HOTEL BOOKING ANALYSIS
(DATA ANALYSIS USING SQL)

The hotel industry depends on data to enhance guest experience and optimize business operations. In this project, I analyze a hotel reservation dataset to uncover patterns in guest behavior, booking trends, pricing, and room preferences

PURPOSE OF THE PROJECT:
To practice SQL querying on real-world data and derive actionable insights.

DATASET DESCRIPTION:

Column	Description
Booking_ID	Unique ID for each booking
no_of_adults	Number of adults
no_of_children	Number of children
no_of_weekend_nights	Weekend nights booked
no_of_week_nights	Weekday nights booked
type_of_meal_plan	Meal plan selected
room_type_reserved	Room type
lead_time	Days between booking and arrival
arrival_date	Arrival date
market_segment_type	Source of booking
avg_price_per_room	Average price per room
booking_status	Confirmed or Canceled

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
INN00001	2	0	1	2	Meal Plan 1	Room_Type 1	224	2017-10-02	Offline
INN00002	2	0	2	3	Not Selected	Room_Type 1	5	2018-11-06	Online
INN00003	1	0	2	1	Meal Plan 1	Room_Type 1	1	2018-02-28	Online
INN00004	2	0	0	2	Meal Plan 1	Room_Type 1	211	2018-05-20	Online
INN00005	2	0	1	1	Not Selected	Room_Type 1	48	2018-04-11	Online
INN00006	2	0	0	2	Meal Plan 2	Room_Type 1	346	2018-09-13	Online
INN00007	2	0	1	3	Meal Plan 1	Room_Type 1	34	2017-10-15	Online
INN00008	2	0	1	3	Meal Plan 1	Room_Type 4	83	2018-12-26	Online

1: Total number of reservations

Query: SELECT COUNT(*) AS total_reservations
        FROM hotel_bookings;

Insight:

total_reservations
▶ 700

2. The meal plan that is most popular among guests

Query: SELECT type_of_meal_plan, COUNT(*) AS popular_mealplan
        FROM hotel_bookings
        GROUP BY type_of_meal_plan
        ORDER BY popular_mealplan DESC
        LIMIT 1;

Insight:

type_of_meal_plan	popular_mealplan
▶ Meal Plan 1	527

3. Average price per room for reservations involving children

Query: SELECT ROUND(AVG(avg_price_per_room),2) AS average_price
        FROM hotel_bookings
        WHERE no_of_children > 0;

Insight:

average_price
▶ 144.57

4. Reservations made for the year 2018

Query:
   - *AS THE DATE IS STORED AS TEXT/STRING-CHANGING IT TO DATE TO FETCH THE YEAR EASILY (Data Cleaning)*

SET SQL_SAFE_UPDATES =0;
update hotel_bookings
SET arrival_date= STR_TO_DATE(arrival_date,'%d-%m-%Y')
WHERE arrival_date IS NOT NULL;
SET SQL_SAFE_UPDATES =0;
ALTER TABLE hotel_bookings MODIFY column arrival_date DATE;

Insight:

	year_reservations
▶	577

5. Most commonly booked room type

Query: SELECT room_type_reserved, COUNT(*) AS common_type
FROM hotel_bookings
GROUP BY room_type_reserved
ORDER BY common_type DESC
LIMIT 1;

Insight:

	room_type_reserved	common_type
▶	Room_Type 1	534

6. <u>Reservations fall on a weekend</u>

Query: SELECT COUNT(*) AS weekend
FROM hotel_bookings
WHERE no_of_weekend_nights>0;
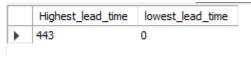
Insight:

	weekend
▶	383

7. 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_bookings;

Insight:

	Highest_lead_time	lowest_lead_time
▶	443	0

8. The most common market segment type for reservations

Query: SELECT market_segment_type, COUNT(*)
AS common_MarketSegment
FROM hotel_bookings

GROUP BY market_segment_type
        ORDER BY common_MarketSegment DESC
        LIMIT 1;
Insight:

	market_segment_type	common_MarketSegment
▶	Online	518

9. reservations have a booking status of "Confirmed"

As there was only 2 types if status in dataset -> "Canceled " AND "Not Canceled". So if the status is not canceled, then it is confirmed

Query: SELECT COUNT(*) AS confirmed_status
        FROM hotel_bookings
        WHERE booking_status !='Canceled';
        SELECT COUNT(*) AS confirmed_status
        FROM hotel_bookings
        WHERE booking_status !='Canceled';
Insight:

	confirmed_status
▶	493

10. The total number of adults and children across all reservations

Query: SELECT SUM(no_of_adults) AS adults, SUM(no_of_children)
        AS children, SUM(no_of_adults + no_of_children)
        AS Total
        FROM hotel_bookings;
Insight:

	adults	children	Total
▶	1316	69	1385

11. Ranking of room types by average price within each market segment

Query: SELECT market_segment_type,
        room_type_reserved,
        average_Price,
        RANK() OVER(PARTITION BY market_segment_type

ORDER BY average_Price DESC) AS rank_segment
FROM(
SELECT market_segment_type,
room_type_reserved,
AVG(avg_price_per_room) AS average_Price
FROM hotel_bookings
GROUP BY market_segment_type, room_type_reserved
) AS derived_table;

Insight:

market_segment_type	room_type_reserved	average_Price	rank_segment
Aviation	Room_Type 4	110	1
Complementary	Room_Type 4	14.5	1
Complementary	Room_Type 1	0.65	2
Complementary	Room_Type 2	0	3
Complementary	Room_Type 7	0	3
Corporate	Room_Type 4	103	1
Corporate	Room_Type 1	81.60884615384614	2
Offline	Room_Type 5	123.83	1
Offline	Room_Type 2	95	2

12. The top 2 most frequently booked room types per market segment

Query: WITH ranked_rooms AS (
      SELECT
      market_segment_type,
      room_type_reserved,
      COUNT(*) AS bookings_count,
      RANK() OVER (
      PARTITION BY market_segment_type
      ORDER BY COUNT(*) DESC
) AS room_rank
      FROM hotel_bookings
      GROUP BY market_segment_type, room_type_reserved
)
      SELECT *
      FROM ranked_rooms
      WHERE room_rank <= 2
      ORDER BY market_segment_type, room_rank;

Insight:

market_segment_type	room_type_reserved	bookings_count	room_rank
Aviation	Room_Type 4	1	1
Complementary	Room_Type 1	10	1
Complementary	Room_Type 4	2	2
Corporate	Room_Type 1	26	1
Corporate	Room_Type 4	1	2
Offline	Room_Type 1	124	1
Offline	Room_Type 4	13	2
Online	Room_Type 1	374	1

13. 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),2) AS weekend,
ROUND(AVG(no_of_week_nights),2) AS week,
ROUND(AVG(no_of_weekend_nights+no_of_week_nights),2)
AS Together
FROM hotel_bookings
GROUP BY room_type_reserved;

Insight:

room_type_reserved	weekend	week	Together
Room_Type 1	0.79	2.09	2.88
Room_Type 4	1.09	2.71	3.80
Room_Type 2	1.00	2.00	3.00
Room_Type 6	1.06	2.56	3.61
Room_Type 5	0.00	2.50	2.50
Room_Type 7	1.00	1.67	2.67

14. Reservations involving children, the most common room type, and the average price for that room type

Query:
SELECT room_type_reserved,
COUNT(*) AS booking_rooms,
ROUND(AVG(avg_price_per_room),2) AS avg_price
FROM hotel_bookings
WHERE no_of_children != 0
GROUP BY room_type_reserved
ORDER BY booking_rooms DESC
LIMIT 1;

Insight:

	room_type_reserved	booking_rooms	avg_price
▶	Room_Type 1	24	123.12

15. 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 averagePrice
>   FROM hotel_bookings
>   GROUP BY market_segment_type
>   ORDER BY averagePrice DESC
>   LIMIT 1;

Insight:

	market_segment_type	averagePrice
▶	Online	112.46

CONCLUSION:
1. There were a total of 700 reservations.
2. Meal Plan 1 was the most popular among the guests
3. The Average Price per room for reservations involving Children was 144.75
4. 577 reservations were made in the year 2018
5. The most commonly booked room type was Room Type 1
6. A total of 383 reservations were made on weekends
7. The highest lead time for reservations was 443, and the Lowest lead time was 0.
8. The most common market segment type for reservations was Online
9. A total of 493 reservations have a booking status of confirmed.
10. The total number of adults and children across all reservations was 1316 and 69, respectively.
11. Room type 1 was one of the most common room types, where reservations involved children.