

Project report for Quiz Master

Modern Application Development – I

Author

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I am Rajdip Malo, a beginner in web development, currently learning Flask, SQLAlchemy, and Jinja. Through this project, I gained hands-on experience in backend development, database management and dynamic templating.

Description

This project involves developing a Quiz Master App. The application allow users to attempt quizzes, store questions and answers in a database, and display results and summary dynamically. Also the admin can add, delete, edit subject chapter and quizzes and their question. The focus is on creating an interactive, user-friendly quiz platform with efficient data management.

Technologies Used

1. Flask: A python web framework user for handling routes, interactions, rendering webpages.
2. Jinja: user for templating HTML pages for loading the page dynamically.
3. Flask-SQLAlchemy: A flask extension used for managing and interaction between the database through across the app.
4. Matplotlib: The library user for data visualization using graphs and charts.
5. Datetime: A python module used for handling the date and time related data.
6. Os Module: Used for file and environment related operations.

DB Schema Design

Relationships

User Model Relationships: One-to-many with score.

Subject Model Relationships: One-to-many with chapter.

Chapter Model Relationships: Many-to-one with subject, One-to-many with quiz.

Quiz Model Relationships: Many-to-one with chapter, One-to-many with question, One-to-many with score.

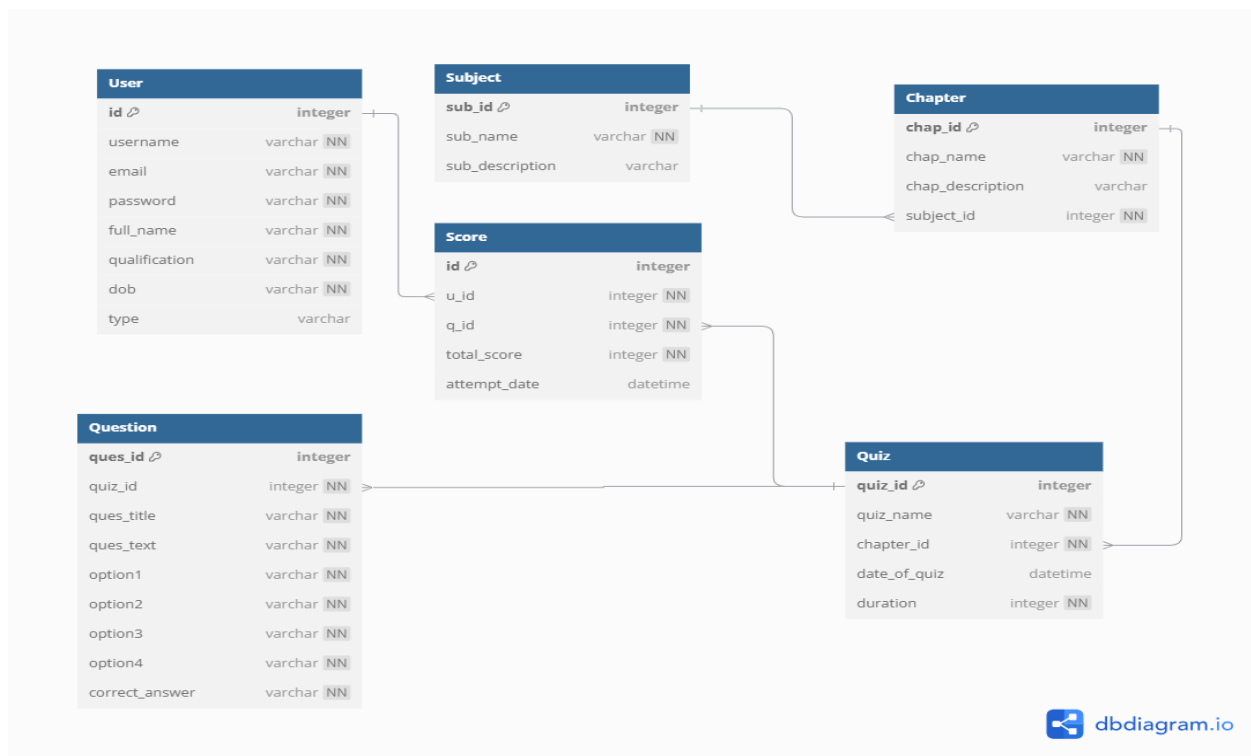
Question Model Relationships: Many-to-one with quiz.

Score Model Relationships: Many to one with user, Many to one with quiz.

I have designed this database as there is a hierarchy from subject -> chapter -> quiz -> question to manage the subject under that all its chapter and for each chapter all its quiz and also all the question in each quiz. And also the score model connects user and quiz so that we can retrieve data for user's past quiz attempt. In the user we can differentiate between general user and the admin of the app in the login page.

Project report for Quiz Master

Modern Application Development – I



Architecture and Features

The quiz master app project follows standard Flask application structure. The root directory includes the file app.py, README.md, .gitignore and also contain controllers , models, static and templates folder. In the controllers folder contain controllers.py which contain routes handles and business logic. The models folder contain instance folder and also models.py and database.py file. In the static folder contain all the css file and the file generated by matplotlib. The templates folder contain all the html file used in the project.

In the quiz master app I have implemented Login , Registration for the users, Quiz interface with the timer , their result with score, summary of the users given quiz by subject wise performance, progress trends and also the search functionality for finding the quiz. For the admin I also added crud management for subject, chapters, quizzes and their question , admin also has the user management feature for view and remove a user and admin also has summary to see top performers, user attempts, subject popularity and time trends of app.

The routes that are used:

- @app.route("/")
- @app.route("/login", methods=["GET", "POST"])
- @app.route("/register", methods=["GET", "POST"])
- @app.route("/admin")
- @app.route("/home/<string:username>/<int:user_id>")
- @app.route("/add_sub", methods=["GET", "POST"])
- @app.route("/delete_sub/<int:sub_id>", methods=["GET"])
- @app.route("/edit_sub/<int:sub_id>", methods=['GET', 'POST'])
- @app.route("/add_chap/<int:sub_id>", methods=["GET", "POST"])

Project report for Quiz Master

Modern Application Development – I

- @app.route("/subject/<int:sub_id>")
- @app.route("/delete_chap/<int:chap_id>", methods=['GET'])
- @app.route("/edit_chap/<int:chap_id>", methods=['GET','POST'])
- @app.route("/add_quiz/<int:chap_id>", methods=["GET","POST"])
- @app.route('/delete_quiz/<int:quiz_id>', methods=['Get'])
- @app.route('/edit_quiz/<int:quiz_id>', methods=['GET','POST'])
- @app.route('/quizzes/subject/<int:sub_id>/chapter/<int:chapter_id>')
- @app.route('/add_ques/<int:quiz_id>', methods=["GET","POST"])
- @app.route('/delete_ques/<int:quiz_id>/<int:ques_id>', methods=['GET'])
- @app.route('/edit_ques/<int:quiz_id>/<int:ques_id>', methods=['GET','POST'])
- @app.route("/users_manage")
- @app.route('/edit_user/<int:user_id>', methods=['GET','POST'])
- @app.route('/delete_user/<int:user_id>', methods=["POST","GET"])
- @app.route('/<string:username>/<int:user_id>/view_quiz/<int:quiz_id>')
- @app.route('/start_quiz/<string:username>/<int:user_id>/quiz/<int:quiz_id>/ques_index/<int:ques_index>', methods=['GET','POST'])
- @app.route('/quiz_result/<string:username>/<int:user_id>/quiz/<int:quiz_id>')
- @app.route('/<string:username>/<int:user_id>/scores')
- @app.route('/admin/search', methods=['GET'])
- @app.route('/user/search/<int:user_id>', methods=['GET'])
- @app.route('/admin/summary')
- @app.route('/<username>/summary')

Video Link: https://drive.google.com/file/d/19Rs8sA_2_yGXtw-UJJwca17W5FRILk6V/view?usp=drive_link