Project Report

Quiz-Master App

Student Details-

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Project Description-

Quiz Master is a web-based educational platform that facilitates exam preparation across multiple subjects. The system supports two user roles: Administrators who manage subjects, chapters, and quizzes, and Students who can attempt quizzes and track their performance. Built with Flask and SQLite, the application features a responsive interface for quiz creation, administration, and performance analytics, streamlining the assessment process for educational institutions.

How I approached-

I designed the system following the Flask MVC architecture pattern. First, I created the database models using SQLAlchemy ORM to establish relationships between subjects, chapters, questions, and quizzes. Then, I implemented the admin functionality for content management, followed by user authentication and quiz attempt features. The frontend was developed using Bootstrap for a responsive design with Jinja2 templating.

Technology Stack-

Backend:- Flask (Python web framework)

Frontend:- HTML, Bootstrap (for responsive design)

Database:- SQLAlchemy (ORM for database interaction)

Data Visualization:- Bootstrap(for creating interactive charts)

PROJECT PRESENTATION VIDEO -
https://drive.google.com/file/d/1kXhOVY6TePS_bBO2UJA2HRMP-AkMmlvW/view?usp=sharing

Database Schema Design

The Quiz Master database uses SQLite with SQLAlchemy ORM, featuring 7 interrelated tables to manage the quiz ecosystem. The User and Admin tables handle authentication with appropriate user credentials and roles. The Subject-Chapter-Question hierarchy establishes a structured content organization, while Quiz, QuizQuestion, and QuizAttempt tables manage test creation and student performance tracking.

Key design features include:

- Cascading deletions to maintain referential integrity

- Foreign key constraints to enforce valid relationships

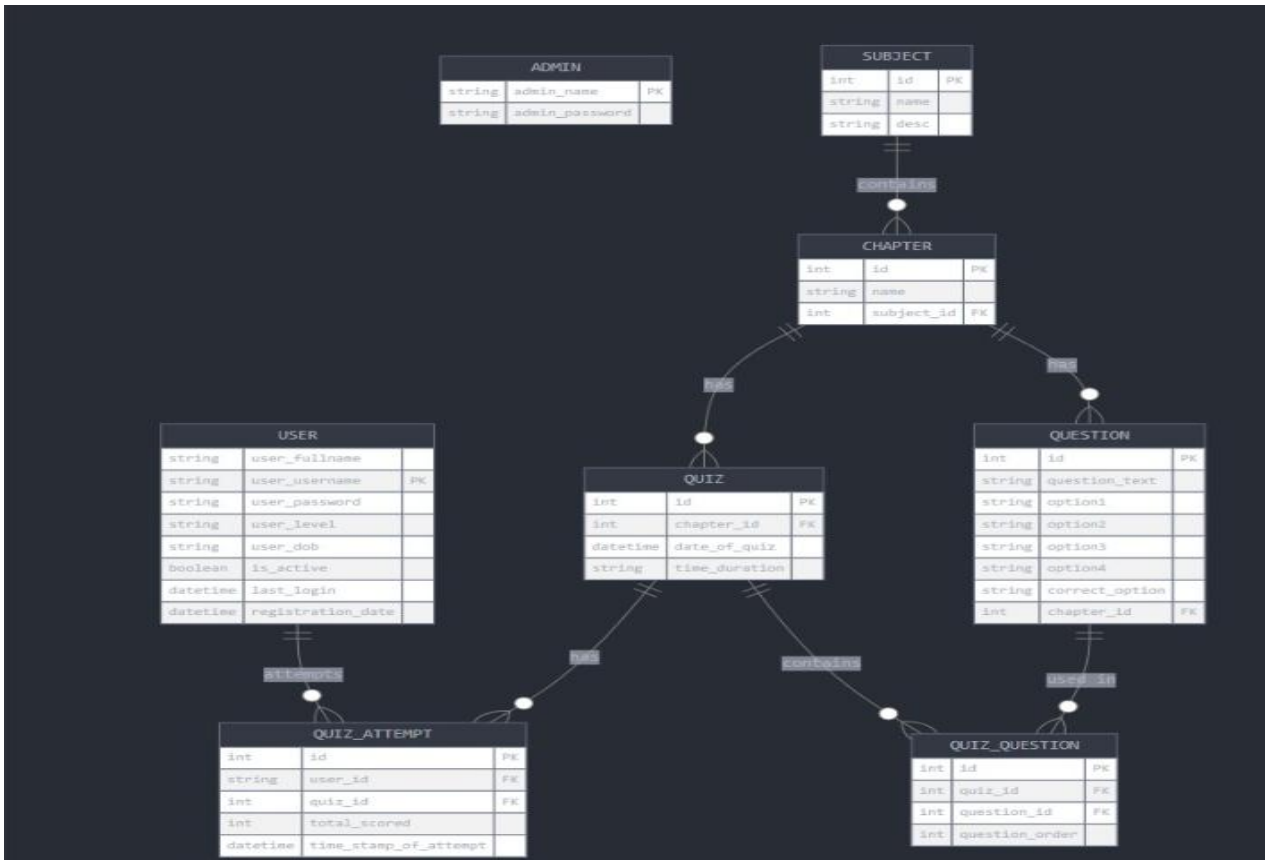
- Many-to-many relationship between quizzes and questions through the QuizQuestion junction table

- Timestamp tracking for quiz attempts and user registration

- Efficient storage of multiple-choice questions with correct answer validation

This schema efficiently organizes educational content while supporting the core functionality of quiz creation, administration, and performance analysis in a structured learning environment.

ER Diagram-


ADMIN
string admin_name PK
string admin_password
SUBJECT
int id PK
string name
string desc
contains
CHAPTER
int id PK
string name
int subject_id FK
has
has
USER
string user_fullname
string user_username PK
string user_password
string user_level
string user_dob
boolean is_active
datetime last_login
datetime registration_date
QUIZ
int id PK
int chapter_id FK
datetime date_of_quiz
string time_duration
QUESTION
int id PK
string question_text
string option1
string option2
string option3
string option4
string correct_option
int chapter_id FK
Attempts
has
contains
user_in
QUIZ_ATTEMPT
int id PK
string user_id FK
int quiz_id FK
int total_scored
datetime time_stamp_of_attempt
QUIZ_QUESTION
int id PK
int quiz_id FK
int question_id FK
int question_order