



# **Hotel Business Data Visualization**

Presented By Radisha Fanni Sianti



## About Me

"I am a fresh graduate of Master of Statistics and Bachelor of Mathematics from Institut Teknologi Sepuluh Nopember. I have a passion for continuing to learn and develop myself by constantly trying to broaden my knowledge in statistics and other related disciplines. I'm enthusiastic about deriving valuable insights from data and leveraging them to facilitate well-informed decision-making."



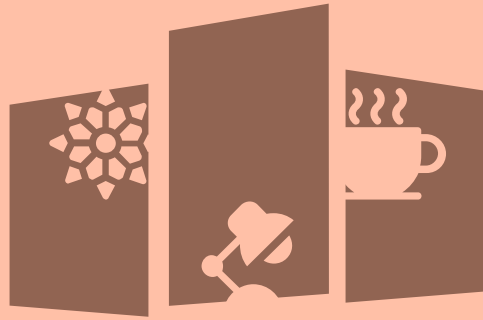
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# Overview



## HOTEL BUSINESS



# Overview

Assessing business performance regularly is very crucial for a company. This project will carry out an in-depth analysis of business operations in the hotel sector.

The main goal of this project is to explore information about how customer behavior impacts the hotel booking process, including its correlation with booking cancellation rates.

The results of the insights obtained will be conveyed through a visual representation of the data to facilitate understanding and increase its persuasive power.

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# Data Preprocessing



# Data



## hotel\_bookings\_data.csv

#	Column	Non-Null Count	Dtype
0	hotel	119390 non-null	object
1	is_canceled	119390 non-null	int64
2	lead_time	119390 non-null	int64
3	arrival_date_year	119390 non-null	int64
4	arrival_date_month	119390 non-null	object
5	arrival_date_week_number	119390 non-null	int64
6	arrival_date_day_of_month	119390 non-null	int64
7	stays_in_weekend_nights	119390 non-null	int64
8	stays_in_weekdays_nights	119390 non-null	int64
9	adults	119390 non-null	int64
10	children	119386 non-null	float64
11	babies	119390 non-null	int64
12	meal	119390 non-null	object
13	city	118902 non-null	object
14	market_segment	119390 non-null	object

15	distribution_channel	119390 non-null	object
16	is_repeated_guest	119390 non-null	int64
17	previous_cancellations	119390 non-null	int64
18	previous_bookings_not_canceled	119390 non-null	int64
19	booking_changes	119390 non-null	int64
20	deposit_type	119390 non-null	object
21	agent	103050 non-null	float64
22	company	6797 non-null	float64
23	days_in_waiting_list	119390 non-null	int64
24	customer_type	119390 non-null	object
25	adr	119390 non-null	float64
26	required_car_parking_spaces	119390 non-null	int64
27	total_of_special_requests	119390 non-null	int64
28	reservation_status	119390 non-null	object

# Data Preprocessing



## Handling Missing Value

### Missing Value (%)

<b>company</b>	<b>94,307 %</b>
<b>agent</b>	<b>13,686 %</b>
<b>city</b>	<b>0,409 %</b>
<b>children</b>	<b>0,003 %</b>

Replace missing values according to data type. Integer and float data types are filled with 0 and object data types are filled with "unknown".

## Handling inappropriate values

### unique value in the meal column



#### Before

Breakfast  
Full Board  
Dinner  
No Meal  
Undefined

#### After

Breakfast  
Full Board  
Dinner  
No Meal

## Handling Unnecessary Data

### Feature Engineering

$$\frac{\text{adults} + \text{children} + \text{babies}}{\text{total\_guests}}$$

There is data that has total\_guest = 0. This data can be deleted so it does not need to be analyzed.

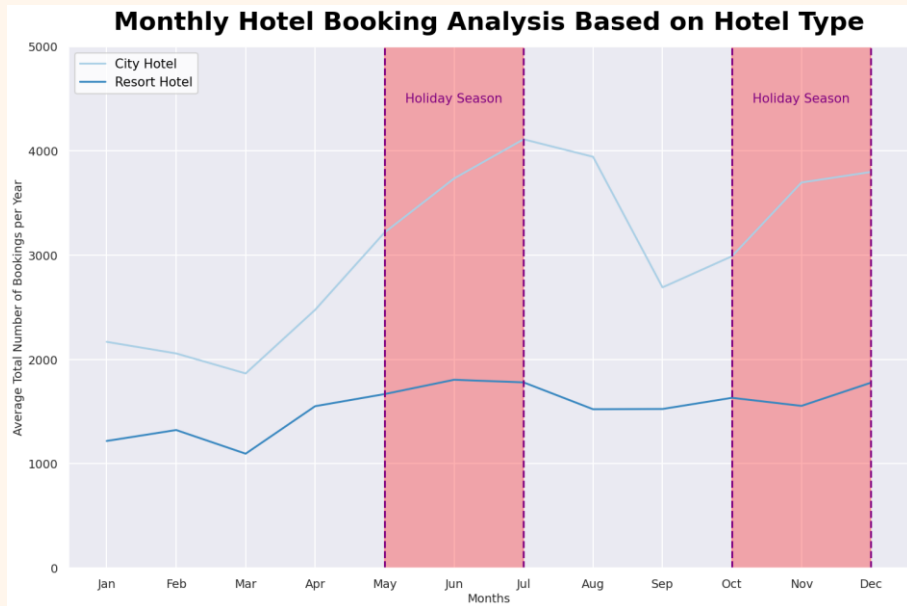




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## **Monthly Hotel Booking Analysis Based on Hotel Type**

# Monthly Hotel Booking Analysis Based on Hotel Type



1

## Average Total Booking

The average total booking for a City Hotel is greater than a Resort Hotel.

2

## Increase in Total Booking

Increased number of bookings in June and July at both types of hotels in the holiday season

3

## Decrease in total bookings

Decrease in total City Hotel bookings during June-September

# Insights and Recommendations



- The difference in average total bookings between Resort Hotels and City Hotels indicates that City Hotels may have a higher attractiveness or booking policy than Resort Hotels. It could result from City Hotel's more strategic location, complete facilities, or a more attractive pricing policy for customers. To improve the performance of Resort Hotels, it is necessary to consider strategies to attract more customers or improve marketing efficiency to equal City Hotels' total bookings.
- The increase in the number of bookings in June and July at both types of hotels, City Hotels, and Resort Hotels, appears to be correlated with the Hari Raya holiday season and school holidays. Many people take advantage of this vacation to travel and stay at hotels. As a result, these hotels may need to anticipate surges in demand during this period by preparing more facilities and staff to serve customers well. It could also be an opportunity to increase special marketing during this holiday season to attract more guests and increase hotel revenue.
- There was a significant decline in bookings in August and September at City Hotels, which may be because these months are not peak season. Therefore, to reduce susceptibility to seasonal fluctuations, City Hotels may need to develop stronger marketing strategies to attract guests outside the holiday season. It could include special offers or promo packages to entice tourists during the low months.

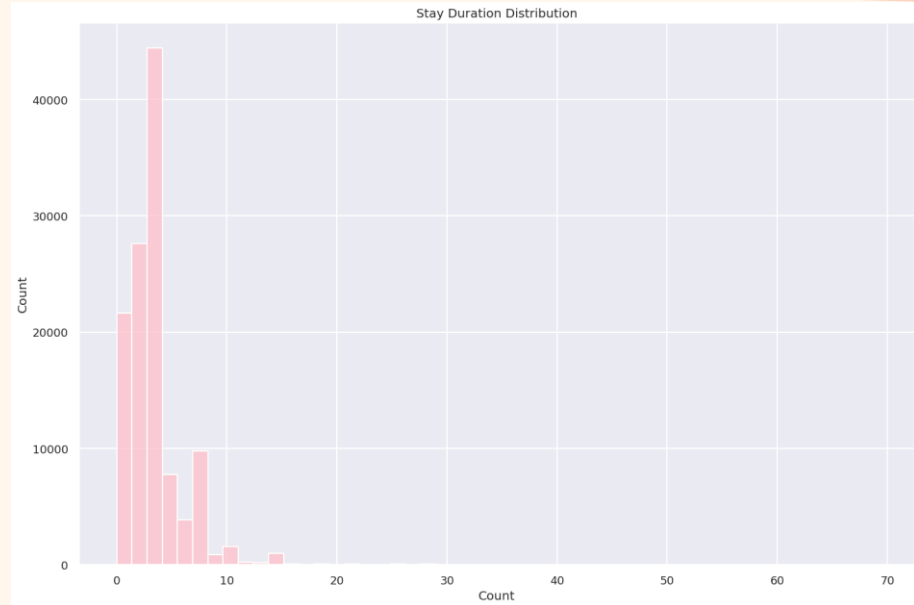
# ***Impact Analysis of Stay Duration on Hotel Bookings Cancellation Rates***

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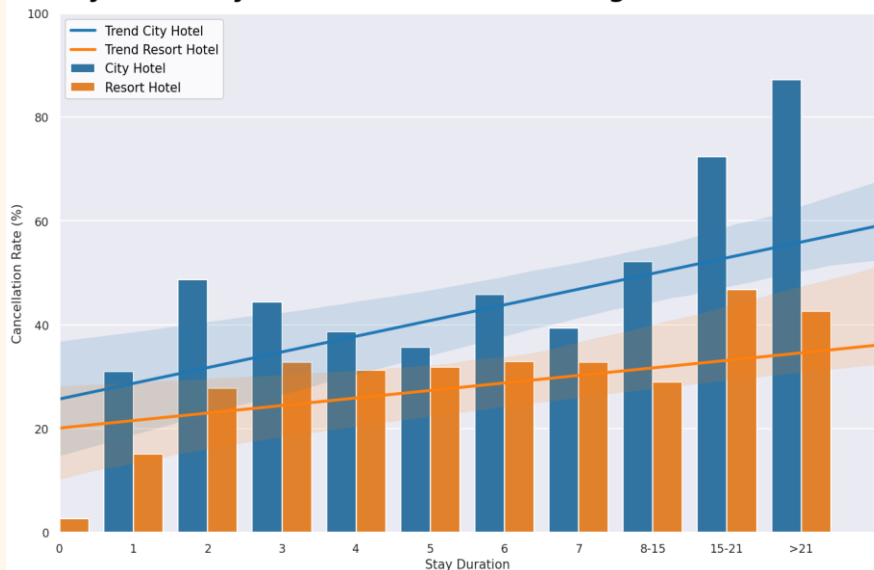
## Distribution Plot of Stay Duration

- The stay duration distribution plot has a positively skewed distribution
- With a positively skewed distribution, most guests tend to stay for a short time. It can be seen from the fact that the peak of the distribution, i.e., the value with the highest frequency, is located to the left of the graph, indicating that many guests make short stays.



# Impact Analysis of Stay Duration on Hotel Bookings Cancellation Rates

Analysis of Stay Duration on Hotel Bookings Cancellation Rates



1

## Positive relationship

The longer the guest stays, the higher the possibility of hotel reservation cancellations.

2

## City Hotel's cancellation rate is high

City Hotel experienced a higher positive trend in increasing cancellation rates as length of stay compared to Resort Hotel.

# Insights and Recommendations



- The positive trend in both types of hotels, City Hotels, and Resort Hotels, indicates that the longer a guest stays, the higher the probability of a hotel reservation cancellation rate. It could mean that longer guests may have more uncertain travel plans, making them more likely to cancel their booking. To combat this, hotels may need to take action, such as increasing cancellation policies that are more flexible for guests booking for a more extended period or offering special incentives to encourage guests to keep their bookings.
- The analysis shows that City Hotels experience a steeper positive trend in increasing cancellation rates as the length of stay increases compared to Resort Hotels. To counter this trend, City Hotels may need to review the cancellation policies and special offers provided to guests booking for a long time. It could include providing additional incentives or a friendlier cancellation policy to guests with extended stays. On the other hand, Resort Hotels may need to consider specific strategies to attract guests to stay longer and reduce the possibility of cancellation.



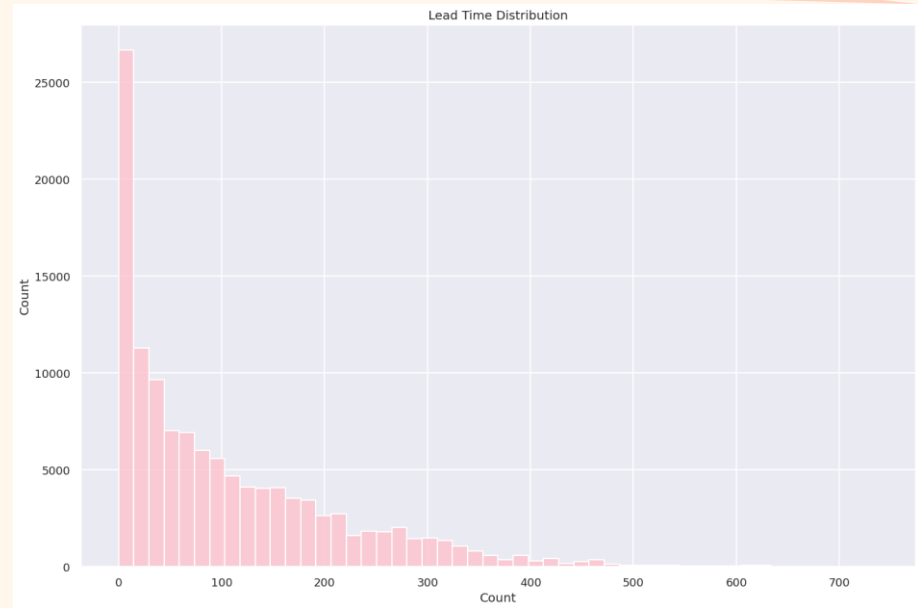
# **Impact Analysis of Lead Time on Hotel Bookings Cancellation Rate**

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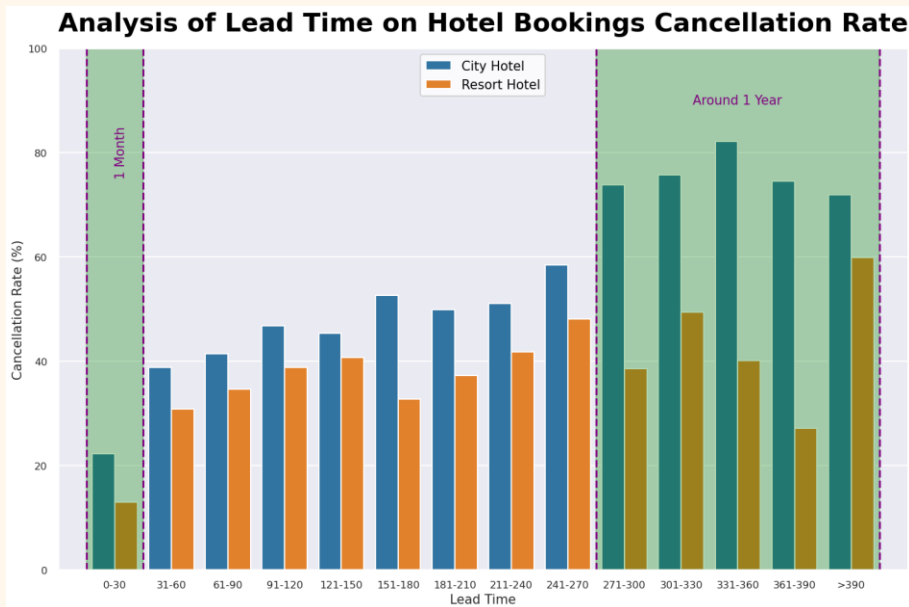


## Distribution Plot of Lead Time

- The lead time distribution plot has a positively skewed distribution
- With a right-skewed distribution, most hotel bookings occur within a relatively short period before the arrival date. It shows that many guests make reservations close to their arrival.



# Impact Analysis of Stay Duration on Hotel Bookings Cancellation Rates



1

## Lowest Total Booking cancellation rate

Occurs when the waiting time is less than 30 days, applies to City Hotel and Resort Hotel.

2

## In a One Year

Resort Hotel booking cancellation rates remain stable at around 40%. Meanwhile, City Hotels have a fairly high risk of cancellation of around 60%

3

## More Than One Year

City Hotel booking cancellation rates are still high, around 80%.

# Insights and Recommendations



- The lowest order cancellation rate occurs when the waiting time is less than 30 days, which applies to City Hotels and Resort Hotels. It shows that guests who make short-term bookings tend to be more committed to their plans, so their chances of cancellation are lower. It can be valuable information for hoteliers to optimize their cancellation policies and marketing strategies. There may be opportunities to provide special incentives or more attractive offers to booking guests soon to reduce cancellation rates and increase booking rates.
- Over one year, the cancellation rate for Resort Hotel bookings has held steady, at around 40% cancellations. It shows that Resort Hotel guests consistently maintain their bookings during this period. On the other hand, City Hotel has a fairly high cancellation risk, with around 60% of cancellations in the same period. City Hotel management may need further evaluation to identify the causes of high cancellation rates and take appropriate action to reduce the risk.
- In the observation period of more than one year, it can be seen that the cancellation rate for City Hotel bookings is still high, around 80%. It shows that there are significant challenges facing City Hotels regarding guest retention in the long term. City Hotel management may need to conduct an in-depth review of cancellation policies, marketing strategies, or customer service that could help reduce cancellation rates and increase guest retention.

# ***Thanks!***



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