

Hospital Management System

Title

Hospital Management System

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:

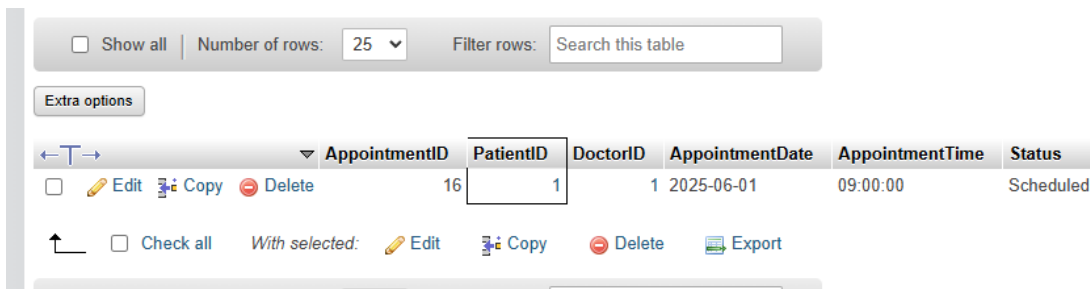
- Frontend: HTML, CSS, JavaScript (React, Angular)
- Backend: Python (Django, Flask), PHP, Node.js
- Database: MySQL, PostgreSQL, MongoDB
- Hosting: AWS, Azure, Heroku

Queries:

Get all appointments for a patient

```
SELECT * FROM Appointments
```

```
WHERE PatientID = 1;
```



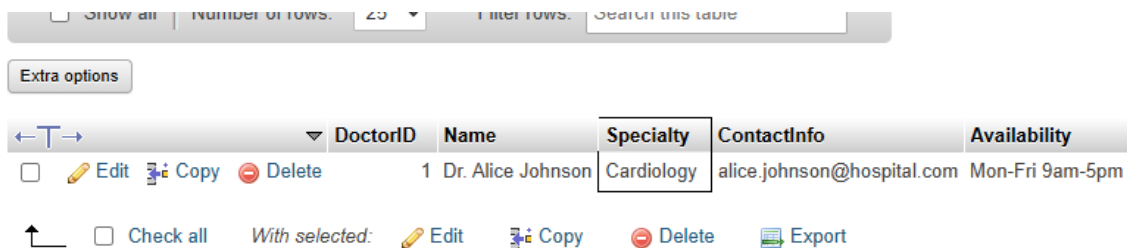
The screenshot shows a web application interface for a database. At the top, there are controls: a checkbox for "Show all", a "Number of rows" dropdown set to 25, and a "Filter rows" search box. Below these is an "Extra options" button. The main table has columns: AppointmentID, PatientID, DoctorID, AppointmentDate, AppointmentTime, and Status. The first row shows AppointmentID 16, PatientID 1, DoctorID 1, AppointmentDate 2025-06-01, AppointmentTime 09:00:00, and Status Scheduled. Below the table, there are action buttons: Edit, Copy, and Delete for the selected row, and a "Check all" checkbox. At the bottom, there are more action buttons: Edit, Copy, Delete, and Export.

AppointmentID	PatientID	DoctorID	AppointmentDate	AppointmentTime	Status
16	1	1	2025-06-01	09:00:00	Scheduled

Get doctors by specialty

```
SELECT * FROM Doctors
```

```
WHERE Specialty = 'Cardiology';
```



The screenshot shows a web application interface for a database. At the top, there are controls: a checkbox for "Show all", a "Number of rows" dropdown set to 25, and a "Filter rows" search box. Below these is an "Extra options" button. The main table has columns: DoctorID, Name, Specialty, ContactInfo, and Availability. The first row shows DoctorID 1, Name Dr. Alice Johnson, Specialty Cardiology, ContactInfo alice.johnson@hospital.com, and Availability Mon-Fri 9am-5pm. Below the table, there are action buttons: Edit, Copy, and Delete for the selected row, and a "Check all" checkbox. At the bottom, there are more action buttons: Edit, Copy, Delete, and Export.

DoctorID	Name	Specialty	ContactInfo	Availability
1	Dr. Alice Johnson	Cardiology	alice.johnson@hospital.com	Mon-Fri 9am-5pm

-- 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

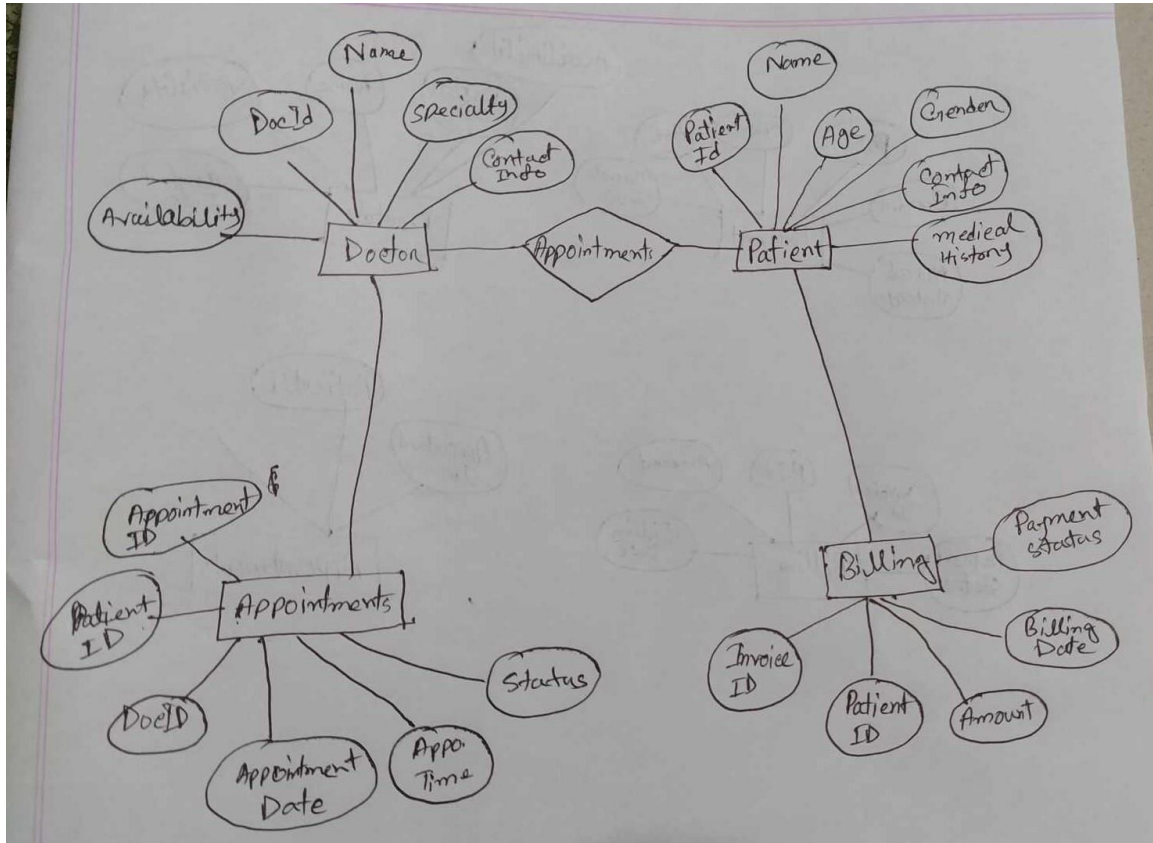
FROM Billing b

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.