AI Review System

Objective

Develop an AI-powered academic review system that can automatically evaluate and grade various types of student submissions, such as essays, research papers, and coding projects. The system should be designed to assist educators in the grading process, providing accurate and consistent evaluations while saving time and effort.

Requirements

- **Multi-Layered AI Functionality:** The system must leverage multiple AI agents, each designed as a microservice to handle a specific aspect of evaluation. These services may include, but are not limited to, Natural Language Processing (NLP) for analyzing written content, plagiarism detection to ensure content originality, and code analysis for technical projects. Each AI agent should function independently but work together as a cohesive unit to provide a well-rounded grading output. The system should allow for the integration of additional AI agents in the future to accommodate evolving educational needs.
- **Dynamic Criteria Adaptability:** Flexibility is key to this project. The system should feature an adaptable architecture that allows instructors to modify grading criteria based on subject, project type, and level of complexity. This adaptability should enable educators to specify unique evaluation standards that the system can interpret dynamically, adjusting its grading approach accordingly to suit various academic requirements.
- **Integration and Data Retrieval:** Seamless integration with existing academic infrastructure is essential. The solution should be able to retrieve student's submissions from multiple sources such as Git repositories, FTP servers, and cloud storage platforms (e.g., Google Drive, Microsoft OneDrive).
- **Cost and Resource Optimization:** Given the high operational costs associated with AI-driven systems, participants should provide a cost-analysis strategy that prioritizes the efficient use of resources, especially cloud-based compute power and data storage. Cost and usage reports to support your optimizations are welcome.
- **User-Friendliness and Automation:** The user experience should be intuitive for educators, offering an easy-to-navigate interface for managing grading, setting criteria, and reviewing AI-generated feedback. Automated features such as reporting and result summaries should enhance usability for teachers, minimizing manual intervention and streamlining the grading process.

Judging Criteria

- **Functionality and Robustness:** The effectiveness and reliability of core functionalities, including submission evaluation and grading accuracy across different types of projects.
- **Ease of Use for Educators:** How intuitive and efficient the interface and user experience are for teachers and staff, focusing on setup, configuration, and result visualization.
- **Flexibility in Grading Criteria:** The system's adaptability in applying subject-specific grading criteria dynamically and the ease with which instructors can customize these criteria.
- **Integration and Compatibility:** The range of platforms and systems (e.g., Git, FTP, cloud storage) the solution integrates with and how seamlessly it performs these integrations.
- **Performance and Scalability:** The system's architecture should be designed to handle a large number of submissions efficiently. Participants should demonstrate their understanding of scalability by implementing appropriate techniques and technologies. The solution should be optimized to utilize resources effectively
- **Results Export:** Implementing a feature that allows educators to export graded submissions based on various criteria.

Bonus Points:

- **Advanced Deployment Techniques:** Using containerization (e.g., Docker, Kubernetes) to simplify deployment and improve system scalability and reliability.
- **Application of Vision Models:** Bonus points for using a vision model to grade handwritten submissions accurately, with an emphasis on its adaptability.
- **LMS Integration**: Bonus points will be awarded for solutions that demonstrate compatibility with at least one Learning Management System (LMS).
- **Microsoft Azure Integration**: Bonus points will be awarded for leveraging Microsoft Azure technologies within the solution, showcasing cloud-based scalability, security, and resource management.
- **Detailed Reporting and Analytics:** Offering in-depth analytics on individual student performance, and areas of improvement based on AI insights.
- **Sustainability and Environmental Consideration:** Points awarded for solutions that showcase energy-efficient design, such as minimizing compute resources usage.
- **Plagiarism Detection:** Integrating plagiarism detection techniques to ensure academic integrity and maintain the originality of student submissions.
- **Post-Grading Analysis**: Exports enhanced with AI-powered insights, including but not limited to sentiment analysis, common areas for improvement across all students, and questions or topics where students provided similar responses.
- **Innovative Features:** Bonus points for implementing novel, creative, or cutting-edge features that significantly enhance the AI-powered grading system.