Biweekly Work Report (Software Engineering Management and Economics)

Time Period: May 5 – May 19

Total Working Hours: 15 hours

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Overview

During this biweekly period, I focused on designing and implementing a MySQL database for the Diabetic Retinopathy Diagnosis System based on the provided Entity-Relationship (ER) diagram. The primary tasks included translating the ER diagram into a relational schema, creating the database with appropriate tables, and populating it with sample data relevant to diabetic retinopathy diagnosis. The total time spent on this task was approximately 15 hours.

Database Creation Process

I began by analyzing the ER diagram, which outlined five entities: `User`, `Patient`, `Doctor`, `Diagnose`, and `Lesion`. Using MySQL 9.3, I created a database named `MedicalDB` with `utf8` encoding to ensure compatibility. The process involved writing a SQL script (`create_medical_database.sql`) to define the schema, set constraints, and insert sample data. The script was executed using Navicat Premium 16, with adjustments made to resolve issues such as foreign key constraints and encoding errors.

Database Design

The database consists of five tables with the following design:

- User: Stores user credentials and roles.
  - `user_id` (INT, PRIMARY KEY, AUTO_INCREMENT), `username` (VARCHAR(100), UNIQUE, NOT NULL), `password` (VARCHAR(255), NOT NULL), `role` (ENUM('patient', 'doctor'), NOT NULL), `created_at` (TIMESTAMP, DEFAULT CURRENT_TIMESTAMP).
- Patient: Stores patient information, linked to `User`.
  - `patient_id` (INT, PRIMARY KEY, AUTO_INCREMENT), `user_id` (INT, FOREIGN KEY, NOT NULL), `name` (VARCHAR(100), NOT NULL), `gender` (ENUM('male', 'female', 'other')), `date_of_birth` (DATE, NOT NULL), `contact_info` (VARCHAR(255)), `medical_history` (TEXT).
- Doctor: Stores doctor information, linked to `User`.
  - `doctor_id` (INT, PRIMARY KEY, AUTO_INCREMENT), `user_id` (INT, FOREIGN KEY, NOT NULL), `name` (VARCHAR(100), NOT NULL), `department` (VARCHAR(100)), `title` (VARCHAR(50)), `contact_info` (VARCHAR(255)).
- Diagnose: Stores diagnosis records, linking `Patient` and `Doctor`.
  - `diagnosis_id` (INT, PRIMARY KEY, AUTO_INCREMENT), `patient_id` (INT, FOREIGN KEY, NOT NULL), `doctor_id` (INT, FOREIGN KEY, NOT NULL), `diagnosis_time` (TIMESTAMP, DEFAULT CURRENT_TIMESTAMP), `summary` (TEXT), `image_path` (VARCHAR(255)).
- Lesion: Stores lesion details from diagnoses.
  - `lesion_id` (INT, PRIMARY KEY, AUTO_INCREMENT), `diagnosis_id` (INT, FOREIGN KEY, NOT NULL), `lesion_type` (VARCHAR(100), NOT NULL), `count` (INT, NOT NULL, `CHECK` (count >= 0)).

Foreign keys are enforced with `ON DELETE CASCADE` to maintain referential integrity. The schema supports the system's needs by storing patient medical histories, doctor details, diagnoses, and lesion data specific to diabetic retinopathy.

Next Steps

I plan to refine the database by adding more sample data and implementing queries to support the diagnosis system’s reporting features. Additionally, I will explore indexing to optimize query performance.