**HOSPITAL MANAGEMENT SYSTEM**

**SQL PROJECT -1**

* 1. **INTRODUCTION:**

The Hospital Management System is a database project designed to manage the complex operations of a healthcare facility. This system provides a structured and efficient way to handle various aspects of hospital administration, including patient management, doctor scheduling, appointment booking, and medication tracking. The system is built using SQL, leveraging relational database concepts to ensure data integrity, security, and easy access to information.

* 1. **OBJECTIVE**

Centralized Data Management: To centralize the storage and management of hospital-related data, ensuring that information is consistent, easily accessible, and secure.

Streamlined Operations: To automate and streamline key hospital operations, such as patient registration, appointment scheduling, and medication dispensing, reducing manual errors and improving efficiency. Improved

Patient Care: By ensuring accurate and timely information flow, the system aims to improve the overall quality of patient care.

* 1. **E R DIAGRAM**
  2. **TABLE CREATION QUERY**

CREATE TABLE Patients (

patient\_id INT PRIMARY KEY,

first\_name VARCHAR(50),

last\_name VARCHAR(50),

dob DATE,

gender VARCHAR(10),

phone\_number VARCHAR(15),

address VARCHAR(100)

);

CREATE TABLE Doctors (

doctor\_id INT PRIMARY KEY,

first\_name VARCHAR(50),

last\_name VARCHAR(50),

specialty VARCHAR(50),

phone\_number VARCHAR(15),

email VARCHAR(50)

);

CREATE TABLE Departments (

department\_id INT PRIMARY KEY,

department\_name VARCHAR(50),

head\_of\_department VARCHAR(100)

);

CREATE TABLE Appointments (

appointment\_id INT PRIMARY KEY,

patient\_id INT,

doctor\_id INT,

appointment\_date DATE,

appointment\_time TIME,

FOREIGN KEY (patient\_id) REFERENCES Patients(patient\_id),

FOREIGN KEY (doctor\_id) REFERENCES Doctors(doctor\_id)

);

CREATE TABLE Medications (

medication\_id INT PRIMARY KEY,

patient\_id INT,

medication\_name VARCHAR(50),

dosage VARCHAR(50),

start\_date DATE,

end\_date DATE,

FOREIGN KEY (patient\_id) REFERENCES Patients(patient\_id)

);

INSERT INTO Patients VALUES

(1, 'John', 'Doe', '1980-01-01', 'Male', '123-456-7890', '123 Elm St'),

(2, 'Jane', 'Smith', '1990-02-02', 'Female', '987-654-3210', '456 Oak St'),

(3, 'Alice', 'Johnson', '1975-03-03', 'Female', '555-555-5555', '789 Maple St'),

(4, 'Bob', 'Brown', '1985-04-04', 'Male', '444-444-4444', '321 Pine St'),

(5, 'Charlie', 'Davis', '1995-05-05', 'Male', '333-333-3333', '654 Birch St'),

(6, 'Emily', 'Wilson', '1982-06-06', 'Female', '222-222-2222', '987 Cedar St'),

(7, 'Frank', 'Miller', '1978-07-07', 'Male', '111-111-1111', '159 Spruce St'),

(8, 'Grace', 'Moore', '1992-08-08', 'Female', '666-666-6666', '753 Fir St'),

(9, 'Henry', 'Taylor', '1968-09-09', 'Male', '777-777-7777', '852 Redwood St'),

(10, 'Ivy', 'Anderson', '1988-10-10', 'Female', '888-888-8888', '951 Palm St');

INSERT INTO Doctors VALUES

(1, 'Dr. James', 'Smith', 'Cardiology', '123-456-7890', 'dr.james@hospital.com'),

(2, 'Dr. Sarah', 'Lee', 'Neurology', '987-654-3210', 'dr.sarah@hospital.com'),

(3, 'Dr. David', 'Kim', 'Orthopedics', '555-555-5555', 'dr.david@hospital.com'),

(4, 'Dr. Laura', 'Clark', 'Pediatrics', '444-444-4444', 'dr.laura@hospital.com'),

(5, 'Dr. Peter', 'Walker', 'Oncology', '333-333-3333', 'dr.peter@hospital.com'),

(6, 'Dr. Nancy', 'Hill', 'Dermatology', '222-222-2222', 'dr.nancy@hospital.com'),

(7, 'Dr. Robert', 'Scott', 'Gastroenterology', '111-111-1111', 'dr.robert@hospital.com'),

(8, 'Dr. Susan', 'White', 'ENT', '666-666-6666', 'dr.susan@hospital.com'),

(9, 'Dr. Michael', 'Brown', 'Urology', '777-777-7777', 'dr.michael@hospital.com'),

(10, 'Dr. Lisa', 'Adams', 'Gynecology', '888-888-8888', 'dr.lisa@hospital.com');

-- Insert into Departments

INSERT INTO Departments VALUES

(1, 'Cardiology', 'Dr. James Smith'),

(2, 'Neurology', 'Dr. Sarah Lee'),

(3, 'Orthopedics', 'Dr. David Kim'),

(4, 'Pediatrics', 'Dr. Laura Clark'),

(5, 'Oncology', 'Dr. Peter Walker'),

(6, 'Dermatology', 'Dr. Nancy Hill'),

(7, 'Gastroenterology', 'Dr. Robert Scott'),

(8, 'ENT', 'Dr. Susan White'),

(9, 'Urology', 'Dr. Michael Brown'),

(10, 'Gynecology', 'Dr. Lisa Adams');

INSERT INTO Appointments VALUES

(1, 1, 1, '2024-08-01', '09:00:00'),

(2, 2, 2, '2024-08-02', '10:00:00'),

(3, 3, 3, '2024-08-03', '11:00:00'),

(4, 4, 4, '2024-08-04', '12:00:00'),

(5, 5, 5, '2024-08-05', '13:00:00'),

(6, 6, 6, '2024-08-06', '14:00:00'),

(7, 7, 7, '2024-08-07', '15:00:00'),

(8, 8, 8, '2024-08-08', '16:00:00'),

(9, 9, 9, '2024-08-09', '17:00:00'),

(10, 10, 10, '2024-08-10', '18:00:00');

INSERT INTO Medications VALUES

(1, 1, 'Aspirin', '100mg', '2024-08-01', '2024-08-10'),

(2, 2, 'Ibuprofen', '200mg', '2024-08-02', '2024-08-12'),

(3, 3, 'Amoxicillin', '500mg', '2024-08-03', '2024-08-13'),

(4, 4, 'Paracetamol', '500mg', '2024-08-04', '2024-08-14'),

(5, 5, 'Ciprofloxacin', '250mg', '2024-08-05', '2024-08-15'),

(6, 6, 'Metformin', '500mg', '2024-08-06', '2024-08-16'),

(7, 7, 'Lisinopril', '10mg', '2024-08-07', '2024-08-17'),

(8, 8, 'Atorvastatin', '20mg', '2024-08-08', '2024-08-18'),

(9, 9, 'Omeprazole', '40mg', '2024-08-09', '2024-08-19'),

(10, 10, 'Simvastatin', '20mg', '2024-08-10', '2024-08-20');

* 1. **BASIC OPERATIONS**

/\*-- Insert a new patient\*/

INSERT INTO Patients (patient\_id, first\_name, last\_name, dob, gender, phone\_number, address)

VALUES (11, 'Tom', 'Harris', '1970-12-12', 'Male', '999-999-9999', '1010 Oak St');

-- Update the phone number of a patient

UPDATE Patients

SET phone\_number = '000-000-0000'

WHERE patient\_id = 1;

-- Delete a patient record

DELETE FROM Patients

WHERE patient\_id = 11;

SELECT p.first\_name, p.last\_name, d.first\_name AS doctor\_first\_name, d.last\_name AS doctor\_last\_name

FROM Patients p

JOIN Appointments a ON p.patient\_id = a.patient\_id

JOIN Doctors d ON a.doctor\_id = d.doctor\_id

WHERE d.doctor\_id = 1;

SELECT a.appointment\_id, p.first\_name, p.last\_name, d.first\_name AS doctor\_first\_name, d.last\_name AS doctor\_last\_name, a.appointment\_time

FROM Appointments a

JOIN Patients p ON a.patient\_id = p.patient\_id

JOIN Doctors d ON a.doctor\_id = d.doctor\_id

WHERE a.appointment\_date = '2024-08-05';

SELECT m.medication\_name, m.dosage, m.start\_date, m.end\_date

FROM Medications m

WHERE m.patient\_id = 1;

SELECT COUNT(\*) AS total\_patients FROM Patients;

SELECT d.first\_name, d.last\_name, COUNT(a.appointment\_id) AS total\_appointments

FROM Doctors d

JOIN Appointments a ON d.doctor\_id = a.doctor\_id

GROUP BY d.first\_name, d.last\_name;

SELECT d.first\_name, d.last\_name

FROM Doctors d

JOIN Departments dep ON d.specialty = dep.department\_name

WHERE dep.department\_name = 'Cardiology';

* 1. **JOINS**

SELECT a.appointment\_id, p.first\_name AS patient\_first\_name, p.last\_name AS patient\_last\_name,

d.first\_name AS doctor\_first\_name, d.last\_name AS doctor\_last\_name, a.appointment\_date, a.appointment\_time

FROM Appointments a

INNER JOIN Patients p ON a.patient\_id = p.patient\_id

INNER JOIN Doctors d ON a.doctor\_id = d.doctor\_id;

SELECT p.first\_name, p.last\_name, a.appointment\_id, a.appointment\_date, a.appointment\_time

FROM Patients p

LEFT JOIN Appointments a ON p.patient\_id = a.patient\_id;

SELECT d.first\_name, d.last\_name, a.appointment\_id, a.appointment\_date, a.appointment\_time

FROM Doctors d

RIGHT JOIN Appointments a ON d.doctor\_id = a.doctor\_id;

SELECT p.first\_name AS patient\_first\_name, p.last\_name AS patient\_last\_name,

d.first\_name AS doctor\_first\_name, d.last\_name AS doctor\_last\_name

FROM Patients p

CROSS JOIN Doctors d;

* 1. **STORED PRICEDURES**

DELIMITER $$

CREATE PROCEDURE GetDoctorAppointments(IN doctorID INT)

BEGIN

SELECT a.appointment\_id, p.first\_name AS patient\_first\_name, p.last\_name AS patient\_last\_name,

a.appointment\_date, a.appointment\_time

FROM Appointments a

INNER JOIN Patients p ON a.patient\_id = p.patient\_id

WHERE a.doctor\_id = doctorID;

END $$

DELIMITER ;

* 1. **VIEWS**

**1. Creating a View for Patient Details with Last Appointment**

CREATE VIEW PatientLastAppointment AS

SELECT p.patient\_id, p.first\_name, p.last\_name, p.dob, p.gender, p.phone\_number, p.address,

MAX(a.appointment\_date) AS last\_appointment\_date

FROM Patients p

LEFT JOIN Appointments a ON p.patient\_id = a.patient\_id

GROUP BY p.patient\_id, p.first\_name, p.last\_name, p.dob, p.gender, p.phone\_number, p.address;

SELECT \* FROM PatientLastAppointment;

**2. Creating a View for Doctor's Schedule**

CREATE VIEW DoctorSchedule AS

SELECT d.doctor\_id, d.first\_name AS doctor\_first\_name, d.last\_name AS doctor\_last\_name,

p.first\_name AS patient\_first\_name, p.last\_name AS patient\_last\_name,

a.appointment\_date, a.appointment\_time

FROM Doctors d

JOIN Appointments a ON d.doctor\_id = a.doctor\_id

JOIN Patients p ON a.patient\_id = p.patient\_id;

**3. Creating a View for Medications Prescribed**

CREATE VIEW MedicationsView AS

SELECT m.medication\_id, p.first\_name AS patient\_first\_name, p.last\_name AS patient\_last\_name,

d.first\_name AS doctor\_first\_name, d.last\_name AS doctor\_last\_name,

m.medication\_name, m.dosage, m.start\_date, m.end\_date

FROM Medications m

JOIN Patients p ON m.patient\_id = p.patient\_id

JOIN Doctors d ON m.doctor\_id = d.doctor\_id;

SELECT \* FROM MedicationsView;

**4. Creating a View for Department-wise Doctor Listing**

CREATE VIEW DoctorByDepartment AS

SELECT d.doctor\_id, d.first\_name, d.last\_name, dep.department\_name

FROM Doctors d

JOIN Departments dep ON d.department\_id = dep.department\_id;

SELECT \* FROM DoctorByDepartment;

**5. Creating a View for Upcoming Appointments**

CREATE VIEW UpcomingAppointments AS

SELECT a.appointment\_id, p.first\_name AS patient\_first\_name, p.last\_name AS patient\_last\_name,

d.first\_name AS doctor\_first\_name, d.last\_name AS doctor\_last\_name,

a.appointment\_date, a.appointment\_time

FROM Appointments a

JOIN Patients p ON a.patient\_id = p.patient\_id

JOIN Doctors d ON a.doctor\_id = d.doctor\_id

WHERE a.appointment\_date >= CURDATE();

SELECT \* FROM UpcomingAppointments;

**1.9 Conclusion**

The Hospital Management System is a robust and scalable solution for managing hospital operations. By using SQL for database management, the system ensures data integrity and efficient processing of complex queries, making it a vital tool for modern healthcare management. This project can be extended with additional features like billing, inventory management, and patient discharge processes to further enhance hospital administration.