**Task Completion Report: Hospital Management System SQL Project**

**STEP 1: DATABASE SCHEMA OVERVIEW**

The Hospital Management System database is designed to manage various hospital-related entities such as patients, doctors, appointments, billing, and rooms. Below is an overview of the tables, their relationships, and the joins used:

**1.1 Tables Used:**

1. **Patients**: Stores patient details like Patient\_ID, FirstName, LastName, Gender, DOB, Contact\_Number, Email, Address, Blood\_Group, Admission\_Date, and Diagnosis.
2. **Doctors**: Stores doctor details like Doctor\_ID, FirstName, LastName, Gender, Specialty, Contact\_Number, Email, Department, and Hire\_Date.
3. **Appointments**: Manages patient appointments with attributes such as Appointment\_ID, Patient\_ID, Doctor\_ID, Appointment\_Date, Appointment\_Time, Diagnosis, and Room\_Number. Patient\_ID and Doctor\_ID are foreign keys, creating relationships with the Patients and Doctors tables.
4. **Billing**: Stores billing information including Bill\_ID, Patient\_ID, Bill\_Date, Total\_Amount, Payment\_Status, and Payment\_Method. Patient\_ID is a foreign key, linking this table to Patients.
5. **Rooms**: Manages room details like Room\_Number, Room\_Type, Availability, and Daily\_Charge. It is linked to the Appointments table via Room\_Number.

**1.2 Joins Used:**

1. **INNER JOIN** between Patients, Appointments, and Doctors to retrieve patient appointments along with the assigned doctor details.
2. **INNER JOIN** between Patients and Billing to fetch billing details for each patient.
3. **INNER JOIN** between Appointments and Rooms to display room information for each patient appointment.

**1.3 Relationships:**

* **Patients - Appointments (One-to-Many)**: A patient can have multiple appointments, and each appointment is linked to a single patient.
* **Doctors - Appointments (One-to-Many)**: A doctor can have multiple appointments, and each appointment is linked to a single doctor.
* **Rooms - Appointments (One-to-One)**: Each appointment is assigned a specific room, and a room can be linked to one appointment at a time.
* **Patients - Billing (One-to-One)**: Each patient has a billing record for their treatment or stay.

**STEP 2: SQL QUERY TO ANALYZE DATA**

**2.1 Query 1: Retrieve Patient Details with Doctor and Room Information**

SELECT

p.FirstName AS Patient\_FirstName,

p.LastName AS Patient\_LastName,

d.FirstName AS Doctor\_FirstName,

d.LastName AS Doctor\_LastName,

a.Appointment\_Date,

a.Diagnosis,

r.Room\_Number,

r.Room\_Type

FROM Patients p

JOIN Appointments a ON p.Patient\_ID = a.Patient\_ID

JOIN Doctors d ON a.Doctor\_ID = d.Doctor\_ID

JOIN Rooms r ON a.Room\_Number = r.Room\_Number;

**2.2 Query 2: Calculate Total Bill per Patient**

SELECT

p.FirstName,

p.LastName,

b.Bill\_Date,

b.Total\_Amount,

b.Payment\_Status,

b.Payment\_Method

FROM Billing b

JOIN Patients p ON b.Patient\_ID = p.Patient\_ID;

**2.3 Query 3: Find Available Rooms**

SELECT Room\_Number, Room\_Type, Daily\_Charge

FROM Rooms

WHERE Availability = 'Available';

**STEP 3: QUERY RESULTS**

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|  |
| --- |
| **1 Result of Query 1: Patient Details with Doctor and Room Information** |
| |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Patient\_FirstName** | **Patient\_LastName** | **Doctor\_FirstName** | **Doctor\_LastName** | **Appointment\_Date** | **Diagnosis** | **Room\_Number** | **Room\_Type** | | John | Doe | Adam | Johnson | 2024-10-03 | High Fever | 101 | General | | Jane | Smith | Emily | Williams | 2024-10-04 | Chronic Headache | 202 | Private | |

**3.2 Result of Query 2: Total Bill per Patient**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **FirstName** | **LastName** | **Bill\_Date** | **Total\_Amount** | **Payment\_Status** | **Payment\_Method** |
| John | Doe | 2024-10-03 | 500.00 | Paid | Credit Card |
| Jane | Smith | 2024-10-04 | 1200.00 | Pending | Insurance |

**3.3 Result of Query 3: Available Rooms**

|  |  |  |
| --- | --- | --- |
| **Room\_Number** | **Room\_Type** | **Daily\_Charge** |
| 202 | Private | 1200.00 |

**STEP 4: INTERPRETATION OF RESULTS**

**4.1 Query 1 Interpretation:**

The first query provides a detailed view of patient appointments along with the attending doctor and the assigned room. The results show that:

* Patient **John Doe** had an appointment with **Dr. Adam Johnson** on **October 3, 2024**, for **High Fever** and was assigned to **Room 101 (General)**.
* Patient **Jane Smith** had an appointment with **Dr. Emily Williams** on **October 4, 2024**, for **Chronic Headache** and was assigned to **Room 202 (Private)**.

**4.2 Query 2 Interpretation:**

The second query summarizes billing information for each patient. The results show:

* **John Doe** paid **$500** for his treatment using a credit card.
* **Jane Smith** has a pending bill of **$1200** to be covered by insurance.

**4.3 Query 3 Interpretation:**

The third query returns the details of rooms that are currently available for assignment. The result shows that:

* **Room 202 (Private)** is available, with a daily charge of **$1200**.