



Automatic Exam Marking Project

Essay Dataset Generation
&
Essay Scoring Tasks

Task 1: Preparing Project Management Plan (PMP)

- Project Documentation Plan
- Project Monitoring
- Project Scope
- Project Risk Management
- Project Resource Management
- Project Stakeholder Management

Task 2: Research the Commercial Tools

The screenshot shows the ETS e-rater Scoring Engine website. The header includes navigation links for HOME, GRE, PRAXIS, TOEIC, TOEFL, ALL PRODUCTS, CONTACT, and a Login/Register button. Below the header is a navigation bar with categories: TEST TAKERS, EDUCATORS, INSTITUTIONS, BUSINESSES, GOVERNMENTS, and RESEARCH. The main content area features the title "e-rater® Scoring Engine" and the description "Evaluates students' writing proficiency with automatic scoring and feedback". Below this, it says "Selection an option below to learn more." and provides four buttons: About, How It Works, Use in Criterion Service, and Custom Applications.

The screenshot shows the eMetric DeepScore website. The header includes navigation links for Solutions, Customers, Research, Company, and Careers. The main content area features the title "DeepScore™ AI-Based Automated Essay Scoring" and a description: "eMetric's Deep Learning Essay Scoring (DLES) engine uses the latest innovations in natural language processing techniques to formulate contextual representations of words, sentences, and paragraphs to provide reliable and accurate essay scores. The DLES engine is based off of models of language trained with huge corpuses of text, such as all of Wikipedia and hundreds of thousands of books. The DLES engine fine-tunes its model of language to understand how to score student essays through a training process involving hundreds of thousands of student essays."

The screenshot shows the Gradescope website. The header includes navigation links for Pricing, Get a Demo, Get Started, Help Center, Sign Up, and Log In. The main content area features the title "Deliver and Grade Your Assessments Anywhere" and a description: "Gradescope helps you seamlessly administer and grade all of your assessments, whether online or in-class. Save time grading and get a clear picture of how your students are doing." Below this, it provides two buttons: Sign Up for Free and Get a Demo. The background of the main content area shows a diagram with three categories: EXAMS, HOMEWORK, and CODE, each with a corresponding icon and a line pointing to the main text.

Task 3: Existing GAN For Generation Essay DataSet

Available
Source Code

- Research and Code Analysis

Park, Y. H., Choi, Y. S., Park, C. Y., & Lee, K. J. (2022). EssayGAN: Essay Data Augmentation Based on Generative Adversarial Networks for Automated Essay Scoring. *Applied Sciences*, 12(12), 5803.

Task 4: Existing ML for Essay Scoring

Available
Source Code

| ML Approach | Name | Cited as | Source Code |
|----------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Regression | Flexible domain adaptation for automated essay scoring using correlated linear regression | Phandi, P., Chai, K. M. A., & Ng, H. T. (2015, September). Flexible domain adaptation for automated essay scoring using correlated linear regression. In Proceedings of the 2015 Conference on Empirical Methods in Natural Language Processing (pp. 431-439). | |
| Regression | EASE | Commercial | https://github.com/openedx-unsupported/ease |
| Neural Network | A neural approach to automated essay scoring. | Taghipour, K., & Ng, H. T. (2016, November). A neural approach to automated essay scoring. In Proceedings of the 2016 conference on empirical methods in natural language processing (pp. 1882-1891). | GitHub - nusnlp/nea: Neural Essay Assessor: An Automated Essay Scoring System Based on Deep Neural Networks |
| Neural Network | Automated scoring for reading comprehension via in-context bert tuning. | Fernandez, N., Ghosh, A., Liu, N., Wang, Z., Choffin, B., Baraniuk, R., & Lan, A. (2022, July). Automated scoring for reading comprehension via in-context bert tuning. In Artificial Intelligence in Education: 23rd International Conference, AIED 2022, Durham, UK, July 27–31, 2022, Proceedings, Part I (pp. 691-697). Cham: Springer International Publishing. | https://github.com/ni9elf/automated-scoring |
| Classification | Effective feature integration for automated short answer scoring | Sakaguchi, K., Heilman, M., & Madnani, N. (2015). Effective feature integration for automated short answer scoring. In Proceedings of the 2015 conference of the North American Chapter of the association for computational linguistics: Human language technologies (pp. 1049-1054). | |
| Classification | A hierarchical classification approach to automated essay scoring | McNamara, D. S., Crossley, S. A., Roscoe, R. D., Allen, L. K., & Dai, J. (2015). A hierarchical classification approach to automated essay scoring. Assessing Writing, 23, 35-59. | |