Hotel Reservation Analysis

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PROJECT

OVERVIEW

Data is very much essential to the hotel sector in order to make well-informed decisions and improve the overall visitor experience. In this project, we have to examine a large dataset of hotel reservations in order to derive important insights. Our objectives is to determine visitor preferences, spot patterns in booking behavior, and identify critical elements that impacts the hotel's operations..

OBJECTIVE:

Our goal is to use SQL for comprehensive dataset exploration and analysis. Its main motive is to uncover patterns through the dataset's specialized queries, which will inform us the strategic choices and maximize the hotel's overall performance.

TOOLS USED:

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.

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
INN00001	2	0	1	2	Meal Plan 1	Room_Type 1	224	2017-10-02	Offline	65	Not_Canceled
INN00002	2	0	2	3	Not Selected	Room_Type 1	5	2018-11-06	Online	106.68	Not_Canceled
INN00003	1	0	2	1	Meal Plan 1	Room_Type 1	1	2018-02-28	Online	60	Canceled
INN00004	2	0	0	2	Meal Plan 1	Room_Type 1	211	2018-05-20	Online	100	Canceled
INN00005	2	0	1	1	Not Selected	Room_Type 1	48	2018-04-11	Online	94.5	Canceled
INN00006	2	0	0	2	Meal Plan 2	Room_Type 1	346	2018-09-13	Online	115	Canceled

DATA ANALYSIS QUERIES

#Query1 :

What is the total number of reservations in the dataset?

```
SELECT COUNT(Booking_ID) AS total_reservation
FROM hotel_data;
```

total_reservation
700

Insights:
There are 700 reservations in the dataset.

DATA ANALYSIS QUERIES

#Query2 :

Which meal plan is the most popular among guests?

```
SELECT type_of_meal_plan, COUNT(type_of_meal_plan) AS total_count FROM hotel_data
GROUP BY type_of_meal_plan
ORDER BY COUNT(type_of_meal_plan) DESC
LIMIT 1;
```

type_of_meal_plan	total_count
Meal Plan 1	527

Insights:
Meal Plan 1 stands out as the most popular choice among guests.

DATA ANALYSIS QUERIES

#Query3:

What is the average price per room for reservations involving

```
SELECT ROUND(AVG(avg_price_per_room),1) AS avg_price_per_room_for_children
FROM hotel_data
WHERE no_of_children >0 ;
```

avg_price_per_room_for_children
144.6

Insights:
Reservations involving children have an average room price of 144.6.

DATA ANALYSIS QUERIES

#Query4:

How many reservations were made in each year?

```
SELECT YEAR(arrival_date) AS year  ,COUNT(*) AS total_reservations FROM hotel_data
GROUP BY YEAR(arrival_date)
ORDER BY YEAR(arrival_date) ASC ;
```

year	total_reservations
2017	123
2018	577

Insights:
In 2017, there were 123 reservations. Also, in 2018, the reservations experienced a significant increase that clearly indicates the positive growth.

DATA ANALYSIS QUERIES

#Query5:

What is the most commonly booked room type?

```
SELECT room_type_reserved, COUNT(room_type_reserved) AS total_booking FROM hotel_data
GROUP BY room_type_reserved
ORDER BY COUNT(room_type_reserved) DESC
LIMIT 1;
```

room_type_reserved	total_booking
Room_Type 1	534

Insights:
The Room_Type 1 Is the guests' top choice for bookings.

DATA ANALYSIS QUERIES

#Query6:

How do guest reservations vary between weekend and weekday

```
SELECT COUNT(*) AS total_weekend_reservations
FROM hotel_data
WHERE no_of_weekend_nights > 0 ;
```

total_weekend_reservations
383

```
-- weekday reservation
SELECT COUNT(*) AS total_weekday_reservations
FROM hotel_data
WHERE no_of_week_nights > 0 ;
```

total_weekday_reservations
656

Insights:

There is higher number of reservations for weekday nights (656) as compared to weekend nights (383) that suggests a guest preference for staying during weekdays.

DATA ANALYSIS QUERIES

#Query7:

What is the highest, lowest, and average lead time for reservations?

```
SELECT MAX(lead_time) AS highest_lead_time,MIN(lead_time) AS lowest_lead_time
FROM hotel_data;
```

highest_lead_time	lowest_lead_time
443	0

```
SELECT AVG(lead_time) AS avg_lead_time
FROM hotel_data;
```

avg_lead_time
83.3000

Insights:

The range of lead times, from 0 to 443 days, suggests diverse booking behaviors among guests. Some prefer last-minute reservations, while others plan well in advance. On average, the reservations have a lead time of 83.30 days.

DATA ANALYSIS QUERIES

#Query8:

What is the distribution of market segments for guests making same-day reservations versus those with long lead times (443 days)?

```sql
-- Query for Same-Day Reservations
SELECT market_segment_type, COUNT(market_segment_type) AS total_market_segment
FROM hotel_data
WHERE lead_time = 0
GROUP BY  market_segment_type;
```

```sql
-- Query for Long Lead Time Reservations
SELECT market_segment_type, COUNT(market_segment_type) AS total_market_segment
FROM hotel_data
WHERE lead_time = 443
GROUP BY  market_segment_type;
```

market_segment_type	total_market_segment
Online	16
Corporate	7
Offline	2
Complementary	1

market_segment_type	total_market_segment
Online	1

Insights:
Urgent last-minute bookings (same-day arrivals) are most common among guests from online, corporate, and offline market segments.

DATA ANALYSIS QUERIES

#Query9:

What is the most common market segment type for reservations?

```
SELECT market_segment_type, COUNT(*) AS total_resevations FROM hotel_data
GROUP BY market_segment_type
ORDER BY COUNT(*) DESC
LIMIT 1;
```

market_segment_type	total_resevations
Online	518

Insights:
The online market segment is the most popular choice among guests , showcasing a clear preference for online reservations.

DATA ANALYSIS QUERIES

#Query10:

What is the total number of confirmed reservations, and what percentage of reservations have a "Confirmed" booking status?

```sql
SELECT COUNT(*) AS confirmed_reservations FROM hotel_data
WHERE booking_status = "Not_Canceled";
```

confirmed_reservations
493

```sql
-- successful reservation %
SELECT ROUND((SUM(CASE WHEN booking_status = "Not_Canceled" THEN 1 ELSE 0 END)/COUNT(*))*100,2) AS successful_reservation_percent
FROM hotel_data;
```

successful_reservation_percent
70.43

Insights:
Out of 700 reservations, 493 are confirmed, indicating a success rate of approximately 70.43%. This suggests a high rate of successful reservations.

DATA ANALYSIS QUERIES

#Query11:

What is the total number of adults and children across all

```
SELECT SUM(no_of_adults) AS total_adults,SUM(no_of_children) AS total_children
FROM hotel_data;
```

total_adults	total_children
1316	69

Insights:
The majority of reservations, totaling 1,316, involve adult guests, while a smaller number, 69, include children. This highlights the hotel's primary appeal to adult.

DATA ANALYSIS QUERIES

#Query12:

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

```
SELECT ROUND(AVG(no_of_weekend_nights),2) AS avg_weekend_nights_for_children
FROM hotel_data
WHERE no_of_children > 0;
```

avg_weekend_nights_for_children
1.00

Insights:
On average, reservations with children involve a one-night stay on weekends, highlighting a preference for weekend stays, particularly suitable for families.

DATA ANALYSIS QUERIES

#Query13:

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

```
SELECT MONTH(arrival_date) AS month, MONTHNAME(arrival_date) AS month_name,COUNT(*) AS total_reservations
FROM hotel_data
GROUP BY MONTH(arrival_date) ,MONTHNAME(arrival_date)
ORDER BY COUNT(*)  DESC ;
```

month	month_name	total_reservations
1	January	11
2	February	28
3	March	52
4	April	67
5	May	55
6	June	84
7	July	44
8	August	70
9	September	80
10	October	103
11	November	54
12	December	52

Insights:

- October stands out as the peak reservation month followed by June and September .
- In contrast, January records the lowest number of reservations, indicating a quieter period.

DATA ANALYSIS QUERIES

#Query14:

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_total_nights FROM hotel_data
GROUP BY room_type_reserved
ORDER BY AVG(no_of_weekend_nights + no_of_week_nights) DESC ;
```

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

Insights:
Guests staying in Room Type 4 tend to spend the most nights on average (3.80), while those in Room Type 5 have the lowest average stay duration (2.50).

DATA ANALYSIS QUERIES

#Query15:

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, COUNT(*) AS total_reservations , ROUND(AVG(avg_price_per_room),2) AS avg_price_per_room
FROM hotel_data
WHERE no_of_children > 0
GROUP BY room_type_reserved
ORDER BY COUNT(*) DESC
LIMIT 1 ;
```

room_type_reserved	total_reservations	avg_price_per_room
Room_Type 1	24	123.12

Insights:
For reservations involving children, Room Type 1 is the preferred choice, with an average room price of 123.12.

DATA ANALYSIS QUERIES

#Query16:

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

```sql
SELECT market_segment_type , ROUND(AVG(avg_price_per_room),2) AS highest_avg_price_per_room
FROM hotel_data
GROUP BY market_segment_type
ORDER BY highest_avg_price_per_room DESC
LIMIT 1;
```

market_segment_type	highest_avg_price_per_room
Online	112.46

Insights:
Online bookings generate the highest average room price, reaching 112.46.

KEY QUESTIONS

1. What is the total number of reservations in the dataset?
2. Which meal plan is the most popular among guests?
3. What is the average price per room for reservations involving children?
4. How many reservations were made in each year?
5. What is the most commonly booked room type?
6. How many reservations fall on a weekend (no_of_weekend_nights > 0)?
7. What is the highest, lowest, and average lead time for reservations?
8. What is the distribution of market segments for guests making same-day reservations versus those with long lead times (443 days)?
9. What is the most common market segment type for reservations?
10. What is the total number of confirmed reservations, and what percentage of reservations have a "Confirmed" booking status?
11. What is the total number of adults and children across all reservations?
12. What is the average number of weekend nights for reservations involving children?
13. How many reservations were made in each month of the year?
14. What is the average number of nights (both weekend and weekday) spent by guests for each room type?
15. For reservations involving children, what is the most common room type, and what is the average price for that room type?
16. Find the market segment type that generates the highest average price per room?

OVERALL INSIGHT

- The dataset comprises 700 bookings.
- Meal Plan 1 is the top pick among guests.
- Bookings that include children have a mean room cost of 144.6.
- The number of reservations rose significantly from 123 in 2017 to a higher figure in 2018.
- Room Type 1 is the most frequently booked.
- Mostly guests (656) opt for weekday stays than weekend stays (383).
- Booking behaviors vary, with lead times from 0 to 443 days.
- On average, bookings are made about 83 days (roughly 3 months) prior to arrival.
- Immediate bookings (arrivals on the same day) are predominantly made by guests from online, corporate, and offline segments.
- The online segment is the most frequently used for bookings.
- Out of 700 bookings, 493 are confirmed, yielding a success rate of approximately 70.43%.
- The majority of bookings (1,316) which are made by adults.
- Bookings that include children typically involve one-night stays over the weekend.
- October is the busiest month for bookings, while January has the fewest.
- For bookings that include children, Room Type 1 is the top choice, with an average room cost of 123.12.
- Online bookings yield the highest average room cost, at 112.46.