



# Hotel Reservation Analysis with SQL

by



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# OVERVIEW

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

# Tool Used

## ► PostgreSQL

PostgreSQL is an open-source relational database management system emphasizing extensibility and SQL compliance.

PostgreSQL features transactions with atomicity, consistency, isolation, durability (ACID) properties, automatically updatable views, materialized views, triggers, foreign keys, and stored procedures.



# Dataset Details:

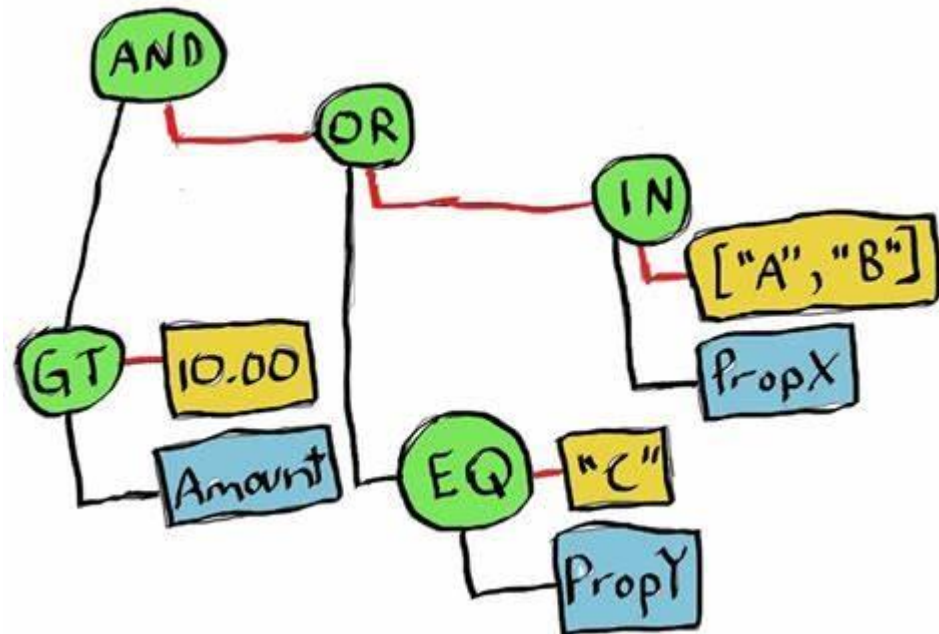
The dataset includes the following columns:

- ▶ **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.

# PROJECT TASK:

- ▶ 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 for the year 20XX (replace XX with the desired 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 and lowest lead time for reservations?
- ▶ 8. What is the most common market segment type for reservations?
- ▶ 9. How many reservations have a booking status of "Confirmed"?
- ▶ 10. What is the total number of adults and children across all reservations?
- ▶ 11. What is the average number of weekend nights for reservations involving children?
- ▶ 12. How many reservations were made in each month of the year?
- ▶ 13. What is the average number of nights (both weekend and weekday) spent by guests for each room type?
- ▶ 14. For reservations involving children, what is the most common room type, and what is the average price for that room type?
- ▶ 15. Find the market segment type that generates the highest average price per room.

# QUERIES >>



➤ What is the total number of reservations in the dataset?

Query		Query History
1	SELECT COUNT(booking_id) AS TotalReservations	
2	FROM hotel_reservation	

Data Output		Messages	Notifications
totalreservations			
bigint			
1	700		

**Ans:**

➤ The total number of reservations in the dataset is **700**

➤ Which meal plan is the most popular among guests?

Query

Query History

1

2

3

4

5

SELECT

type\_of\_meal\_plan,

COUNT

(\*)

AS

Popular\_Meal\_Plan

FROM

hotel\_reservation

GROUP

BY

type\_of\_meal\_plan

ORDER

BY

Popular\_Meal\_Plan

DESC

LIMIT

1;

Data Output

Messages

Notifications

≡+

▼

▼

type\_of\_meal\_plan

character varying

popular\_meal\_plan

bigint

1

Meal Plan 1

527

**Ans:**

- The most popular meal plan among guest is **MEAL PLAN 1** which is approximately **527 number of orders**.



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

Query Query History

```
1 SELECT ROUND(AVG(avg_price_per_room), 2) AS AveragePricePerRoomWithChildren
2 FROM hotel_reservation
3 WHERE no_of_children > 0
```

Data Output Messages Notifications

averagepriceperroomwithchildren numeric

1	144.57
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**Ans:**

- The average price per room for reservations involving children is **\$144.57**


- How many reservations were made for the year 2018?

Query Query History

```
1 SELECT COUNT(booking_id) AS "2018TotalResevation"
2 FROM hotel_reservation
3 WHERE arrival_date > '2017-12-31'
```

Data Output Messages Notifications

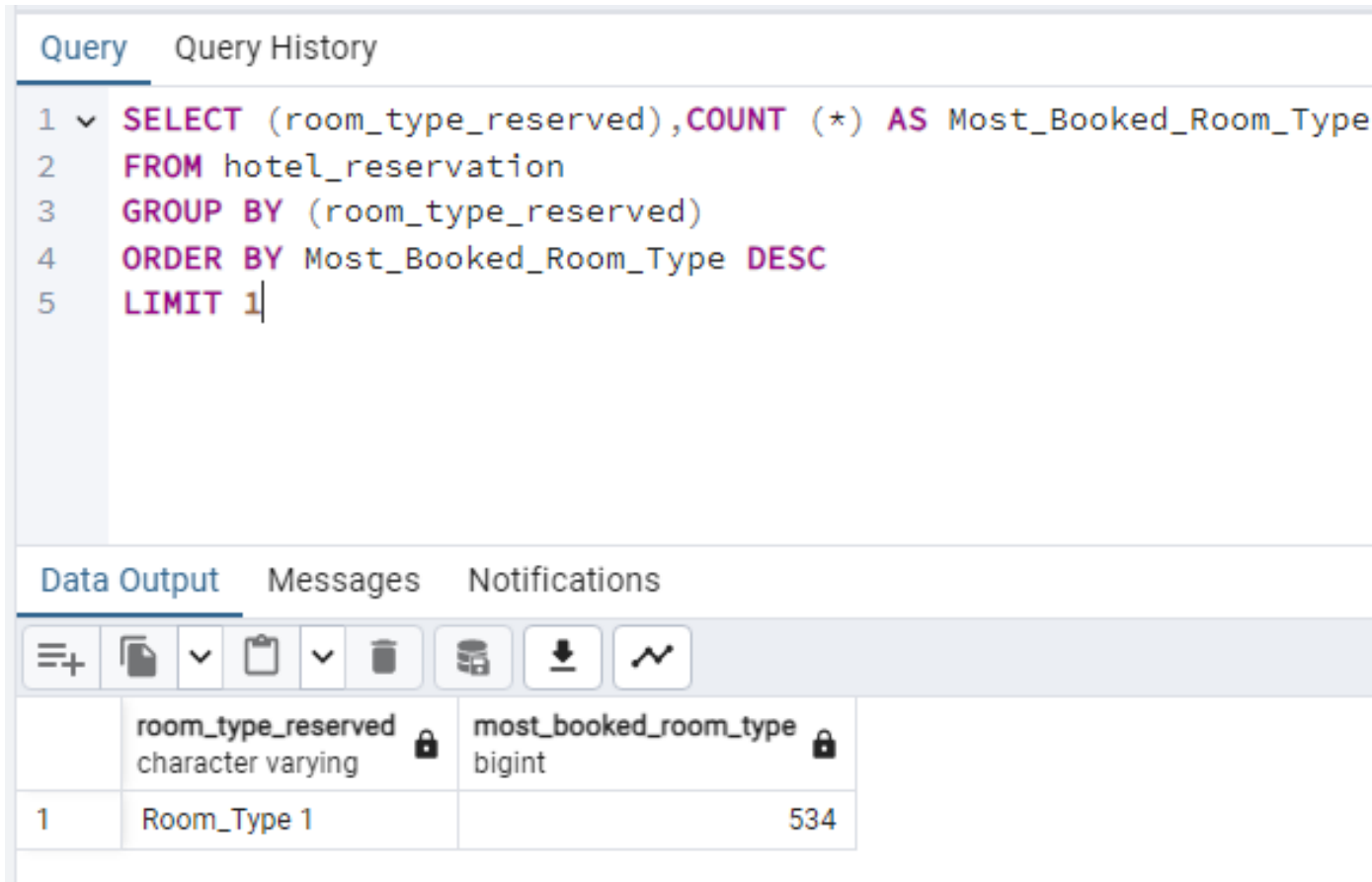
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	2018TotalResevation 
1	577

**Ans:**

- Total Reservation that was made in year 2018 is **577**

➤ What is the most commonly booked room type?



The screenshot shows a SQL query editor with a query window and a data output window. The query window contains the following SQL code:

```
1 SELECT (room_type_reserved), COUNT (*) AS Most_Booked_Room_Type
2 FROM hotel_reservation
3 GROUP BY (room_type_reserved)
4 ORDER BY Most_Booked_Room_Type DESC
5 LIMIT 1
```

The data output window shows the results of the query. It has a toolbar with icons for expand, save, undo, redo, delete, refresh, download, and chart. The output table has two columns: `room_type_reserved` (character varying) and `most_booked_room_type` (bigint). The first row shows the result:

	room_type_reserved character varying	most_booked_room_type bigint
1	Room_Type 1	534

**Ans:**

➤ The most commonly booked room type is **ROOM\_TYPE 1 = 534**

➤ How many reservations fall on a weekend?

Query Query History

```
1 SELECT COUNT(no_of_weekend_nights) AS Total_Weekend_Reservation
2 FROM hotel_reservation
3 WHERE no_of_weekend_nights >0
```

Data Output Messages Notifications

total\_weekend\_reservation bigint

1	383
---	-----

**Ans:**

➤ Total Reservation that fall on Weekend is = **383**

- What is the highest and lowest lead time for reservations?

Query Query History

```
1 SELECT
2 MAX (lead_time) AS Highest_lead_time,
3 MIN (lead_time) AS Lowest_lead_time
4 FROM hotel_reservation
```

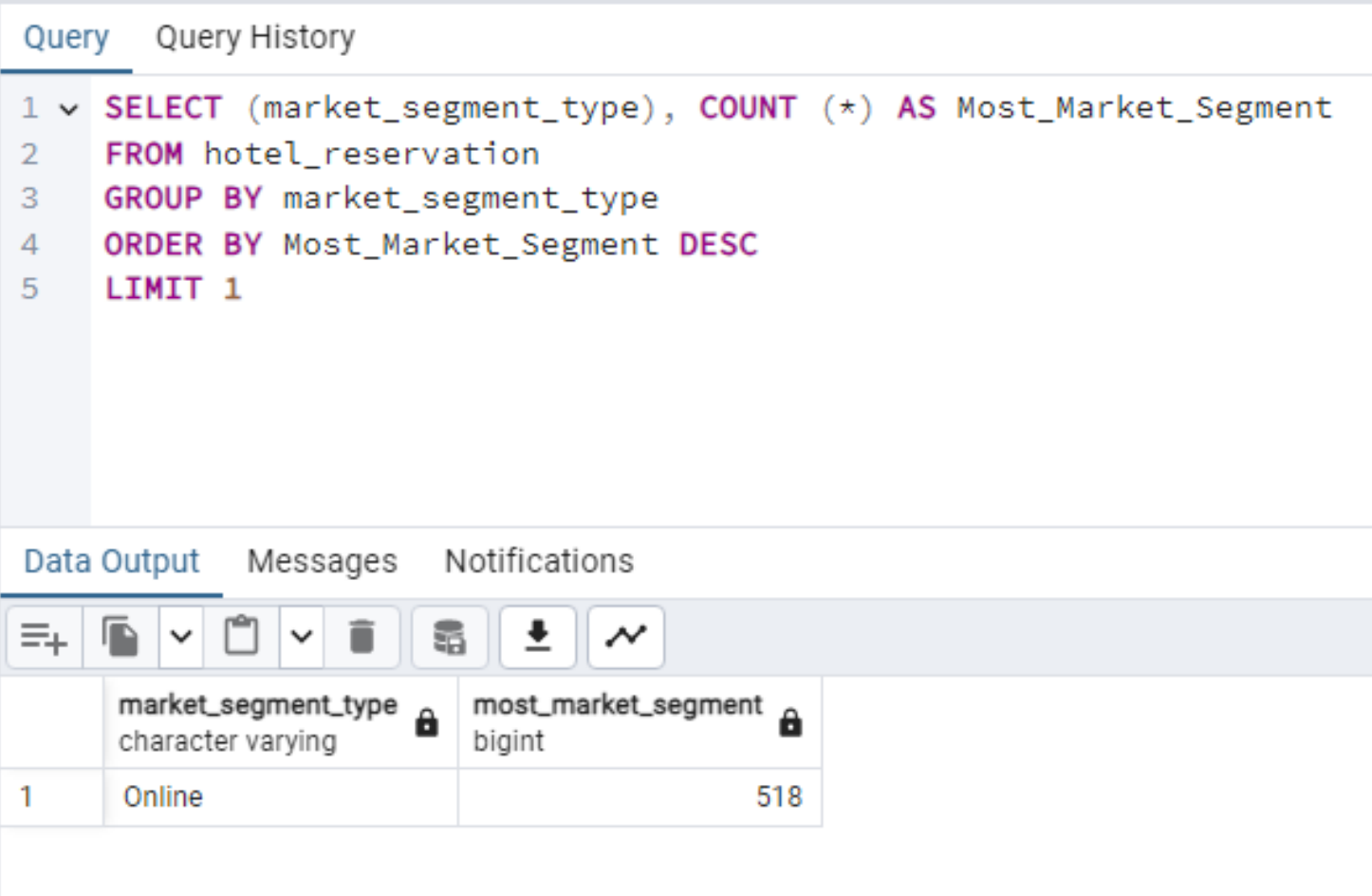
Data Output Messages Notifications

	highest_lead_time integer	lowest_lead_time integer
1	443	0

**Ans:**

- The Highest Lead Time is = **383** while the Lowest Lead Time is = **0**

- What is the most common market segment type for reservations?



The screenshot shows a database query interface. At the top, there are tabs for 'Query' and 'Query History'. The 'Query' tab is active, displaying a SQL query with line numbers 1 through 5. Below the query, there are tabs for 'Data Output', 'Messages', and 'Notifications'. The 'Data Output' tab is active, showing a table with two columns: 'market\_segment\_type' (character varying) and 'most\_market\_segment' (bigint). The table contains one row with the value 'Online' for the first column and '518' for the second column. Above the table, there is a toolbar with icons for various actions like expand, copy, paste, delete, and download.

```
1 SELECT (market_segment_type), COUNT (*) AS Most_Market_Segment
2 FROM hotel_reservation
3 GROUP BY market_segment_type
4 ORDER BY Most_Market_Segment DESC
5 LIMIT 1
```

	market_segment_type character varying	most_market_segment bigint
1	Online	518

**Ans:**

- The most common market segment type for reservations is = **Online which is 518 count of reservation**

- How many reservations have a booking status of "Confirmed"??

The screenshot shows a SQL query editor with two tabs: "Query" and "Query History". The "Query" tab is active, displaying the following SQL query:

```
1 SELECT COUNT (booking_status) AS Confirmed_Reservation
2 FROM hotel_reservation
3 WHERE booking_status = 'Not_Canceled'
```

Below the query editor, there are three tabs: "Data Output", "Messages", and "Notifications". The "Data Output" tab is active, showing a table with the results of the query. The table has two columns: "confirmed\_reservation" (type: bigint) and a lock icon. The first row shows the value 493.

	confirmed_reservation
1	493

**Ans:**

- Total reservation with the booking status **"Confirmed"** which is = 493

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

Query Query History

```
1 SELECT
2     SUM(CASE WHEN no_of_adults IS NULL THEN 0 ELSE no_of_adults END) AS
   total_adults,
3     SUM(CASE WHEN no_of_children IS NULL THEN 0 ELSE no_of_children END) AS
   total_children
4 FROM hotel_reservation
```

Data Output Messages Notifications

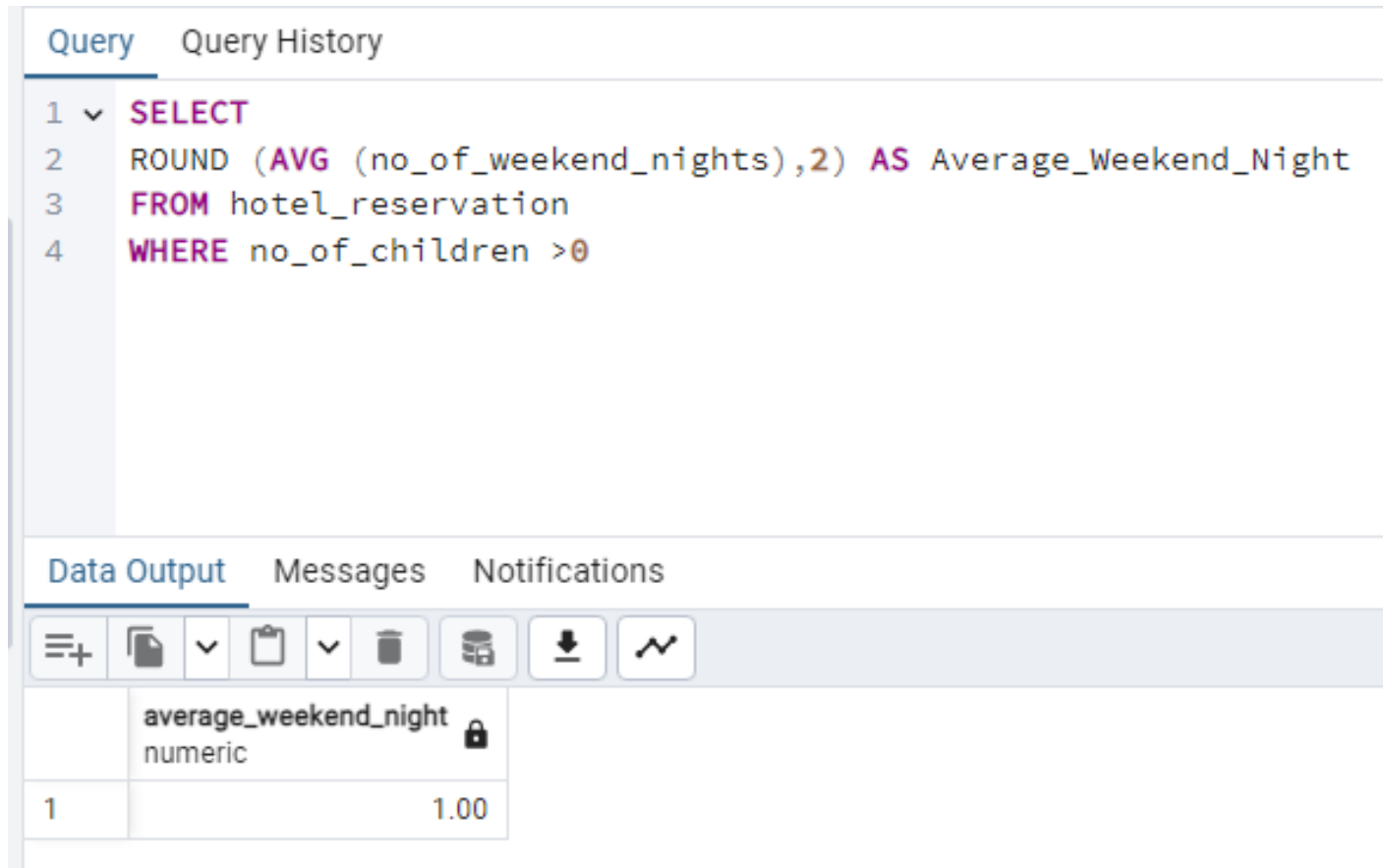
	total_adults bigint	total_children bigint
1	1316	69

**Ans:**

- The total number of adults **is = 1,316** and children across all reservations **is = 69**



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



The screenshot shows a database query editor with two tabs: "Query" and "Query History". The "Query" tab is active, displaying a SQL query:

```
1 SELECT
2 ROUND (AVG (no_of_weekend_nights),2) AS Average_Weekend_Night
3 FROM hotel_reservation
4 WHERE no_of_children >0
```

Below the query editor, there are three tabs: "Data Output", "Messages", and "Notifications". The "Data Output" tab is active, showing a table with one row of results. The table has a header row with the column name "average\_weekend\_night" and its data type "numeric". The first row of data shows the value "1.00".

	average_weekend_night numeric
1	1.00

**Ans:**

- The average number of weekend nights for reservations involving children **is = 1.00**

## ➤ How many reservations were made in each month of the year 2017 & 2018?

Query Query History

```
1 SELECT to_char(DATE_TRUNC('month', arrival_date), 'Month') AS Month_Name,
2 COUNT (booking_id) AS Total_Count
3 FROM hotel_reservation
4 WHERE arrival_date < '2018-12-31'
5 GROUP BY Month_Name
6 ORDER BY Total_Count DESC
```

Data Output Messages Notifications

	month_name text	total_count bigint
1	October	103
2	June	84
3	September	80
4	August	70
5	April	67
6	May	55
7	November	54
8	March	52
9	December	51
10	July	44
11	February	28
12	January	11

➤ **2017 - 2018  
RESERVATION**

Query Query History

```
1 SELECT to_char(DATE_TRUNC('month', arrival_date), 'Month') AS Month_Name,
2 COUNT (booking_id) AS Total_reservations_2017
3 FROM hotel_reservation
4 WHERE arrival_date < '2018-01-01'
5 GROUP BY Month_Name
6 ORDER BY Total_reservations_2017 DESC
```

Data Output Messages Notifications

	month_name text	total_reservations_2017 bigint
1	October	40
2	September	35
3	August	14
4	November	13
5	December	13

➤ **2017  
RESERVATION**

Query Query History

```
1 SELECT to_char(DATE_TRUNC('month', arrival_date), 'Month') AS Month_Name,
2 COUNT (booking_id) AS Total_reservations_2018
3 FROM hotel_reservation
4 WHERE arrival_date > '2017-12-31'
5 GROUP BY Month_Name
6 ORDER BY Total_reservations_2018 DESC
```

Data Output Messages Notifications

	month_name text	total_reservations_2018 bigint
1	June	84
2	April	67
3	October	63
4	August	56
5	May	55

➤ **2018  
RESERVATION**

**Ans:**

- The analyses shows the overall total reservations for each month which OCTOBER takes the lead with **= 103 RESERVATIONS**

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

Query		Query History
<pre>1 select room_type_reserved, 2 ROUND(AVG( no_of_weekend_nights + no_of_week_nights),2) AS Average_Night_Num 3 FROM hotel_reservation 4 GROUP BY room_type_reserved 5 ORDER BY room_type_reserved ASC;</pre>		
Data Output		Messages   Notifications
<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div>		
	room_type_reserved character varying	average_night_num 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

**Ans:**

- The average number of nights for both weekend and weekday

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

Query		Query History	
1	SELECT	(room_type_reserved), COUNT(*) AS Common_Room_Type,	
2		ROUND(AVG(avg_price_per_room),2) AS avg_price_Room_Type	
3	FROM	hotel_reservation	
4	WHERE	no_of_children >0	
5	GROUP BY	room_type_reserved	
6	ORDER BY	Common_Room_Type DESC	

Data Output		Messages	Notifications
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	room_type_reserved character varying	common_room_type bigint	avg_price_room_type numeric
1	Room_Type 1	24	123.12
2	Room_Type 6	17	185.33
3	Room_Type 2	5	112.08
4	Room_Type 7	1	187.04
5	Room_Type 4	1	86.32

**Ans:**

- Result shows The average price per room type and most common room type from highest to lowest

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

Query		Query History
1	SELECT	market_segment_type,
2	ROUND(AVG (avg_price_per_room),2)	AS Highest_Avg_Price
3	FROM	hotel_reservation
4	GROUP BY	market_segment_type
5	ORDER BY	Highest_Avg_Price DESC

Data Output		Messages	Notifications
<div><div>≡+</div><div></div><div>▼</div><div></div><div>▼</div><div></div><div></div><div></div><div></div></div>			
	market_segment_type character varying	highest_avg_price numeric	
1	Online	112.46	
2	Aviation	110.00	
3	Offline	89.98	
4	Corporate	82.40	
5	Complementary	2.54	

**Ans:**

- The market segment type that generates the highest average price per room is **ONLINE = \$112.46**

# CONCLUSION

This hotel reservation dataset analysis provided valuable insights into guest booking trends. Here are the key takeaways:

- I identified the overall reservation volume and popular meal plans.
- I analyzed pricing trends for rooms with children and reservations made during specific years.
- I determined the most frequently booked room type and weekend stay patterns.
- I explored lead times, booking statuses, market segments, and guest demographics.
- I investigated the relationship between room type, children, and pricing for reservations.
- I pinpointed the market segment generating the highest average room revenue.

## ► ***This information can be used to:***

- **Optimize room pricing strategies** based on room type, market segment, and guest preferences.
- **Develop targeted marketing campaigns** for specific guest demographics and popular booking periods.
- **Improve resource allocation** by understanding lead times and weekend booking trends.
- **Identify areas for improvement** in guest experience based on market segment analysis.

*By leveraging these insights, the hotel can make data-driven decisions to increase revenue, enhance guest satisfaction, and achieve operational efficiency*

# THANK YOU



ADEDOKUN ABDULMALIK ADEYEMI