

31 DAYS OF MYSQL

# DATA

# *December*

31 Days. 31 MySQL Projects. One Skill Level Up

\* Day 5 — Hospital Management \*

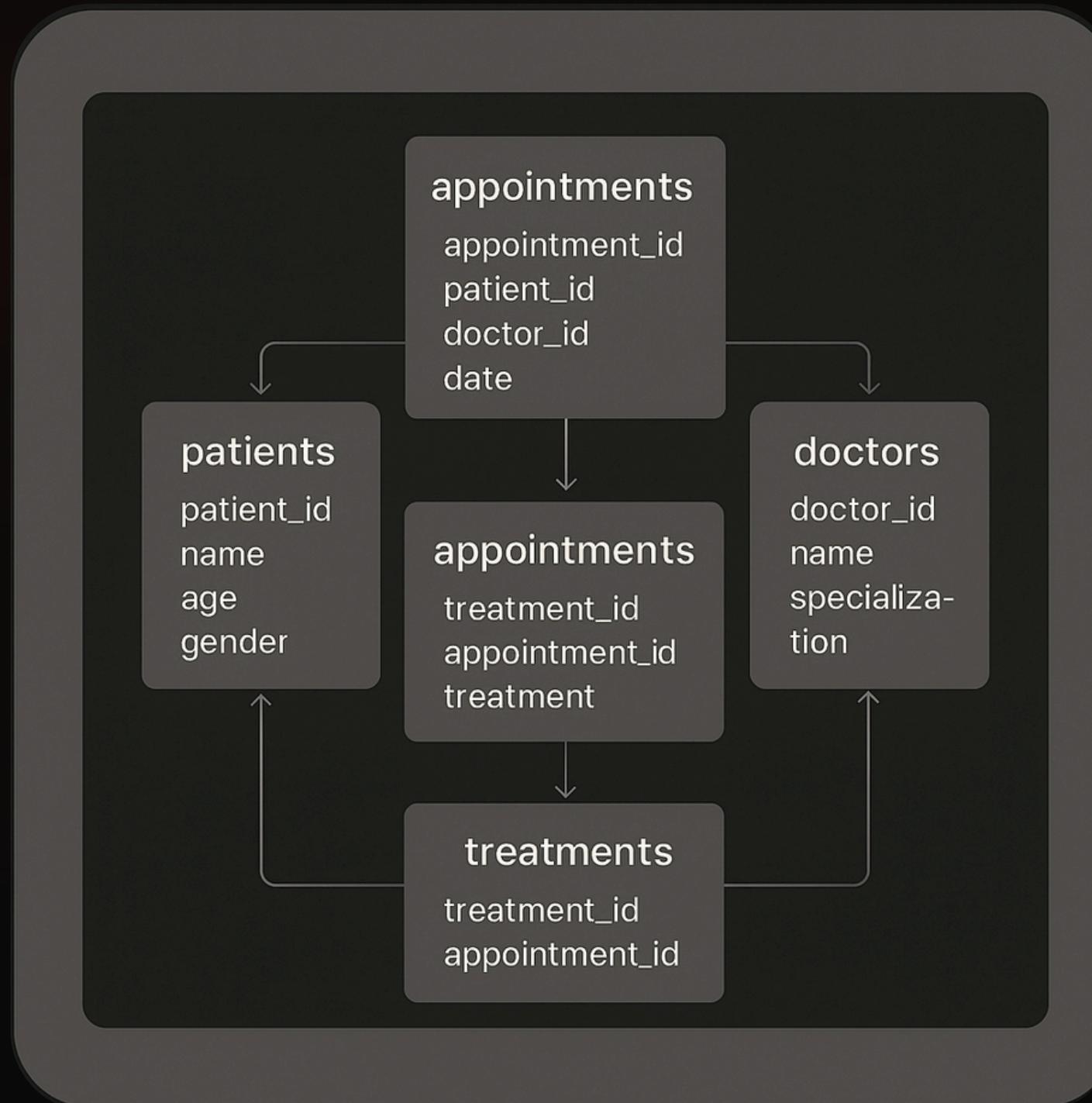


## PROJECT OVERVIEW

This project focuses on analyzing a real-world Hospital Management relational database consisting of patients, doctors, appointments, treatments, and billing tables.

The objective was to transform raw hospital operational data into meaningful insights using SQL – helping understand patient flow, doctor performance, treatment patterns, and overall hospital efficiency.

# DATABASE SCHEMA



## Patients

- patient\_id
- Name
- Age
- Gender

## Doctors

- Doctor\_id
- Name
- specialization

## appointments

- appointment\_id
- patient\_id
- Doctor\_id
- Date

## Treatments

- treatment\_id
- appointment\_id
- treatment

# **Query 1-2: Treatment Details & Multi-Doctor Patients**

**Query 1: For each treatment, show patient name, doctor name, treatment name, and treatment date.**

```
SELECT p.name AS patient, d.name AS doctor,
t.treatment, a.date
FROM treatments t
JOIN appointments a ON t.appointment_id =
a.appointment_id
JOIN patients p ON a.patient_id = p.patient_id
JOIN doctors d ON a.doctor_id = d.doctor_id;
```

**Query 2: List all patients who have appointments with more than one doctor.**

```
SELECT p.name
FROM appointments a
JOIN patients p ON a.patient_id =
p.patient_id
GROUP BY p.name
HAVING COUNT(DISTINCT a.doctor_id) > 1;
```

# Query 3-4-5: Appointment & Billing Insights

## Book Appointment

Patient Name

John Doe

Doctor

Dr. Smith

Date

2024-05-10



Book Appointment



**Query 3: Show all appointments with patient name, doctor name, and appointment date.**

```
SELECT p.name AS patient, d.name AS doctor, a.date  
FROM appointments a  
JOIN patients p ON a.patient_id = p.patient_id  
JOIN doctors d ON a.doctor_id = d.doctor_id;
```



**Query 4: Count how many appointments each doctor has.**

```
SELECT d.name,  
COUNT(a.appointment_id) AS total_appointments  
FROM doctors d  
LEFT JOIN appointments a ON  
d.doctor_id = a.doctor_id  
GROUP BY d.name;
```



**Query 5: Find total bill amount generated by each patient.**

```
SELECT p.name, SUM(b.amount) AS total_bill  
FROM bills b  
JOIN patients p ON b.patient_id = p.patient_id  
GROUP BY p.name;
```

## Query 6-7: Untreated Patients & Doctor Treatment Counts

**Q6: List patients who have never taken any treatment.**

```
SELECT p.name  
FROM patients p  
LEFT JOIN appointments a ON p.patient_id =  
a.patient_id  
LEFT JOIN treatments t ON a.appointment_id =  
t.appointment_id  
WHERE t.treatment_id IS NULL;
```

**Q7: For each doctor, show total treatments performed.**

```
SELECT d.name, COUNT(t.treatment_id) AS  
total_treatments  
FROM doctors d  
JOIN appointments a ON d.doctor_id = a.doctor_id  
JOIN treatments t ON a.appointment_id =  
t.appointment_id  
GROUP BY d.name;
```

List patients who have never taken any treatment



## Query 8-9: Highest Billing & January Appointments

1

**Q8: Show the most expensive bill (highest amount).**

```
SELECT * FROM bills  
ORDER BY amount DESC  
LIMIT 1;
```

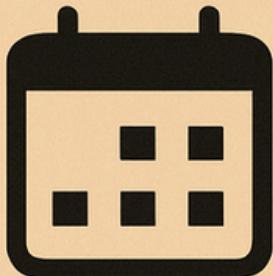
2

**Q9: List patients who had an appointment in January 2025.**

```
SELECT DISTINCT p.name  
FROM appointments a  
JOIN patients p ON a.patient_id = p.patient_id  
WHERE a.date LIKE '2025-01%';
```



Show the  
most expensive  
bill (highest  
amount.)



List patients  
who had  
an appointment  
in January 2025.

List patients who had an  
appointment in January 2025.

## Query 10-11: Age-Based Patient Insights

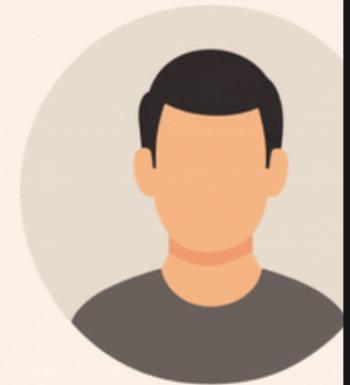
### Top Patients Above 30



Male  
Patient  
**43**



Female  
Patient  
**32**



Male  
Patient  
**55**



Male



Female

**Query 10: List all patients with age greater than 30.**

```
SELECT * FROM patients  
WHERE age > 30;
```

**Query 11: Find the average age of patients for each gender.**

```
SELECT gender, AVG(age) AS avg_age  
FROM patients  
GROUP BY gender;
```

**Query 12: Get the names of all doctors who specialize in ‘Cardiology’.**

```
SELECT name FROM  
doctors  
WHERE specialization =  
'Cardiology';
```

Get the names of all doctors who specialize in ‘Cardiology’.





## Key Skills Used

- Advanced SQL joins and aggregations across patients, doctors, appointments, treatments, and billing tables.
- Subqueries, NOT EXISTS logic, and date-based filtering to identify patient activity, doctor performance, and treatment patterns.
- Analytical SQL techniques to generate insights such as most expensive bills, untreated patients, appointment trends, and specialization-based doctor statistics.
- Use of GROUP BY, HAVING, window functions, and multi-table relationships to produce hospital operational insights.



# HOSPITAL MANAGEMENT SYSTEM



## CONCLUSION

This analysis showed how structured hospital data can be transformed into actionable insights—improving patient care, optimizing doctor workloads, streamlining billing processes, and enhancing overall hospital efficiency. The project highlights SQL as a powerful tool for healthcare analytics and smarter operational decision-making.

**31 DAYS OF MYSQL, DATA DECEMBER**

**THANK**  
*You!*

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**GitHub: <https://github.com/Altaf0099>**

**\* Day 5 – Hospital Management \***