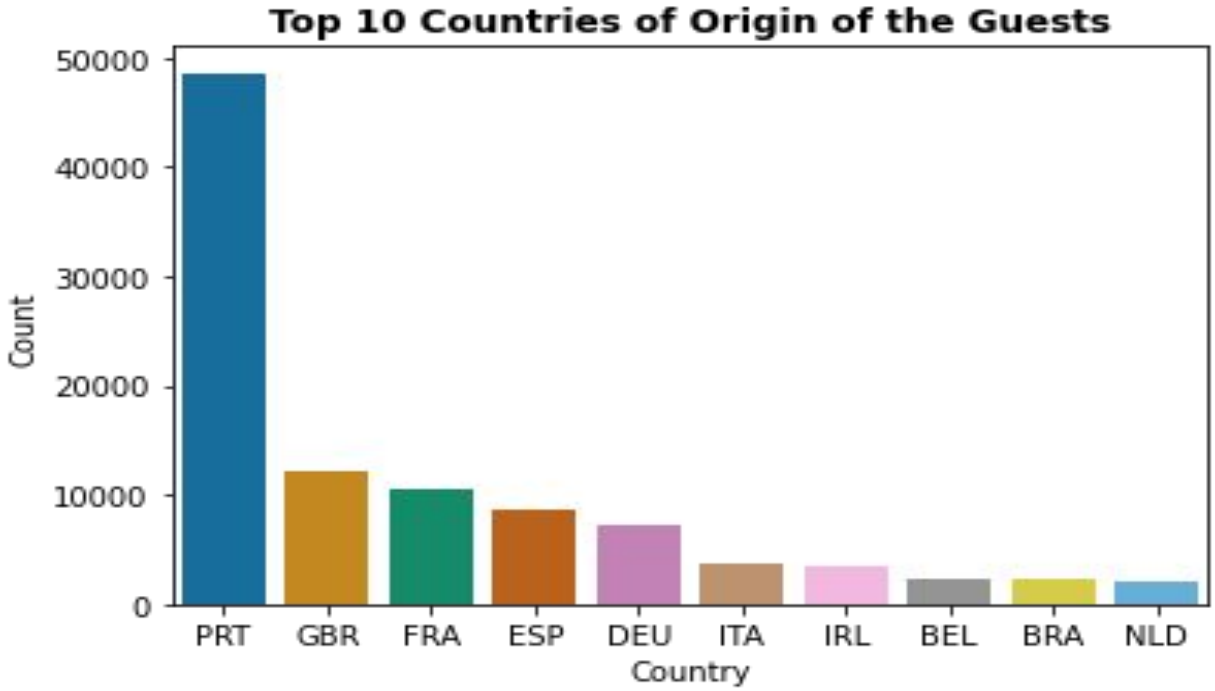


3.Is there a significant difference in the ADR(Average Daily Rate) during peak seasons and off seasons?

It can be inferred from the plot that, Average daily rate(ADR) is higher during the peak seasons and ADR is lower during off seasons. The above difference is true for both city hotel as well as resort hotel.

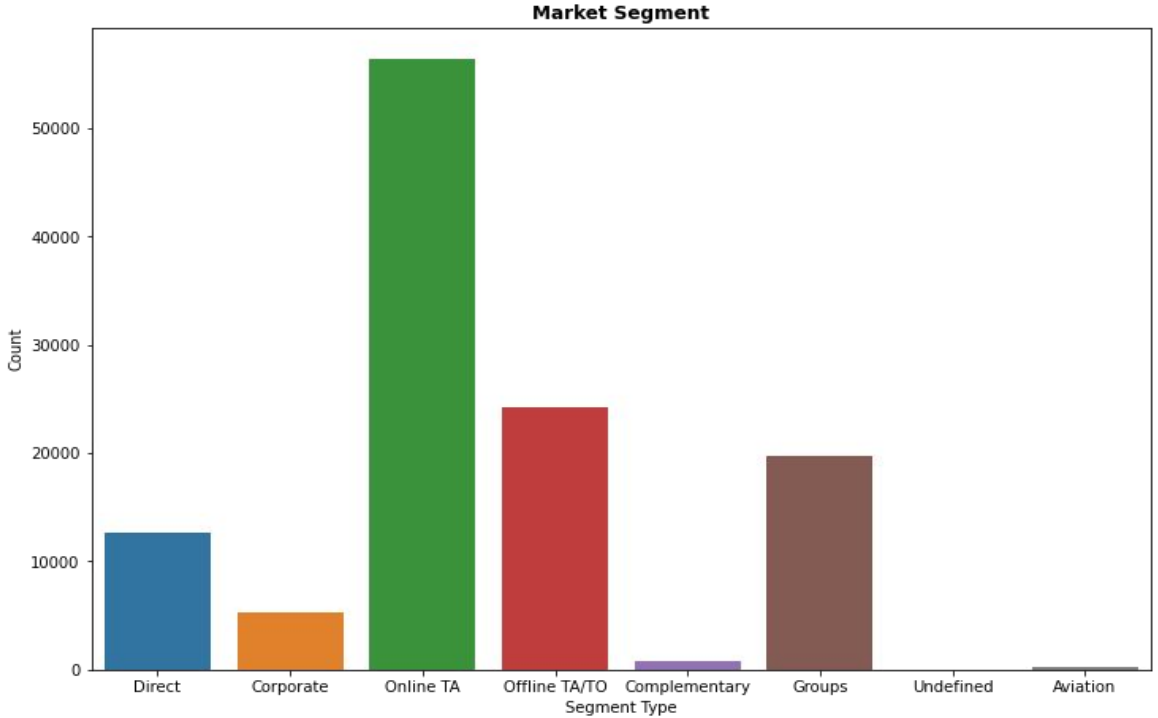


4.The country that has most number of guests:



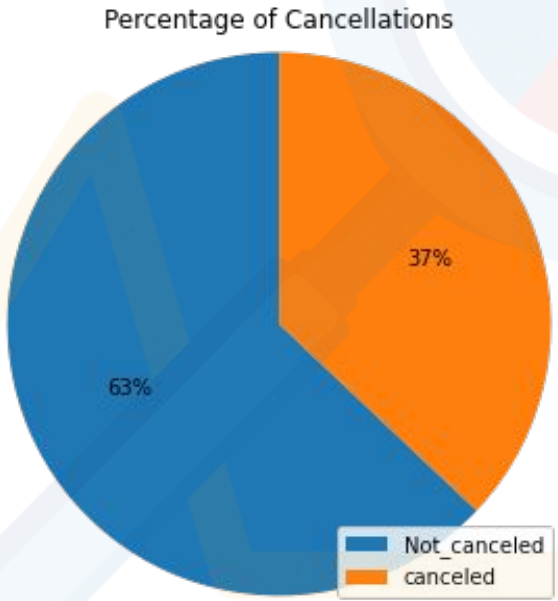
It is depicted from the graph that most of the customers are from Portugal.

5.The mode of booking



It is clear that most of the customers book through Online Travel Agents(TA)followed by offline Travel Agents(TA) and Tour Operators(TO).

Cancellation Insights



1. Which type of hotel had Higher rate of Cancellation?

We noticed that city hotels had higher rate of cancellations of 42% and resort hotels has a lower rate of cancellations of 28%

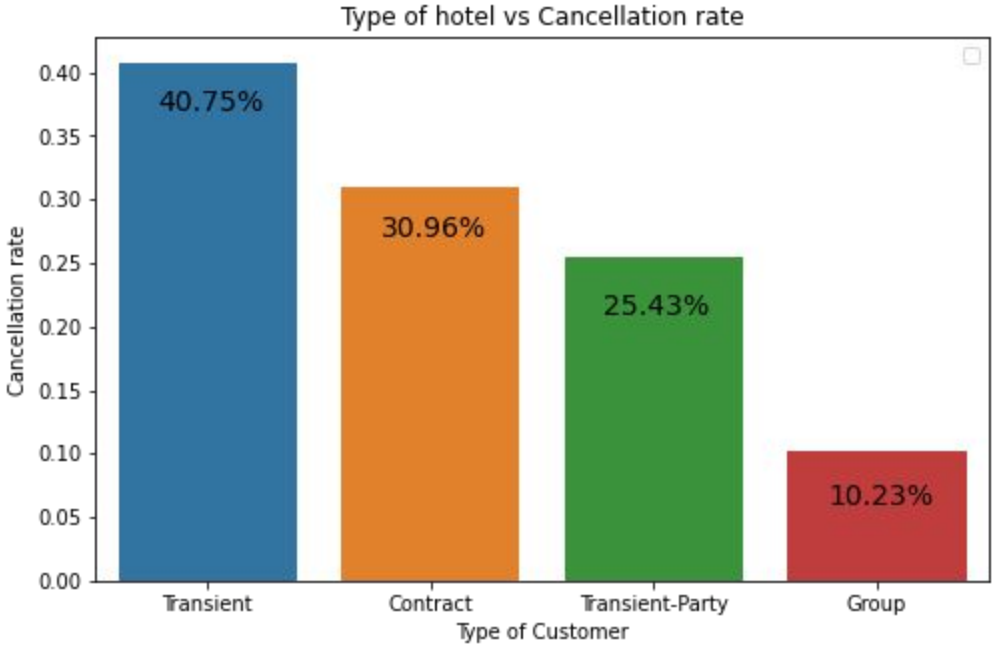
We can conclude that people book city hotels more and also tend to cancel it easily, and people book resort hotels less but once book they do not cancel it easily.

False: 0 True :1

2.How does customer type effect cancellations?

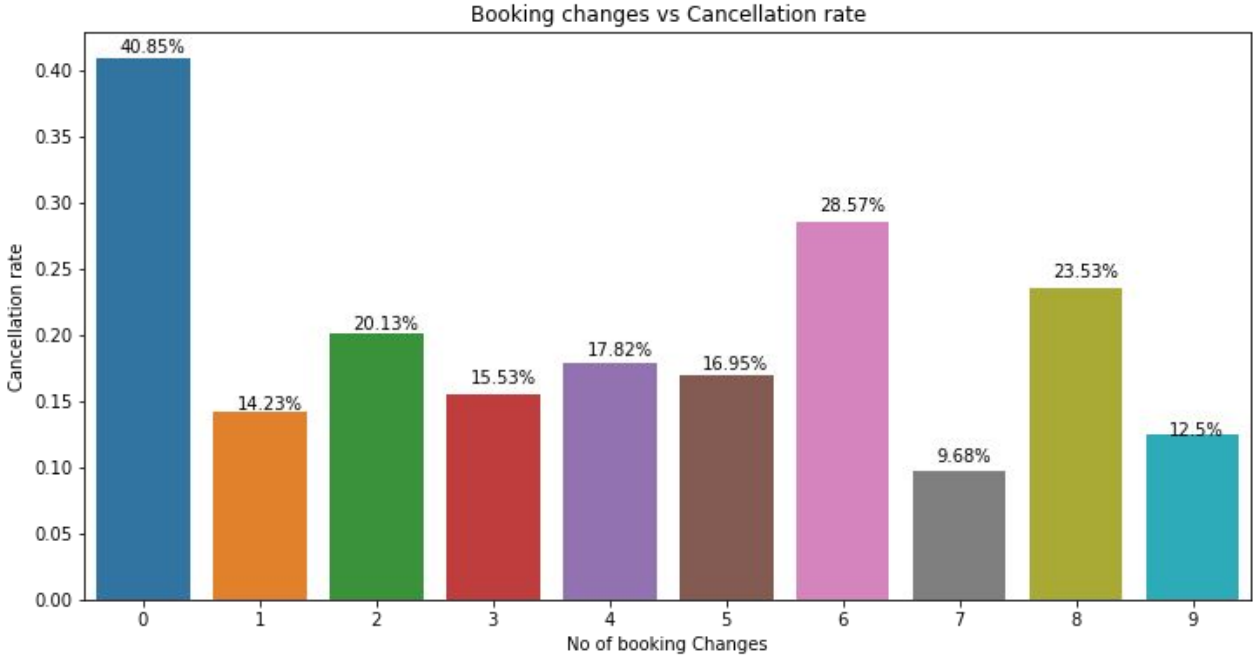
Transient type customers have highest cancellation rate and Group customers have least cancellation rate and Contract and Transient-Party type were intermediate.

Here we noticed a similar trend as in type of hotel. The more the number of bookings from a single type of customers, higher is the tendency to cancel and vice versa.



3.Does the change no of booking changes affect the cancellation?

We can notice that the cancellation rate was lower when the customers were allowed for changes

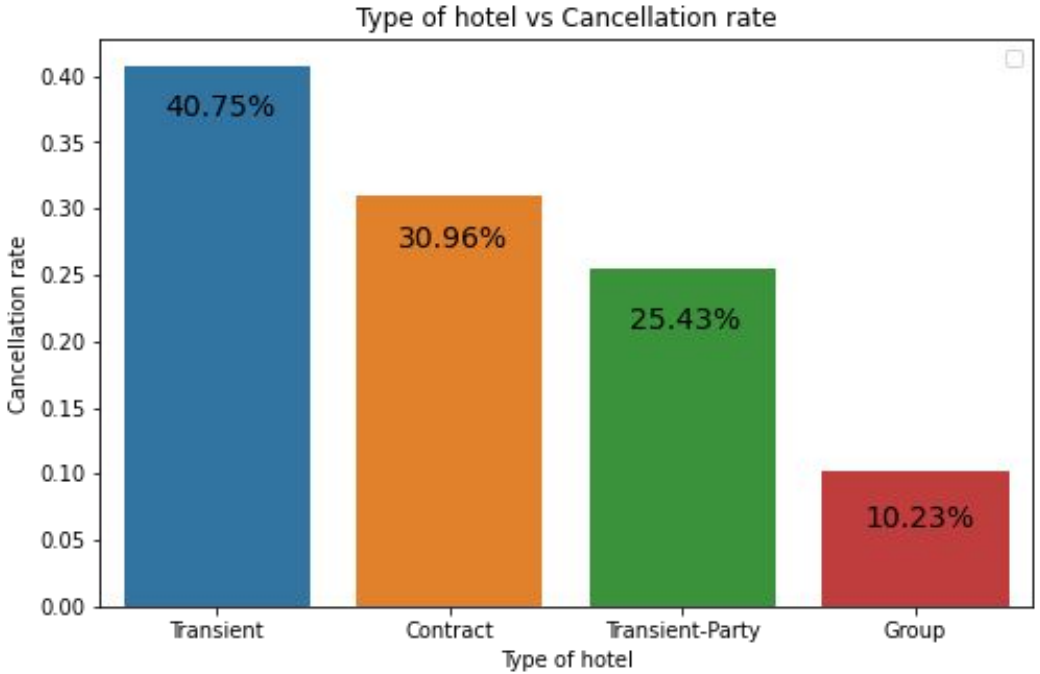


Being liberal on allowing customers to change their bookings can help in reducing the cancellation rate. However it is better to limit is to 5.

4.What if the assigned room is not same as reserved room?

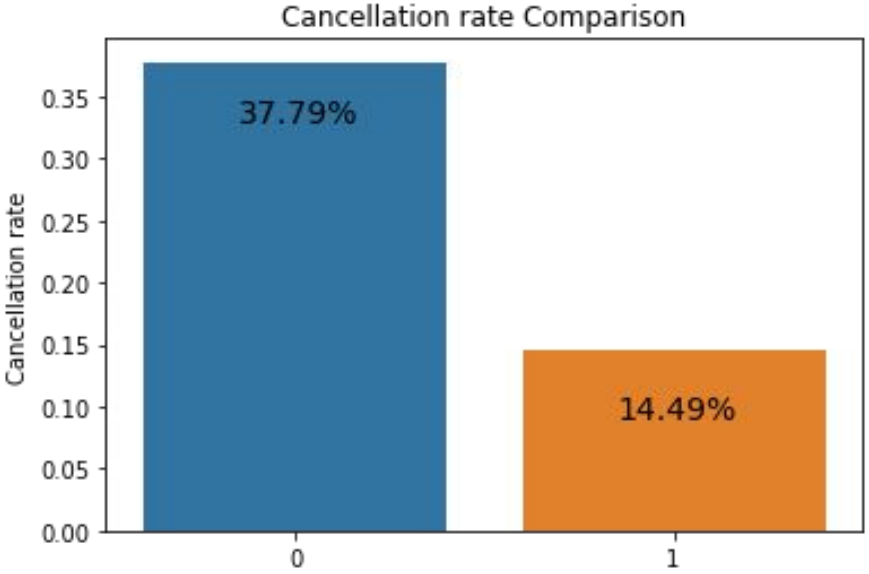
We noticed that when same room was not assigned, the cancellation rate was very low.

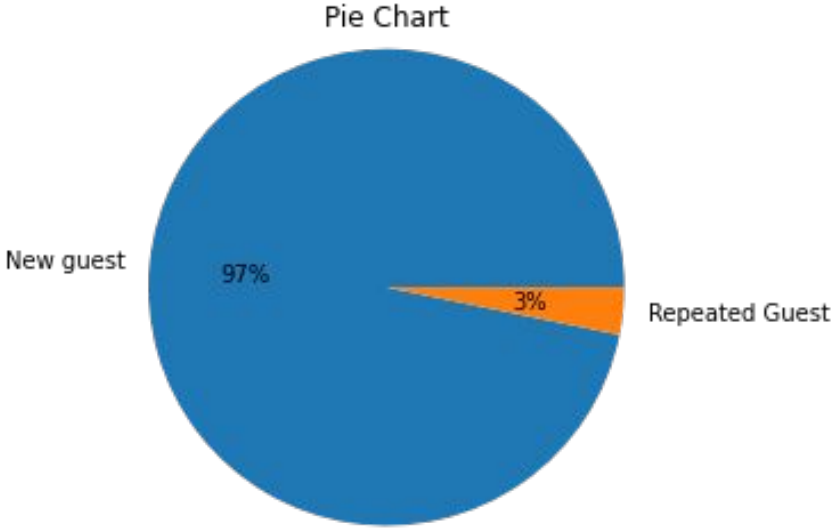
Assigning a better room drastically reduce the cancellation rate. So, if possible we offer a better room when the customer is planning to cancel the booking.



5.How often does the repeated guest cancel the booking?

We noticed that number of repeated guests are low, but the repeated guests have a very low rate of cancelations.

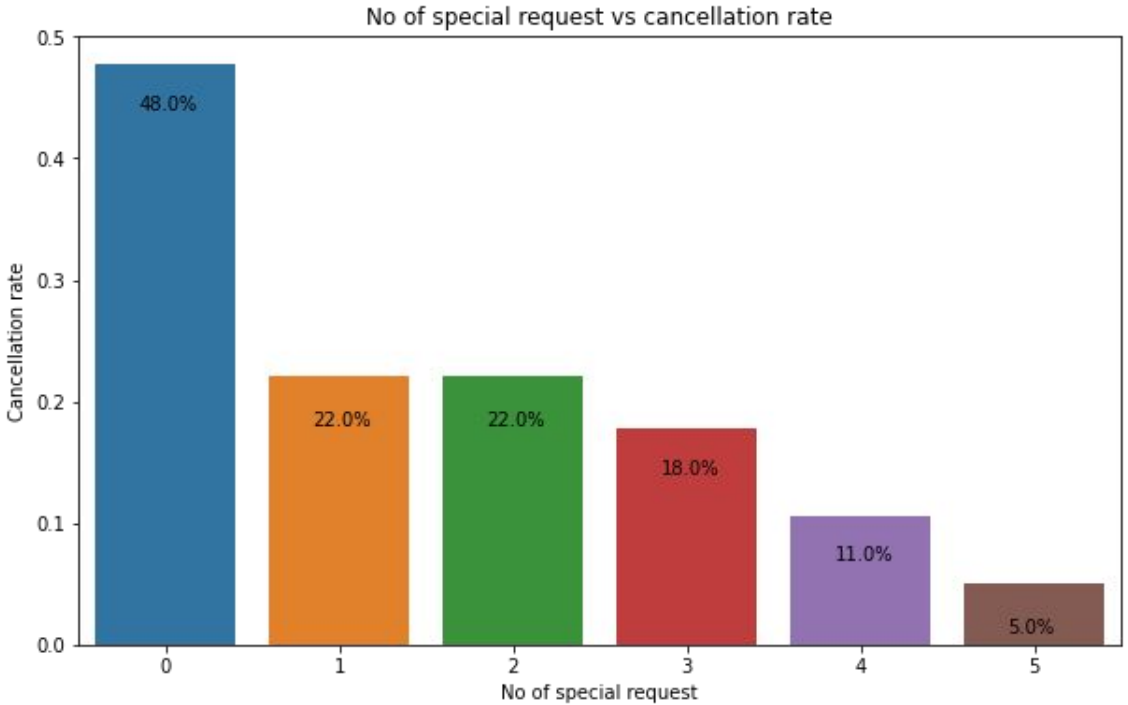




Coming up with a strategies to change a new customer into returning customer is one of the key ways to reduce the cancellation rate.

6.Does special requests decrease the cancellation rate?

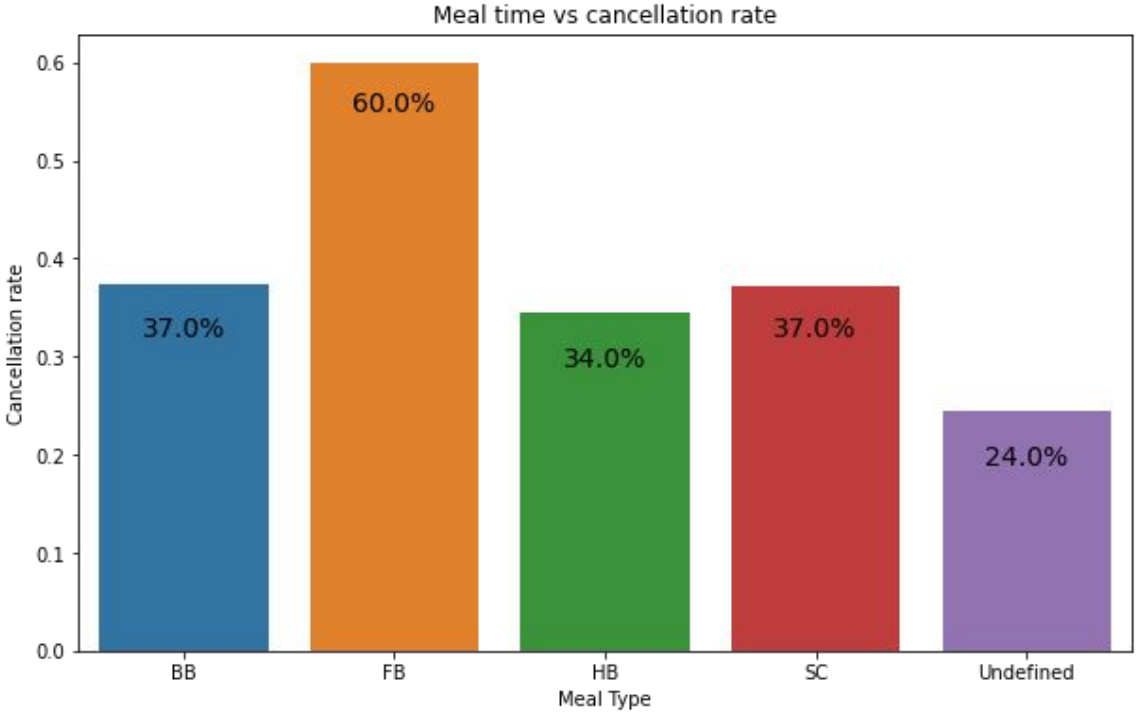
We notice that the cancellation rates are much lower if there are special requests.



Marketing campaigns must specify on the options we provide for special books so has to attract more of such bookings that can have lower cancellations rates.

7.Which type of meal type bookings have highest cancellation rate?

We noticed that Full board bookings had the hight rate of cancellations and other meal type showed a simliar rate.



There is no significant effect on cancelations from type of meal. Providing discounts on full board booking might help in reducing cancellations.

Conclusions and Inferences

After analysing our data we found out some important conclusions:

1. The peak seasons for the hotel are July and August and off seasons are January and December
2. The ADR varies with the peak seasons, ADR is higher for peak seasons and lower for off seasons.
3. Most of the customers are from Western European countries and mode of booking chosen is Travel Agents and Tour Operators.
4. Weekends are more busy and usually people stays in a hotel for less than 5 days.
5. It doesn't matter if hotel has parking space. Most people doesn't consider it as a preference while booking hotels.
6. As per marketing strategy, we should provide offers to the visitors like Family/Group of people.

7. We can conclude that people book city hotels more and also tend to cancel it easily, and people book resort hotels less but once book they do not cancel it easily.
8. Here we noticed a similar trend as in type of hotel. The more the number of bookings from a single type of customers, higher is the tendency to cancel and vice versa.
9. Being liberal on allowing customers to change their bookings can help in reducing the cancellation rate. However it is better to limit is to 5.
10. Coming up with a strategies to change a new customer into returning customer is one of the key ways to reduce the cancellation rate.
11. Marketing campaigns must specify on the options we provide for special books so has to attract more of such bookings that can have lower cancellations rates.

Thank You