MAD2 - PROJECT REPORT

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I am Pragya Tripathi, a second-year student in the IITM BS Degree Program, and I'm also pursuing a B.Tech.

This report presents my work on *The Quiz Master – V2*, a multi-user interactive application designed to help users improve their exam preparation through targeted quizzes and performance tracking.

Description:

The Quiz Master - V1 project is an interactive multi-user application designed as an exam preparation site, helping users practice quizzes across various subjects and topics. The platform supports two roles: user and admin. Admins can manage subjects, chapters, quizzes, and users, while users can take quizzes, track their scores, and monitor their progress.

Technology used:

Frontend: Built using Vue.js with Vue CLI (advanced setup) for a dynamic and modular single-page application (SPA) experience. Bootstrap is used exclusively for styling and layout.

Backend: Flask powers the RESTful API, handling all business logic and communication between the frontend and database.
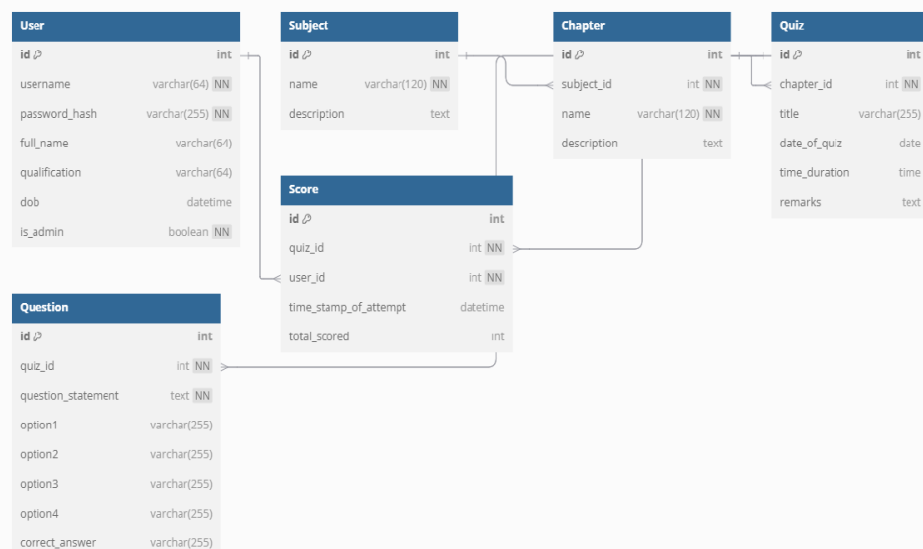
Database: SQLite is used as the sole database for data persistence and storage.

Authentication: JWT (JSON Web Tokens) is used to implement secure user authentication and protect restricted routes.

Graphs and Analytics: Chart.js is used on the backend to generate visualizations such as line and pie charts.

Development Environment: The project is developed using Visual Studio Code within a Python virtual environment.

DB Schema Design:

1.) User Table
Schema: id (Primary key), username, password_hash, full_name, qualification, dob, is_admin.
Relationships: One-to-Many with Score table.

2.) Subject Table
Schema: id (Primary key), name, description.
Relationships: One-to-Many with Chapter table.

3.) Chapter Table
Schema: id (Primary key), subject_id, name, description.
Relationships: Many-to-One with Subject table, One-to-Many with Quiz table.

4.) Question Table
Schema: id (Primary key), quiz_id, question_statement, option1, option2, option3, option4, correct_answer.
Relationships: Many-to-One with Quiz table.

5.) Quiz Table
Schema: id (Primary key), chapter_id, title, date_of_quiz, time_duration, remarks.
Foreign keys: chapter_id (References Chapter table)
Relationships: Many-to-One with Chapter table, One-to-Many with Question and Score tables.

6.) Score Table
Schema: id (Primary key), quiz_id, user_id, time_stamp_of_attempt, total_scored.
Foreign keys: quiz_id (References Quiz table), user_id (References User table)
Relationships: Many-to-One with Quiz and User tables.

Architecture and Features

The root folder of the project, **QuizMaster-V2**, is organized into distinct sections to separate backend, frontend, and configuration concerns. The **backend directory** contains all core backend logic, including **models.py** for defining database schemas, **config.py** for environment settings, and route handlers such as **auth_routes.py** and **quiz_routes.py**. It also includes **init_db.py** to initialize the SQLite database. The frontend directory holds the **Vue.js** single-page application, with all view components located in src/views and routing managed through src/router/index.js. The instance folder contains the application's SQLite database (**database.sqlite3**), ensuring persistent data storage.

The root directory includes **app.py**, which serves as the main entry point for launching the Flask server, along with essential files like **requirements.txt** for dependencies and a **readme.txt** for project documentation. The application implements core functionalities including secure JWT-based authentication, user and admin roles, and full CRUD operations for subjects, chapters, quizzes, and questions. Admins can seamlessly manage quiz content and view consolidated insights through integrated search features. Users can take quizzes, view scores instantly, and track their progress through intuitive visualizations. The platform emphasizes modularity, responsiveness, and ease of use, offering a structured yet dynamic quiz-taking experience.

Demonstration Video Link:

https://drive.google.com/drive/folders/1EPiY2q_AD0LeYONSlqB9AZSEaCUC5-e6?usp=sharing