

Project Report

Quiz Master V-1 MAD-1 Project

Author

Name: Swaraj Choudhary

Roll Number: 23f1001245

Student Email: 23f1001245@ds.study.iitm.ac.in

Description

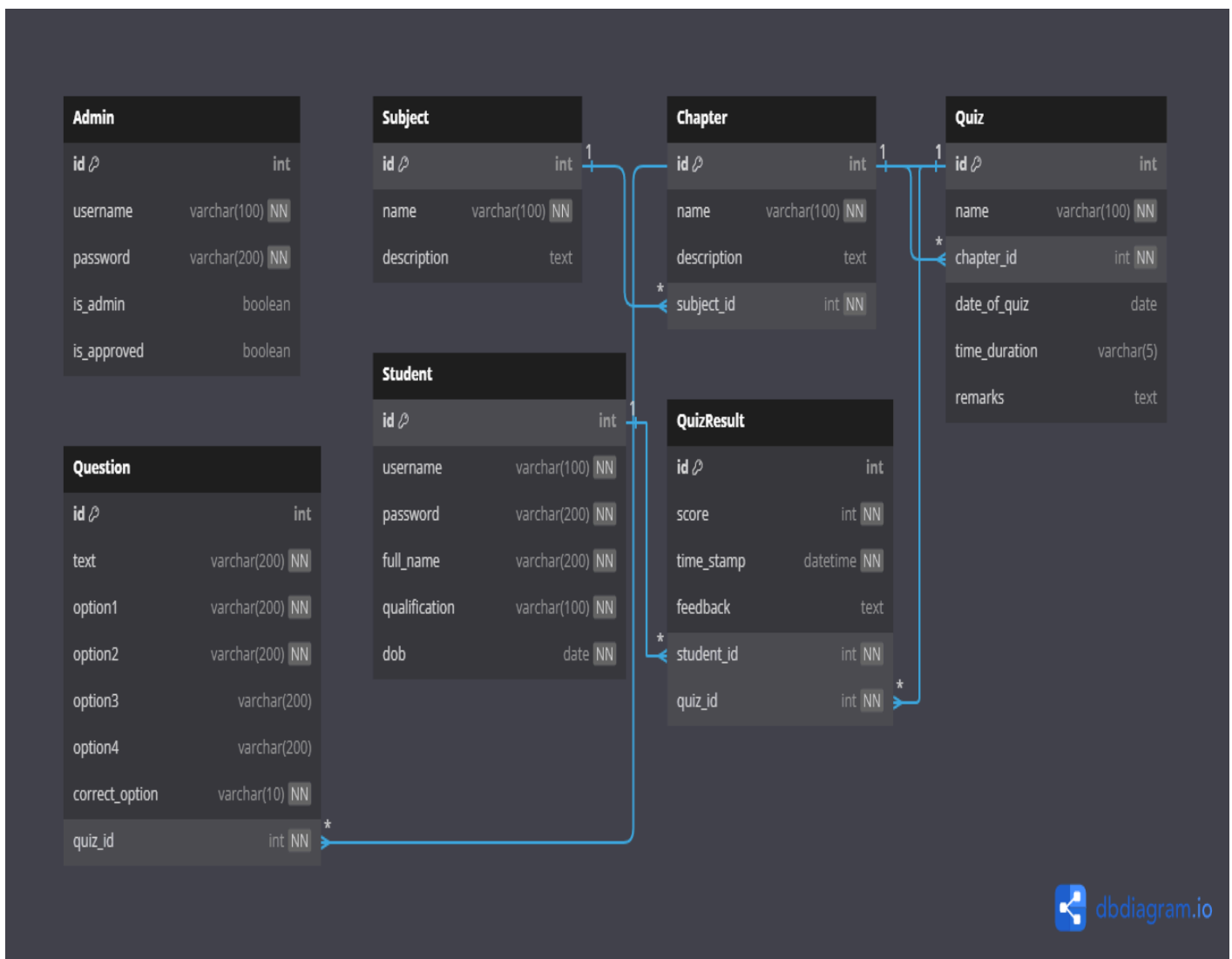
Quiz Master - V1 is an interactive exam preparation platform designed to make learning more engaging and organized. With a simple yet powerful interface, administrators can create and manage quizzes, while students can test their knowledge and track their progress. Built using Flask and SQLite, this application ensures a smooth and structured quiz experience for users.

Technologies Used

- **Flask** – The core web framework used to build the application.
- **Jinja2** – A templating engine for rendering dynamic HTML pages.
- **SQLite** – A lightweight relational database for storing quiz data.
- **Flask-SQLAlchemy** – An ORM (Object-Relational Mapper) for managing database interactions.
- **Flask-Migrate** – Enables database migrations and schema updates.
- **Werkzeug Security** – Provides secure password hashing and validation.
- **Matplotlib** – Used for generating graphical representations of quiz results.
- **NumPy** – Supports numerical computations for quiz result analysis.
- **Session & Flash (Flask)** – Manages user sessions and displays notifications.
- **OS Module** – Handles environment variables and file paths for secure configurations.
- **Datetime Module** – Used to timestamp quiz attempts and results.

DB Schema Design

- **Admin:** Stores admin credentials; the only role with full control over subjects, quizzes, and users.
- **Student:** Contains user details like name, email, password, qualification, and date of birth.
- **Subject:** Represents different study areas, each linked to multiple chapters.
- **Chapter:** Subdivides subjects into specific topics, each containing multiple quizzes.
- **Quiz:** Stores quiz details, including associated chapter, date, duration, and remarks.
- **Question:** Contains MCQs for each quiz with four options and the correct answer.
- **QuizResult:** Records student quiz attempts, including scores, timestamps, and feedback.



Architecture and Features

- **Lightweight Flask-Based Design**
 - Single backend file, `main.py`, managing routes, logic, and database interactions.
 - Uses **SQLite**, stored in the `instance/` folder, for structured data management.
- **Separation of Concerns**
 - **Backend:** Flask handles user authentication, quiz management, and result tracking.
 - **Frontend:** Jinja2 templates in the `templates/` folder dynamically render HTML pages.
 - **Styling:** HTML, CSS, and Bootstrap ensure a responsive and user-friendly interface.

Key Features of the Project:

- **Admin Functionality**
 - Admin can create, edit, and delete **subjects, chapters, quizzes, and questions**.
 - User management allows the admin to oversee registered students.
- **User Experience**
 - Students can **register, log in, and attempt quizzes** at their convenience.
 - Real-time **score calculation** after each quiz attempt.
 - Quiz results are stored, allowing users to **track past performance**.
- **Interactive & Scalable**
 - Secure authentication with **hashed passwords** for user data protection.
 - Clean and interactive UI for seamless navigation and quiz-taking experience.

Video

Presentation video for project demonstration: <https://youtu.be/-GX1MA7Rf-E>