PROJECT REPORT

Modern Application Development I
Quiz Master App

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Project Statement :

It is a multi-user app (one requires an administrator and other users) that acts as an exam preparation site for multiple courses.

Technologies Used :

- Python
- Flask
- Flask SQLAlchemy
- Jinja2 templates
- CSS
- SQLite for data storage
- ChartJs

Database Schema :

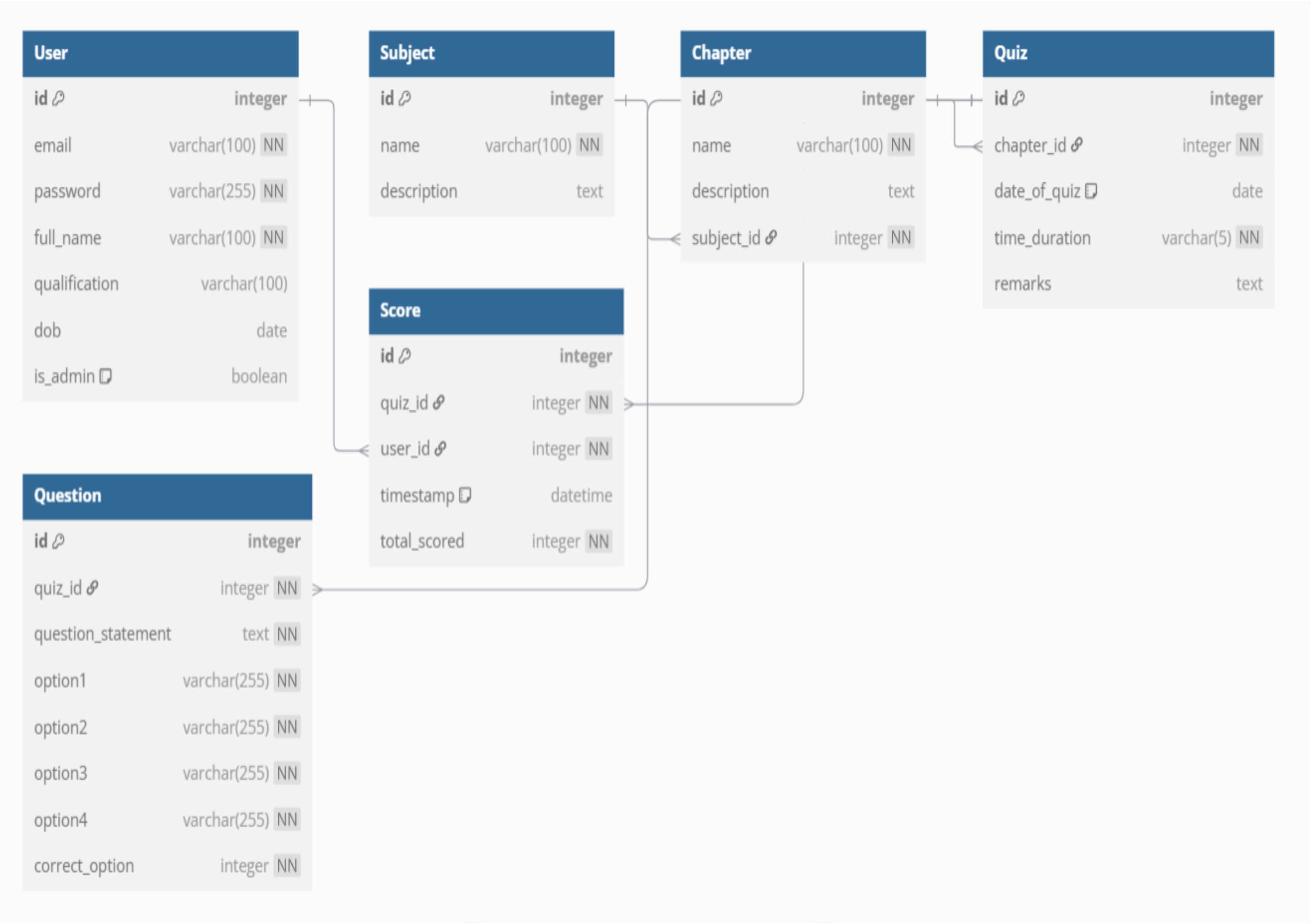
The Database schema comprises following Classes/Entities:

1. **User** - Stores User details and attributes such as id, email, password, full_name, qualification, dob, and is_admin flag to differentiate between admin and regular users.
2. **Subject** - Stores academic subject information such as id, name, and description, representing the highest level in the content hierarchy.
3. **Chapter** - Stores chapters belonging to subjects with fields such as id, name, description, and subject_id (Foreign Key to Subject table), organizing content within each subject.
4. **Quiz** - Stores quizzes created for specific chapters having fields such as id, chapter_id (Foreign Key to Chapter table), date_of_quiz, time_duration (in HH:MM format), and remarks.
5. **Question** - Stores questions for each quiz with fields such as id, quiz_id (Foreign Key to Quiz table), question_statement, four options (option1 through option4), and correct_option indicating which option is correct.

6. **Score** - Stores user quiz attempt results with fields such as id, quiz_id (Foreign Key to Quiz table), user_id (Foreign Key to User table), timestamp of completion, and total_scored points, tracking performance metrics.

ER Diagram :

The Entity Relationship Diagram below shows the Database Schema and relationship:



User		
id	integer	
email	varchar(100)	NN
password	varchar(255)	NN
full_name	varchar(100)	NN
qualification	varchar(100)	
dob	date	
is_admin	boolean	

Subject		
id	integer	
name	varchar(100)	NN
description	text	

Chapter		
id	integer	
name	varchar(100)	NN
description	text	
subject_id	integer	NN

Quiz		
id	integer	
chapter_id	integer	NN
date_of_quiz	date	
time_duration	varchar(5)	NN
remarks	text	

Score		
id	integer	
quiz_id	integer	NN
user_id	integer	NN
timestamp	datetime	
total_scored	integer	NN

Question		
id	integer	
quiz_id	integer	NN
question_statement	text	NN
option1	varchar(255)	NN
option2	varchar(255)	NN
option3	varchar(255)	NN
option4	varchar(255)	NN
correct_option	integer	NN

Architecture Design :

The Model View Controller-MVC architecture has been implemented in this project. The project has following structure:

1. **Templates** - Contains all HTML views for user interfaces including admin_dashboard, user_dashboard, quiz, start_quiz, etc.
2. **Models** – Contain models.py defining all database entities (User, Subject, Chapter, Quiz, Question, Score).

3. **Static** - Contains CSS stylesheets and favicon images for visual styling.
4. **Instance** - Contains the SQLite database file (quizmaster.sqlite).
5. **Application Python Files**:
    - app.py - Main application initialization and configuration
    - routes.py - Contains main blueprint with educational content routes
    - auth.py - Contains authentication blueprint with login/registration routes

Main features:

The project has separate login and registration based on roles

Admin Dashboard

- Create, edit, and delete subjects
- Create, edit, and delete chapters under specific subjects
- Create quizzes under specific chapters
- Set quiz parameters (date, time duration in HH:MM format, remarks)
- Create multiple-choice questions with four options
- Specify the correct option (1-4) for each question
- Edit and delete questions within quizzes
- View subject-wise top scores through bar charts
- Subject-wise user attempt statistics via doughnut charts
- Search functionality across users, subjects, and quizzes

User Dashboard

- View available quizzes organized by subject and chapter
- Timer-based quiz interface with automatic submission
- Submit answers and receive immediate feedback and scoring
- View historical quiz attempts and scores
- Subject-wise performance visualization through bar charts
- Monthly quiz attempt statistics with pie charts showing attempted vs. not attempted quizzes

Video Link :

https://drive.google.com/file/d/19cXzpW9B_W9g36SAhvpa-pob8IW7Ppml/view?usp=sharing