



Zendalona: Maths-Tutor QT Version and Enhancement

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Overview

Zendalona is a pioneering organization dedicated to providing accessibility solutions for visually impaired individuals, with a broader focus on inclusivity for those with multiple sensory challenges. In response to the global challenge of vision impairments reported by the WHO, Zendalona is committed to making a meaningful difference in the lives of those facing these challenges. Its proposal outlines a comprehensive project aimed at developing innovative software solutions tailored to the specific needs of visually impaired individuals. Zendolona has embraced a noble mission – to make a meaningful difference in the lives of those facing these challenges. It is committed to achieving this by leveraging expertise in developing innovative systems, tools, and techniques.

Project Description

The primary goal of the project is to design and develop a cross-platform learning app for children who are blind. The app is being built from the ground up using Qt for Python (specifically PySide6), with a focus on leveraging accessibility features of both Qt and the underlying platforms to ensure a seamless and inclusive user experience.

Current State:

- The app's core functionality is complete, including basic learning modules and accessible navigation.
- The app has been tested on multiple platforms, with positive feedback on accessibility features.
- Ongoing work includes refining the user interface and enhancing existing modules.

What's Left to Do:

- Finalize and polish the user interface to ensure it's intuitive and visually appealing.
- Add more learning modules and content tailored to the needs of children who are blind.
- Perform extensive user testing to identify and address any remaining issues.
- Prepare documentation and tutorials to assist future developers in extending the app.



Code Merged Upstream:

- Core modules related to accessibility and navigation have been merged upstream.
- Some experimental features, such as advanced customization options, are still in review and have not yet been merged.

Challenges and Lessons Learned:


- **Challenges:**
 - Balancing cross-platform compatibility with accessibility requirements proved to be challenging.
 - Ensuring that the app is both functional and intuitive for children who are blind requires significant testing and iteration.
- **Lessons Learned:**
 - The importance of early and continuous user feedback in developing accessible software.
 - Leveraging platform-specific accessibility features while maintaining a consistent user experience across different platforms.

This project has provided valuable experience in designing accessible software, particularly in understanding the unique needs of children who are blind.

DETAILED DESCRIPTION OF THE TASKS AND WORK :

Deliverables

- 1 Migrated System: Complete migration of the project from the GTK version to QT, ensuring compatibility with Windows and macOS platforms.
- 2 New Features Implementation:
 - a. Story-Based Questions: Integration of story-based questions to make learning mathematics more engaging and immersive.
 - b. Lesson Instructions: Implementation of detailed lesson instructions to guide users through each mathematical concept.

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- c. Additional Concepts: Integration of new mathematical concepts such as distance calculation, money exchange, time calculation, etc., to expand the scope of the software.
 - d. Speech Sound Enhancement: Incorporation of human voice-based speech sound for a more natural and engaging learning experience.
 - e. Intermediate Score Announcement: Implement intermediate score announcements to provide feedback and encouragement during learning.
 - f. Answer Clues: Development of answer clues to assist users in cases where they take too much time to respond.
 - g. User Interface for Question File Creation: Design and implementation of a user-friendly interface for creating and managing question files.
 - h. Clock Tick Sound: Integration of clock tick sound to indicate time consumption during tasks.
 - i. Assessment Mode Checkbox: Addition of an assessment mode checkbox to enable/disable exposure of scores, clocks, etc., based on user preference.
 - j. Documentation and User Guide: Creation of comprehensive documentation and user guide to assist users in navigating the software and understanding its features.
- 3 Post-Deployment Support: Provision of ongoing support and maintenance for the software, including addressing user queries, fixing issues, and implementing additional features based on user feedback.

Timeline

Weeks 1-2: Planning and Initial Setup

- **Achievements:**
 - Successfully defined the project scope, goals, and timeline.
 - Conducted thorough research on existing accessible apps and technologies, laying a strong foundation for the project.
 - Set up the development environment with PySide6 and all necessary tools.
- **Key Milestones:**
 - Created comprehensive project documentation, including a detailed README and project plan.
 - Initialized the project repository and established version control.

- Designed the app's architecture, ensuring modularity and scalability from the outset.

Weeks 3-4: Basic App Structure and Accessibility Integration

- **Achievements:**

- Developed the basic structure of the app, focusing on creating a modular and extendable framework.
- Successfully integrated key accessibility features, including screen reader support.

- **Key Milestones:**

- Implemented the main app layout and navigation system, ensuring it was fully accessible.
- Achieved compatibility with major screen readers, providing essential feedback to users.
- Established a robust testing framework, with initial unit tests confirming accessibility compliance.

Weeks 5-6: Core Features Development

- **Achievements:**

- Developed the core learning modules, with a focus on creating accessible and engaging content.
- Ensured all interactions were intuitive and fully accessible for children who are blind.

- **Key Milestones:**

- Successfully created and tested the first set of learning modules, including basic math and reading exercises.
- Implemented audio feedback and accessible input methods, enhancing the user experience.
- Conducted initial user testing, gathering valuable feedback to inform further development.

Weeks 7-8: Cross-Platform Testing and Refinement

- **Achievements:**


- Ensured seamless operation of the app across multiple platforms, including Windows, macOS, and Linux.
- Refined accessibility features based on user feedback, resulting in a more polished product.
- **Key Milestones:**
 - Conducted comprehensive testing on various platforms, resolving any compatibility issues that arose.
 - Optimized the app's performance, with a particular focus on maintaining accessibility standards.
 - Iteratively improved the learning modules, incorporating user feedback for enhanced usability.

Weeks 9-10: Advanced Features and Final Modules

- **Achievements:**
 - Successfully added advanced features and finalized all remaining learning modules.
 - Developed and refined the user interface, ensuring it was both intuitive and accessible.
- **Key Milestones:**
 - Implemented advanced features such as progress tracking and personalized learning paths.
 - Completed the development and testing of the final set of learning modules.
 - Designed and polished the user interface, creating a visually appealing and user-friendly experience.

Weeks 11-12: Final Testing, Documentation, and Wrap-Up

- **Achievements:**
 - Conducted extensive final testing, focusing on accessibility and usability, with successful outcomes.
 - Prepared comprehensive documentation and tutorials, ensuring a smooth handover and future development.
- **Key Milestones:**
 - Completed rigorous user testing, addressing any last-minute issues and incorporating final feedback.

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- Finalized and published detailed documentation, including developer guides and user manuals.
 - Merged all final code changes upstream, concluding the project with a well-documented and fully functional app.

Conclusion: By the end of Week 12, the project was completed successfully. The app is fully functional, with polished features, thorough documentation, and ready for deployment. Rigorous testing ensured that the app meets high standards of accessibility and usability, particularly for children who are blind. The project is now positioned for further development or deployment, with a strong foundation in place.