Hotel Reservation Analysis with SQL

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6 STEPS

01 Project Overview

02 Problem Statement

03 Data Processing

04 Data Analysis using SQL

05 Insights

01 Project Overview

STEP 01

Project Overview

The hotel industry relies on data to make informed decisions and provide a better guest experience. In this project, I will work with a hotel reservation dataset to gain insights into guest preferences, booking trends, and other key factors that impact the hotel's operations. I will use SQL to query and analyze the data, as well as answer specific questions about the dataset.

- What is the total number of reservations in the dataset?
- Which meal plan is the most popular among guests?
- What is the average price per room for reservations involving children?
- How many reservations were made for the year 20XX (replace XX with the desired year)?
- What is the most commonly booked room type?
- How many reservations fall on a weekend (no_of_weekend_nights > 0)?
- What is the highest and lowest lead time for reservations?

STEP 01: Continue

- What is the most common market segment type for reservations?
- How many reservations have a booking status of "Confirmed"?
- What is the total number of adults and children across all reservations?
- What is the average number of weekend nights for reservations involving children?
- How many reservations were made in each month of the year?
- What is the average number of nights (both weekend and weekday) spent by guests for each room
- type?
- For reservations involving children, what is the most common room type, and what is the average
- price for that room type?
- Find the market segment type that generates the highest average price per room.

02 Problem Statement

STEP 02

Problem statement

Optimizing Hotel Reservations for Increased Revenue and Guest Satisfaction

The hospitality industry thrives on efficient reservation management. However, current reservation systems might not be fully capturing the potential for maximizing occupancy, revenue, and guest satisfaction.

This analysis aims to identify key trends and patterns within hotel reservation data. By analyzing hotel reservation data, we can gain valuable insights to optimize hotel operations, increase revenue, and create a more satisfying guest experience.

03 Data Processing

STEP 03

First Step: Data Validation

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.

STEP 03

Second Step: Data Collection:
I began by importing the dataset from My Drive to assess its contents and check for any data errors using Google sheets In this step, it was essential to thoroughly review and process the dataset's content. The dataset comprised 12 columns and a total of 701 rows.. then I saved the file in my local machine as .CSV (Comma-Separated Values) file.

Third Step: Data Preparation Process:
After ensuring the data's integrity, I proceeded to create a database named "Hotel_Reservation_Analysis" before Importing the dataset to SSMS Workbench. This step ensures that the data is securely and accurately stored in the designated database for further analysis and exploration.

04

Data Analysis Using SQL

STEP 04

OUTLINE

I utilized the table data import wizard within SSMS Workbench to load both datasets onto the SQL server. Once this step was finished, I examined the tables. Following that, I conducted exploratory data analysis on the dataset to uncover notable observations.

First step:

- By using DDL: create the database “Name”
- We have imported the datasets from .CSV file format
- By using DQL : select * from “ table name” and i have done this to review and check my table datasets

STEP 04

OUTLINE

Second step :

- The 1st, 4th, 6th, and 9th Query i have used count (*) function to get the total the total number of reservations, reservations were made for the year 2017 & also 2018,reservations fall on a weekend and reservations have a booking status of "Confirmed"as the follow:

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

Results Messages

total_reservations
700

```
SELECT COUNT(*) AS num_reservations
FROM [dbo].[Hotel Reservation Dataset]
WHERE YEAR(arrival_date) = 2017;
SELECT COUNT(*) AS num_reservations
FROM [dbo].[Hotel Reservation Dataset]
WHERE YEAR(arrival_date) = 2018;
```

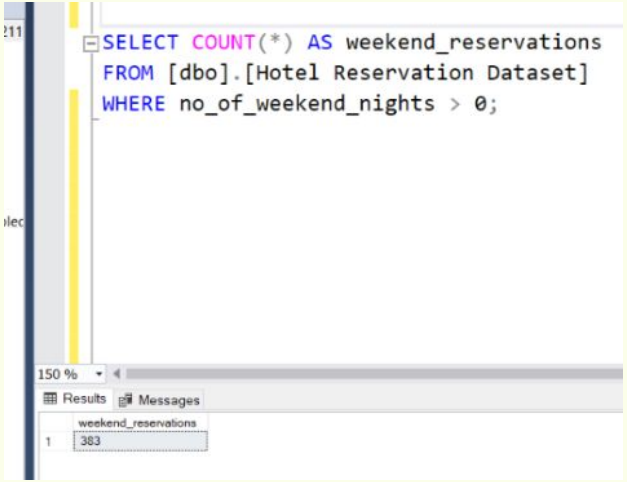
Results Messages

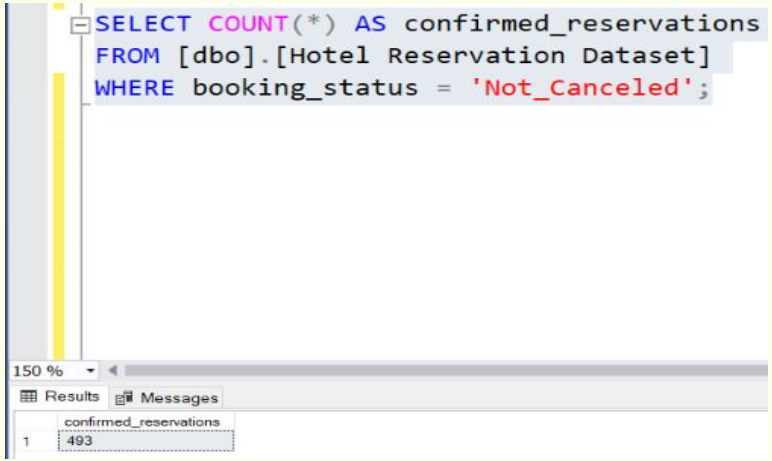
num_reservations
123

STEP 04

OUTLINE

Second step : following..

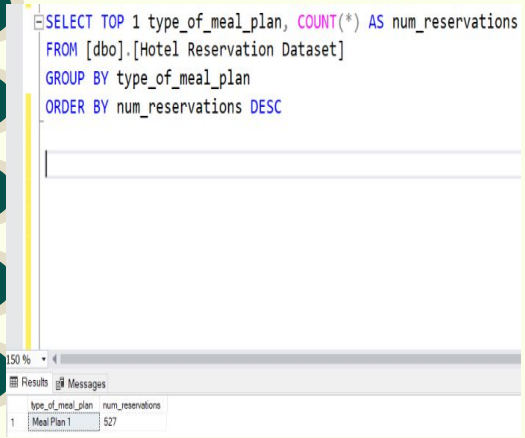




STEP 04

OUTLINE

Third step : 2nd, 5th and 8th queries requiring the same which the most popular meal,most commonly booked room type, and the most commonly market segment type for reservation

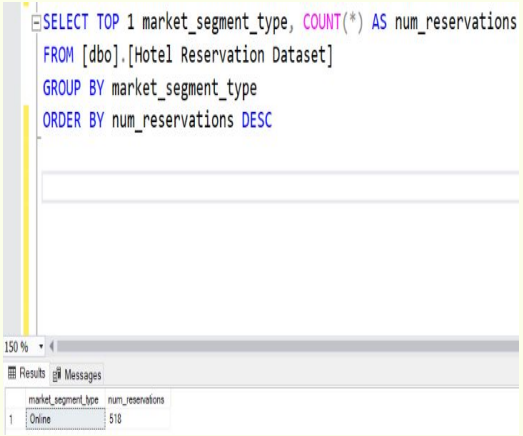


```
SELECT TOP 1 type_of_meal_plan, COUNT(*) AS num_reservations
FROM [dbo].[Hotel Reservation Dataset]
GROUP BY type_of_meal_plan
ORDER BY num_reservations DESC
```

150 %

Results | Messages

	type_of_meal_plan	num_reservations
1	Meal Plan 1	527

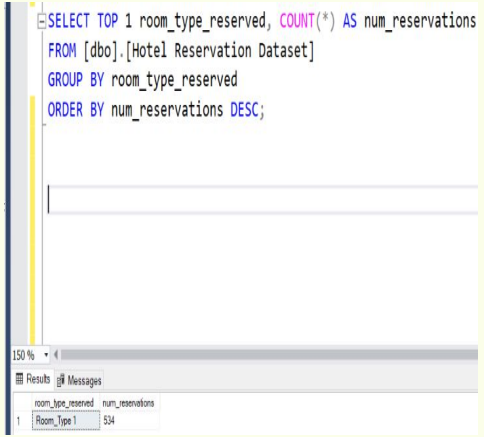


```
SELECT TOP 1 market_segment_type, COUNT(*) AS num_reservations
FROM [dbo].[Hotel Reservation Dataset]
GROUP BY market_segment_type
ORDER BY num_reservations DESC
```

150 %

Results | Messages

	market_segment_type	num_reservations
1	Online	518



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

150 %

Results | Messages

	room_type_reserved	num_reservations
1	Room_Type 1	534

STEP 04

OUTLINE

Fourth step : 3rd, 11th, 13th, 14th, and 15th queries requiring the same which the most average so i used the AVG to get what's required for each:

3rd: average price per room

for reservations involving children

11th: the average number of

weekend nights for

reservations involving children?

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

	avg_price_with_children
1	144.568333307902

```
SELECT AVG(no_of_weekend_nights) AS avg_weekend_nights_with_children
FROM [dbo].[Hotel Reservation Dataset]
WHERE no_of_children > 0;
```

	room_type_reserved	num_reservations
1	Room_Type 1	534

STEP 04

OUTLINE

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

```
SELECT room_type_reserved,
       AVG(CASE WHEN arrival_date IS Not Null THEN 1 ELSE 0 END) AS avg_nights
FROM [dbo].[Hotel Reservation Dataset]
GROUP BY room_type_reserved;
```

150 %

Results | Messages

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

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

```
WITH children_reservations AS (
    SELECT Booking_ID, room_type_reserved, avg_price_per_room
    FROM [dbo].[Hotel Reservation Dataset]
    WHERE no_of_children > 0
)
SELECT TOP 1 cr.room_type_reserved, AVG(cr.avg_price_per_room) AS avg_price
FROM children_reservations AS cr
GROUP BY cr.room_type_reserved
ORDER BY COUNT(*) DESC
```

150 %

Results | Messages

	room_type_reserved	avg_price
1	Room_Type 1	123.12291653951

STEP 04

OUTLINE

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

```
SELECT TOP 1 market_segment_type, AVG(avg_price_per_room) AS avg_price
FROM [dbo].[Hotel Reservation Dataset]
GROUP BY market_segment_type
ORDER BY avg_price DESC
```

150 %

Results | Messages

	market_segment_type	avg_price
1	Online	112.455212331647

STEP 04

OUTLINE

Finally the last step which is for queries : 7th, 10th and 12th
7th: i used the max and min function to query for the highest and lowest lead time as the follow:

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

min_lead_time	max_lead_time
0	443

10th : i used the sum function to query the total number for adult and children for reservation as the follow:

```
SELECT SUM(no_of_adults) AS total_adults, SUM(no_of_children) AS total_children
FROM [dbo].[Hotel Reservation Dataset];
```

total_adults	total_children
1316	69

12th : reservations were made in each month of the year so i used count function to count the number of reservation per night for each month as the follow

```
SELECT MONTH(arrival_date) AS month, COUNT(*) AS num_reservations
FROM [dbo].[Hotel Reservation Dataset]
GROUP BY MONTH(arrival_date)
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

05 Insights

STEP 05

- The total reservations made is 700.
- The Most popular meal among the guest is the Meal Plan 1, which represent 527, meal plan 2 represent only 64 .. and other not selected ..
- Average Price Per Room for reservations involving Children = $144.57
- Total reservations made in 2018 is 577
- The most commonly booked room type is Room Type 1 with total reservations of 534.
- Weekend reservations is 383
- The highest lead time is 443 while the lowest lead time is 0.
- Online with Total Reservations of 518
- Total confirmed booking status is 493
- Reservations involving Adults and Children across all reservations: Adults = 1316 Children = 69
- Average weekend nights with Children is 1. This implies in every weekend reservation, the guests includes children.

STEP 05

- Monthly Reservation :Highest - October = 103 reservations ,Lowest - January = 11 reservations.There is more reservation during Autumn compared to Winter season.
- Average Weekend and Weekday nights spent by guests:The guests prefer the Room Type 4 and 6.
- Most common room type and average price for reservations involving children: Room Type 1 with the highest number of reservations has an average price of $123.12.Room Type 7 with the lowest number of reservations has an average price of $187.04 being the highest average price.The number of reservations is not determinant to the price of room type.
- Market Segment that generates highest average price per room:Online market segment with an average price per room of $112.26

THANKS!

Are there any questions?

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