

Product Name: AutoCorrect+ (AI-Enhanced Descriptive Answer Evaluation)

Proposal Prepared By:

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Date: 22 April 2024

Product Description

Evaluating descriptive answers is a time consuming task that requires a lot of manual work. It is prone to grader fatigue, bias, and the inconsistency that arises from varying standards. We have developed a solution to address these issues. Our automated grading system uses advanced NLP and ML techniques, enabling accurate and consistent evaluation of descriptive responses.

AutoCorrect+ uses several NLP tools, including NLTK for tokenization, stop word removal, and sklearn library for text similarity calculations using approaches such as cosine similarity and Jaccard distance. AutoCorrect+ uses these techniques to build a solid framework for efficiently grading descriptive answers. This system is also integrated with Django, which provides a user-friendly interface for both administrators and users. Educators may easily manage pending user registrations, check and analyze exam outcomes, add and remove courses and questions. Similarly, students can register, log in, attempt exams, view their results, and update their profiles seamlessly through the provided interfaces.

Overall, AutoCorrect+ goal is to improve the traditional manual grading process, bringing efficiency, accuracy, and scalability to educational assessment systems.

Product Value

AutoCorrect+, would be valuable for below reasons:

Time Efficiency: Manually evaluating descriptive answers is a time-consuming task, especially in large classes or online courses with many students. AutoCorrect+ automates this process, which reduces the workload of evaluators.

Consistency and fairness: We address the age-old issue of consistency and fairness in grading. Manual grading often leads to discrepancies and biases. However, AutoCorrect+ ensures a level playing field by providing fair and consistent evaluation of answers, regardless of who's grading them.

Scalability: As class sizes grow and assessments become more frequent, AutoCorrect+ scales effortlessly to meet the demand, without compromising on accuracy or quality.

Resource Optimization: Lastly, it saves resources. By reducing the need for extra grading materials, AutoCorrect+ helps schools save money and be more sustainable.

Building the Product

To create AutoCorrect+, we used the Natural Language Processing and Machine Learning libraries and frameworks. We begin by measuring semantic similarity between a student's answer and a pre-defined model answer. This involves a fusion of natural language processing techniques and machine learning algorithms. These are the steps involved:

Text Preprocessing: We start by preparing the textual data, tokenizing answers, removing stop words, and optionally performing stemming or lemmatization.

Text Vectorization: Next, textual data is converted into numerical vector representations using the CountVectorizer from scikit-learn, capturing word importance through frequencies.

Similarity Scoring: a. Cosine Similarity: Measures the angle between answer vectors, indicating text similarity.
b. Jaccard Distance: Calculates distance between unique word sets, converted into a similarity score.

Answer Scoring: Scores from similarity measures are mapped to grading ranges and aggregated to derive a total score for the answer script.

User Interface Development: We've developed a user-friendly interface using the Django framework, empowering administrators to manage registrations, exams, and subjects. Students seamlessly register, attempt exams, and view results through the interface.

This methodology ensures efficient and accurate grading, making AutoCorrect+ a robust solution for automated evaluation

Determining Success

To assess the effectiveness of AutoCorrect+, we can use the following methods:

Benchmark Testing: Create a representative collection of student responses and associated human-graded scores. Using this dataset, you can evaluate AutoCorrect+'s performance and compare its grading accuracy to that of humans.

Inter-rater Reliability: Determine the agreement between AutoCorrect+'s scores and those awarded by various human graders to evaluate the system's consistency and reliability.

User Feedback: Collect input from teachers, students, and other stakeholders who use AutoCorrect+ in real-world circumstances. Their feedback can provide vital insights on the system's usability, efficacy, and potential areas for development.

Deployment and Value Creation

AutoCorrect+ can be used in a variety of educational environments to create value for different stakeholders:

Educational Institutions: AutoCorrect+ is compatible with learning management systems and evaluation platforms used by schools, colleges, and universities. This can help simplify the grading process, minimize instructors' workloads, and offer students with quick feedback.

Online Learning Platforms: As online education becomes more popular, AutoCorrect+ can be extremely useful for Massive Open Online Courses (MOOCs) and other e-learning platforms that require large-scale descriptive assignment grading.

Standardized Testing Organizations: AutoCorrect+ can be used by organizations that provide large-scale standardized tests, such as college entrance examinations or professional certification assessments, to ensure consistent and equitable grading across a large number of candidates.