Hotel Reservation Analysis with SQL

Mentorness Internship program

Batch :MIP-DA-08

TASK "2"

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Contents

Topics Covered

Project Overview:

This project inlves analyzing a hotel reservation dataset using SQL to gain insights into guest preferences, booking trends, and other key factors impacting hotel operations. The goal is to develop data analysis skills in a practical context and help the hotel industry make informed decisions for a better guest experience.

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.

Descriptions of SQL Queries and Results

1. **Total Number of Reservations: Counts the total number of records in the dataset.**
2. **Most Popular Meal Plan: Identifies the meal plan with the highest number of reservations.**
3. **Average Price Per Room for Reservations Involving Children: Calculates the average room price for reservations that include children.**
4. **Reservations for Year 20XX: Counts the number of reservations for a specific year (e.g., 2023).**
5. **Most Commonly Booked Room Type: Finds the room type reserved most frequently.**
6. **Reservations on Weekends: Counts reservations with any weekend nights.**
7. **Highest and Lowest Lead Time: Determines the maximum and minimum number of days between booking and arrival.**
8. **Most Common Market Segment Type: Identifies the most frequent market segment for reservations.**
9. **Confirmed Reservations: Counts the reservations with a status of "Confirmed".**
10. **Total Adults and Children: Sums the total number of adults and children across all reservations.**
11. **Average Weekend Nights for Reservations with Children: Computes the average number of weekend nights for reservations that include children.**
12. **Monthly Reservations: Counts the number of reservations made in each month.**
13. **Average Number of Nights by Room Type: Calculates the average total nights (weekend + weekday) for each room type.**
14. **Common Room Type and Average Price for Reservations with Children: Finds the most common room type and its average price for reservations that include children.**
15. **Market Segment with Highest Average Price Per Room: Identifies the market segment that generates the highest average room price.**

****These queries will give you detailed insights into the hotel's booking patterns and guest preferences. To visualize the results, you can use tools like SQL Server Reporting Services (SSRS), Excel, or any other data visualization tools that can connect to SQL databases.**

Here are the SQL queries to answer each of the 15 questions about the hotel reservation dataset.

```sql
SELECT TOP (1000) [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]
  FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
```

1. Total Number of Reservations:

```
SELECT COUNT(*) AS total_reservations FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$'] ;
```

100 %

Results | Messages

	total_reservations
1	700

2. Most Popular Meal Plan:

```
  SELECT type_of_meal_plan, COUNT(*) AS count
FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
GROUP BY type_of_meal_plan
ORDER BY count DESC
LIMIT 1;

SELECT TOP 1 room_type_reserved, COUNT(*) AS count
FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
GROUP BY room_type_reserved
ORDER BY count DESC;
```

0 %

Results | Messages

	room_type_reserved	count
1	Room_Type 1	534

3. Average Price Per Room for Reservations Involving Children:

```
SELECT AVG(avg_price_per_room) AS average_price
FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
WHERE no_of_children > 0;
```

100 %

Results | Messages

	average_price
1	144.568333333333

4. Reservations Made for the Year 2018 :

```
SELECT COUNT(*) AS reservations_in_year
FROM  [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
WHERE YEAR(arrival_date) = 2018;
```

100 %

Results | Messages

	reservations_in_year
1	577

5. Most Commonly Booked Room Type:

```
SELECT TOP 1 room_type_reserved, COUNT(*) AS count
FROM  [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
GROUP BY room_type_reserved
ORDER BY count DESC;
```

100 %

Results | Messages

	room_type_reserved	count
1	Room_Type 1	534

6. Reservations That Fall on a Weekend:

```
SELECT COUNT(*) AS weekend_reservations
FROM  [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
WHERE no_of_weekend_nights > 0;
```

100 %

Results | Messages

	weekend_reservations
1	383

7. Highest and Lowest Lead Time:

```
  SELECT MAX(lead_time) AS max_lead_time, MIN(lead_time) AS min_lead_time
FROM  [hotel_reservations].[dbo].['Hotel Reservation Dataset$'] ;
```

100 %

Results | Messages

	max_lead_time	min_lead_time
1	443	0

8. Most Common Market Segment Type :

```
SELECT TOP 1 market_segment_type, COUNT(*) AS count
FROM  [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
GROUP BY market_segment_type
ORDER BY count DESC;
```

100 %

Results | Messages

	market_segment_type	count
1	Online	518

9. Reservations with Booking Status "Confirmed":

```sql
SELECT COUNT(*) AS confirmed_reservations
FROM  [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
WHERE booking_status = 'Not_Canceled';
```

100 %

Results | Messages

	confirmed_reservations
1	493

10. 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 [hotel_reservations].[dbo].['Hotel Reservation Dataset$'];
```

100 %

Results | Messages

	total_adults	total_children
1	1316	69

11. Average Number of Weekend Nights for Reservations Involving Children:

```
SELECT AVG(no_of_weekend_nights) AS average_weekend_nights
FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$'];
```

100 %

Results | Messages

	average_weekend_nights
1	0.851428571428571

12. Reservations Made in Each Month of the Year:

```
SELECT MONTH(arrival_date) AS month, COUNT(*) AS reservations_count
FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
GROUP BY MONTH(arrival_date)
ORDER BY month;
```

100 %

Results | Messages

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

13. Average Number of Nights (Both Weekend and Weekday) Spent by Guests for Each Room Type:

```
SELECT room_type_reserved,
       AVG(no_of_weekend_nights + no_of_week_nights) AS average_nights
FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
GROUP BY room_type_reserved;
```

100 %

Results | Messages

	room_type_reserved	average_nights
1	Room_Type 1	2.87827715355805
2	Room_Type 2	3
3	Room_Type 4	3.8
4	Room_Type 5	2.5
5	Room_Type 6	3.61111111111111
6	Room_Type 7	2.66666666666667

14. Most Common Room Type and Average Price for Reservations Involving Children:

```sql
SELECT TOP 1
    room_type_reserved,
    COUNT(*) AS count,
    AVG(avg_price_per_room) AS average_price
FROM [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
WHERE no_of_children > 0
GROUP BY room_type_reserved
ORDER BY count DESC;
```

100 %

Results | Messages

	room_type_reserved	count	average_price
1	Room_Type 1	24	123.122916666667

15. Market Segment Type that Generates the Highest Average Price Per Room:

```sql
SELECT TOP 1
    market_segment_type,
    AVG(avg_price_per_room) AS average_price
FROM  [hotel_reservations].[dbo].['Hotel Reservation Dataset$']
GROUP BY market_segment_type
ORDER BY average_price DESC;
```

100 %

Results | Messages

	market_segment_type	average_price
1	Online	112.455212355212

Overall Conclusion

This analysis provides valuable insights into various aspects of hotel operations, guest preferences, and booking trends. By leveraging these insights, the hotel can make data-driven decisions to improve guest satisfaction, optimize pricing, enhance marketing strategies, and streamline operations.

Effective use of SQL for data analysis in this context demonstrates the power of querying databases to extract actionable insights, which are crucial for strategic decision-making in the hotel industry.

Thank you!