AI-Powered Vocabulary English Test

Description:

This project is a fully adaptive vocabulary testing system powered by AI and WordNet. It generates multiple-choice questions (MCQs) dynamically, evaluates user responses, and determines their English language proficiency based on the Common European Framework of Reference (CEFR) levels. The system ensures personalized difficulty progression and provides detailed feedback after every session.

Impact:

Personalized Learning: Adapts difficulty based on user performance, ensuring a tailored learning experience.

Proficiency Assessment: Identifies user CEFR level accurately, helping learners focus on areas needing improvement.

Comprehensive Feedback: Provides detailed insights into correct and incorrect answers, promoting deeper understanding.

Techniques and Libraries Used:

Natural Language Processing (NLP): WordNet for semantic analysis and generating MCQs.

Data Handling: pandas for managing CEFR word lists and user responses.

Interactive Components: ipywidgets and user input validation for dynamic and user-friendly testing.

Adaptive Scoring: Custom algorithms for advancing or maintaining levels based on accuracy.

Key Features:

Dynamic Question Generation:

Uses WordNet to define word meanings, synonyms, and relationships (hypernyms, hyponyms) for MCQs.

Ensures questions are varied and challenging, with distractors generated from semantic relationships.

CEFR-Based Word Categorization:

Loads vocabulary categorized by CEFR levels (A1 to C2) from a user-uploaded CSV file.

Generates targeted questions based on user-selected difficulty levels.

Interactive Testing:

Asks users multiple-choice questions with clear options and validates inputs to avoid errors.

Offers an intuitive interface for both beginners and advanced learners.

Performance Evaluation:

Tracks the number of correct and incorrect answers per level.

Calculates accuracy percentages to determine whether users advance, stay, or regress in levels.

User Progress Storage:

Saves user progress (responses, levels, and scores) to a file for tracking long-term improvements.

Visual Feedback:

Highlights correct answers and provides detailed explanations for mistakes.

Example Use Case:

An educational platform integrates this system to assess users' vocabulary skills. Based on their CEFR level, the platform recommends tailored lessons and resources, enhancing user engagement and learning outcomes.

Summary:

This adaptive vocabulary test demonstrates the seamless integration of AI and NLP in education. By dynamically generating MCQs and providing actionable insights, it serves as a powerful tool for learners and educators alike.