

# HOTEL RESERVATION SYSTEM

USING MySQL



# INTRODUCTION

In today's fast-paced digital world, the hospitality industry has transformed significantly, driven by technological advancements that enhance guest experiences and streamline operations.

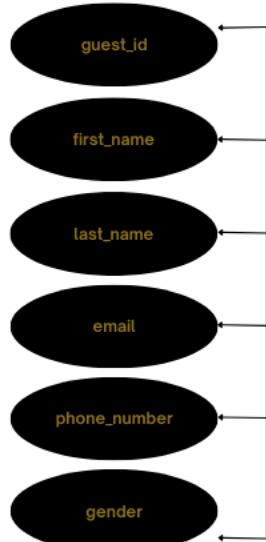
A Hotel Reservation System (HRS) is essential for managing bookings, guest information, and hotel services efficiently. This project will explore the key components and benefits of an HRS, highlighting its role in transforming hotel management and enhancing guest experiences.



# Entity Relationship Diagram of Hotel Reservation System

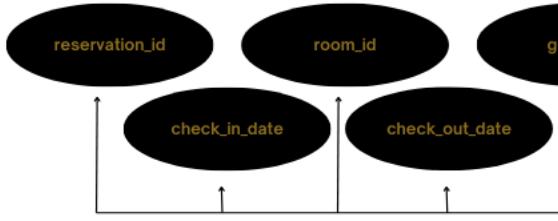
**Guests - Reservations**

One guest can have many reservations.



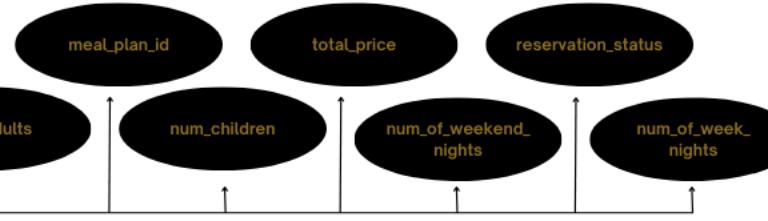
**Rooms - Reservations**

One room can be reserved in many reservations.



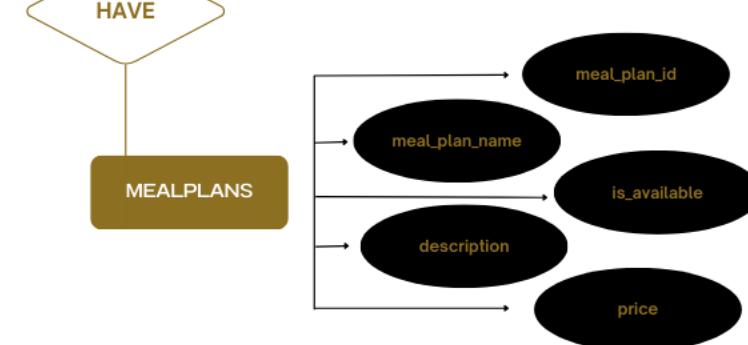
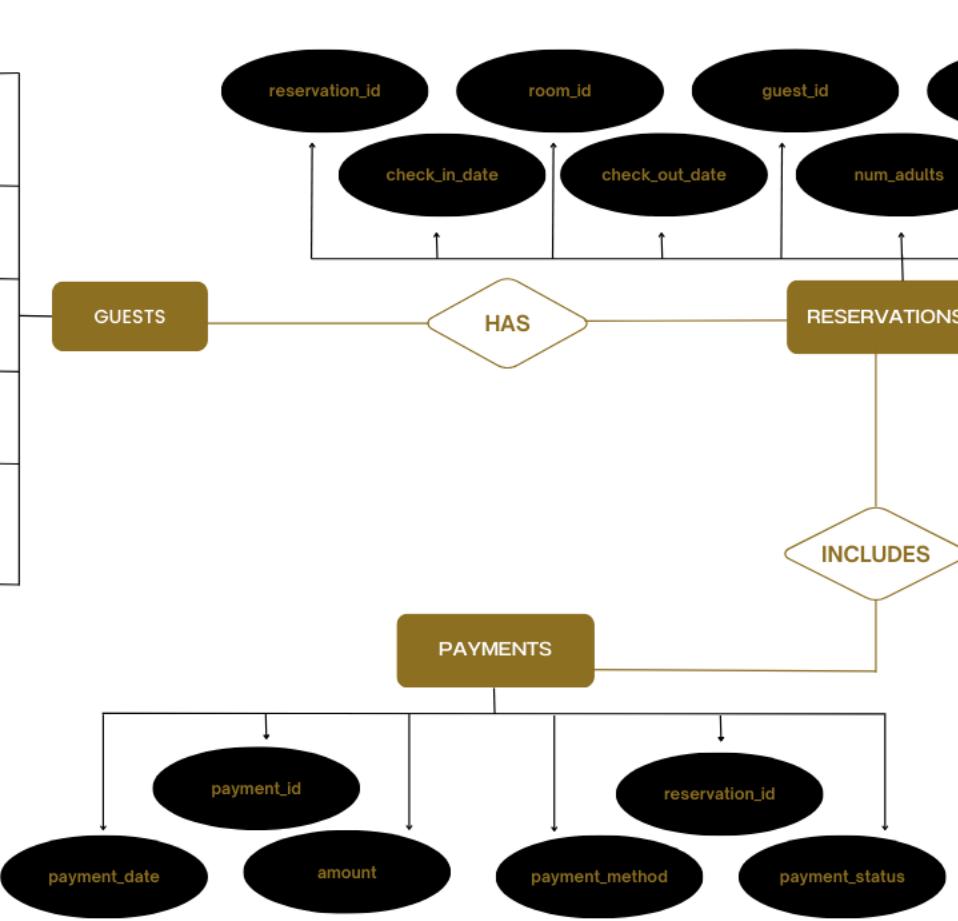
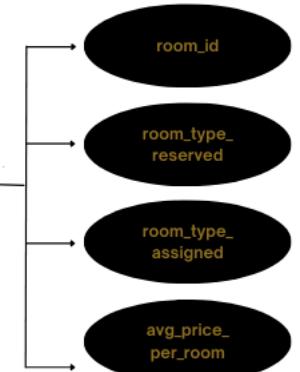
**MealPlans - Reservations**

One meal plan can be associated with many reservations.



**Reservations - Payments**

One reservation can have many payments.



# Display all the unique categories of rooms.

```
SELECT DISTINCT(room_type_reserved) FROM Rooms;
```

room_type_reserved
Deluxe Suite
Standard Room
Mountain View Room
Ocean View Room
Family Room
Single Room
King Room
Queen Room
Penthouse Suite
Luxury Suite
Economy Room
Accessible Room
Executive Suite
Standard Double Room
Business Room
Superior Room
Presidential Suite



# How many reservations are there for each reservation status?

```
SELECT reservation_status, COUNT(*) AS "total_reservations"  
FROM Reservations  
GROUP BY reservation_status;
```



Result Grid | Filter Rows:

	reservation_status	total_reservations
▶	confirmed	63
	canceled	10
	pending	17

3 15:57:52 SELECT reservation\_status, COUNT(\*) AS "total\_reservations" FROM Reservations ... 3 row(s) returned

# Calculate the percentage of weekend nights for each reservation.

```
SELECT reservation_id,(num_of_weekend_nights / DATEDIFF(check_out_date, check_in_date)) * 100  
AS "weekend_percentage"  
FROM Reservations  
WHERE DATEDIFF(check_out_date, check_in_date) > 0;
```



	reservation_id	weekend_percentage
▶	2	50.0000
	4	20.0000
	5	16.6667
	6	40.0000
	7	0.0000
	8	25.0000
	9	37.5000
	10	33.3333
	12	50.0000
	13	20.0000
	14	0.0000
	15	20.0000
	16	20.0000
	17	0.0000
	18	40.0000
	19	20.0000
	21	20.0000



4 16:07:16

SELECT reservation\_id,(num\_of\_weekend\_nights / DATEDIFF(check\_out\_date, che... 79 row(s) returned

# What is the average duration of stay for all reservations?

```
SELECT AVG(DATEDIFF(check_out_date, check_in_date))  
AS "average_stay_duration"  
FROM Reservations;
```

	average_stay_duration
▶	5.0778

4 16:12:09 SELECT AVG(DATEDIFF(check\_out\_date, check\_in\_date)) AS "average\_stay\_du... 1 row(s) returned



# How would you mark rooms 1,6,19,21 as "under maintenance" by updating its status?



## UPDATE Rooms

```
SET room_type_assigned = 'Under Maintenance'  
WHERE room_id IN (1,6,19,21);  
SELECT * FROM Rooms WHERE room_id IN (1,6,19,21);
```

Result Grid				
	room_id	room_type_reserved	room_type_assigned	avg_price_per_room
▶	1	Deluxe Suite	Under Maintenance	0.06
	6	Single Room	Under Maintenance	0.02
	19	Beachfront Room	Under Maintenance	400.00
	21	Loft Room	Under Maintenance	0.07
*	HULL	NULL	NULL	NULL

- 85 23:55:39 UPDATE Rooms SET room\_type\_assigned = 'Under Maintenance' WHERE room\_i... 4 row(s) affected Rows matched: 4 Changed: 4 Warnings: 0
- 86 23:56:18 SELECT \* FROM Rooms WHERE room\_id IN (1,6,19,21) LIMIT 0, 1000 4 row(s) returned

# How can you delete all reservations that fall between a specific date range from '2024-01-01' to '2024-01-31'?

```
DELETE FROM Reservations WHERE check_in_date BETWEEN '2024-01-01' AND '2024-01-31';  
SELECT * FROM Reservations;
```

	reservation_id	room_id	guest_id	check_in_date	check_out_date	total_price	reservation_status	num_adults	num_children	num_of_weekend_nights	num_of_week_nights
▶	2	2	2	2024-02-12	2024-02-14	300.00	confirmed	1	0	1	1
	4	4	4	2024-03-20	2024-03-25	800.00	confirmed	3	0	1	3
	5	5	5	2024-04-01	2024-04-07	600.00	confirmed	2	2	1	4
	6	6	6	2024-05-15	2024-05-20	400.00	pending	1	1	2	3



```
104 01:24:58 DELETE FROM Reservations WHERE check_in_date BETWEEN '2024-01-01' A... 11 row(s) affected  
105 01:25:55 SELECT * FROM Reservations LIMIT 0, 1000 79 row(s) returned
```

# What is the first name initial and full last name of each guest separated by a dot?

```
SELECT CONCAT(LEFT(first_name, 1), '.', ' ', last_name)  
AS "name_with_initial" FROM Guests;
```



Result Grid
name_with_initial
J. Doe
J. Smith
J. Doe
E. Davis
C. Brown
S. Williams
D. Jones
L. Garcia
J. Martinez
L. Hernandez
R. Lopez
J. Wilson
D. Anderson
K. Thomas
M. Taylor
M. Moore
J. Jackson

## **How can we mask the last four digits of all female guests phone numbers for privacy?**

```
SELECT REPLACE(phone_number, SUBSTR(phone_number, -4), '****')  
AS "masked_phone" FROM Guests WHERE gender = "Female";
```



# Which guests have either a phone number or an email , but are not male?

```
SELECT * FROM Guests
```

```
WHERE (phone_number IS NOT NULL OR email IS NOT NULL) AND NOT gender = 'Male';
```



	guest_id	first_name	last_name	email	phone_number	gender
▶	2	Jane	Smith	jane.smith@example.com	123-456-7891	Female
	4	Emily	Davis	emily.davis@example.com	123-456-7893	Female
	6	Sarah	Williams	sarah.williams@example.com	123-456-7895	Female
	8	Laura	Garcia	laura.garcia@example.com	123-456-7897	Female
	10	Linda	Hernandez	linda.hernandez@example.com	123-456-7899	Female
	12	Jessica	Wilson	jessica.wilson@example.com	123-456-7801	Female
	14	Karen	Thomas	karen.thomas@example.com	123-456-7803	Female
	16	Michelle	Moore	michelle.moore@example.com	123-456-7805	Female
	18	Ashley	Martin	ashley.martin@example.com	123-456-7807	Female
	20	Amanda	Perez	amanda.perez@example.com	123-456-7809	Female
	22	Laura	Harris	laura.harris@example.com	123-456-7811	Female
	24	Emily	Lewis	emily.lewis@example.com	123-456-7813	Female
	26	Grace	Walker	grace.walker@example.com	123-456-7815	Female
	28	Samantha	Young	samantha.young@example.com	123-456-7817	Female
	30	Megan	King	megan.king@example.com	123-456-7819	Female
	32	Elizabeth	Scott	elizabeth.scott@example.com	123-456-7821	Female
	34	Ava	Adams	ava.adams@example.com	123-456-7823	Female



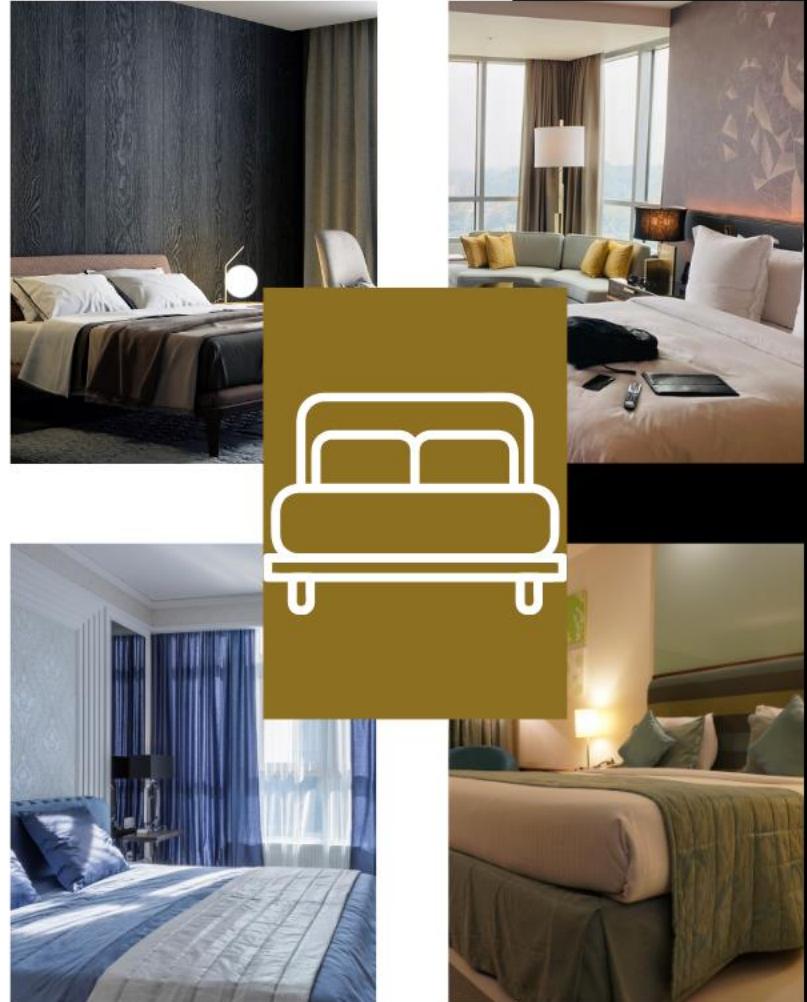
36 19:29:12 SELECT \* FROM Guests WHERE (phone\_number IS NOT NULL OR email IS NO...

50 row(s) returned

# How can we categorize room types into “Budget”, “Mid-range” “Luxury” based on their average price?

```
SELECT room_type_reserved, AVG(avg_price_per_room)
AS "average_price",
CASE
WHEN AVG(avg_price_per_room) < 100 THEN "Budget"
WHEN AVG(avg_price_per_room) BETWEEN 100 AND 200 THEN "Mid-range"
ELSE "Luxury"
END
AS "price_category"
FROM Rooms
GROUP BY room_type_reserved;
```

room_type_reserved	average_price	price_category
Deluxe Suite	250.000000	Luxury
Standard Room	150.000000	Mid-range
Mountain View Room	200.000000	Mid-range
Ocean View Room	300.000000	Luxury
Family Room	350.000000	Luxury
Single Room	100.000000	Mid-range
King Room	275.000000	Luxury
Queen Room	225.000000	Luxury
Penthouse Suite	500.000000	Luxury
Luxury Suite	400.000000	Luxury
Economy Room	80.000000	Budget
Accessible Room	120.000000	Mid-range
Executive Suite	350.000000	Luxury
Standard Double Room	180.000000	Mid-range
Business Room	220.000000	Luxury



# How can we check if a reservation is for family based on the number of adults and children?

```
SELECT reservation_id, num_adults, num_children,  
IF(num_adults >= 2 AND num_children > 0, 'Family', 'Not Family') AS "reservation_type"  
FROM Reservations;
```

Result Grid | Filter Rows: Export:

	reservation_id	num_adults	num_children	reservation_type
▶	1	2	1	Family
	2	1	0	Not Family
	3	2	2	Family
	4	3	0	Not Family
	5	2	2	Family
	6	1	1	Not Family
	7	2	0	Not Family
	8	1	1	Not Family
	9	2	2	Family
	10	1	0	Not Family
	11	3	1	Family
	12	2	1	Family
	13	2	2	Family
	14	1	1	Not Family
	15	2	2	Family
	16	2	0	Not Family
	17	1	1	Not Family



# What is the total amount paid for each payment method used by guests?

```
SELECT payment_method, SUM(amount) AS "total_payments" FROM Payments  
GROUP BY payment_method  
ORDER BY total_payments DESC;
```

Result Grid | Filter Rows:

	payment_method	total_payments
▶	Credit Card	34500.00
	PayPal	24300.00
	Debit Card	24200.00
	Cash	19200.00



5 17:50:58 SELECT payment\_method, SUM(amount) AS "total\_payments" FROM Payments GR... 4 row(s) returned

# What is the total amount of payments received each month for the years?

```
SELECT YEAR(payment_date) AS "year", MONTH(payment_date) AS "month",
SUM(amount) AS "total_payments" FROM Payments
GROUP BY YEAR(payment_date), MONTH(payment_date)
ORDER BY year, month;
```

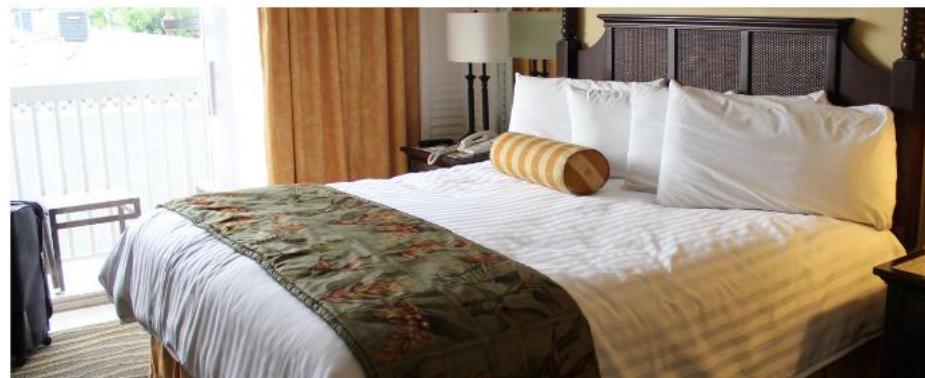
	Result Grid	Filter Rows:	
	year	month	total_payments
▶	2024	11	7800.00
	2024	12	7050.00
	2025	1	6250.00
	2025	2	5650.00
	2025	3	5400.00
	2025	4	6950.00
	2025	5	6050.00
	2025	6	5950.00
	2025	7	7800.00
	2025	8	7050.00
	2025	9	6250.00
	2025	10	5650.00
	2025	11	5400.00
	2025	12	6350.00
	2026	1	6650.00
	2026	2	5950.00



# Which room type has the most reservations?

```
SELECT room_type_reserved FROM Rooms WHERE room_id IN  
(SELECT room_id FROM Reservations GROUP BY room_id ORDER BY COUNT(*) DESC)  
LIMIT 1;
```

Result Grid	
	room_type_reserved
▶	Deluxe Suite



73 23:19:57 SELECT room\_type\_reserved FROM Rooms WHERE room\_id IN (SELECT room\_i... 1 row(s) returned

# Which guest have made reservation in OCTOBER 2024?

```
SELECT guest_id,first_name,last_name FROM Guests WHERE guest_id IN  
(SELECT guest_id FROM Reservations WHERE MONTH(check_in_date) = 10  
AND YEAR(check_in_date) = 2024);
```



Result Grid | Filter Rows:

	guest_id	first_name	last_name
▶	9	James	Martinez
	19	Andrew	Lee
	30	Megan	King
•	NULL	NULL	NULL

31 18:53:50 SELECT guest\_id,first\_name,last\_name FROM Guests WHERE guest\_id IN (SELE... 3 row(s) returned

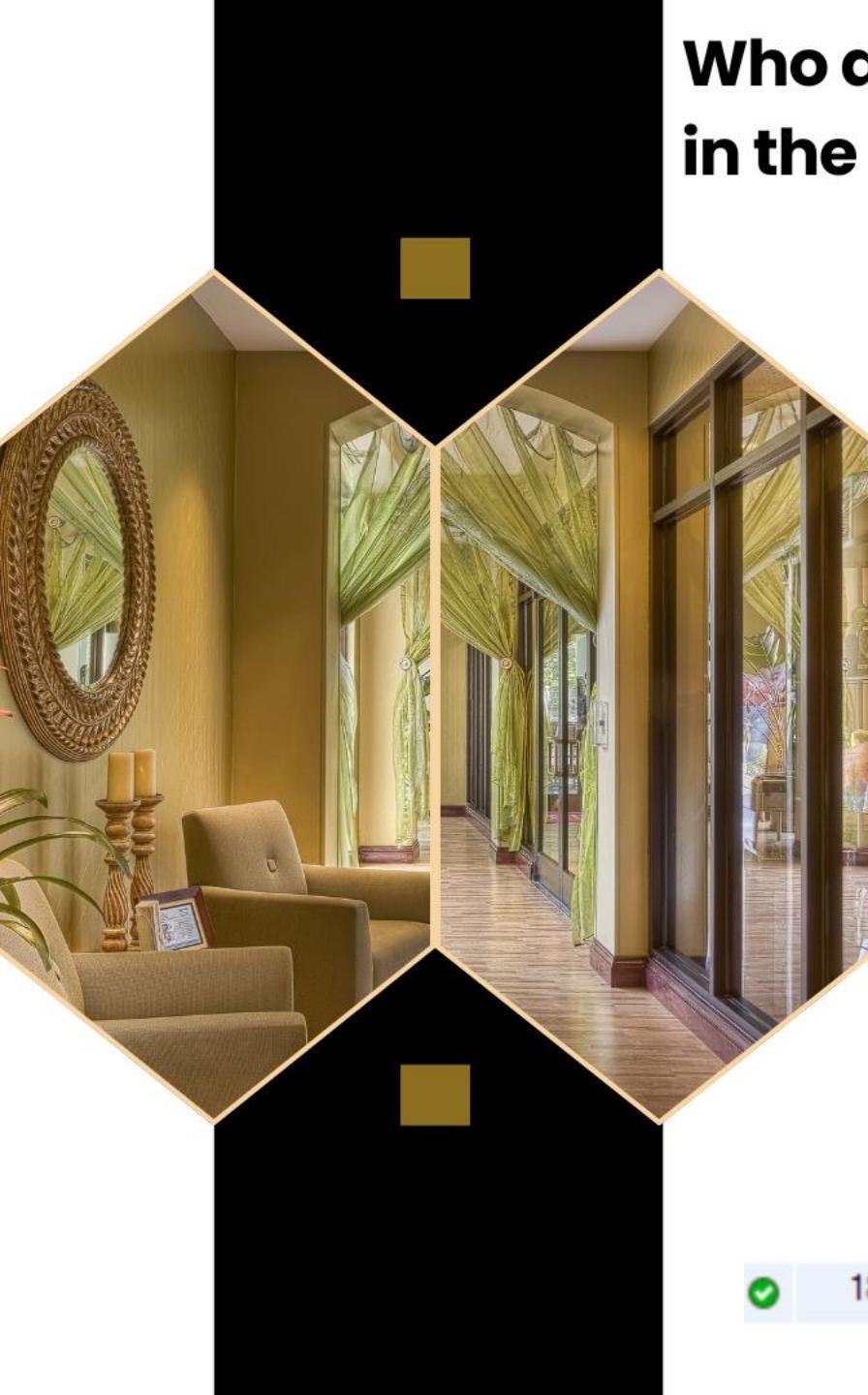
# How can you find meal plans that have been selected by guests who have made reservations?

```
SELECT meal_plan_id, meal_plan_name FROM MealPlans  
WHERE meal_plan_id IN  
(SELECT meal_plan_id FROM Reservations WHERE meal_plan_id IS NOT NULL);
```



Result Grid		Filter Rows:
	meal_plan_id	meal_plan_name
▶	1	Breakfast Only
	2	Half Board
	3	Full Board
	NONE	NONE

93 00:41:21 SELECT meal\_plan\_id, meal\_plan\_name FROM MealPlans WHERE meal\_plan\_id I... 3 row(s) returned



# Who are the TOP-5 guests by total reservation spending in the hotel?

```
SELECT g.guest_id,g.first_name,g.last_name,SUM(r.total_price) AS "total_spending"  
FROM Guests AS g  
JOIN  
Reservations AS r  
ON (g.guest_id = r.guest_id)  
GROUP BY g.guest_id, g.first_name, g.last_name  
ORDER BY total_spending DESC  
LIMIT 5;
```

Result Grid | Filter Rows:  Export:

	guest_id	first_name	last_name	total_spending
▶	30	Megan	King	2570.00
	23	Ryan	Clark	2540.00
	3	John	Doe	2350.00
	27	Alexander	Hall	2350.00
	25	Ethan	Robinson	2200.00

18 17:31:24 SELECT g.guest\_id,g.first\_name,g.last\_name,SUM(r.total\_price) AS "total\_spending" 5 row(s) returned

# Which guests have made more than one reservation?



```
SELECT g.first_name, g.last_name, COUNT(r.reservation_id) AS "total_reservations"  
FROM Guests AS g  
JOIN  
Reservations AS r  
ON (g.guest_id = r.guest_id)  
GROUP BY g.guest_id  
HAVING COUNT(r.reservation_id) > 1;
```

Result Grid			Filter Rows:
	first_name	last_name	total_reservations
▶	John	Doe	3
	Jane	Smith	3
	John	Doe	3
	Emily	Davis	3
	Chris	Brown	3
	Sarah	Williams	3
	David	Jones	3
	Laura	Garcia	3
	James	Martinez	3
	Linda	Hernandez	3
	Robert	Lopez	2
	Jessica	Wilson	2
	Daniel	Anderson	2
	Karen	Thomas	2
	Matthew	Taylor	2
	Michelle	Moore	2
	Joshua	Jackson	2



26 18:30:43

SELECT g.first\_name, g.last\_name, COUNT(r.reservation\_id) AS "total\_reservations..." 30 row(s) returned

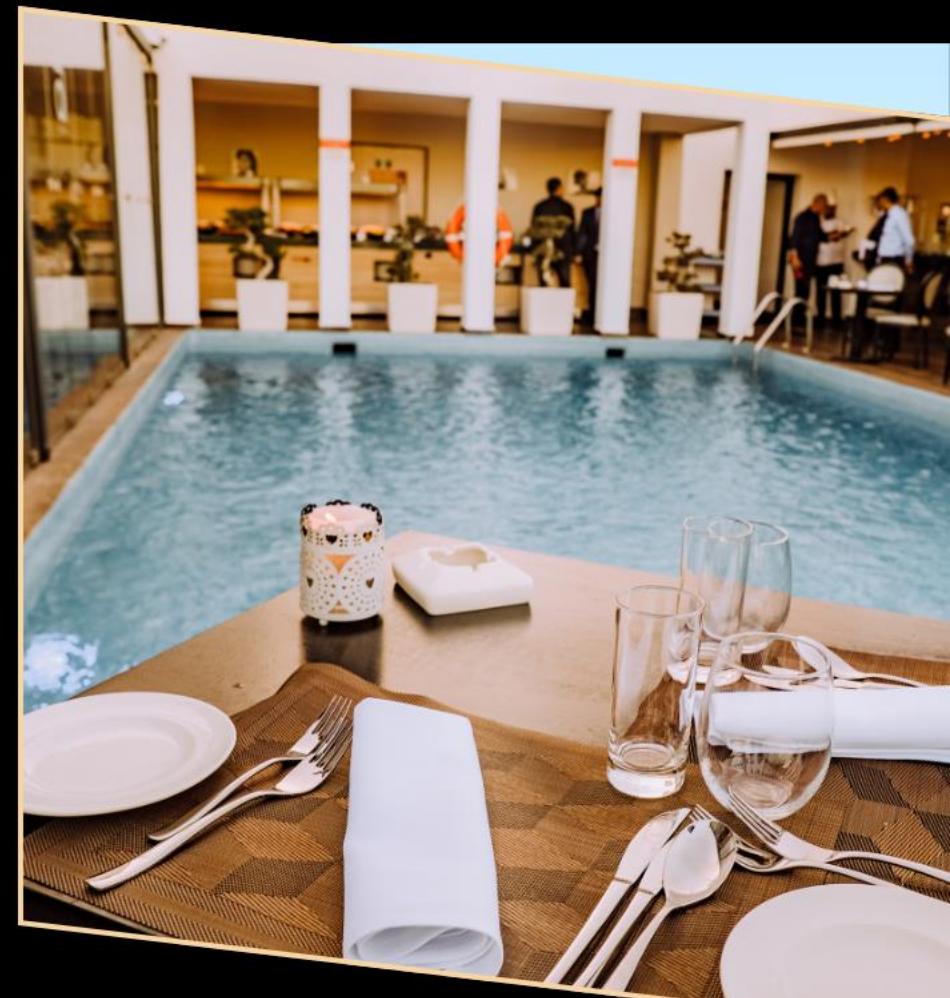
# What is the most popular meal plan?

```
SELECT mp.meal_plan_id,mp.meal_plan_name,COUNT(r.reservation_id)
AS "Total_reservation"
FROM Mealplans AS mp
LEFT JOIN
Reservations AS r
ON (mp.meal_plan_id = r.meal_plan_id)
GROUP BY mp.meal_plan_id, mp.meal_plan_name
ORDER BY Total_reservation DESC
LIMIT 3;
```

Result Grid | Filter Rows: Export

	meal_plan_id	meal_plan_name	Total_reservation
▶	1	Breakfast Only	34
	2	Half Board	33
	3	Full Board	23

7 16:35:07 SELECT mp.meal\_plan\_id,mp.meal\_plan\_name,COUNT(r.reservation\_id) AS "Total... 3 row(s) returned



# Overall Insights



## Data-Driven Decision Making:

The insights gained from these queries emphasize the importance of data in informing business strategies, enhancing guest experiences, and optimizing operational efficiency.

## Guest-Centric Approach:

Many of the insights focus on understanding guest behavior and preferences, which is crucial for developing targeted marketing strategies and improving service offerings.

## Financial Performance Monitoring:

Analyzing payment methods, monthly payment trends, and top spenders supports effective financial management and resource allocation.

## Operational Efficiency:

Insights into reservation statuses, maintenance needs, and family accommodations highlight areas for improving overall operational efficiency and guest satisfaction.

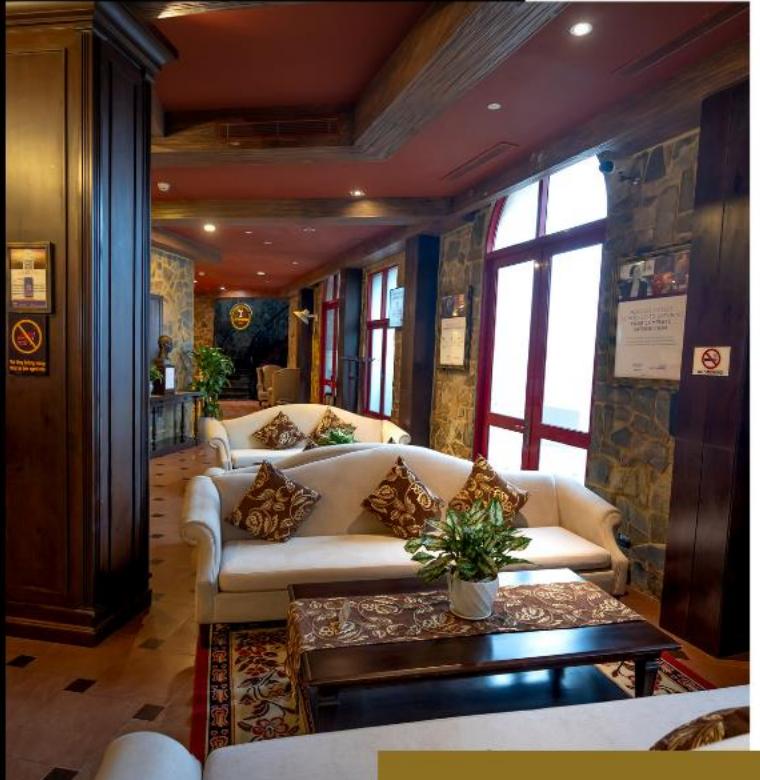
## Privacy and Compliance:

Measures like masking sensitive information reflect the hotel's commitment to privacy and regulatory compliance, enhancing guest trust.

# Conclusion

The hotel reservation system project establishes an efficient framework for managing guest information, reservations, payments, and room availability. By leveraging a well-structured database, the system enhances the guest experience through personalized services and targeted marketing. Data-driven insights into guest preferences, revenue trends, and operational efficiency enable informed decision-making and strategic planning. Additionally, privacy measures ensure compliances and build trust with guests. Overall, this project provides a solid foundation for optimizing hotel operations and fostering customer loyalty while allowing for future growth and enhancements.





Thank  
You!