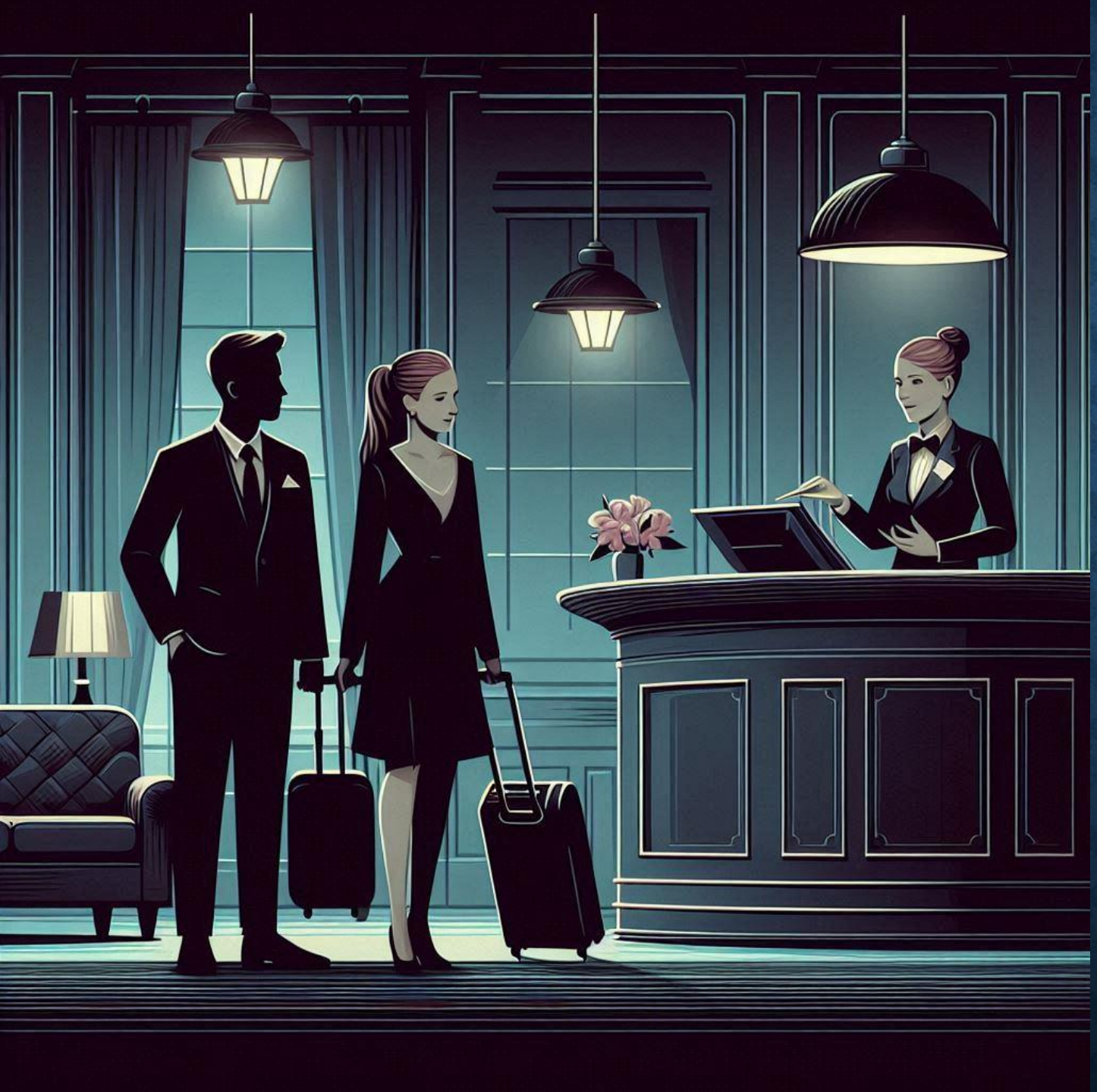

Hotel Reservation Analysis with SQL

Presented by Tufan Kundu

Overview:

The hotel industry relies on data to make informed decisions and enhance the overall guest experience. In this project, we delve into a comprehensive hotel reservation dataset to extract meaningful insights. Our goal is to uncover guest preferences, Identify booking trends and discover key factors influencing how the hotel operates.

Objective :

Our objective is to leverage SQL for in-depth exploration and analysis of the dataset.

By addressing specific queries related to the dataset , our goal is to reveal patterns

that will guide strategic decisions and optimize the overall performance of the hotel.

Tool Used :

Dataset Overview :

- **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.

Q1. What is the total number of reservations in the dataset?

Query:

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

Output:

	total_reservation
▶	700

Insight: there are 700 reservations in the dataset

Q2. Which meal plan is the most popular among guests?

Query:

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

Output:

type_of_meal_plan	Total_count
Meal Plan 1	527

Insight: Meal plan 1 is the most popular meal among the guest with the total count of 527

Q3.What is the average price per room for reservations involving children?

Query:

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

Output:

avg_price_per_room_involving_children
144.57

Insight: average price per room for reservations involving children is ₹144.57

Q4. How many reservations were made for the year 2017 ?

Query:

```
SELECT
    YEAR(arrival_date) AS Year, COUNT(*) AS reservations
FROM
    hotel_data
WHERE
    YEAR(arrival_date) = 2017
GROUP BY YEAR(arrival_date);
```

Output:

Year	reservations
2017	123

Insight: 123 reservations were made for the year 2017

Q5. What is the most commonly booked room type?

Query:

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

Output:

room_type_reserved	total_booking
Room_Type 1	534

Insight: Room_type_1 is the most commonly booked room type with total_booking of 534

Q6. How many reservations fall on a weekend (no_of_weekend_nights > 0)?

Query:

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

Output:

weekend_reservation
383

Insight: There are 383 weekend reservations

Q7. What is the highest and lowest lead time for reservations?

Query:

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

Output:

highest_lead_time	lowest_lead_time
443	0

Insight: 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.

Q8. What is the most common market segment type for reservations?

Query:

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

Output:

market_segment_type	total_count
Online	518
Offline	140
Corporate	27
Complementary	14
Aviation	1

Insight: Online is the most common market segment type for reservations

Q9. How many reservations have a booking status of "Confirmed"?

Query:

```
SELECT
    booking_status, COUNT(*) AS total_count
FROM
    hotel_data
WHERE
    booking_status = 'Not_Canceled';
```

Output:

booking_status	total_count
Not_Canceled	493

Insight: 493 reservations have a booking status of "Confirmed"

Q10. What is the total number of adults and children across all reservations?

Query:

```
SELECT
    SUM(no_of_adults) AS total_no_of_adults,
    SUM(no_of_children) AS total_no_of_children
FROM
    hotel data;
```

Output:

total_no_of_adults	total_no_of_children
1316	69

Insight: The majority of reservations, totaling 1,316, involve adult guests, while a smaller number, 69, include children.

Q11. What is the average number of weekend nights for reservations involving children?

Query:

```
SELECT
    AVG(no_of_weekend_nights) AS Avg_weekend_night_with_children
FROM
    hotel_data
WHERE
    no_of_children > 0;
```

Output:

Avg_weekend_night_with_children
1.0000

Insight: On average, reservations with children involve a one-night stay on weekends.

Q12. How many reservations were made in each month of the year?

Query:

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

Output:

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

Insight: October stands out as the peak reservation month (103 total_reservations)followed by June and September . In contrast, January records the lowest number of reservations (11 total_reservations), indicating a quieter period.

Q13. What is the average number of nights (both weekend and weekday) spent by guests for each room type?

Query:

```
SELECT
    room_type_reserved,
    ROUND(AVG(no_of_weekend_nights + no_of_week_nights),
            2) AS avg_nights_spent
FROM
    hotel_data
GROUP BY room_type_reserved
ORDER BY avg_nights_spent DESC;
```

Output:

room_type_reserved	avg_nights_spent
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

Insight: 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).

Q14. For reservations involving children, what is the most common room type, and what is the average price for that room type?

Query:

```
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 total_reservations DESC
LIMIT 1;
```

Output:

room_type_reserved	total_reservations	avg_price_per_room
Room_Type 1	24	123.12

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

Q15. Find the market segment type that generates the highest average price per room.

Query:

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

Output:

market_segment_type	avg_price_per_room
Online	112.46

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

Recommendations

- Implement targeted promotions for Room Type 1 to capitalize on its popularity.
- Tailor marketing strategies to attract online bookings, the most prevalent segment.
- Explore partnerships or promotions to boost reservations during quieter months like January.
- Enhance confirmation and booking processes to maintain the high success rate of reservations.
- Focus on enhancing services and promotions during weekdays to meet the strong demand for reservations on weekday nights (656), creating an opportunity to attract a larger number of guests.
- Continue monitoring and adapting strategies based on changing guest preferences and market trends.

Thank You