



MENTOR NESS

# HOTEL RESERVATION ANALYSIS WITH SQL

PRESENTED BY MANJIRI SAWANT  
DATA ANALYST INTERN @MENTORNESS

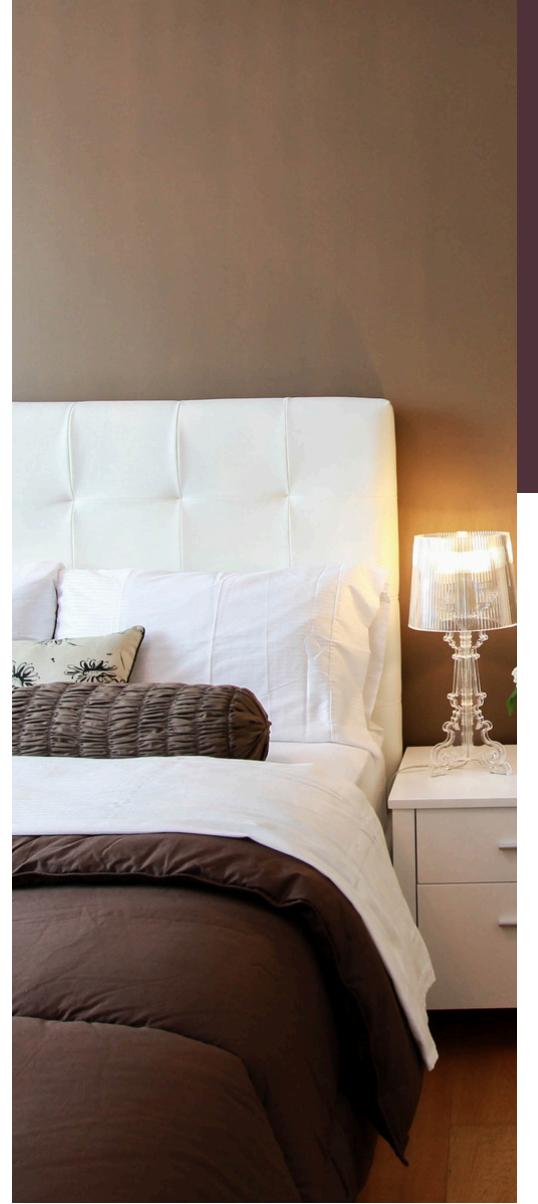




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# Analyzing Guest Behavior and Booking Trends Using Hotel Reservation Dataset

The hotel industry relies on data to make informed decisions and provide a better guest experience. Data analysis plays a crucial role in this process, providing valuable insights that can inform strategic decisions.



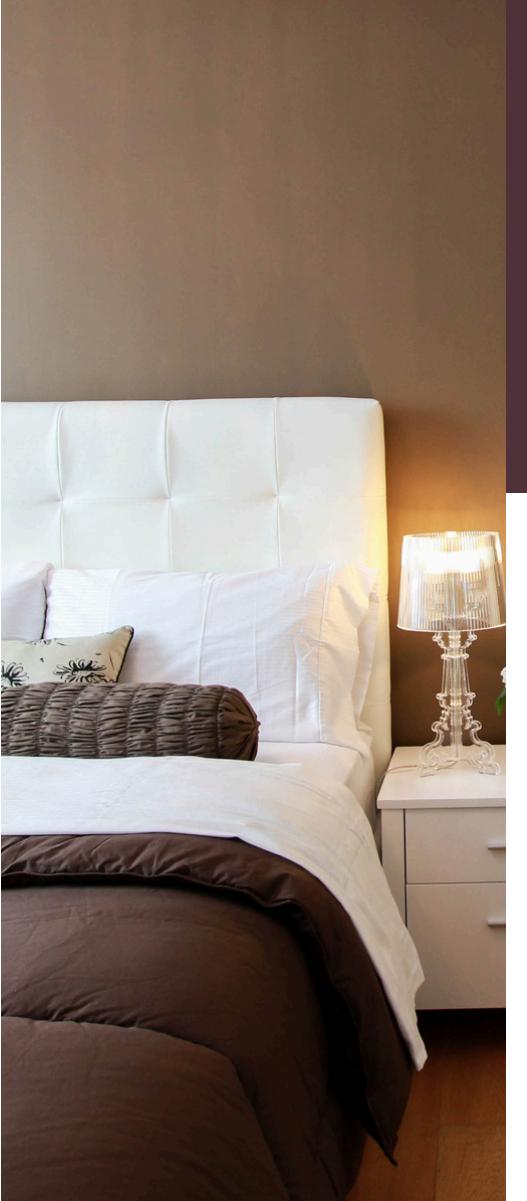


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# Leveraging SQL for Hotel Reservation Insights

Through SQL analysis, we expect to uncover valuable insights such as:

- Popular Room Types
- Optimal Booking Channels
- Seasonal Trends
- Cancellation Patterns





# Dataset Details :

The dataset includes the following columns:

- **Booking\_ID:** A unique identifier for each hotel reservation.
- **no\_of\_adults:** The number of adults in the reservation.
- **no\_of\_children:** The number of children in the reservation.
- **no\_of\_weekend\_nights:** The number of nights in the reservation that fall on weekends.
- **no\_of\_week\_nights:** The number of nights in the reservation that fall on weekdays.
- **type\_of\_meal\_plan:** The meal plan chosen by the guests.
- **room\_type\_reserved:** The type of room reserved by the guests.
- **lead\_time:** The number of days between booking and arrival.
- **arrival\_date:** The date of arrival.
- **market\_segment\_type:** The market segment to which the reservation belongs.
- **avg\_price\_per\_room:** The average price per room in the reservation.
- **booking\_status:** The status of the booking.



# Dataset Overview



Booking_ID	no_of_adults	no_of_children	no_of_weekend_nights	no_of_weeknights	type_of_meal_plan	room_type	lead_time	arrival_date	market_segment	avg_price_per_booking	booking_status
INN00001	2	0	1	2	Meal Plan	1 Room_Type	224	2/10/2017	Offline	65	Not_Canceled
INN00002	2	0	2	3	Not Selected	Room_Type	5	6/11/2018	Online	106.68	Not_Canceled
INN00003	1	0	2	1	Meal Plan	1 Room_Type	1	2/28/2018	Online	60	Canceled
INN00004	2	0	0	2	Meal Plan	1 Room_Type	211	5/20/2018	Online	100	Canceled
INN00005	2	0	1	1	Not Selected	Room_Type	48	11/4/2018	Online	94.5	Canceled
INN00006	2	0	0	2	Meal Plan	2 Room_Type	346	9/13/2018	Online	115	Canceled
INN00007	2	0	1	3	Meal Plan	1 Room_Type	34	10/15/2017	Online	107.55	Not_Canceled
INN00008	2	0	1	3	Meal Plan	1 Room_Type	83	12/26/2018	Online	105.61	Not_Canceled
INN00009	3	0	0	4	Meal Plan	1 Room_Type	121	6/7/2018	Offline	96.9	Not_Canceled
INN00010	2	0	0	5	Meal Plan	1 Room_Type	44	10/18/2018	Online	133.44	Not_Canceled
INN00011	1	0	1	0	Not Selected	Room_Type	0	11/9/2018	Online	85.03	Not_Canceled
INN00012	1	0	2	1	Meal Plan	1 Room_Type	35	4/30/2018	Online	140.4	Not_Canceled
INN00013	2	0	2	1	Not Selected	Room_Type	30	11/26/2018	Online	88	Canceled
INN00014	1	0	2	0	Meal Plan	1 Room_Type	95	11/20/2018	Online	90	Canceled
INN00015	2	0	0	2	Meal Plan	1 Room_Type	47	10/20/2017	Online	94.5	Not_Canceled
INN00016	2	0	0	2	Meal Plan	2 Room_Type	256	6/15/2018	Online	115	Canceled
INN00017	1	0	1	0	Meal Plan	1 Room_Type	0	5/10/2017	Offline	96	Not_Canceled
INN00018	2	0	1	3	Not Selected	Room_Type	1	10/8/2017	Online	96	Not_Canceled



# Analysis Question - Total Reservations



## 01. What is the total number of reservations in the dataset?

SQL Query:

```
Use hoteldb;
SELECT * FROM hotel_reservation;

Select
    COUNT(*) as No_of_reservations
From hotel_reservation;
```

Result:

No_of_reservations
700



# Analysis Question - Popular Meal Plan



## 02. Which meal plan is the most popular among guests?

SQL Query:

```
Select  
    type_of_meal_plan as most_popular_meal_plan  
From hotel_reservation  
Group by type_of_meal_plan  
Order by COUNT(*) desc  
Limit 1;
```

Result:

	most_popular_meal_plan
▶	Meal Plan 1

# Analysis Question - Price per room with Children



## 03. What is the average price per room for reservations involving children?

SQL Query:

```
Select  
    no_of_children,  
    ROUND(AVG(avg_price_per_room),2) as avg_price_per_room  
From hotel_reservation Where no_of_children > 0  
Group by no_of_children  
Order by no_of_children asc;
```

Result:

	no_of_children	avg_price_per_room
▶	1	127.06
	2	167.08



# Analysis Question - Total Reservations in 2017



## 04.1. How many reservations were made for the year 2017?

SQL Query:

```
Select  
    Year(arrival_date) as year,  
    COUNT(*) as no_res_made  
From hotel_reservation  
Where Year(arrival_date) = 2017  
Group by Year(arrival_date);
```

Result:

	year	no_res_made
▶	2017	123



# Analysis Question - Total Reservations in 2018



## 04.2. How many reservations were made for the year 2018?

SQL Query:

```
Select  
    Year(arrival_date) as year,  
    COUNT(*) as no_res_made  
From hotel_reservation  
Where Year(arrival_date) = 2018  
Group by Year(arrival_date);
```

Result:

	year	no_res_made
▶	2018	577



# Analysis Question - Most Commonly Booked Room Type



## 05. What is the most commonly booked room type?

SQL Query:

```
Select  
    room_type_reserved as booked_roomtype,  
    Count(*) as res_count  
From hotel_reservation  
Group by room_type_reserved  
Order by res_count desc  
Limit 1;
```

Result:

	booked_roomtype	res_count
▶	Room_Type 1	534

# Analysis Question - Weekend Reservations



## 06. How many reservations fall on a weekend (no\_of\_weekend\_nights > 0)?

SQL Query:

```
Select  
    Count(*) as res_weekend_count  
From hotel_reservation  
Where no_of_weekend_nights > 0;
```

Result:

	res_weekend_count
▶	383



# Analysis Question - Lead Time



## 07. What is the highest and lowest lead time for reservations?

SQL Query:

```
Select  
    max(lead_time) as highest_lead_time,  
    min(lead_time) as lowest_lead_time,  
    Round(avg(lead_time)) as avg_lead_time  
From hotel_reservation;
```

Result:

	highest_lead_time	lowest_lead_time	avg_lead_time
▶	443	0	83

# Analysis Question - Market Segment



## 08. What is the most common market segment type for reservations?

SQL Query:

```
Select  
    market_segment_type,  
    Count(*) as res_cnt  
From hotel_reservation  
Group by market_segment_type  
Order by res_cnt desc  
limit 1;
```

Result:

	market_segment_type	res_cnt
▶	Online	518

# Analysis Question - Confirmed Reservations



## 09. How many reservations have a booking status of "Confirmed"?

SQL Query:

```
Select  
    Count(*) as confirmed_booking  
From hotel_reservation  
Where booking_status = "Not_canceled";
```

Result:

	confirmed_booking
▶	493

# Analysis Question - Adults and Children Across All Reservations



## 10. What is the total number of adults and children across all reservations?

SQL Query:

```
Select  
    SUM(no_of_adults) as total_no_adults,  
    SUM(no_of_children) as total_no_children,  
    (SUM(no_of_adults) + SUM(no_of_children)) as total_guests  
From hotel_reservation;
```

Result:

	total_no_adults	total_no_children	total_guests
▶	1316	69	1385

# Analysis Question - Weekend Nights with Children



## 11. What is the average number of weekend nights for reservations involving children?

SQL Query:

```
Select  
    ROUND(avg(no_of_weekend_nights)) as avg_weekend_nights  
From hotel_reservation  
Where no_of_children > 0;
```

Result:

	avg_weekend_nights
▶	1

# Analysis Question - Reservations by Month



## 12. How many reservations were made in each month of the year?

Result:

SQL Query:

```
Select  
    monthname(arrival_date) as month,  
    Count(*) as res_count  
From hotel_reservation  
Group by Month(arrival_date)  
Order by res_count desc;
```

	month	res_count
▶	October	95
	June	87
	August	76
	September	67
	May	61
	March	60
	November	50
	April	48
	February	43
	December	42
	July	42
	January	29



## Analysis Question - Length of Stay by Room Type Weekends Vs Weekdays



**13. What is the average number of nights (both weekend and weekday) spent by guests for each room type?**

SQL Query:

```
Select  
    room_type_reserved as room_type,  
    Round(avg(no_of_weekend_nights)) as avg_weekend_nights,  
    Round(avg(no_of_week_nights)) as avg_weekday_nights  
From hotel_reservation  
Group by room_type_reserved;
```

Result:

room_type	avg_weekend_nights	avg_weekday_nights
Room_Type 1	1	2
Room_Type 4	1	3
Room_Type 2	1	2
Room_Type 6	1	3
Room_Type 5	0	3
Room_Type 7	1	2

# Analysis Question - Room Type and Price with Children



**14. For reservations involving children, what is the most common room type, and what is the average price for that room type?**

SQL Query:

```
Select  
    room_type_reserved as room_type,  
    Count(*) as res_cnt,  
    Round(avg(avg_price_per_room),1) as avg_price  
From hotel_reservation  
Where no_of_children > 0  
Group by room_type_reserved  
Order by res_cnt desc  
limit 1;
```

Result:

	room_type	res_cnt	avg_price
▶	Room_Type 1	24	123.1



# Analysis Question - Market Segment And Price



## 15. Find the market segment type that generates the highest average price per room.

SQL Query:

```
Select  
    market_segment_type,  
    Round(avg(avg_price_per_room),1) as high_avg_price_per_room  
From hotel_reservation  
Group by market_segment_type  
Order by high_avg_price_per_room desc  
Limit 1;
```

Result:

	market_segment_type	high_avg_price_per_room
▶	Online	112.5



# Analyzing Booking Lead Time Trends



# Analysis Question - Lead Time by Season



## 16. Is there a significant difference in the distribution of booking lead time across different seasons?

SQL Query:

```
With cte as (
  Select
    lead_time,
    monthname(arrival_date) as month,
    Count(*) as res_count
  From hotel_reservation
  Group by Month(arrival_date)
  Order by Month(arrival_date))
Select
  month,
  ROUND(Avg(lead_time)) as avg_lead_time,
  res_count
From cte
Group by month
Order by res_count desc;
```

Result:

	month	avg_lead_time	res_count
▶	October	34	95
	June	5	87
	August	143	76
	September	346	67
	May	211	61
	March	2	60
	November	48	50
	April	35	48
	February	224	43
	July	56	42
	December	83	42
	January	64	29



# Seasonality & Lead Time: Key Insight

- 01.** **Peak Season:** October boasts the highest reservation count (95) with shorter lead time (34 days), suggesting last-minute bookings.
- 02.** **Shoulder Season:** September shows a moderate reservation count (67) but a much longer lead time (346 days), indicating early planning for potential events or fall activities.
- 03.** **Low Season:** March and January have the lowest reservation counts (60 & 29) but contrasting lead times. March sees last-minute bookings (2 days) while January has a moderate lead time (64 days).



## Actionable Strategies:

- 01.** **Peak Season:** Implement dynamic pricing, ensure adequate staffing, and offer last-minute deals.
- 02.** **Shoulder Season:** Target marketing towards events and offer special packages to incentivize early bookings.
- 03.** **Low Season:** Offer significant discounts and packages to attract guests during low-demand periods. Analyze reasons behind March's short lead time for potential targeted marketing.

# Analysis Question - Cancellation Lead time by Market Segment



17. Which market segment type has the highest number of cancelled reservations? For that segment, how does the average lead time for cancelled bookings compare to the average lead time for confirmed bookings?

SQL Query:

```
+ With x as (
+   y as (
select
    x.market_segment_type,
    x.avg_lead_time as cncl_lead_time,
    x.res_cnt as cncl_res_cnt,
    y.avg_lead_time as ntcncl_lead_time,
    y.res_cnt as ntcncl_res_cnt
  from x
  join y
Using(market_segment_type)
```

Result:

	market_segment_type	cncl_lead_time	cncl_res_cnt	ntcncl_lead_time	ntcncl_res_cnt
▶	Online	138	205	56	313



# Analysis of Online Booking Cancellations and Lead Time

Online bookings have the highest number of cancelled reservations.

## ***Lead Time Comparison:***

Cancelled Online Bookings: The average lead time for cancelled online bookings is 138 days.

Confirmed Online Bookings: The average lead time for confirmed online bookings is 56 days.

## ***Possible Interpretations:***

- **Flexibility in Online Booking:** Online bookings might offer more flexibility in terms of cancellation policies, encouraging guests to book further in advance while keeping their options open.
- **Comparison Shopping and Cancellations:** Guests who book online might be more likely to compare prices and potentially find better deals closer to the date, leading to cancellations with a longer lead time.



## Actionable Strategies:

- 01.** ***Targeted Communication for Online Bookings:*** Develop targeted communication strategies for online bookings based on lead time. For reservations made far in advance (over 100 days), consider sending reminder emails or special offers closer to the arrival date to incentivize confirmation.
  
- 02.** ***Flexible Cancellation Policies:*** Consider offering tiered cancellation policies for online bookings. This could involve stricter cancellation penalties for last-minute cancellations but more lenient policies for cancellations made with a longer lead time (e.g., exceeding 100 days).
  
- 03.** ***Competitive Offers:*** Regularly monitor competitor pricing and promotions, especially for online booking platforms. If possible, the hotel might want to adjust its online rates or highlight unique value propositions to compete effectively and reduce online booking cancellations.



Manjiri Sawant @Mentorness



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