

Quiz Master - V1

MODERN APPLICATION
DEVELOPMENT I

Project Report

AUTHOR

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About - I'm a diploma-level student in the IIT Madras online BS program for Data Science. I'm into web app development and love exploring how data science can be applied in real-world projects.

DESCRIPTION

QuizMaster - V1 is a web-based exam preparation platform where admins create and manage subjects, chapters, and quizzes, while users can register, take quizzes, and track their scores. Users can attempt quizzes from various subjects, view past performances, and improve over time. Admins have full control over content, including adding, editing, and organizing quizzes. The platform ensures a structured and engaging learning experience with score tracking and analytics. Built using Flask, Jinja2, Bootstrap, and SQLite for seamless functionality.

TECHNOLOGIES USED

- **Flask** - Backend framework for handling requests and routing.
- **Flask-SQLAlchemy** - ORM for managing the SQLite database.
- **Flask-Login** - Handles user authentication and session management.
- **Werkzeug** - Provides secure password hashing and authentication utilities.
- **SQLite** - Lightweight database for storing quizzes and user data.
- **Jinja2** - Templating engine for dynamic HTML rendering.
- **HTML, CSS** - For a responsive and user-friendly UI.
- **JavaScript** - Frontend interactivity and dynamic content.
- **Chart.js** - Generates quiz performance charts and analytics.

DB SCHEMA DESIGN

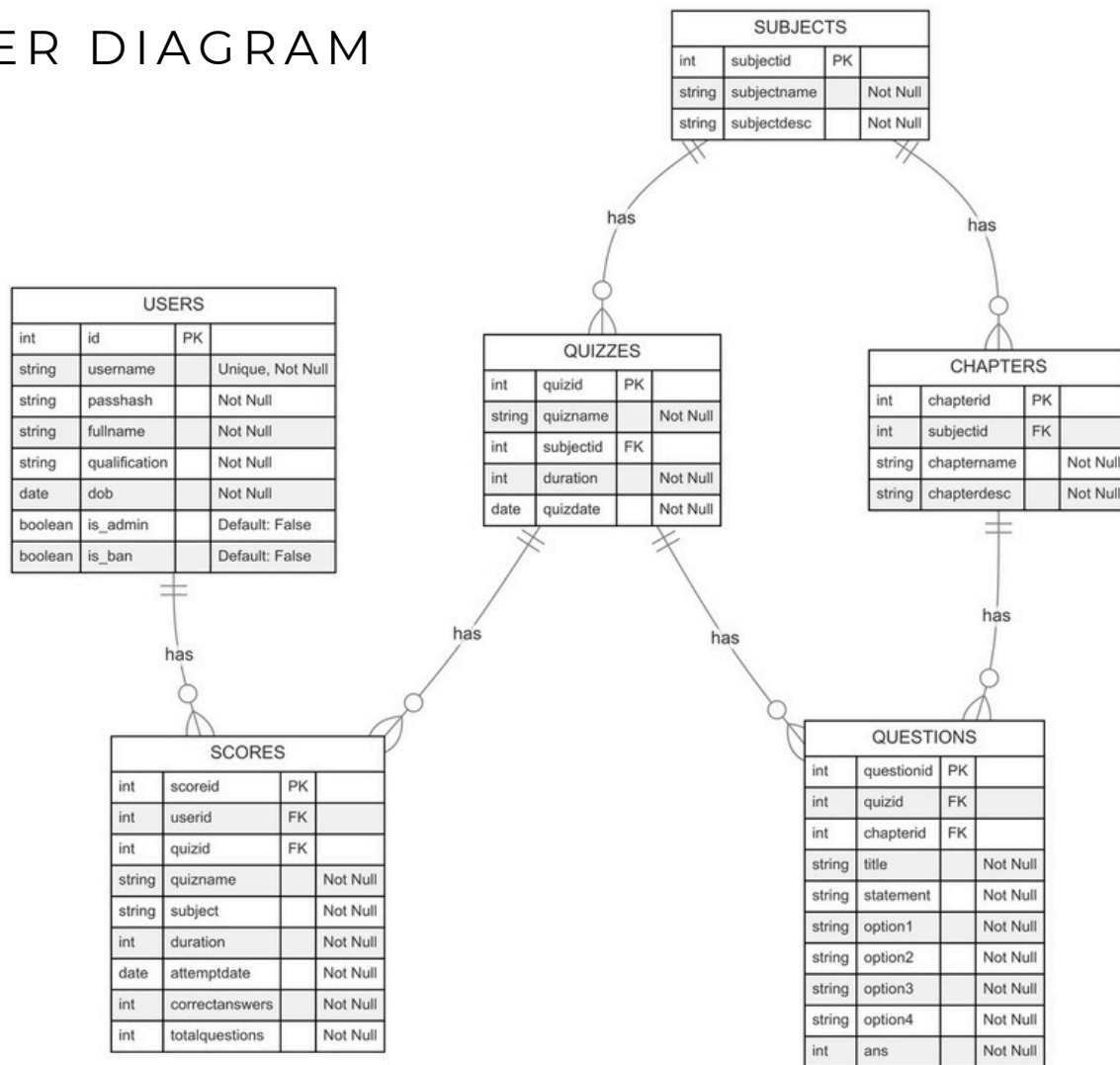
The database is structured to manage users, subjects, quizzes, and scores efficiently while maintaining data integrity.

- **Users:** Stores user details like username, password (hashed), role (admin or user), and status (banned or active).
- **Subjects:** Each subject represents a course or field of study, containing a name and description.
- **Chapters:** Chapters belong to a subject, breaking it down into smaller, manageable sections.
- **Quizzes:** Each quiz belongs to a subject, has a set duration, and a scheduled date.
- **Questions:** Every quiz consists of multiple-choice questions linked to both a quiz and a chapter.
- **Scores:** Tracks user quiz attempts, recording correct answers, total questions, and attempt dates.

Why this design?

- Keeps data structured and easy to manage.
- Ensures secure authentication using hashed passwords.
- Optimizes performance with clear relationships between tables.
- Scalable for adding more subjects, quizzes, and users.

ER DIAGRAM



ARCHITECTURE AND FEATURES

The project follows an MVC architecture, with controllers handling logic, models managing the database, and views stored in templates/ using Jinja2. Static assets like CSS and JS are in static/.

Features

- User Authentication - Secure login with hashed passwords.
- **Admin Dashboard** - Manage subjects, quizzes, and users.
- **Quiz System** - Users attempt quizzes, scores recorded.
- **Data Validation** - Frontend (HTML5/JS) and backend (Flask) validation.
- **Charts & Analytics** - User performance statistics using Chart.js