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AI Voice-Based Revision Assistant

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Abstract: This paper introduces an AI-powered Voice-Based Revision Assistant designed to enhance the effectiveness of self-study for students. The application allows users to select their own PDF notes and engage in a voice-driven interaction where they can ask and answer questions in their natural speaking style. The AI compares the user's spoken answers with the relevant content extracted from the PDF to identify missing keywords and provides immediate, personalized feedback. Moreover, the app offers simplified explanations or full correct answers upon request, making the learning process more interactive, personalized, and efficient.

Keywords: *Voice Recognition, PDF Analysis, AI Revision Assistant, Keyword Extraction, Speech Feedback, Self-Learning, Python, Educational Technology.*

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I. INTRODUCTION

The learning experience of students is often hampered by monotonous and passive revision practices. Conventional methods lack personalization and fail to provide instant feedback on missed content. This paper presents an AI-driven Voice-Based Revision Assistant that combines PDF reading, voice recognition, and intelligent feedback generation to make self-revision more dynamic and effective.

➢ *Problem Statement*

Traditional self-revision lacks interactivity and real-time evaluation,making it difficult for students to Assess the completeness of their knowledge.Students often miss essential points without realizing it and have no means of immediate correction or guidance during solo study sessions.

➢ *Proposed Solution*

The proposed solution leverages Python libraries such as Speech Recognition, PyPDF2, and pyttsx3 along with a Tkinter-based GUI to:

- Extract and analyze PDF content.
- Recognize and process user-spoken questions and answers.
- Detect missing keywords in the spoken answer compared to the PDF.
- Provide real-time, spoken feedback and suggest simplified explanations or the full correct answer if requested.

➢ *Uniqueness and Usefulness*

Unlike static quiz applications, this assistant offers a flexible, voice-based interface that adapts to the user's speaking style and expression. Its ability to extract and match context from any user-provided PDF makes it universally applicable for various subjects. This approach encourages active recall, reinforces learning, and offers personalized tutoring without human intervention.

➢ *Technologies Used*

- Python
- Speech Recognition
- PyPDF2
- pyttsx3
- Tkinter
- Git &GitHub

II. CONCLUSION

The AI Voice-Based Revision Assistant offers an effective way to transform the traditional revision process into a smart, interactive, and student-centered activity. It helps learners identify gaps in their knowledge in real-time, provides helpful feedback, and supports efficient preparationfor exams or presentations.

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