Database Management Systems

Health Database System Proposal

Group Members:

- **Abdullah Alshamrani (Team Leader)**
- **Hussam Alanazi**
- **Jack Saunders**

Submission Date: 12/8/2024

Project Title: Health Database System

Project Overview:
The Health Database System is a robust, database-driven application tailored for managing patient records, medical histories, appointment schedules, and billing processes within a healthcare facility. This system is designed to improve operational efficiency, reduce administrative workload, and enhance the accessibility and security of healthcare data. Built using a MySQL relational database integrated with a Node.js backend and HTML/CSS/JavaScript interfaces, the application combines user-friendliness with reliable data management capabilities.

Functionalities:

The following functionalities are categorized based on their application areas and SQL operations:

1. **Patient Management:**
    - **Insert:** Add new patient records, including personal details, gender, insurance information, and emergency contact.
    - **Select:** Search and retrieve patient details by ID or other criteria (e.g., name, DOB).
    - **Update:** Modify patient details such as phone number, email, or address.
    - **Delete:** Remove a patient record only if no associated appointments exist.
2. **Medical Records Management:**
    - **Insert:** Record new diagnoses, treatment plans, allergies, prescriptions, and associated appointment dates for patients.
    - **Select:** Search and view medical records by patient ID.

    - **Update:** Update existing records with changes to treatment plans, diagnoses, or prescriptions.
    - **Delete:** Delete specific medical records when necessary.
3. **Appointment Management:**
    - **Insert:** Schedule new appointments, including patient ID, doctor's name, date, time, and type.
    - **Select:** Retrieve all appointments or filter by patient ID or date.
    - **Update:** Reschedule appointments or modify status (e.g., "Completed" or "Cancelled").
    - **Delete:** Cancel or delete appointments.
4. **Billing Management:**
    - **Insert:** Add new billing records, including patient ID, due amount, payment method, and due date.
    - **Select:** Retrieve billing information filtered by patient ID or payment status.
    - **Update:** Change payment statuses (e.g., "Paid" or "Pending") and update payment methods or amounts.
    - **Delete:** Remove billing records where applicable.

Implemented SQL Operations:

- **SELECT:** Used in all modules to retrieve and display records from the database.
- **INSERT INTO:** Used to add new records for patients, appointments, medical records, and billing.
- **UPDATE:** Used to modify existing records (e.g., patient contact details, appointment times, or billing status).
- **DELETE:** Used to safely remove data from tables while maintaining referential integrity.

Purpose and Impact:

The Health Database System simplifies the management of critical healthcare operations by automating repetitive tasks and centralizing data storage. It ensures data accuracy, security, and accessibility, empowering healthcare professionals to focus on delivering quality care. The system is designed to be scalable, making it adaptable for both small clinics and larger healthcare facilities.

Conclusion:

This project addresses key challenges in healthcare data management by combining robust database operations with an intuitive user interface. It complies with the project requirements for database operations and represents a practical application of database management system principles.