ReadAble : A Personalized Dyslexia Reading Support System

Abstract

This web application is designed to empower individuals with dyslexia by delivering a fully personalized, interactive reading support environment built with standard web technologies (HTML, CSS, and JavaScript). Upon first use, the learner completes a brief diagnostic quiz that pinpoints specific challenges—whether they relate to phonological awareness, visual processing, rapid naming, or working memory. Based on these results, the system dynamically assembles a tailored training plan that focuses on the user's areas of greatest need.

To reinforce skill development, the app leverages the browser's native Web Speech API: during reading exercises, passages are rendered on-screen and can be narrated aloud using the SpeechSynthesisUtterance interface, allowing learners to follow highlighted text in real time. For writing and comprehension practice, speech-to-text tools convert spoken responses into text, fostering greater confidence and reducing the barriers of manual spelling and typing. Step-by-step animations break down complex tasks into manageable segments, and progress tracking dashboards chart improvements over time.

By combining a familiar tech stack (HTML for structure, CSS for dyslexia-friendly styling, and JavaScript for interactivity and speech integration) with evidence-based instructional strategies, this adaptive platform not only makes reading more accessible but also promotes consistent, measurable progress for dyslexic learners.

Team members

Name	Roll No
Anu Prasad	AM.EN.U4AIE22105
Aparna S	AM.EN.U4AIE22106
Bhamini R	AM.EN.U4AIE22111

Team Contributions

Student 1(AM.EN.U4AIE22105**):**

- **Research**
  Conducted in-depth research to develop quiz questions tailored to identify different types of dyslexia, including phonological, visual, auditory, memory-related, and dyscalculia. Additionally, explored dyslexia-friendly color palettes and layout designs to minimize visual strain and enhance overall user experience.

- **Development Tasks**

    - Designed and developed the landing page, clearly presenting the project objectives and features, including signup and login functionalities, with secure local storage integration.
    - Created the diagnostic quiz module, enabling users to assess their specific reading challenges.

Student 2(AM.EN.U4AIE22106**):**

- **Research**
  Explored a range of audio analysis and text-to-speech technologies, emphasizing their role in improving accessibility for users with dyslexia. Also examined typographic strategies and readability enhancements, including the implementation of specialized fonts like OpenDyslexic.

- **Development Tasks**

    - Built the reading analysis module, incorporating real-time text highlighting and audio playback using the Web Speech API.
    - Developed the results section, which interprets quiz responses and provides feedback on the user's reading difficulties.

Student 3(AM.EN.U4AIE22111**):**

- **Research**
  Studied the types of dyslexia and best practices for addressing each through targeted interventions and training methodologies.

- **Development Tasks**

    - Designed and implemented customized training plans for each dyslexia type, integrating supportive tools such as audio guides, animated steps, and progressive skill-building exercises.