Hospital Management System

Title

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Introduction

A Hospital Management System (HMS) is a software application designed to manage the various aspects of hospital operations such as medical, administrative, financial, and legal issues, along with the processing of services. It provides an integrated information system to manage all hospital operations effectively and efficiently.

Objectives

- Streamline hospital operations
- Improve patient care and satisfaction
- Enhance data security and accessibility
- Reduce paperwork and manual workload

Features

- Patient Registration
- Appointment Scheduling
- Billing and Invoicing
- Electronic Medical Records (EMR)
- Inventory Management
- Staff Management
- Reporting and Analytics

Entities and Attributes

- Patient: ID, Name, Age, Gender, Contact Info, Medical History
- Doctor: ID, Name, Specialty, Contact Info, Availability
- Appointment: Appointment ID, Patient ID, Doctor ID, Date, Time, Status
- Billing: Invoice ID, Patient ID, Amount, Date, Payment Status

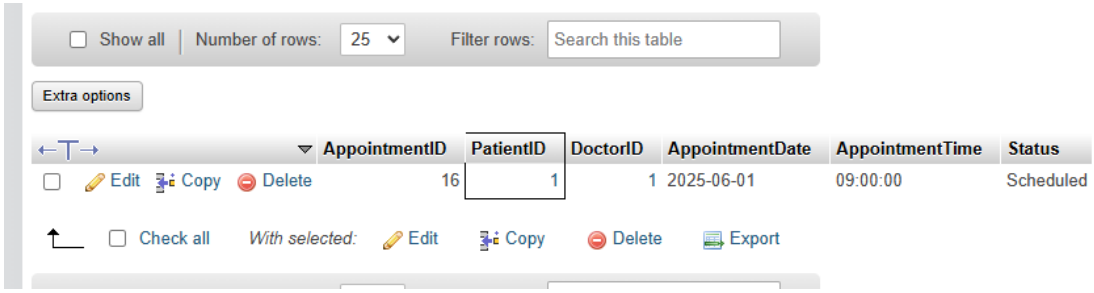
Technology

The HMS can be developed using modern technologies like:
- Frontend: HTML, CSS, JavaScript (React, Angular)
- Backend: Python (Django, Flask), PHP, Node.js
- Database: MySQL, PostgreSQL, MongoDB
- Hosting: AWS, Azure, Heroku

Queries:

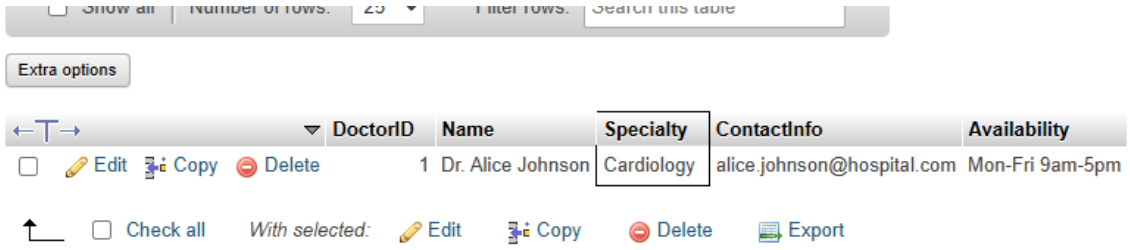
Get all appointments for a patient

```
SELECT * FROM Appointments
WHERE PatientID = 1;
```



Get doctors by specialty

```
SELECT * FROM Doctors
WHERE Specialty = 'Cardiology';
```




```
-- Get the number of appointments per month
SELECT
   DATE_FORMAT(AppointmentDate, '%Y-%m') AS Month,
   COUNT(*) AS TotalAppointments
FROM Appointments
GROUP BY Month
ORDER BY Month;
```

Month	TotalAppointments
2025-06	3

```
-- Get total revenue per month
SELECT
    DATE_FORMAT(BillingDate, '%Y-%m') AS Month,
    SUM(Amount) AS TotalRevenue
FROM Billing
GROUP BY Month
ORDER BY Month
```

Month	TotalRevenue
2025-05	500.00

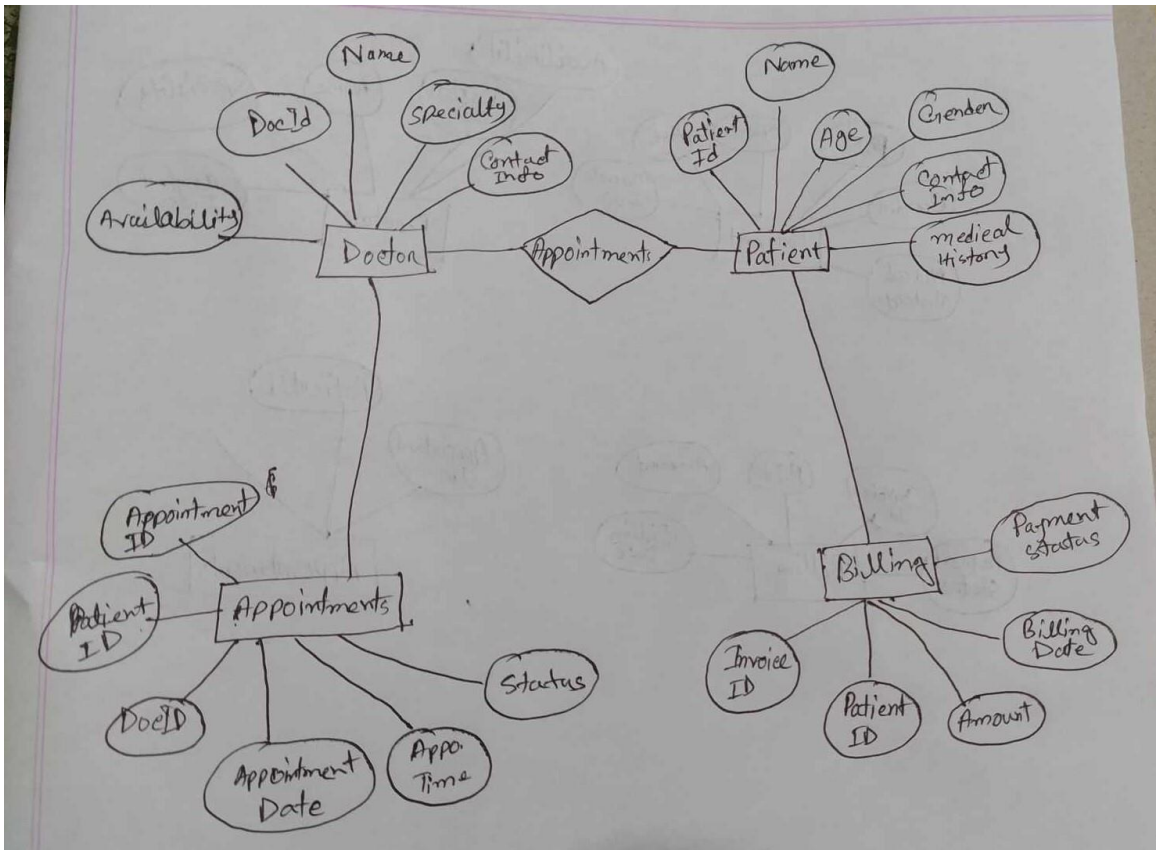
```
-- Get the most frequently visited doctor
SELECT
    d.Name AS DoctorName,
    COUNT(*) AS TotalAppointments
FROM Appointments a
JOIN Doctors d ON a.DoctorID = d.DoctorID
GROUP BY a.DoctorID
ORDER BY TotalAppointments DESC
LIMIT 1;
```

DoctorName	TotalAppointments
Dr. Alice Johnson	1

```
-- Get list of patients who have unpaid bills
SELECT
    p.Name AS PatientName,
    b.Amount,
    b.BillingDate
FROM Billing b
JOIN Patients p ON b.PatientID = p.PatientID
WHERE b.PaymentStatus != 'Paid';
```

PatientName	Amount	BillingDate
John Doe	500.00	2025-05-26

ER Diagram:



Conclusion

A Hospital Management System simplifies the complexity of hospital operations by providing an efficient platform to manage data and workflows. With automation and centralized information, it enhances the quality of patient care and operational efficiency.