
Hotel Reservation Analysis with SQL

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HOTEL

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❑ INTRODUCTION

- In the highly competitive hospitality industry, understanding and analyzing reservation data is crucial for making informed decisions that enhance customer satisfaction and optimize revenue. This presentation delves into hotel reservation analysis using **SQL**, a powerful tool for querying and managing large datasets efficiently.
- Our objective is to uncover valuable insights from reservation data by leveraging **SQL**'s capabilities.
- By examining customer demographics, room type preferences, booking trends, and revenue patterns, we aim to provide actionable recommendations for improving hotel operations, marketing strategies, and overall guest experiences



❑ PROBLEM STATEMENT

- I am tasked with analyzing a hotel reservation dataset to uncover critical insights that can enhance the decisionmaking process and improve the guest experience. By using SQL to query the dataset, I will address key questions such as the total number of reservations, the most popular meal plans, and booking trends over specific years and months. Additionally, I will identify the most commonly booked room types, weekend reservation patterns, and lead times for bookings. The analysis will explore the distribution of market segments, the total number of adults and children across all reservations, and the average duration of stays. These insights will be instrumental in developing data-driven strategies to optimize hotel operations and enhance guest satisfaction.



❏ DATASET DESCRIPTION

- ❖ The dataset used for this analysis provides comprehensive information about the hotel reservations. It include 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.

□ Overview of dataset

	Booking_ID	no_of_adults	no_of_children	no_of_weekend_nights	no_of_week_nights	type_of_meal_plan	room_type_reserved	lead_time	arrival_date	market_segment_type	avg_price_per_room	booking_status
1	INN00001	2	0	1	2	Meal Plan 1	Room_Type 1	224	02-10-2017	Offline	65	Not_Canceled
2	INN00002	2	0	2	3	Not Selected	Room_Type 1	5	06-11-2018	Online	107	Not_Canceled
3	INN00003	1	0	2	1	Meal Plan 1	Room_Type 1	1	28-02-2018	Online	60	Canceled
4	INN00004	2	0	0	2	Meal Plan 1	Room_Type 1	211	20-05-2018	Online	100	Canceled
5	INN00005	2	0	1	1	Not Selected	Room_Type 1	48	11-04-2018	Online	95	Canceled
6	INN00006	2	0	0	2	Meal Plan 2	Room_Type 1	346	13-09-2018	Online	115	Canceled
7	INN00007	2	0	1	3	Meal Plan 1	Room_Type 1	34	15-10-2017	Online	108	Not_Canceled
8	INN00008	2	0	1	3	Meal Plan 1	Room_Type 4	83	26-12-2018	Online	106	Not_Canceled
9	INN00009	3	0	0	4	Meal Plan 1	Room_Type 1	121	06-07-2018	Offline	97	Not_Canceled
10	INN00010	2	0	0	5	Meal Plan 1	Room_Type 4	44	18-10-2018	Online	133	Not_Canceled
11	INN00011	1	0	1	0	Not Selected	Room_Type 1	0	11-09-2018	Online	85	Not_Canceled
12	INN00012	1	0	2	1	Meal Plan 1	Room_Type 4	35	30-04-2018	Online	140	Not_Canceled
13	INN00013	2	0	2	1	Not Selected	Room_Type 1	30	26-11-2018	Online	88	Canceled
14	INN00014	1	0	2	0	Meal Plan 1	Room_Type 1	95	20-11-2018	Online	90	Canceled
15	INN00015	2	0	0	2	Meal Plan 1	Room_Type 1	47	20-10-2017	Online	95	Not_Canceled
16	INN00016	2	0	0	2	Meal Plan 2	Room_Type 1	256	15-06-2018	Online	115	Canceled
17	INN00017	1	0	1	0	Meal Plan 1	Room_Type 1	0	05-10-2017	Offline	96	Not_Canceled
18	INN00018	2	0	1	3	Not Selected	Room_Type 1	1	10-08-2017	Online	96	Not_Canceled
19	INN00019	2	0	2	2	Meal Plan 1	Room_Type 1	99	30-10-2017	Online	65	Canceled
20	INN00020	2	0	1	0	Meal Plan 1	Room_Type 1	12	04-10-2017	Offline	72	Not_Canceled

➤ Total 700 reservation were made according to the data.

❑ **NOTE:** Before performing EDA it is important to verify data types of columns in SQL is essential for maintaining data integrity, optimizing performance, ensuring accurate query results, and preventing data loss. Neglecting this crucial step can lead to a host of problems, from data inconsistencies to performance issues and increased storage costs.

➤ Changing Datatype of columns

```
alter table Hotel_Reservation  
alter column avg_price_per_room decimal;  
|  
alter table Hotel_Reservation  
alter column no_of_children int;
```

```
alter table Hotel_Reservation  
alter column no_of_adults decimal;  
  
alter table Hotel_Reservation  
alter column no_of_children int;
```

```
alter table Hotel_Reservation  
alter column no_of_weekend_nights int;
```


➤ Checking the Null Values in columns

```
select
    SUM( case when Booking_ID is null then 1 else 0 END) null_value_booking_id,
    SUM( case when no_of_adults is null then 1 else 0 END) null_value_no_of_adults,
    SUM( case when no_of_children is null then 1 else 0 END) null_value_no_of_children,
    SUM( case when no_of_week_nights is null then 1 else 0 END) null_value_no_of_week_nights,
    SUM( case when no_of_weekend_nights is null then 1 else 0 END) null_value_no_of_weekend_nights,
    SUM( case when type_of_meal_plan is null then 1 else 0 END) null_value_type_of_meal_plan,
    SUM( case when room_type_reserved is null then 1 else 0 END) null_value_room_type_reserved,
    SUM( case when lead_time is null then 1 else 0 END) null_value_lead_time,
    SUM( case when arrival_date is null then 1 else 0 END) null_value_arrival_date,
    SUM( case when market_segment_type is null then 1 else 0 END) null_value_market_segment_type,
    SUM( case when avg_price_per_room is null then 1 else 0 END) null_value_avg_price_per_room,
    SUM( case when booking_status is null then 1 else 0 END) null_value_booking_status
from Hotel_Reservation;
```

Results		Messages								
	null_value_booking_id	null_value_no_of_adults	null_value_no_of_children	null_value_no_of_week_nights	null_value_no_of_weekend_nights	null_value_type_of_meal_plan	null_value_room_type_reserved	null_value_lead_time	null_value_arrival_date	null_value_market_segment_type
1	0	0	0	0	0	0	0	0	0	0

➤ DATA EXPLORATION AND ANALYSIS

Query 1

1. What is the total number of reservations in the dataset?

```
select COUNT(*) row_count  
from Hotel_Reservation;
```

	row_count
1	700

Total 700 reservations were made as per the dataset

➤ DATA EXPLORATION AND ANALYSIS

Query 2

2. Which meal plan is the most popular among guests?

```
--Which meal plan is the most popular among guests?
```

```
select type_of_meal_plan, COUNT(type_of_meal_plan) value_count_meal_plan  
from Hotel_Reservation  
group by type_of_meal_plan  
order by value_count_meal_plan desc;
```

	type_of_meal_plan	value_count_meal_plan
1	Meal Plan 1	527
2	Not Selected	109
3	Meal Plan 2	64

'Meal plan 1' seems to be the most popular among guests. 527 guests selected this type of meal plan.

➤ DATA EXPLORATION AND ANALYSIS

Query 3

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

```
select AVG(avg_price_per_room) as avg_price  
from Hotel_Reservation  
where no_of_children != 0;
```

	avg_price
1	144.625000

Average price per room for reservations involving children is 144.57 units.

➤ DATA EXPLORATION AND ANALYSIS

Query 4

4. How many reservations were made for the year 2018?

```
--How many reservations were made for the year 20XX (replace XX with the desired year)?  
  
select COUNT(*) no_of_reservations  
  from Hotel_Reservation  
 where SUBSTRING(arrival_date,7,4) = '2018';
```

	no_of_reservations
1	577

Total 577 reservations were made in the year 2018.

➤ DATA EXPLORATION AND ANALYSIS

Query 5

5. What is the most commonly booked room type?

```
-- What is the most commonly booked room type?  
  
select room_type_reserved, count(room_type_reserved) no_of_room_book  
from Hotel_Reservation  
group by room_type_reserved  
order by no_of_room_book desc;
```

	room_type_reserved	no_of_room_book
1	Room_Type 1	534
2	Room_Type 4	130
3	Room_Type 6	18
4	Room_Type 2	8
5	Room_Type 7	6
6	Room_Type 5	4

Most commonly room type booked by the guests was seen to be “Room Type 1”.

➤ DATA EXPLORATION AND ANALYSIS

Query 6

6. How many reservations fall on a weekend (no_of_weekend_nights > 0)?

```
--How many reservations fall on a weekend (no_of_weekend_nights > 0)?  
  
select count(*) no_of_reservation_fall_on_weekend  
  from Hotel_Reservation  
 where no_of_week_nights > 0;  
|
```

	no_of_reservation_fall_on_weekend
1	656

Number of reservations which included weekend nights were 656.

➤ DATA EXPLORATION AND ANALYSIS

Query 7

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

```
--What is the highest and lowest lead time for reservations?
```

```
select MAX(lead_time) as highest_lead_time , MIN(lead_time) as lowest_lead_time  
from Hotel_Reservation;
```

	highest_lead_time	lowest_lead_time
1	99	0

Highest and Lowest Lead Time were 99 and 0 units recorded as per the data.

➤ DATA EXPLORATION AND ANALYSIS

Query 8

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

```
--What is the most common market segment type for reservations?
```

```
select market_segment_type, count(market_segment_type) no_of_reservations  
  from Hotel_Reservation  
 group by market_segment_type  
 order by no_of_reservations desc;
```

	market_segment_type	no_of_reservations
1	Online	518
2	Offline	140
3	Corporate	27
4	Complementary	14
5	Aviation	1

Online medium is the most common method for reservations.

➤ DATA EXPLORATION AND ANALYSIS

Query 9

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

```
--How many reservations have a booking status of "Confirmed"?  
  
select COUNT(*) no_of_reservation  
  from Hotel_Reservation  
 where booking_status='Not_Canceled';
```

	no_of_reservation
1	493

There were 493 reservations stating that the booking_status as "Not Cancelled".

➤ DATA EXPLORATION AND ANALYSIS

Query 10

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

```
select SUM(no_of_children) total_children, SUM(no_of_adults) total_adults
      from Hotel_Reservation
```

	total_children	total_adults
1	69	1316

The total no. of children and adults across all reservations were “69” and “1316” respectively as per the records.

➤ DATA EXPLORATION AND ANALYSIS

Query 11

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

```
select round(AVG(no_of_weekend_nights),2) as average_no_of_weekend_night
from Hotel_Reservation
where no_of_children > 0;
```

	average_no_of_weekend_night
1	1

Average number of weekend nights for reservations involving children is “1”.

➤ DATA EXPLORATION AND ANALYSIS

Query 12

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

	year_1	month_1	no_of_reservation
1	2017	07	8
2	2017	08	14
3	2017	09	35
4	2017	10	40
5	2017	11	13
6	2017	12	13
7	2018	01	11
8	2018	02	28
9	2018	03	52
10	2018	04	67
11	2018	05	55
12	2018	06	84
13	2018	07	36
14	2018	08	56
15	2018	09	45
16	2018	10	63
17	2018	11	41
18	2018	12	39

--How many reservations were made in each month of the year?

```
select SUBSTRING(arrival_date,7,4) as year_1 ,SUBSTRING(arrival_date,4,2) as month_1,count(*) as no_of_reservation
from Hotel_Reservation
group by SUBSTRING(arrival_date,7,4),SUBSTRING(arrival_date,4,2)
order by SUBSTRING(arrival_date,7,4)|
```

← Output

↑
Query

➤ DATA EXPLORATION AND ANALYSIS

Query 13

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

```
select room_type_reserved, (AVG(no_of_weekend_nights) + AVG(no_of_week_nights)) as avergae_number_of_nights
from Hotel_Reservation
group by room_type_reserved;
```

	room_type_reserved	avergae_number_of_nights
1	Room_Type 1	2
2	Room_Type 2	3
3	Room_Type 4	3
4	Room_Type 5	2
5	Room_Type 6	3
6	Room_Type 7	2

➤ DATA EXPLORATION AND ANALYSIS

Query 14

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

```
--For reservations involving children, what is the most common room type, and what is the average  
--price for that room type?
```

```
select room_type_reserved, Sum(avg_price_per_room) average_price  
  from Hotel_Reservation  
 where no_of_children > 0  
 group by room_type_reserved  
 order by average_price desc;
```

	room_type_reserved	average_price
1	Room_Type 6	3152
2	Room_Type 1	2957
3	Room_Type 2	560
4	Room_Type 7	187
5	Room_Type 4	86

For the reservations involving children, the most common room type is “Room Type 6” having the average price per room to be 3152 units

➤ DATA EXPLORATION AND ANALYSIS

Query 15

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

```
--Find the market segment type that generates the highest average price per room.  
  
select market_segment_type, round(AVG(avg_price_per_room),2) average_price_per_room  
  from Hotel_Reservation  
 group by market_segment_type  
 order by average_price_per_room desc;
```

	market_segment_type	average_price_per_room
1	Online	112.490000
2	Aviation	110.000000
3	Offline	90.030000
4	Corporate	82.410000
5	Complementary	2.570000

“Online” market segment generated the highest average price per room.

❏ INSIGHTS

- The analysis of the hotel reservation dataset reveals key insights into guest preferences and booking trends.
- 'Meal plan 1' and 'Room Type 1' are the most popular choices among the 700 reservations, with 577 reservations made in 2018 and 656 including weekend nights.
- The average room price for reservations involving children is 3152 units, with lead times ranging from 0 to 443 days.
- The 'Online' market segment is the most common and generates the highest average price per room.
- Overall, there are 1316 adults and 69 children across all reservations, providing valuable insights for strategic decision-making in the hotel.

Thank you!

A white rectangular card is tilted slightly to the right. It features the words "Thank you!" written in a black, cursive script. The text is surrounded by several gold-colored stars of varying sizes. Below the text, there is a thick, gold-colored brushstroke that curves from left to right. The card is set against a light beige background.