

## Author

Kaushal Vaid

24f2000681

[24f2000681@ds.study.iitm.ac.in](mailto:24f2000681@ds.study.iitm.ac.in)

This is Kaushal Vaid, a self-driven student and MERN Stack Developer exploring different technology, AI/ML, and Deep Learning.

## Description

This project is a **Flask-based quiz app** with **user authentication, quiz management, and result tracking**. It enables users to attempt quizzes, view past results, and allows admins to manage subjects, chapters, quizzes, and questions efficiently.

## Technologies used

### Backend Technologies

- **Flask** – Web framework for handling routes, requests, and responses.
- **Flask-SQLAlchemy** – ORM for database interactions with SQLite.
- **Flask-Dotenv** – Manages environment variables securely.

### Database & Security

- **SQLite** – Lightweight database for storing quizzes, users, and attempts.
- **Werkzeug Security** – Secure password hashing and validation.

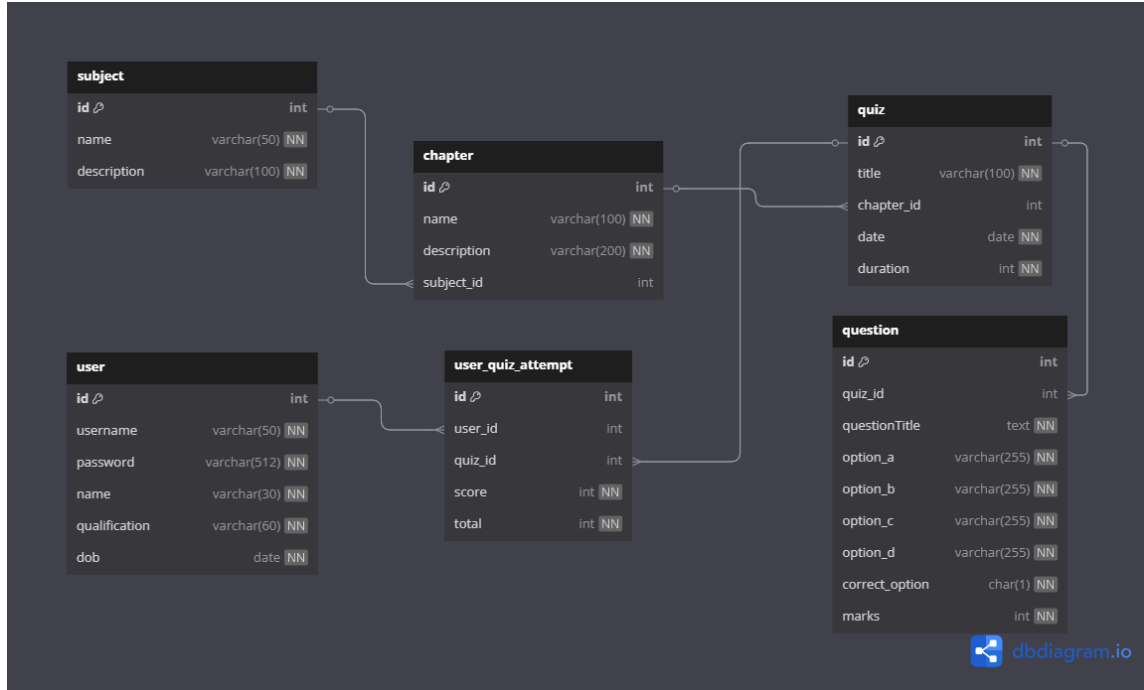
### Data Processing & Visualization

- **Matplotlib** – Generates quiz performance visualizations.
- **Counter (collections module)** – Analyzes quiz attempt data.

### Frontend Technologies

- **Jinja2** – Templating engine for rendering dynamic HTML pages.
- **Bootstrap (CSS & HTML)** – Responsive UI and styling.

## DB Schema Design




## Architecture and Features

The project follows the **MVC architecture**, ensuring a structured codebase. **Models** (defined in `models.py`) handle database interactions via SQLAlchemy. **Views** (stored in `templates/`) use Jinja2 for dynamic rendering, while **Controllers** (`routes.py`, `app.py`) manage request handling and logic. Static assets like CSS and images are in `static/`. Configuration is in `config.py`, and `.env` stores environment variables.

The system includes **user authentication, quiz creation, and automated scoring**. Admins can manage subjects, chapters, quizzes, and questions. Users can **attempt quizzes, track progress**, and **view performance** analytics via `matplotlib`. The UI, built with **Bootstrap**, ensures a responsive experience.

## Video

 MAD-1 Project Video.mp4