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***Project***

Quiz Application Report

1. Introduction  
    The Quiz Application is an interactive web-based tool that allows users to take quizzes on various topics. The system provides a question-and-answer interface, along with a timer that counts down from 20 seconds for each question. It also keeps track of the user's score, displays the results at the end, and allows users to restart the quiz.
2. System Requirements

* OS: Windows, macOS, Linux; any OS will do with a modern browser
* Browser: Google Chrome, Mozilla Firefox, Safari, Edge
* Web Technologies:
  + HTML: The structural and content base of the application
  + CSS: Styles for the layout and to make it aesthetically appealing
  + JavaScript: Application logic and functionality

1. Key Features
2. Quiz Functionality:  
   * One question at a time
   * Four options to each question.
   * This lets the user choose only one.
   * At the end, it will give the user a correct score from the quiz.
3. Timer:

* Assigns each question a 20-second countdown timer.
* Upon reaching zero, the application moves to the next question.
* A new question resets the timer.

1. Scoring System:

* All user answers are verified against the actual correct answer.
* A score is calculated according to the number of correct answers obtained.

1. Result Presentation:

* Presents the user's score upon completion of all questions.
* Provides a feature to retake the test by restarting the quiz.

1. Responsive Interface:

* The app is designed to be used across multiple devices (desktop, tablets, smartphones).
  + A clean, user-friendly interface with clear fonts, colors, and buttons.

1. Functionality Breakdown  
    HTML  
    The HTML structure defines the layout and content of the quiz app. Key elements include:

* A container for displaying the quiz title and question.
* A list of answer options that users can click on.
* A submit button to navigate to the next question.
* A restart button that allows users to restart the quiz after completion.

CSS  
 The CSS provides the visual styling for the application, including:

* Centering the quiz container on the screen.
* Styling the question, options, and buttons.
* Animating the fade-in effect of the quiz container when the page loads.
* Styling the timer display to show the countdown.

JavaScript  
 The JavaScript offers the logic to:

* Show each question along with its choices.
* Record the score for the user.
* Control the countdown timer from 20 seconds.
* Handle input from the user, such as choosing an answer and moving on to the next question.
* Reset the quiz and timer when the user restarts the quiz.

Timer Logic

* A setInterval() method is applied to decrement the timer every second.
* The timer is displayed dynamically on the screen.
* Once the timer reaches zero, the application automatically moves to the next question.

1. User Interface  
    The user interface is simple and intuitive:

* A quiz title is displayed at the top.
* A question and four options are shown in the middle.
* A timer is displayed just above the question.
* Navigation buttons ("Next Question" and "Restart Quiz") facilitate the navigation of the quiz.

1. Security Considerations

* Cross-Site Scripting (XSS): Input is sanitized by making sure the options and answers are hard-coded and not user-generated.
* Data Validation: The quiz options are predefined, which minimizes the risk of invalid input.

1. Limitations

* Fixed Number of Questions: The current quiz is based on a fixed set of five questions. A future version could integrate a larger database of questions or allow users to select quiz topics.
* Timer Constraint: The app uses a fixed 20-second timer per question. Adjusting the timer based on question difficulty could be an improvement.

1. Future Enhancements
2. Increasing the Number of Questions: Increase the number of questions and categories to increase the diversity of quizzes.
3. User Authentication: Allow users to sign in and save their quiz results for future reference.
4. Leaderboard: Provide a leaderboard with the top scorers.
5. Feedback Mechanism: Provide feedback to the user immediately after each question on whether they selected the correct answer or not.
6. Conclusion  
    The Quiz Application gives users a basic, functional, and interactive place to test their knowledge. Featuring a timer, tracking of scores, and an option to restart the quiz, it is very user-friendly and gives immediate feedback. Improvements can be made to the system to increase its scalability and add more interactive features, but this is a really great system to start with for building something more complex in the future.

This is a summary report on the application's functionality, features, and scope for improvement.