Web Dev Quiz - Documentation

1. Overview

Web Dev Quiz is an interactive quiz application designed to test and improve web development knowledge. It features:

- **Timed quizzes** on various topics (HTML, CSS, JavaScript, React, etc.).
- **AI-generated questions** using Google's Gemini API.
- **Study resources** with links to W3Schools tutorials.
- **Progress tracking** with score summaries and explanations.

2. Features

Quiz Features

- **Multiple Topics:** HTML, CSS, JavaScript, React, Python, Java, C#, C++, and Software Development Concepts.
- **Difficulty Levels:** Easy, Medium, and Hard.
- **Timed Questions:** 60 seconds per question.
- **Instant Feedback:** Correct/incorrect answers with explanations.
- **Score Tracking:** Final results with performance breakdown.

Study Features

- **Topic Selection:** Choose a topic to study.
- **Curated Resources:** Direct links to W3Schools tutorials, references, and examples.

Technical Features

- **React.js:** Frontend built with React.
- **Gemini API:** AI-powered question generation.
- **Netlify Deployment:** Hosted on Netlify for easy access.

3. Installation & Setup

Prerequisites

- Node.js (v16+).
- npm / Yarn.
- Google Gemini API Key (for question generation)

Steps to Run Locally

1. **Clone the repository:**

```
bash
git clone https://github.com/your-repo/web-dev-quiz.git
cd web-dev-quiz
```

2. **Install dependencies:**

```
bash
npm install
```

3. **Set up environment variables:**
   - **Create the .ENV file:**

```
env
VITE_GEMINI_API_KEY=your_api_key_here
```

4. **Run the app:**

```
bash
npm run dev
```

5. **Build for production:**

```
bash
npm run build
```

4. Deployment (Netlify)

Manual Deployment

1. **Build the app:**

```
bash
npm run build
```

2. **Drag & drop** the build folder into Netlify.

5. File Structure

```
text
src/
├── App.js          # Main app with routing
├── About.js        # About page
├── Study.js        # Study topics selection
├── StudyTopic.js   # Study resources per topic
├── Footer.js       # Footer component
├── index.js        # React entry point
public/
├── index.html      # Base HTML
.env                # Environment variables
```

6. API Usage (Gemini AI)

The app uses **Google's Gemini API** to generate quiz questions dynamically.

Prompt Structure

```
js
`Generate 5 ${difficulty} level MCQs about ${topic} for web development.
Format as JSON array with:
{
  "question": "Question text",
  "options": ["Option1", "Option2", "Option3", "Option4"],
  "correctAnswer": "CorrectOption",
  "explanation": "Brief explanation"
}`
```

7. Future Improvements

- **User Accounts:** Save progress and scores.
- **Leaderboard:** Compare scores with others.
- **More Topics:** Expand to backend (Node.js, SQL).
- **Dark/Light Mode:** Better theme support.