

Hotel Reservation Analysis (with SQL)

A Comprehensive Analysis of Hotel Reservation Data

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Introduction

In today's hospitality industry, data plays a pivotal role in shaping operational strategies and enhancing guest satisfaction. Hotels gather vast amounts of data from reservations, which, when analyzed effectively, provide valuable insights into guest preferences, booking patterns, and operational efficiency. In this project, we delve into a comprehensive analysis of a hotel reservation dataset using SQL, a powerful language for managing and querying structured data.

Objective

1. Utilize SQL queries to explore and analyze a hotel reservation dataset.
2. Identify the total number of reservations and understand booking trends over time.
3. Determine popular meal plans, preferred room types, and average booking prices.
4. Analyze guest demographics, including the number of adults and children per reservation.
5. Investigate lead times, booking statuses, and market segment preferences.
6. Provide actionable insights to optimize resource allocation and enhance guest experiences.





Dataset Overview

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.

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


SELECT

```
COUNT(Booking_ID) AS Total_Reservations  
FROM  
mentorness.hotel_reservation;
```

	Total_Reservations
▶	700



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

SELECT

```
type_of_meal_plan, COUNT(*) AS num_reservations
FROM
    mentorness.hotel_reservation
GROUP BY type_of_meal_plan
ORDER BY num_reservations DESC
LIMIT 1;
```

	type_of_meal_plan	num_reservations
▶	Meal Plan 1	527

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

SELECT

ROUND(AVG(avg_price_per_room), 2) AS Average_Price_per_Room

FROM

mentorness.hotel_reservation

WHERE

no_of_children > 0;

	Average_Price_per_Room
▶	144.57

4. How many reservations were made for the year 20XX (replace XX with the desired year)?

SELECT

```
SUBSTRING(arrival_date, - 4) AS year,  
COUNT(*) AS total_reservations  
FROM  
mentorness.hotel_reservation  
WHERE  
SUBSTRING(arrival_date, - 4) = '2017' OR '2018'  
GROUP BY year;
```

	year	total_reservations
▶	2017	123
	2018	577

5. What is the most commonly booked room type?

SELECT

```
room_type_reserved,  
COUNT(room_type_reserved) AS total_bookings
```

FROM

```
mentorness.hotel_reservation
```

```
GROUP BY room_type_reserved
```

```
ORDER BY total_bookings DESC;
```

	room_type_reserved	total_bookings
▶	Room_Type 1	534
	Room_Type 4	130
	Room_Type 6	18
	Room_Type 2	8
	Room_Type 7	6
	Room_Type 5	4

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

SELECT

```
COUNT(*) AS weekend_reservations
```

FROM

```
mentorness.hotel_reservation
```

WHERE

```
no_of_weekend_nights > 0;
```

	weekend_reservations
▶	383

7. 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  
mentorness.hotel_reservation;
```

	highest_lead_time	lowest_lead_time
▶	443	0

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

```
SELECT  
    market_segment_type, COUNT(*) AS segment_count  
FROM  
    mentorness.hotel_reservation  
GROUP BY market_segment_type  
ORDER BY segment_count DESC;
```

	market_segment_type	segment_count
▶	Online	518
	Offline	140
	Corporate	27
	Complementary	14
	Aviation	1

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

```
SELECT  
    COUNT(*) AS confirmed_reservations  
FROM  
    mentorness.hotel_reservation  
WHERE  
    booking_status = 'Not_Canceled';
```

	confirmed_reservations
▶	493

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

SELECT

```
SUM(no_of_adults) AS total_adults,  
SUM(no_of_children) AS total_children
```

FROM

```
mentorness.hotel_reservation;
```

	total_adults	total_children
▶	1316	69

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

```
SELECT  
    ROUND(AVG(no_of_weekend_nights), 2) AS Avg_Weekend_Nights_with_Children  
FROM  
    mentorness.hotel_reservation  
WHERE  
    no_of_children > 0;
```

Avg_Weekend_Nights_with_Children	
▶	1.00

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

SELECT

```
MONTH(STR_TO_DATE(arrival_date, '%d-%m-%Y')) AS month,  
COUNT(*) AS num_reservations  
FROM  
mentorness.hotel_reservation  
GROUP BY MONTH(STR_TO_DATE(arrival_date, '%d-%m-%Y'))  
ORDER BY month;
```

	month	num_reservations
▶	1	11
	2	28
	3	52
	4	67
	5	55
	6	84
	7	44
	8	70
	9	80
	10	103
	11	54
	12	52

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

SELECT

```
room_type_reserved,  
ROUND(AVG(no_of_weekend_nights + no_of_week_nights), 2) AS avg_nights
```

FROM

```
mentorness.hotel_reservation
```

GROUP BY room_type_reserved;

	room_type_reserved	avg_nights
▶	Room_Type 1	2.88
	Room_Type 4	3.80
	Room_Type 2	3.00
	Room_Type 6	3.61
	Room_Type 5	2.50
	Room_Type 7	2.67

14. 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 AS most_common_room_type,  
ROUND(AVG(avg_price_per_room), 2) AS average_price
```

FROM

```
mentorness.hotel_reservation
```

WHERE

```
no_of_children > 0
```

```
GROUP BY room_type_reserved
```

```
ORDER BY average_price DESC;
```

	most_common_room_type	average_price
▶	Room_Type 7	187.04
	Room_Type 6	185.33
	Room_Type 1	123.12
	Room_Type 2	112.08
	Room_Type 4	86.32

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

```
SELECT  
    market_segment_type,  
    ROUND(AVG(avg_price_per_room), 2) AS average_price  
FROM  
    mentorness.hotel_reservation  
GROUP BY market_segment_type  
ORDER BY average_price DESC;
```

	market_segment_type	average_price
▶	Online	112.46
	Aviation	110
	Offline	89.98
	Corporate	82.4
	Complementary	2.54



Conclusion

1. In 2017, September and October saw the highest number of reservations. In 2018, the peak months were March, April, May, June, August, and October.
2. Out of 700 reservations, 493 were confirmed, indicating that approximately 70% of reservations were confirmed while 30% were canceled.
3. Around 73% of customers booked their hotel rooms online.
4. Room_type_1 was the most popular room type among customers.
5. Meal plan_1 was the most popular meal plan among guests. For families with children, Room_type_1 was also the most preferred room type.
6. The dataset includes 69 children and 1316 adults.

Recomendation

01

Enhance Meal Plans: Expand and promote popular meal plans to boost guest satisfaction.

02

Family Packages: Create special offers targeting families, based on preferred room types and pricing.

03

Seasonal Promotions: Implement targeted marketing campaigns for peak and off-peak seasons to maximize occupancy.

04

Optimize Room Allocation & Early Booking Incentives : Manage inventory based on the most commonly booked room types and average stay duration.
Offer discounts to encourage early reservations and reduce last-minute bookings.





Mentorness Internship Program

Thank You

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