HOTEL RESERVATION ANALYSIS

PROJECT OVERVIEW

- In this project, you will leverage SQL to explore and analyze a comprehensive hotel reservation dataset. This practical experience will enhance your data analysis skills by enabling you to answer critical questions and extract meaningful insights from real-world data.
- The hotel industry increasingly relies on data-driven decision-making to optimize operations, enhance guest satisfaction, and boost profitability. By working with a hotel reservation dataset, you will delve into various aspects of hotel management, including guest preferences, booking trends, and operational efficiency. Through SQL queries, you will uncover patterns and answer specific questions that can help improve hotel services and strategies.

DATASET DESCRIPTION

- 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.

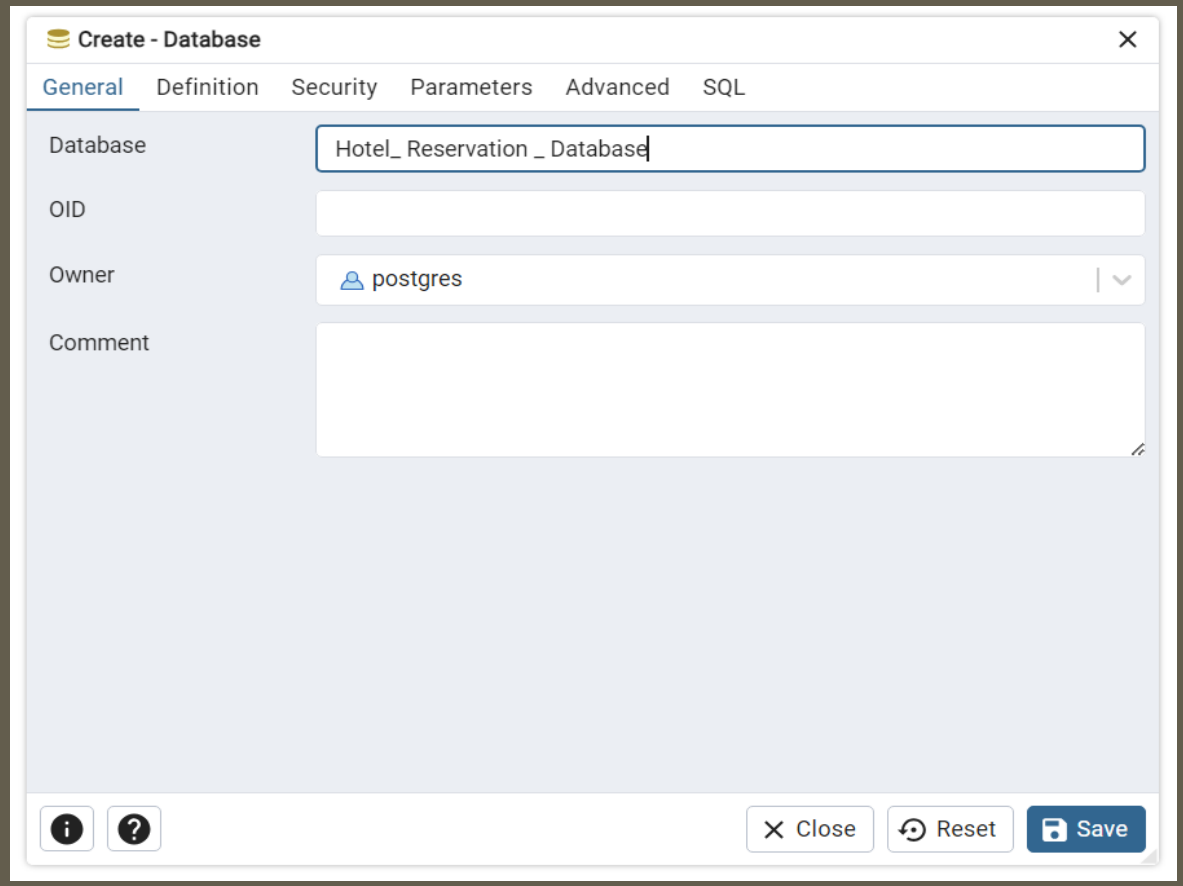
DATABASE AND TOOL

- Database Management System used.

- Management Tool: pgAdmin

CREATING DATABASE

- Hotel_Reservation_Database



CREATE TABLE

- Create table query:

➢ While creating a table I used " If not exists" in the query because I assumed That I was working in the organization and I was not sure if the table I was going to create was already in the database or not.

Query | Query History

```
CREATE TABLE IF NOT EXISTS HOTEL_RESERVATION(
    booking_ID VARCHAR(20) PRIMARY KEY,
    no_of_adults INT,
    no_of_children INT,
    no_of_weekend_nights INT,
    no_of_week_nights INT,
    type_of_meal_plan VARCHAR(50),
    room_type_reserved VARCHAR(50),
    lead_time INT,
    arrival_date DATE,
    market_segment_type VARCHAR(20),
    average_price_per_room DECIMAL,
    booking_status VARCHAR(20)
);
```

DATA SUCCESSFULLY IMPORTED INTO THE TABLE

```
6
7   Select * from hotel_reservation;
```

Data Output | Messages | Notifications

	booking_id character varying (50)	no_of_adults integer	no_of_children integer	no_of_weekend_nights integer	no_of_week_nights integer	type_of_meal_plan character varying (50)	room_type_reserved character varying (50)	lead_time integer	arrival_date date	ma ch
1	INN00001	2	0	1	2	Meal Plan 1	Room_Type 1	224	2017-10-02	Of
2	INN00002	2	0	2	3	Not Selected	Room_Type 1	5	2018-11-06	On
3	INN00003	1	0	2	1	Meal Plan 1	Room_Type 1	1	2018-02-28	On
4	INN00004	2	0	0	2	Meal Plan 1	Room_Type 1	211	2018-05-20	On
5	INN00005	2	0	1	1	Not Selected	Room_Type 1	48	2018-04-11	On
6	INN00006	2	0	0	2	Meal Plan 2	Room_Type 1	346	2018-09-13	On
7	INN00007	2	0	1	3	Meal Plan 1	Room_Type 1	34	2017-10-15	On
8	INN00008	2	0	1	3	Meal Plan 1	Room_Type 4	83	2018-12-26	On
9	INN00009	3	0	0	4	Meal Plan 1	Room_Type 1	121	2018-07-06	Of
10	INN00010	2	0	0	5	Meal Plan 1	Room_Type 4	44	2018-10-18	On
11	INN00011	1	0	1	0	Not Selected	Room_Type 1	0	2018-09-11	On
12	INN00012	1	0	2	1	Meal Plan 1	Room_Type 4	35	2018-04-30	On
13	INN00013	2	0	2	1	Not Selected	Room_Type 1	30	2018-11-26	On

Total rows: 700 of 700 | Query complete 00:00:00.373 | Ln 7, Col 33

DATA CLEANING

- Query to find NULL Values:

```
SELECT *
    FROM hotel_reservation
    WHERE booking_id IS NULL OR
          no_of_adults IS NULL OR
          no_of_children IS NULL OR
          no_of_weekend_nights IS NULL OR
          no_of_week_nights IS NULL OR
          type_of_meal_plan IS NULL OR
          room_type_reserved IS NULL OR
          lead_time IS NULL OR
          arrival_date IS NULL OR
          market_segment_type IS NULL OR
          avg_price_per_room IS NULL OR
          booking_status IS NULL;
```

Query | Query History

Data Output | Messages | Notifications

booking_id character varying (50)	no_of_adults integer	no_of_children integer	no_of_weekend_nights integer	no_of_week_nights integer	type_of_meal_plan character varying (50)	room_type_reserved character varying (50)	lead_time integer	arrival_date date	marke chara

➢ Handling the **NULL** values is a crucial task in data analysis. As it leads to **biased results** or **conclusions** if not handled properly.

➢ As you can see below screenshot we got an output after executing the query that we didn't Have NULL values in any of the columns of the dataset.

1. WHAT IS THE TOTAL NUMBER OF RESERVATIONS IN THE DATASET?

- Query:

Query | Query History

```
1  ----Q.1. What is the total number of reservations in the dataset?
2
3      SELECT COUNT(*) AS Total_Reservations
4      FROM Hotel_Reservation;
5
```

- Output:

	total_reservations bigint
1	700

2. WHICH MEAL PLAN IS THE MOST POPULAR AMONG GUESTS?

- Query:

```
-----Q.2. Which meal plan is the most popular among guests?


      SELECT type_of_meal_plan As popular_meal_plan_among_guests,
      COUNT(*) AS meal
      FROM Hotel_Reservation
      GROUP BY type_of_meal_plan
      ORDER BY meal DESC
      LIMIT 1;
```

- Output:

	popular_meal_plan_among_guests character varying (50)	meal bigint
1	Meal Plan 1	527

3. WHAT IS THE AVERAGE PRICE PER ROOM FOR RESERVATIONS INVOLVING CHILDREN?

- Query:

```
------Q.3. What is the average price per room for reservations involving children?


      SELECT
      AVG(avg_price_per_room) AS avg_price_per_rooms
      FROM Hotel_Reservation
      WHERE no_of_children > 0;
```

- Output:

	avg_price_per_rooms numeric
1	144.5683333333333333

4. HOW MANY RESERVATIONS WERE MADE FOR THE YEAR 20XX (REPLACE XX WITH THE DESIRED YEAR)?

- Query:

```
------Q.4.How many reservations were made for the year 20XX (replace XX with the desired year)?


    SELECT COUNT(*) AS total_reservations_for_year_2017
    FROM Hotel_Reservation
    WHERE EXTRACT(YEAR FROM arrival_date) = 2017;
```

- Output:

	total_reservations_for_year_2017 bigint
1	123

5. WHAT IS THE MOST COMMONLY BOOKED ROOM TYPE?

- Query:

```
------Q.5. What is the most commonly booked room type?

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

- Output:

	room_type_reserved character varying (50)	total_count bigint
1	Room_Type 1	534

6. HOW MANY RESERVATIONS FALL ON A WEEKEND (NO_OF_WEEKEND_NIGHTS > 0)?

- Query:

```
------Q.6. How many reservations fall on a weekend (no_of_weekend_nights > 0)?

      SELECT
      COUNT(*) AS reservations_fall_on_weekend
      FROM Hotel_Reservation
      WHERE no_of_weekend_nights > 0;
```

- Output:

	reservations_fall_on_weekend bigint
1	383

7. WHAT IS THE HIGHEST AND LOWEST LEAD TIME FOR RESERVATIONS?

- Query:

```
------Q.7. What is the highest and lowest lead time for reservations?

            SELECT
            MAX(lead_time) AS Highest_lead_time,
            MIN(lead_time) AS lowest_lead_time
            FROM Hotel_Reservation;
```

- Output:

	highest_lead_time integer	lowest_lead_time integer
1	443	0

8. WHAT IS THE MOST COMMON MARKET SEGMENT TYPE FOR RESERVATIONS?

- Query:

```
-----Q.8. What is the most common market segment type for reservations?

      SELECT
      MAX(market_segment_type) AS most_common_segment
      FROM Hotel_Reservation
      GROUP BY market_segment_type
      ORDER BY most_common_segment DESC
      LIMIT 1;
```

- Output:

	most_common_segment text
1	Online

9. HOW MANY RESERVATIONS HAVE A BOOKING STATUS OF "CONFIRMED"?

- Query:

```
-----Q.9. How many reservations have a booking status of "Confirmed"?

      SELECT
      COUNT (*) AS Confirmed_bookings
      FROM Hotel_Reservation
      WHERE booking_status = 'Not_Canceled';
```

- Output:

	confirmed_bookings bigint
1	493

10. WHAT IS THE TOTAL NUMBER OF ADULTS AND CHILDREN ACROSS ALL RESERVATIONS?

- Query:

```
----Q.10. What is the 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_Reservation;
```

- Output:

	total_adults bigint	total_children bigint
1	1316	69

11. WHAT IS THE AVERAGE NUMBER OF WEEKEND NIGHTS FOR RESERVATIONS INVOLVING CHILDREN?

- Query:

```
----Q.11. What is the average number of weekend nights for reservations involving children?

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

- Output:

	average_weekend_nights numeric
1	1.00

12. HOW MANY RESERVATIONS WERE MADE IN EACH MONTH OF THE YEAR?

- Query:

```
----Q.12. How many reservations were made in each month of the year?


        SELECT
        EXTRACT (YEAR FROM arrival_date) AS reservation_year,
        EXTRACT (MONTH FROM arrival_date) AS reservation_month,
        COUNT(booking_ID) AS reservations_in_each_month
        FROM Hotel_Reservation
        GROUP BY reservation_year, reservation_month
        ORDER BY reservation_year, reservation_month ASC;
```

- Output:

	reservation_year numeric	reservation_month numeric	reservations_in_each_month bigint
1	2017	7	8
2	2017	8	14
3	2017	9	35
4	2017	10	40
5	2017	11	13
6	2017	12	13
7	2018	1	11
8	2018	2	28
9	2018	3	52
10	2018	4	67
11	2018	5	55
12	2018	6	84

13. WHAT IS THE AVERAGE NUMBER OF NIGHTS (BOTH WEEKEND AND WEEKDAY) SPENT BY GUESTS FOR EACH ROOM TYPE?

- Query:

```
----Q.13. 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 avgerage_no_of_nights
        FROM Hotel_Reservation
        GROUP BY room_type_reserved
        ORDER BY room_type_reserved ASC;
```

- Output:

	room_type_reserved character varying (50)	avgerage_no_of_nights numeric
1	Room_Type 1	2.88
2	Room_Type 2	3.00
3	Room_Type 4	3.80
4	Room_Type 5	2.50
5	Room_Type 6	3.61
6	Room_Type 7	2.67

14. FOR RESERVATIONS INVOLVING CHILDREN, WHAT IS THE MOST COMMON ROOM TYPE, AND WHAT IS THE AVERAGE PRICE FOR THAT ROOM TYPE?

- Query:

```
--Q.14. 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 AS most_common_room_type,
   ROUND(AVG(avg_price_per_room), 2) AS average_prices
   FROM Hotel_Reservation
   WHERE no_of_children > 0
   GROUP BY room_type_reserved
   ORDER BY room_type_reserved
   LIMIT 1;
```

- Output:

	most_common_room_type character varying (50)	average_prices numeric
1	Room_Type 1	123.12

15. FIND THE MARKET SEGMENT TYPE THAT GENERATES THE HIGHEST AVERAGE PRICE PER ROOM.

- Query:

```
----Q.15. Find the market segment type that generates the highest average price per room.

        SELECT
        market_segment_type AS segment_type,
        MAX(avg_price_per_room) AS highest_average_price_per_room
        FROM Hotel_Reservation
        GROUP BY segment_type
        ORDER BY highest_average_price_per_room DESC
        LIMIT 1;
```

- Output:

	segment_type character varying (50)	highest_average_price_per_room numeric
1	Online	258.00

INSIGHTS

- In 2017 September and October were the months when maximum reservation were made and in 2018 March, April, May, June, August and October were the month when the maximum reservations were made by the customers.
- Out of 700 reservation 493 were confirmed and based on this we can say that approximately 70% were confirmed reservations and 30% customers canceled the reservations.
- Approximately 73% of the customers booked hotel rooms online.
- Room_type_1 was the most popular room type among the customers.
- Meal_plan_1 was the most popular meal among the customers.
- Room_type_1 was the most popular room among the customers who had children with them.

THANK YOU