Final Project Report

Author
Name: Chittem Kameswara Sai
Roll Number: 23f3004461
Student Email: 23f3004461@ds.study.iitm.ac.in
About me: As i mentioned above i am kameswara sai , a graduate from BVK degree college with a Bsc statistics and computer science degree , currently pursuing Msc computer science in AU.

Description
In this project, I have developed This project which is a web-based quiz application "**Quiz Master**" that allows users to take quizzes, answer multiple-choice questions, and view their scores. It includes features like user authentication, quiz timers, and score tracking, all powered by Flask and a relational database.

Technologies Used

- **Flask**: A micro web framework for Python, used for building the web application.
- **Flask-SQLAlchemy**: An extension for Flask to integrate SQLAlchemy, an ORM for interacting with the database.
- **Flask-WTF**: For handling forms in a secure and easy-to-use manner.
- **SQLite**: For the relational database used to store application data.
- **JavaScript**: For client-side logic and dynamic content updates.
- **Jinja2**: For templating and rendering dynamic content in HTML.

- **Flask Extensions:** `Flask, render_template, request, redirect, url_for, flash, session, Flask_sqlalchemy.`
- **Other Extensions:** `Datetime`

The purpose behind using these technologies is to efficiently build a lightweight web application, ensuring ease of database interaction, scalability, and a clean user interface.

DB Schema Design
The project uses the following database schema:

- **User**
    - `user_id (Primary Key)`
    - `email (Unique, Not Null)`

    - password (Not Null)
    - full_name (Not Null)
    - qualification (Not Null)
    - dob (Not Null)
- **Subject**
    - subject_id (Primary Key)
    - subject_name (Not Null)
    - subject_description (Not Null)
- **Chapter**
    - chapter_id (Primary Key)
    - chapter_name (Not Null)
    - chapter_description (Not Null)
    - subject_id (Foreign Key)
- **Quiz**
    - quiz_id (Primary Key)
    - quiz_name (Not Null)
    - chapter_id (Foreign Key)
    - date_of_quiz (Not Null)
    - time_duration (Not Null)
- **Questions**
    - question_id (Primary Key)
    - quiz_id (Foreign Key)
    - question_statement (Not Null)

    - `option_1, option_2, option_3, option_4 (Not Null)`
    - `correct_option (Not Null)`
    - `marks (Not Null)`
- **Score**
    - `score_id (Primary Key)`
    - `user_id (Foreign Key)`
    - `quiz_id (Foreign Key)`
    - `score (Not Null)`
    - `total_marks(Not Null)`
    - `attempt_date(Not Null)`

The relationships between tables are carefully designed to reflect the structure of quizzes, chapters, and users. Foreign key constraints ensure referential integrity across related entities.

Architecture and Features
The application follows a Model-View-Controller (MVC) architecture:

- **Models**: Defined using SQLAlchemy to handle the database schema.
- **Views**: Handled using Jinja2 templates for rendering dynamic HTML pages.
- **Controllers**: Flask routes manage the logic and interaction between the models and views.

Features:

- **User Authentication**: Users can register, log in, and log out.
- **Quiz Interface**: Users can participate in quizzes, view questions, and submit answers.
- **Timer**: A countdown timer is implemented for quizzes.
- **Scores**: Users can view their scores after submitting the quiz.
- **Search Functionality**: A search bar is available for looking up quizzes or chapters.

Additional features like email validation and secure password handling have been implemented to ensure robust functionality.

Video

23f3004461_Quiz_master_demo.mp4