Hospital Management System – SQL Database Project

1. Introduction:

A Hospital Management System is essential for streamlining operations in any healthcare facility. This project simulates a backend database for a hospital, covering various real-world entities like doctors, patients, visits, prescriptions, and billing. The primary goal is to manage these components efficiently and extract useful insights using SQL queries.

2. Abstract:

The database design includes structured relational tables with relationships enforced using foreign keys. This ensures data integrity across departments, doctors, patients, and medical visits. Through a series of well-structured queries, the project delivers analytical insights such as billing summaries, patient histories, visit statistics, and medication usage trends. The system represents a scalable foundation for hospital data management and analysis.

3. Tools Used:

MySQL / SQL Workbench: Core tool for schema creation and query execution.
ER Modeling: Used to define relationships across hospital entities.
SQL Queries: Joins, aggregations, constraints, and grouping functions used to extract insights.
Normalized Schema: Ensures no data redundancy.

4. Steps Involved:

1.Schema & Table Creation:

- **Created schema:** Hospital_Management_Analysis.
- **Tables:** Departments, Doctors, Patients, Visits, Bills, Medications, Prescriptions.

2.Data Insertion:

- Added sample records across all tables simulating a functional hospital with 5 departments and 5 patients.

3.Relational Mapping:

- Doctors linked to departments.
- Visits linked to both doctors and patients.
- Billing and prescriptions mapped to specific visits.

4.Query Execution:

- Analytical queries executed to extract:
  - List of doctors with their departments.
  - Full visit and billing history of patients.
  - Total revenue generated by each department.
  - Count of visits per doctor.
  - Frequently prescribed medications.
  - Pending payment patients.

5. Conclusion:

The Hospital Management SQL project successfully demonstrates how relational databases can be used to manage healthcare systems efficiently. It provides clear visibility into the working of a hospital, including operations, finances, and patient care history. The analytical queries built on top of this model make it a powerful tool for administrative decisions and performance monitoring.