Hospital Management System - Project Report

1. Title

AI-Powered Hospital Management System Using MySQL Workbench

2. Introduction

This project presents a Hospital Management System (HMS) designed to streamline and digitalize core hospital functions such as patient management, doctor management, visit tracking, and billing. Built using MySQL Workbench for database design and management, this system ensures efficient handling of patient visits, doctor schedules, and financial transactions.

3. Objective

To develop a robust, scalable, and easy-to-use database system for managing hospital operations such as patient records, doctor assignments, visits, and billing, with real-time data integrity and automation features.

4. Tools and Technologies

- **Database**: MySQL Workbench
- **Language**: SQL (DDL, DML, Procedures, Triggers)
- **Operating System**: Windows

5. System Design

5.1 Entity Relationship Diagram (ERD)

Entities:

- Patients
- Doctors
- Visits
- Bills

Relationships:

- One-to-Many: Patients to Visits
- One-to-Many: Doctors to Visits
- One-to-One: Visits to Bills

5.2 Schema Description

1. Patients

- patient_id (PK)
- name
- age
- gender
- contact
- address

2. Doctors

- doctor_id (PK)
- name
- specialization
- contact

3. Visits

- visit_id (PK)

- patient_id (FK)
- doctor_id (FK)
- visit_date
- diagnosis
- status (Admitted/Discharged)

4. Bills

- bill_id (PK)
- visit_id (FK)
- consultation_fee
- treatment_cost
- total_amount
- payment_status (Paid/Unpaid)

6. Implementation Details

6.1 Database Creation and Tables

All tables are created using SQL DDL commands with appropriate constraints such as Primary Keys and Foreign Keys to ensure data integrity.

6.2 Sample Data Insertion

SQL DML commands are used to insert sample records for testing and demonstration.

6.3 Stored Procedure

Procedure Name: CalculateBill

- Inputs: visit_id, consultation_fee, treatment_cost

- Function: Automatically calculates total_amount and inserts into Bills with status 'Unpaid'.

6.4 Trigger

Trigger Name: update_bill_on_discharge

- Event: AFTER UPDATE on Visits

- Function: Automatically updates the payment_status to 'Paid' in Bills when a patient is discharged.

7. Sample Queries

- List of all visits with patient and doctor details

- List of unpaid bills

- Total income generated from paid bills

8. Reports Generated

- **Visit Report**: Displays all patient visits with diagnosis, doctor, and status.

- **Billing Report**: Displays consultation fee, treatment cost, total amount, and payment status.

- **Income Summary**: Shows total income from all paid bills.

9. Conclusion

The Hospital Management System built using MySQL Workbench provides an efficient and reliable way to manage hospital data. It reduces manual errors, enhances data retrieval, and automates billing processes with the help of stored procedures and triggers. This system can be further scaled to include modules such as pharmacy, lab tests, and staff management.