Capstone Project – 1

Hotel Booking Analysis

Team Members

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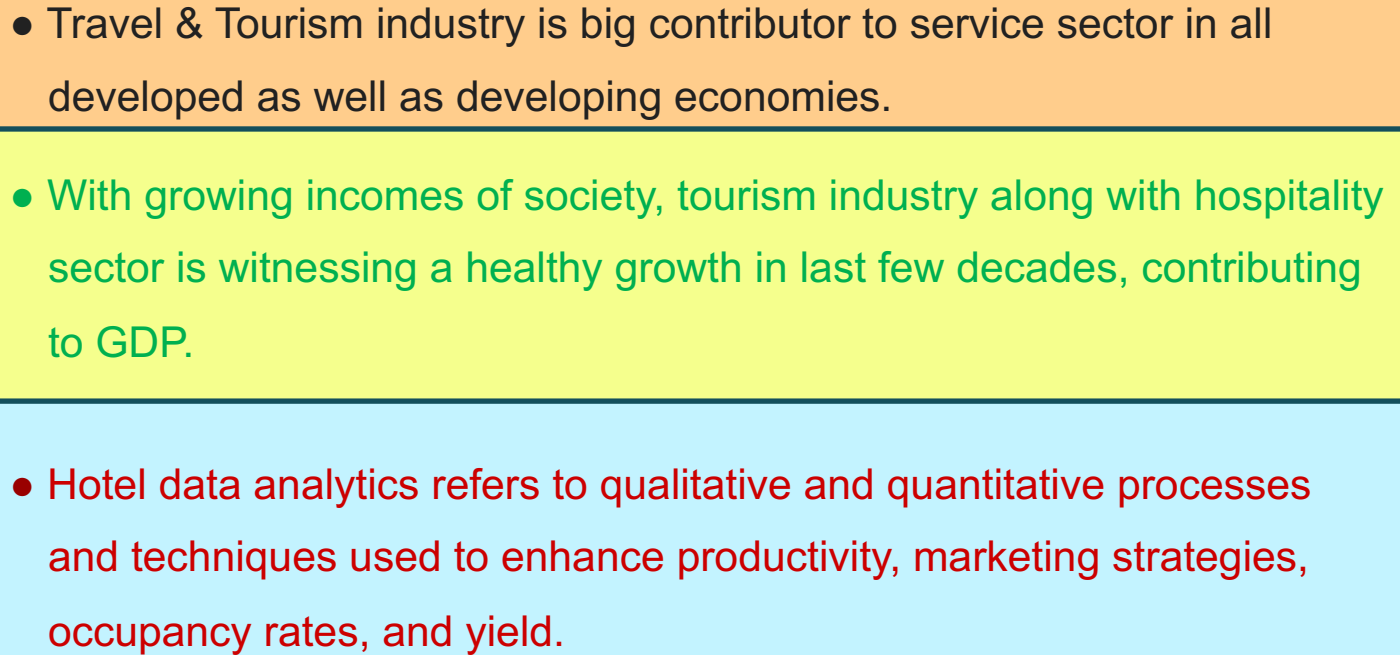# CONTENTS:

1) Problem statement

2) Data Analysis: Preparing dataset

3) Visualization of dataset

   - *Booking & Cancellation of different hotel types*

   - *Home countries of guests*

   - *Year & Month wise analysis*

   - *Hotel room price variation with different factors*

   - *Meals, Room type and Parking Space requirement*

   - *Lead Time*

4) Summary

5) Conclusion

Why Hotel Booking Analysis?

- Travel & Tourism industry is big contributor to service sector in all developed as well as developing economies.

- With growing incomes of society, tourism industry along with hospitality sector is witnessing a healthy growth in last few decades, contributing to GDP.

- Hotel data analytics refers to qualitative and quantitative processes and techniques used to enhance productivity, marketing strategies, occupancy rates, and yield.

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EXPLORATORY DATA ANALYSIS

Preparing Data Set

- Libraries used in Hotel booking:

  - NumPy (*for numerical arrays*),

  - Pandas (*powerful analysis tool*),

  - Seaborn, Matplotlib and Plotly (*to plot graphs*)

- Shape: 119390, 32

- ***Null values*** present in columns: company, agent, country & children – ***Removed.***

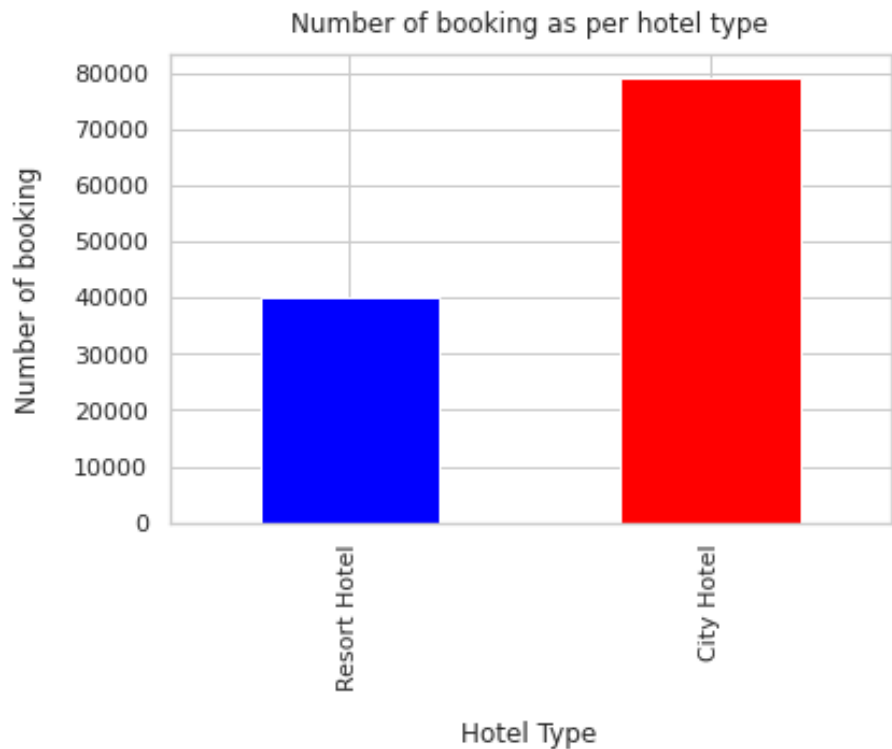- Removed rows where adults, children & babies all are zero (180 rows).

VISUALIZATION OF DATA

Correlation between columns using Heatmap
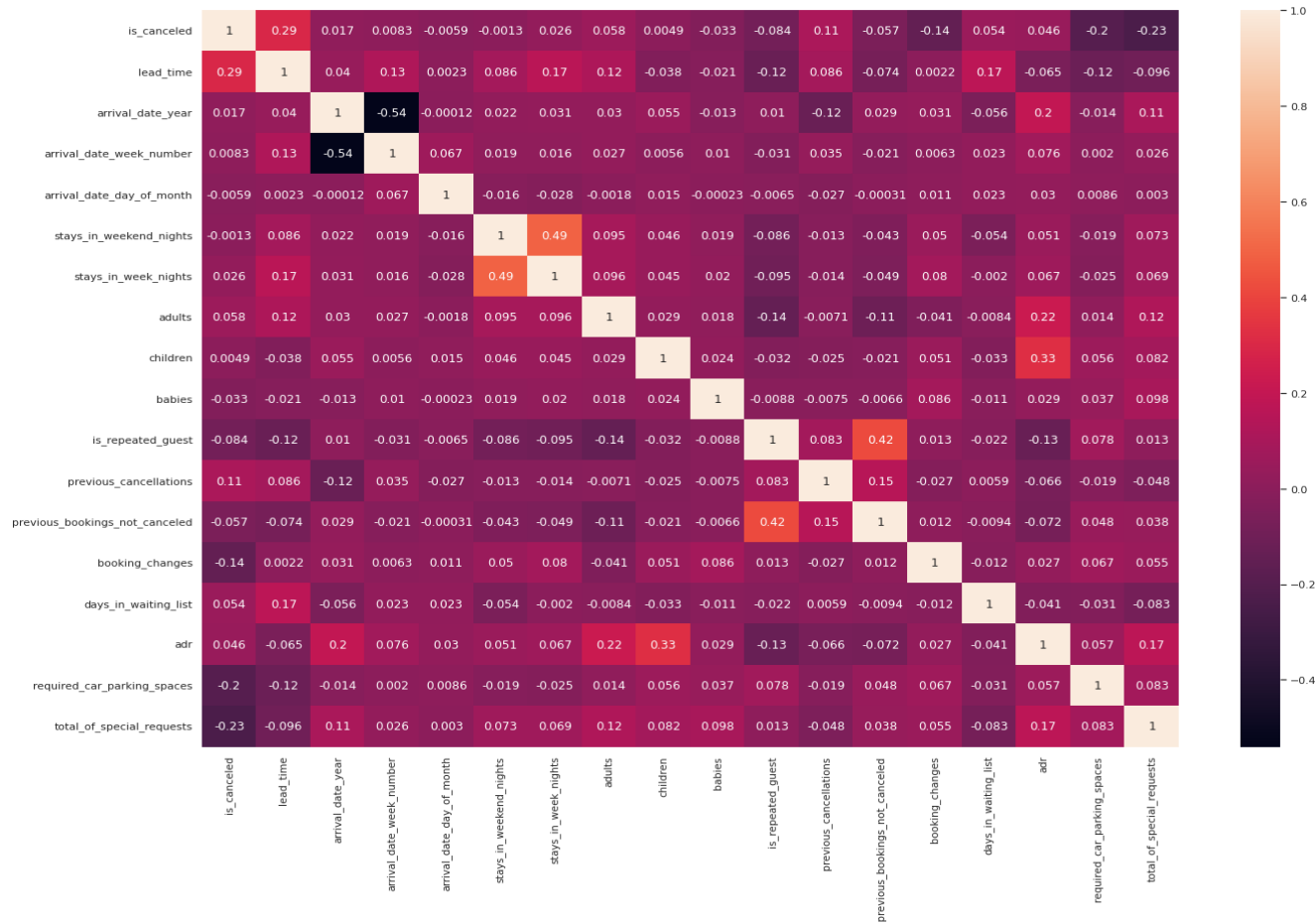
Heatmap depicts that there's no correlation between parameters.

Bookings in different types of hotels?

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Number of booking as per hotel type

- Dataset has 2 types of hotels: City & Resort hotel

- Bookings:

  - Resort: ~ 40000

  - City: ~ 80000

- City hotels are booked almost twice as Resort hotels.

- Most people prefers to stay in City hotel as compared to Resort hotel.

How many people cancelled their bookings?

Bookings: Cancelled and not cancelled
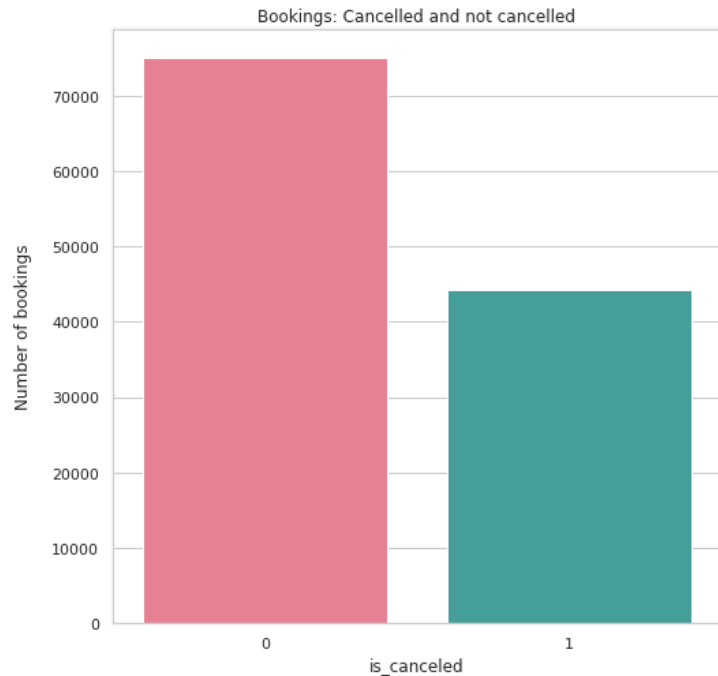
- 0 represents Bookings not cancelled
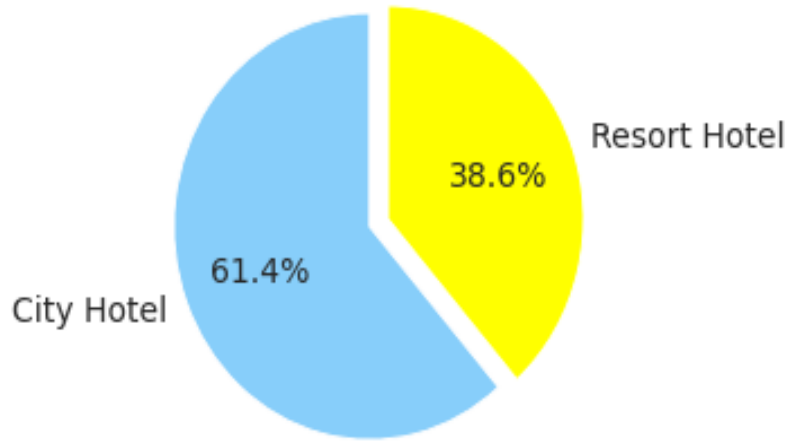- 1 represents Cancelled Bookings

- Total Bookings: 119210

- Non-cancelled = ~63%; Cancelled = ~37%

- City Hotel is most popular among guests as it was booked the most & got cancelled as well.

Hotel wise Bookings: Cancelled & Not Cancelled

In which hotel most guests are actually staying?

- *Analysing the data only for guests who didn't cancelled their bookings.*

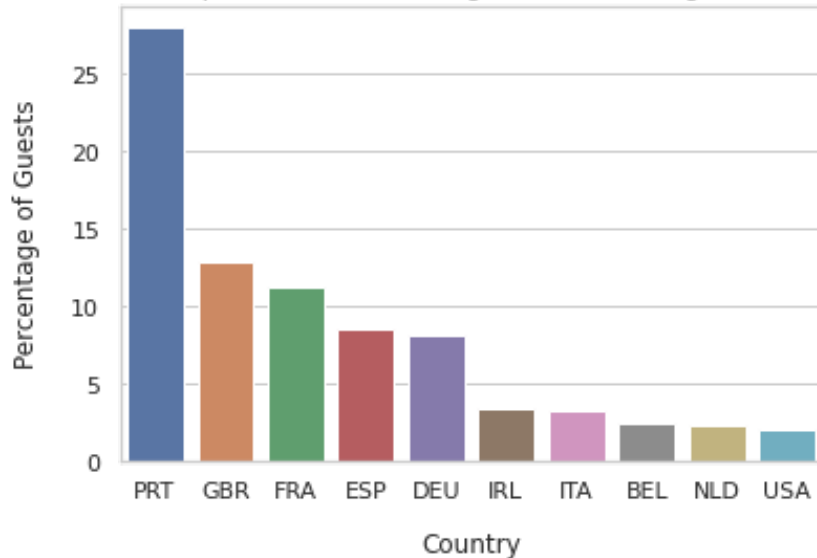
Guests staying in different types of hotel

Almost 46000 (61.4%) guests stayed in City hotels while almost 29000 (38.6%) stayed in Resort hotels.

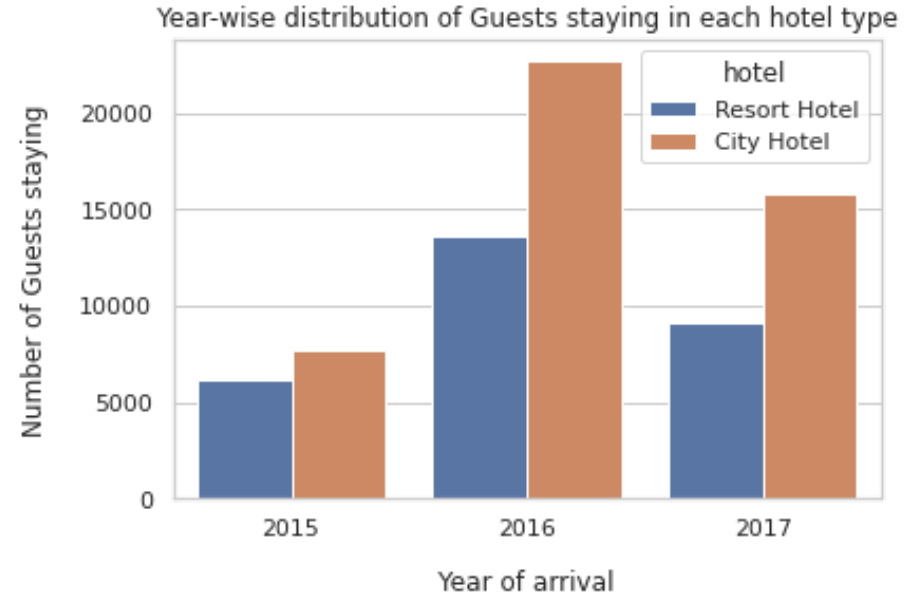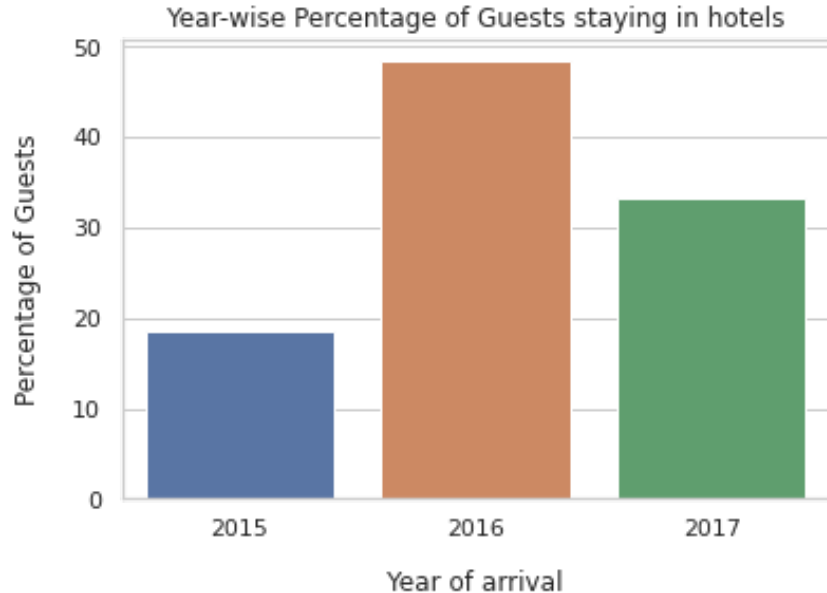# From which country most guests are coming ?

Top 10 Countries most guests are coming from

Most guests come from Portugal (~ 28%), followed by Great Britain (~ 13%), France (11.3%) and other countries.

People from all over the world are staying in these hotels but most tourists are from European countries.

In which year most guests arrive?

- Guests increased by 1.5 times in 2016 compared to 2015; & then decreased by almost 15% in 2017.

- Almost **50% of total guests were in 2016** alone, so it was a good year for hotels for their revenue.

- Number of guests staying in **City hotel remains higher** than resort hotels each year.

In which months most guests arrive?

Total no of Guests per Months
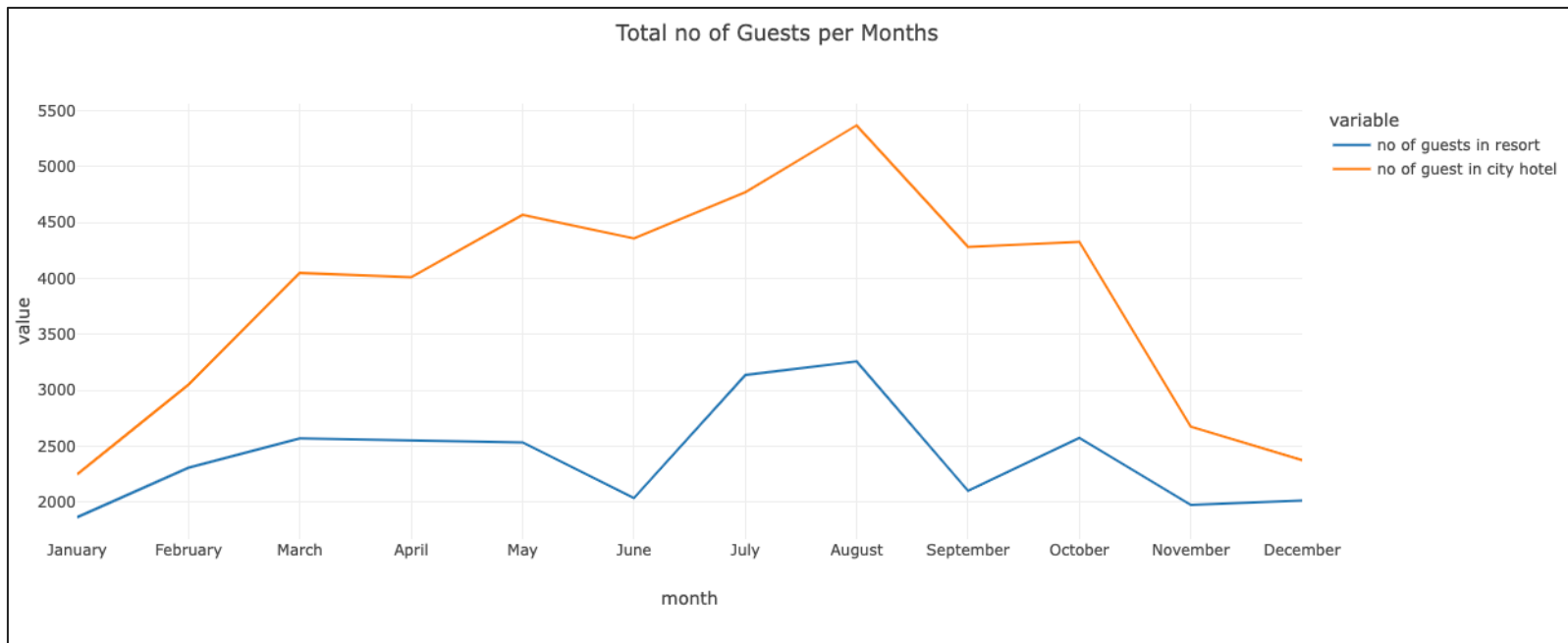
- Both hotels have highest guests in August.
- Both hotels have moderate guests from February to May and in September & October.

Hotel price variation per month over the year?

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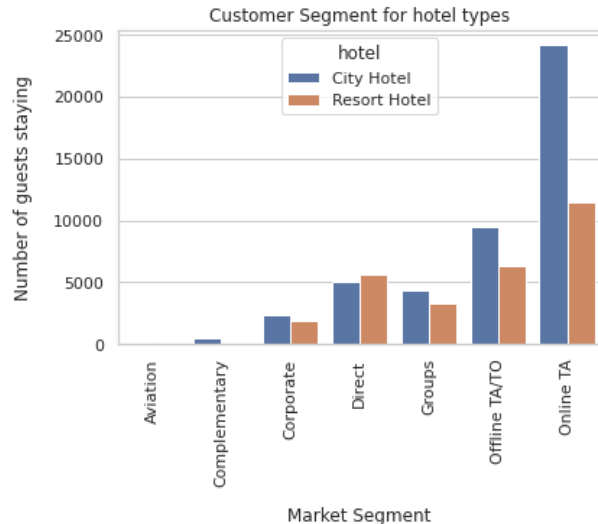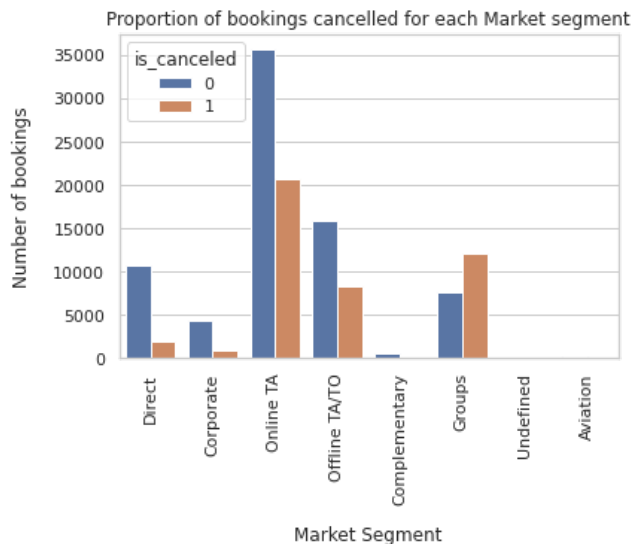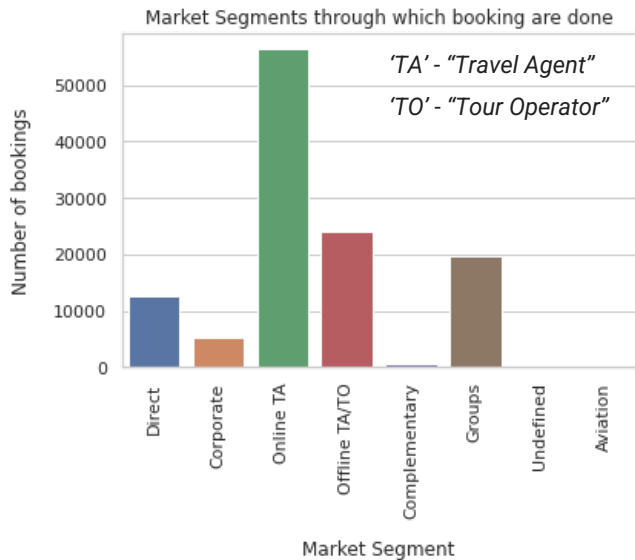Average revenue for each occupied guest room over the Months
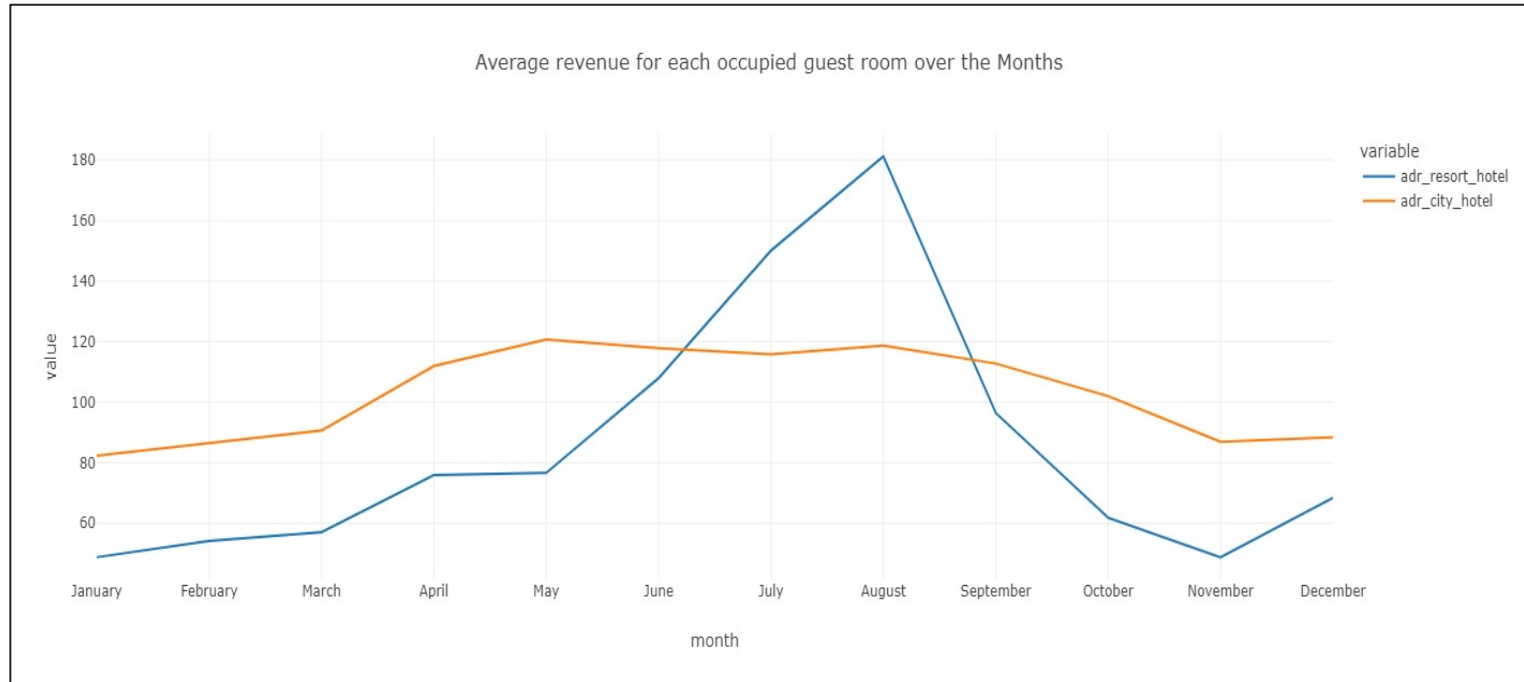
- **Average monthly revenue per room per day (ADR)** for both hotels increases from March.

- ADR of city hotel is around $110 - 120 during summer season.

- ADR in Resort are much higher during summer, *July – August,* reaches a maximum of ***$180,*** .
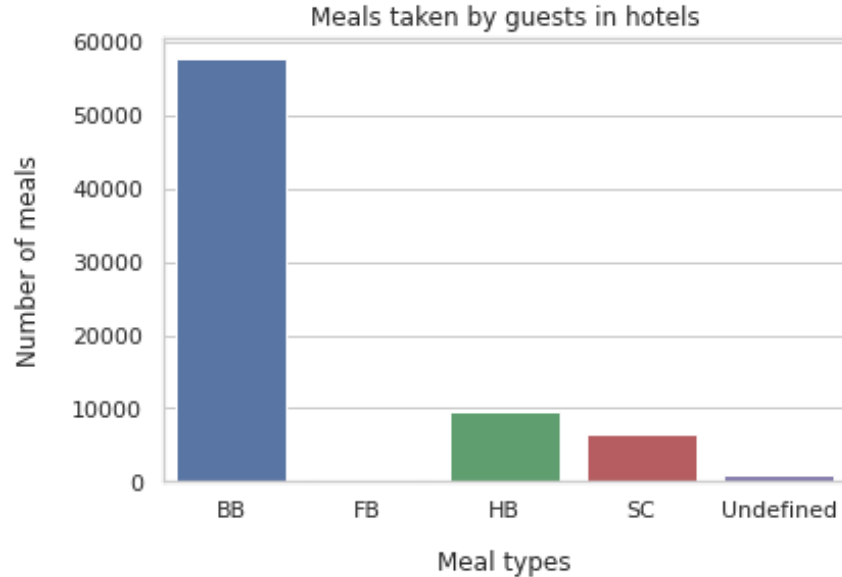
ADR for different types of rooms?
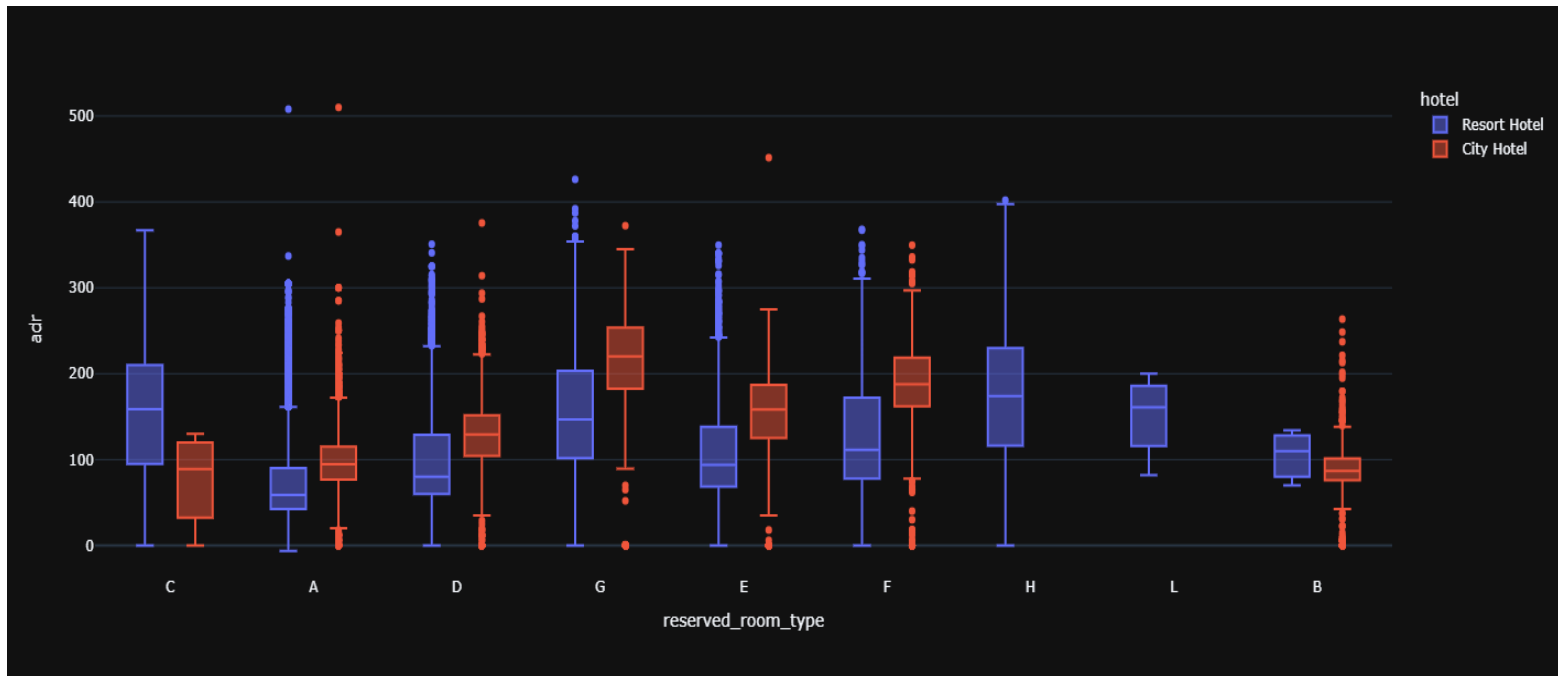
- ADR depends on room type.

- For most room types, ADR of city hotels is generally higher than that of resort hotels.

- Mean of ADR for most rooms lies between $70 - $180, but sometimes increase very high even upto $500.

Market Segments of bookings

Market Segments through which booking are done

'TA' - "Travel Agent"

'TO' - "Tour Operator"

Proportion of bookings cancelled for each Market segment

Customer Segment for hotel types

- Maximum bookings by Online (47.56%) & Offline TA (21.17%); but high cancellation as well for both hotels.

- Cancellations: 'Online TA' is ~ 36%; 'Offline TA' is ~ 33%.

- 'Direct' and 'Corporate' segments have less bookings, but their cancellation rate is also very low.

- 'Group' segment – More than 50% of bookings get cancelled.

- Only direct segment gives more customers to resort hotels, for all others City Hotel has more guests.

Which meals are preferred by guests?


Meals taken by guests in hotels

Meal Types:

- *BB - Bed & Breakfast*
- *FB - Full board (breakfast, lunch & dinner)*
- *HB - Half board (breakfast + lunch / dinner)*
- *Undefined/SC — no meal package*

Bed & Breakfast (BB) is the most common meal (almost 79%) preferred by guests in hotels, followed by Half Board (HB).

How many guests required car parking space?

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Number of car parkings spaces required by guests
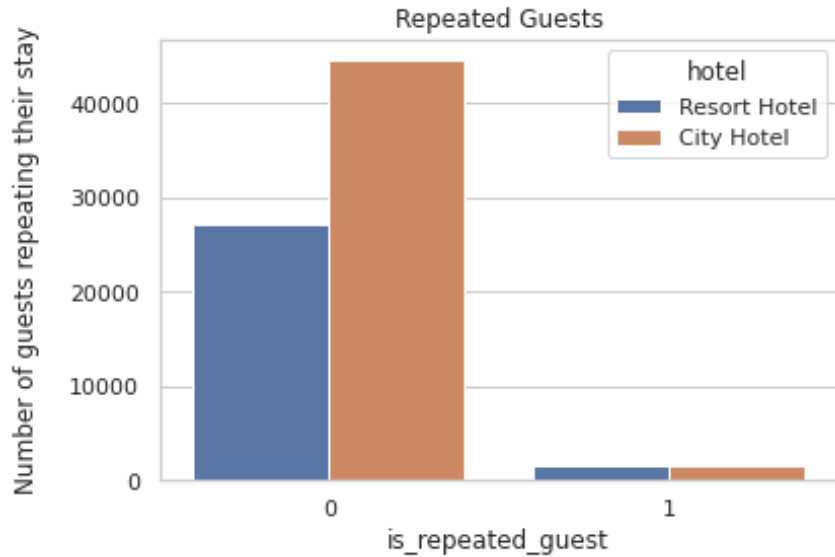

GUEST PARKING ONLY
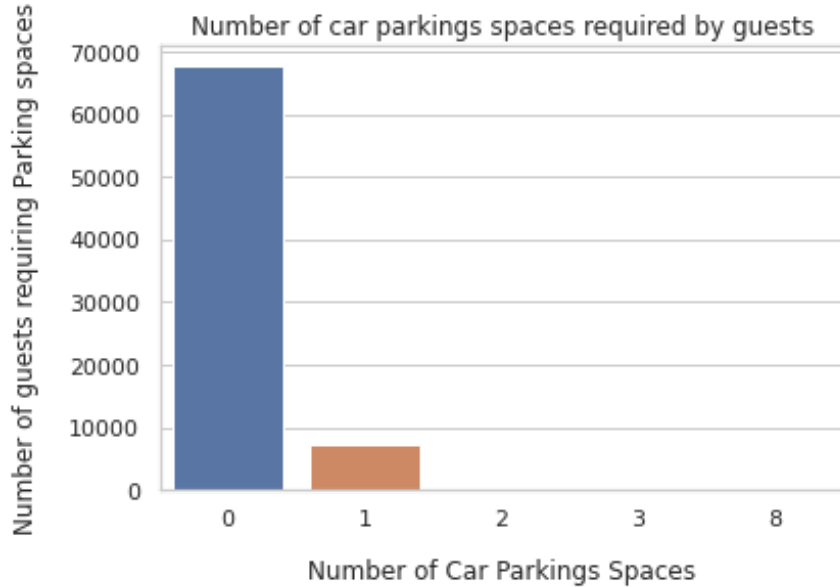
- Majority of guests do not require a car parking space.

- Some guests (around 7000) need parking space for only 1 car.

- Only a few guests need car parking space for 2, 3 or even 8 cars.

required_car_parking_spaces
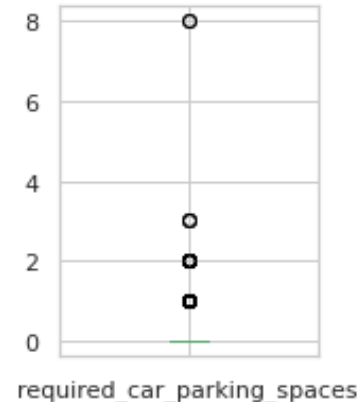
How many guests repeat their stay at same hotel?

- *0 represents stay not repeated*
- *1 represents stay repeated*

- Very few **repeated guests** - *Less than 5% of guests.*
- Percentage of repeated guests in both hotels is almost same.

# Reservation status of guests?

Reservation status of guests

1% of guests didn't check-in and didn't inform the hotel as well that they are not arriving.

Reservation status:

- Cancelled - booking cancelled by guest;
- Check-Out - guest checked in & already departed;
- No-Show - guest didn't check-in & didn't inform hotel

Booking proportion of different room types

Guests staying in different room types
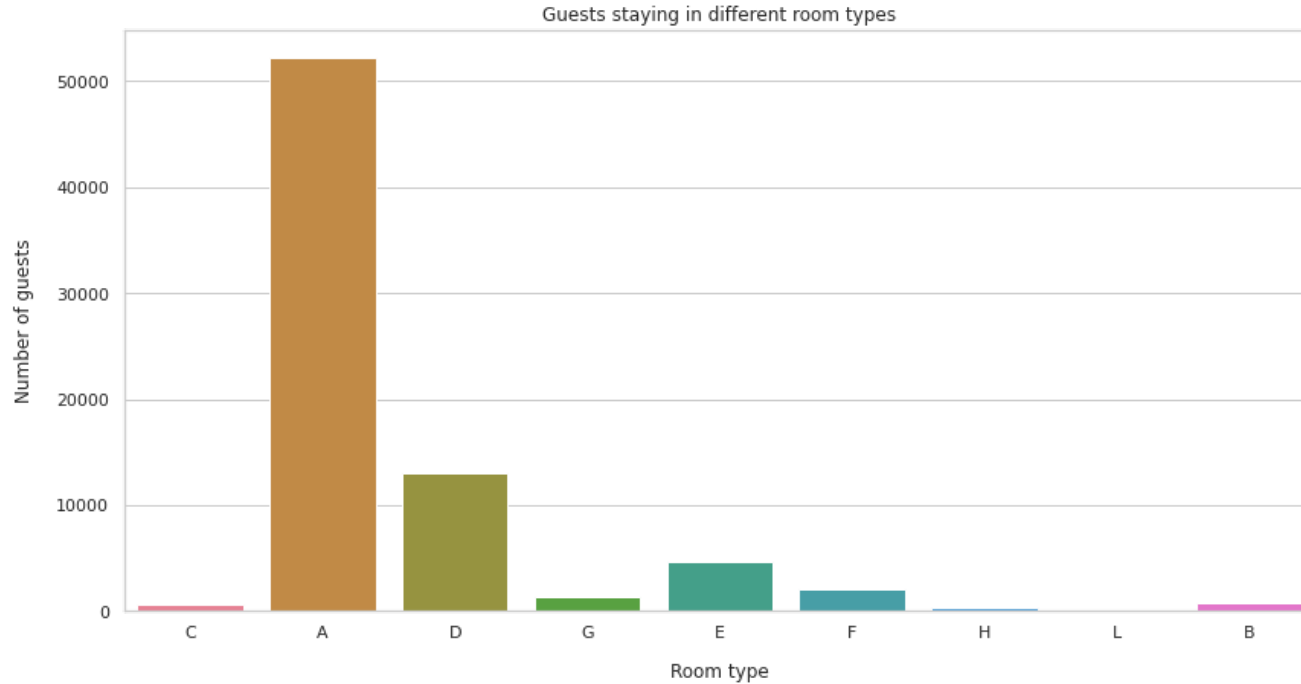
70% of guests prefer to stay in 'A' type rooms, & 17% guests stay in 'D' type rooms.

Deposit made at the time of booking

Number of bookings & cancellations with different Deposit types
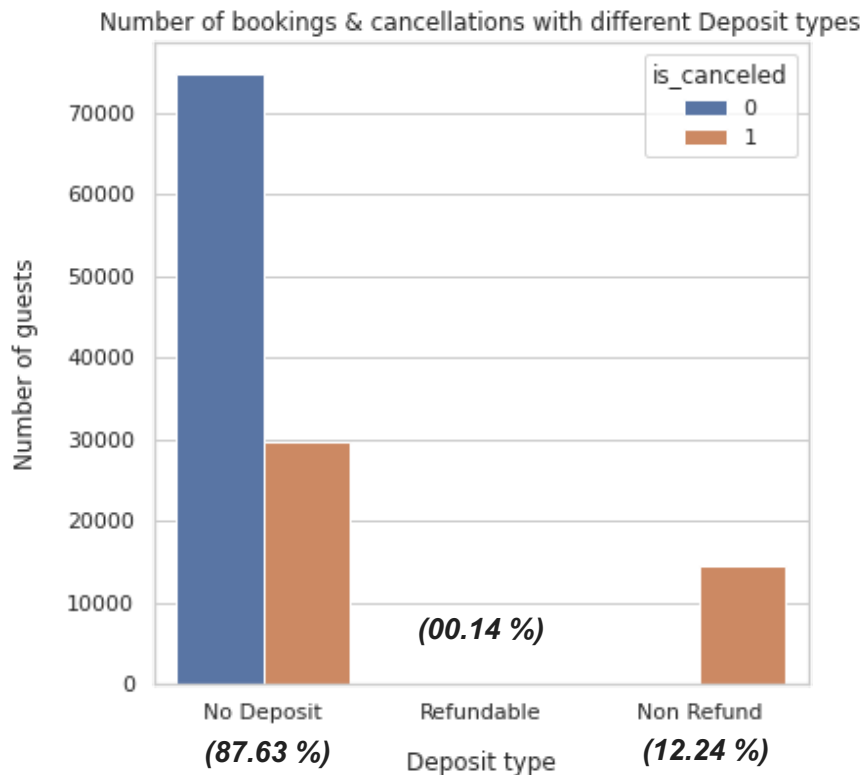
Most customers book 'No Deposit' rooms, and these bookings also gets cancelled the most.

'Refundable' deposit type bookings are very less; may be due to fact that refundable bookings are costlier than non-refundable.

Almost no cancellations with 'Refundable' bookings, while almost all 'Non-refundable' deposit type bookings got cancelled.

Thus 'Non-refundable' booking doesn't guarantee that booking won't get cancelled.
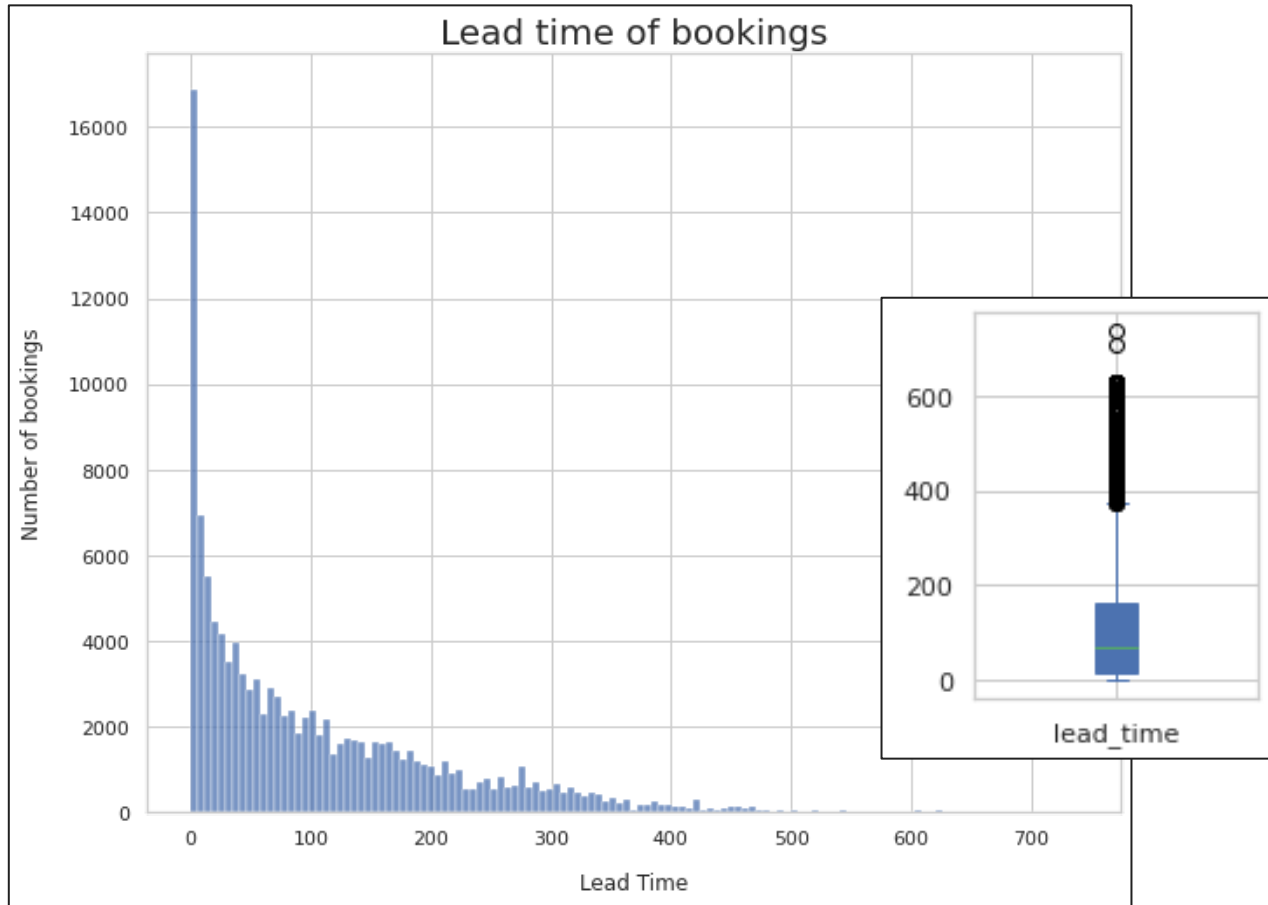
How many guests stay with children?

No of children with guests
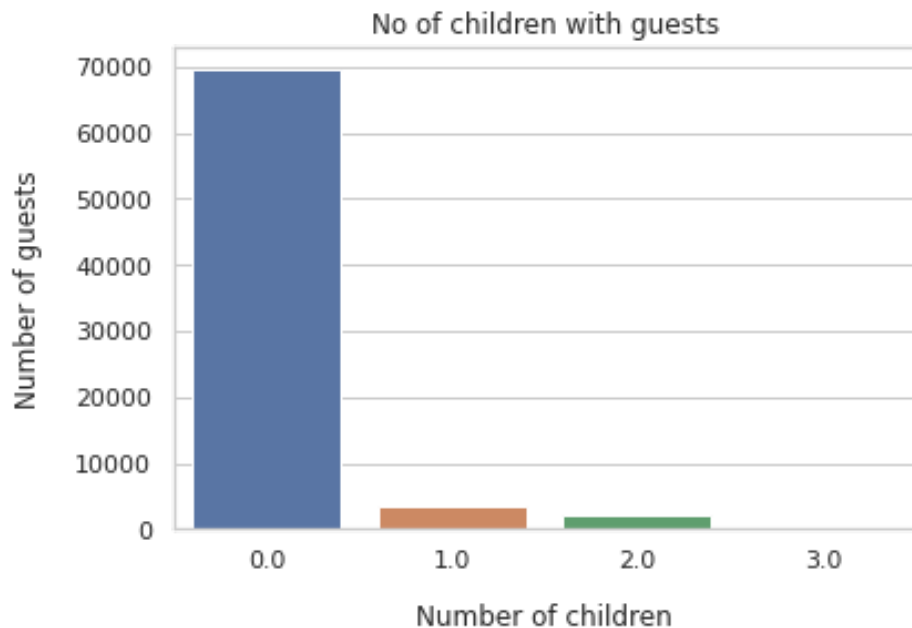
4% of guests have 1 child and **3% guests have 2 children**.

More than 92% of guests staying in hotels are without any children.

Lead Time of Bookings

Lead time of bookings

- Most guests book hotels on the same day of check-in.
- Number of bookings decreases as lead time increases.
- Lead time of maximum bookings is < 200 days, with some outliers where lead time > 600 days.

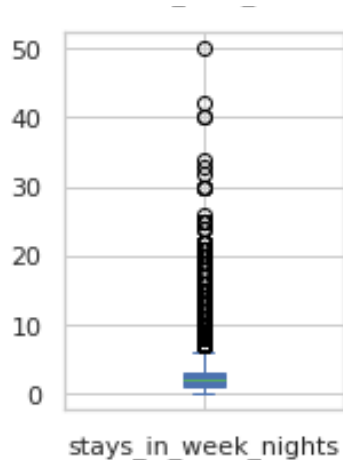# Lead Time versus Cancellation

Lead time versus cancellation
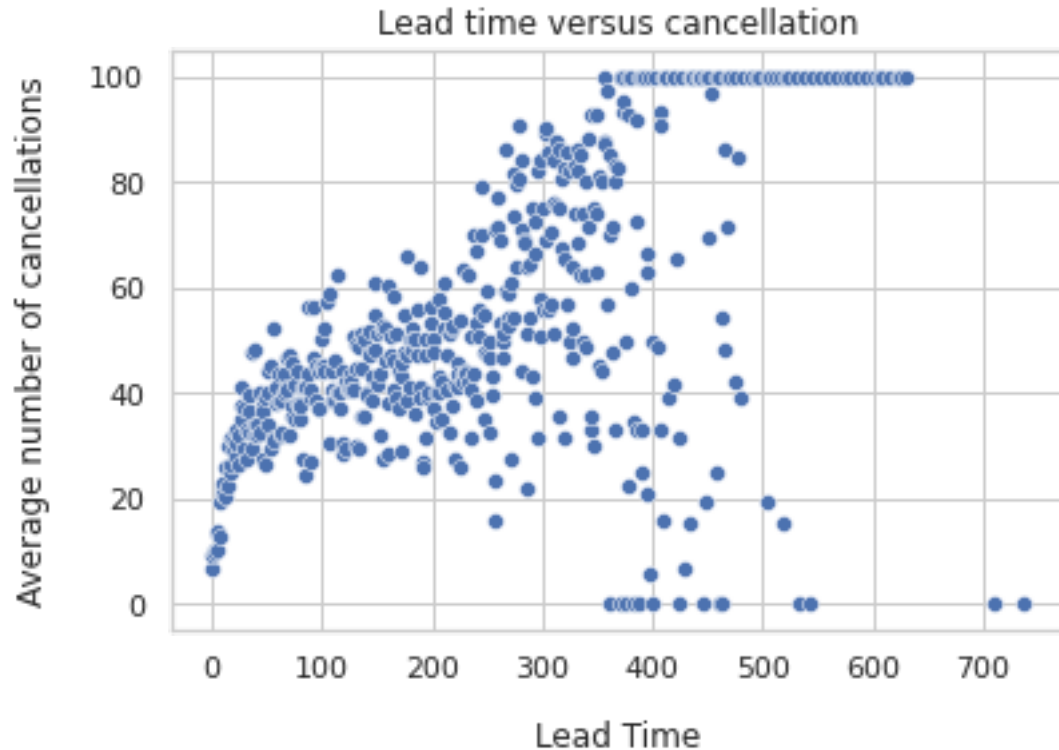
More the Lead time (time between booking & check-in day), higher the chances of booking getting cancelled.
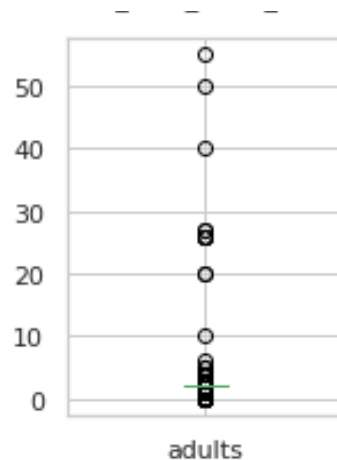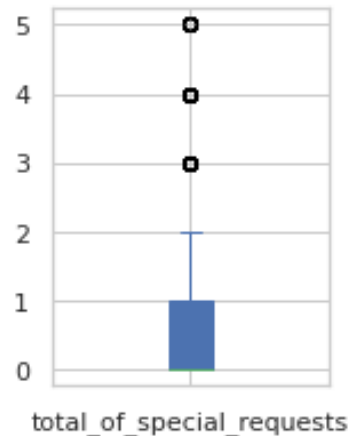
Analyzing Outliers
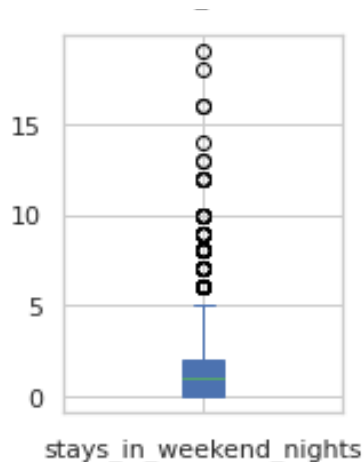
Maximum weekend night stays are of less than 5, with few outliers of even > 15 nights.

Maximum week-night stays are also of less than 5, with few outliers of even > 30 nights.

Maximum bookings are for < 5 adults; with few exceptions where adults > 10.

Generally, there are 0 or 1 special requests, with few bookings where special requests > 2.

SUMMARY

- **Hotel room prices** are **most affected by seasonality,** prices surge to **maximum** in summer season (*July-August*); but certain other parameters, like **room types, meal arrangements** also **affect** the hotel **pricing.**

- Hotels have **maximum customers in Summers** (*June –August),* probably because **people go for vacation**. So, hotels should be prepared with **adequate staff & services**.

- **Winter** is a **lean period** for hotel business; thus, hotels can provide **winter discounts** and **offers** to boost their business.

- Most people **plan** their stay **1-3 months in advance**. So, hotels should **advertise a few months before peak season** when most people book hotels.

- Most customers **don't want to repeat their stay** at same hotel. Hotels should provide **special discounts** and coupons **for next visit**.

SUMMARY

- **Most** guests are **without children**, so there can be some **discounts for couple** stays.
- **City hotels** are **booked almost twice** compared to Resort hotels.
- **Cancellation** rate is **very high**, hotels should **find out the reasons and improve facilities** to minimize the cancellations.
- **Maximum** number of **bookings** is through *Travel Agents* by *Online mode.* Hotels should conduct **promotional events** and more discounts to **encourage other booking modes**.
- **Most** of the **guests** are **from European countries**; hotels should **advertise discounts, seasonal offers** in **these countries** to attract more customers.
- **Maximum guests** stay in *'A' type room*, services & facilities in others should be improved.
- **2016** was a **good year** for hotel industry, where they generated maximum revenue.
- Customers with *'No Deposit'* **cancels the most**, thus hotels should **charge a significant deposit** at time of booking.

CONCLUSION

- Travel & **Hospitality** is a very **seasonal business**, and revenue generation is very low during certain months of the year.

- Hotels should plan a **proper growth strategy** and should focus on increasing sales by promoting **seasonal discounts, special discounts** for **repeated & first-time customers, couple discounts** and so on.

- Taking insights from lead time, hotel *marketing & advertising team* should focus on promoting these discounts and reaching to customers few months before peak season.

- Hotels should get a '*customer satisfaction feedback'* & improve their services and facilities to make guests' **stay** more **pleasant and comfortable**.

- Hotels should organize *group games, bone-fire, parties at evening* to make **stay more enjoyable** for guests.

THANK YOU

PLEASE VISIT AGAIN !