



North South University

Department of Electrical & Computer Engineering

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Project Name: LLM marking system

Course No: CSE 299 **Sec:** 03

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Git Repository: <https://github.com/tajul06/Cse299-sec-3-project->

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INTRODUCTION

The use of technology has become essential in the ever-changing field of education to improve the efficacy and efficiency of several procedures. With the help of prompt engineering and large language models (LLMs), this project aims to transform the way that educational institutions evaluate students. Our goal is to create an online platform that will enable us to automatically assess student answers and match them to pre-established rubrics that teachers provide. This novel method has the potential to greatly reduce teachers' effort associated with marking assignments in addition to streamlining the assessment workflow. Furthermore, the system aims to enable students to receive timely and constructive feedback, promoting a more dynamic and adaptable learning environment. As we begin this project, the convergence of sophisticated language models.

Features

Teacher's Capabilities

Teachers can sign in with their google accounts.

Create Assessments:

- Generate assessments for various subjects and topics using the system's intuitive interface.
- Define rubrics and criteria for evaluation based on specific learning objectives.

Customize Rubrics:

- Tailor rubrics to align with the unique requirements of different assignments and projects.
- Adjust assessment parameters to reflect the diverse nature of student responses.

Review Analytics:

- Access real-time analytics and performance insights for individual students and the entire class.
- Identify trends, strengths, and weaknesses in student understanding.

Provide Feedback:

- Offer constructive feedback to students through automated feedback reports generated by the system.
- Address specific areas of improvement and commend exemplary work.

Adapt Assessments:

- Modify assessments based on the evolving needs of the curriculum or student progress.
- Integrate adaptive learning features to cater to individual student learning paths.

Monitor Progress:

- Track student progress over time, allowing for a comprehensive understanding of their academic development.
- Use data-driven insights to make informed decisions about instructional strategies.

Student's Capabilities:

Students can sign in with their google accounts.

Submit Assignments:

- Submit assignments and assessments through the web-based system, providing written or multimedia responses.
- Receive instant confirmation of submission.

Receive Immediate Feedback:

- Access automated feedback reports shortly after completing assessments.
- Understand strengths and weaknesses in responses to enhance learning.

Access Learning Resources:

- Receive personalized recommendations for additional learning resources based on individual performance.
- Access supplementary materials, such as articles, videos, or practice exercises.

Track Progress:

- Monitor personal academic progress through a user-friendly dashboard.
- Review past assessments and feedback to identify areas for improvement.

Engage in Adaptive Learning:

- Benefit from adaptive learning pathways that guide students toward personalized educational experiences.
- Receive prompts and guidance tailored to individual learning styles.

Communicate with Teachers:

- Initiate communication with teachers regarding specific assessment queries or clarification needs.
- Collaborate with educators to address challenges and seek additional support.

TECHNOLOGY

In this project, the latest technologies for developing this application in order to give users a better experience.

Appendix

1. Questions on English Literature:

1. Discuss the potential impact of climate change on biodiversity. Provide examples and suggest measures to mitigate these effects
2. Compare and contrast two renewable energy sources, such as solar and wind power. Evaluate their environmental benefits and challenges.
3. Analyze the environmental impact of single-use plastics. Propose alternative solutions and discuss their feasibility.
4. Choose an endangered ecosystem and outline strategies for its conservation. Highlight the importance of preserving biodiversity within this ecosystem.
5. Explore the concept of sustainable agriculture. How can farmers adopt practices that promote environmental health and food security simultaneously?
6. Assess the role of urban planning in promoting environmental sustainability. Provide examples of cities implementing effective sustainable practices.
7. Discuss the challenges and solutions related to water conservation in a specific region. How can communities address water scarcity issues?
8. Evaluate the role of corporations in promoting environmental sustainability. Provide examples of companies with successful sustainability initiatives.
9. Analyze the effectiveness of a specific environmental policy in addressing ecological concerns. Propose potential improvements or adjustments.
10. Examine the impact of consumer choices on the environment. How can individuals make sustainable decisions in their daily lives?

Rubrics on English Literature

Criteria	Excellent (5 points)	Good (3 points)	Satisfactory (2 points)	Needs Improvement (1 point)	Inadequate (0 points)
Content & Analysis	Comprehensive analysis with well-supported arguments and examples.	Good analysis with appropriate supporting details.	Adequate analysis but may lack depth or clarity.	Limited analysis, insufficient examples.	Little to no analysis.
Understanding of Topic	Demonstrates a profound understanding of the environmental sustainability topic.	Shows a solid understanding of the topic.	Understands the topic to a basic extent.	Demonstrates a weak understanding of the topic.	Fails to grasp the topic.
Organization & Clarity	Well-organized, logical structure; ideas flow smoothly.	Organized with some clarity; may lack smooth transitions.	Adequate organization but may be disjointed; unclear ideas.	Disorganized; difficult to follow.	Poor organization; ideas are scattered.
Use of Evidence	Strong use of relevant data, statistics, and examples.	Adequate use of evidence; some points lack support.	Limited use of evidence; may not effectively support points.	Minimal use of evidence; weak connection to points.	No use of evidence or irrelevant evidence.
Writing Mechanics	Exceptional grammar, spelling, and punctuation.	Minor errors in grammar, spelling, or punctuation.	Noticeable errors in grammar, spelling, or punctuation.	Numerous errors; impairs readability.	Unacceptable number of errors; difficult to comprehend.

2. Questions on Biological experiences:

1. Describe the structure and function of mitochondria in a eukaryotic cell.
2. Explain the process of DNA replication, highlighting the key enzymes involved.
3. Provide examples of adaptive features in animals that enhance their survival in specific environments.
4. Outline the stages of photosynthesis and discuss the role of chlorophyll in the process.
5. Discuss the difference between dominant and recessive traits in genetic inheritance.
Provide examples
6. Explain how enzymes facilitate biochemical reactions, including the factors influencing their activity.
7. Describe the symbiotic relationship between a specific plant and an animal species, highlighting the mutual benefits.
8. Identify and explain the functions of the major components of the human respiratory system.
9. Compare and contrast aerobic and anaerobic respiration, including their end-products and energy yield.
10. Discuss the applications and ethical considerations of genetic engineering in agriculture.

Rubrics on Biological experiences:

Criteria	Excellent (5 points)	Good (3 points)	Satisfactory (2 points)	Needs Improvement (1 point)	Inadequate (0 points)
Knowledge & Understanding	Demonstrates a deep understanding of the biology topic, providing accurate and detailed information.	Shows a solid understanding with some minor errors or omissions.	Understands the topic to a basic extent but may have significant inaccuracies.	Demonstrates a weak understanding with major inaccuracies or vague points.	Fails to grasp the topic.
Clarity & Conciseness	Presents information in a clear and concise manner, with well-structured responses.	Generally clear, but may lack conciseness or have minor organization issues.	Adequate clarity but may be somewhat unclear or disorganized.	Difficult to follow due to disorganization or lack of clarity.	Extremely unclear and disorganized.

Application & Examples	Provides relevant and well-explained examples or applications related to the biology topic.	Includes examples, but they may lack specificity or relevance.	Offers basic examples, but they may not effectively illustrate points.	Limited or inaccurate examples; may not be relevant to the topic.	No or irrelevant examples provided.
Depth of Analysis	Offers a nuanced and insightful analysis of the biology topic, going beyond surface-level information.	Presents a solid analysis but may lack depth or clarity in certain aspects.	Provides a basic analysis without in-depth exploration of certain aspects.	Limited analysis with inaccuracies or vague points.	No meaningful analysis provided.
Scientific Terminology	Uses accurate scientific terminology appropriately and consistently.	Mostly uses accurate terminology, with occasional errors.	Uses terminology to a basic extent but may have significant inaccuracies.	Demonstrates a weak command of scientific terminology.	Misuses scientific terminology consistently.

3. Questions on Artificial Intelligence:

1. Discuss the challenges and ethical implications associated with bias in artificial intelligence algorithms.
2. Examine the ethical considerations surrounding the deployment of autonomous vehicles. What potential risks and benefits should be considered?
3. Analyze the ethical implications of AI systems on individual privacy, particularly in the context of data collection and surveillance.
4. Discuss the importance of algorithmic transparency in AI systems. How does transparency contribute to ethical AI development?
5. Explore the ethical considerations of implementing AI in healthcare, including issues related to patient data, diagnosis, and treatment decisions.
6. Assess the ethical implications of AI technology leading to job displacement. What measures can be taken to address these concerns?
7. Examine the challenges of integrating ethical decision-making capabilities into AI systems. How can AI be designed to make morally sound decisions?
8. Discuss the ethical concerns surrounding deepfake technology. What measures can be taken to mitigate the negative impact of deepfakes?
9. Analyze the ethical considerations associated with the use of AI in educational settings, including issues related to student privacy and bias.
10. Explore the ethical dilemmas of using AI in military applications. What guidelines should be in place to ensure responsible and ethical use?

Rubrics on Artificial Intelligence

Criteria	Excellent (5 points)	Good (3 points)	Satisfactory (2 points)	Needs Improvement (1 point)	Inadequate (0 points)
Knowledge & Understanding	Demonstrates a deep understanding of AI ethics, providing accurate and detailed information.	Shows a solid understanding with some minor errors or omissions.	Understands the topic to a basic extent but may have significant inaccuracies.	Demonstrates a weak understanding with major inaccuracies or vague points.	Fails to grasp the topic.
Clarity & Conciseness	Presents information in a clear and concise manner, with well-structured responses.	Generally clear, but may lack conciseness or have minor organization issues.	Adequate clarity but may be somewhat unclear or disorganized.	Difficult to follow due to disorganization or lack of clarity.	Extremely unclear and disorganized.

Application & Examples	Provides relevant and well-explained examples or applications related to AI ethics.	Includes examples, but they may lack specificity or relevance.	Offers basic examples, but they may not effectively illustrate points.	Limited or inaccurate examples; may not be relevant to the topic.	No or irrelevant examples provided.
Depth of Analysis	Offers a nuanced and insightful analysis of AI ethics, going beyond surface-level information.	Presents a solid analysis but may lack depth or clarity in certain aspects.	Provides a basic analysis without in-depth exploration of certain aspects.	Limited analysis with inaccuracies or vague points.	No meaningful analysis provided.
Critical Thinking	Demonstrates critical thinking by examining various perspectives on AI ethics issues.	Shows some critical thinking but may lack depth or overlook certain perspectives.	Demonstrates a basic level of critical thinking but may be one-sided.	Limited critical thinking with inaccuracies or oversights.	Fails to apply critical thinking to the topic.

4. Questions on Globalization:

1. Provide a concise definition of globalization and discuss the key drivers that have facilitated its expansion.
2. Analyze the concept of cultural homogenization in the context of globalization. What are the positive and negative aspects of this phenomenon?
3. Discuss the impact of globalization on global trade patterns, including the role of multinational corporations.
4. Examine how globalization has contributed to income inequality, considering both within and between countries.
5. Evaluate the role of international organizations in global governance. How do they influence global policies and decisions?
6. Analyze the relationship between globalization and international migration, considering economic, social, and political factors.
7. Discuss the environmental consequences of globalization, including issues related to climate change and resource depletion.
8. Explore the role of technology in driving globalization. How has technological advancement facilitated global interconnectedness?

9. Examine the reasons behind resistance to globalization, considering cultural, economic, and political factors.
10. Discuss how globalization impacts national identity. What challenges and opportunities does it pose for preserving cultural identity?

Globalization Rubric:

Criteria	Excellent (5 points)	Good (3 points)	Satisfactory (2 points)	Needs Improvement (1 point)	Inadequate (0 points)
Knowledge & Understanding	Demonstrates a deep understanding of globalization, providing accurate and detailed information.	Shows a solid understanding with some minor errors or omissions.	Understands the topic to a basic extent but may have significant inaccuracies.	Demonstrates a weak understanding with major inaccuracies or vague points.	Fails to grasp the topic.
Clarity & Conciseness	Presents information in a clear and concise manner, with well-structured responses.	Generally clear, but may lack conciseness or have minor organization issues.	Adequate clarity but may be somewhat unclear or disorganized.	Difficult to follow due to disorganization or lack of clarity.	Extremely unclear and disorganized.
Application & Examples	Provides relevant and well-explained examples or applications related to globalization.	Includes examples, but they may lack specificity or relevance.	Offers basic examples, but they may not effectively illustrate points.	Limited or inaccurate examples; may not be relevant to the topic.	No or irrelevant examples provided.
Depth of Analysis	Offers a nuanced and insightful analysis of globalization, going beyond surface-level information.	Presents a solid analysis but may lack depth or clarity in certain aspects.	Provides a basic analysis without in-depth exploration of certain aspects.	Limited analysis with inaccuracies or vague points.	No meaningful analysis provided.

Critical Thinking	Demonstrates critical thinking by examining various perspectives on globalization issues.	Shows some critical thinking but may lack depth or overlook certain perspectives.	Demonstrates a basic level of critical thinking but may be one-sided.	Limited critical thinking with inaccuracies or oversights.	Fails to apply critical thinking to the topic.
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5. Questions on Ancient Civilizations :

1. Describe the social structure of Mesopotamian civilizations, highlighting the roles of different classes.
2. Discuss the architectural and engineering techniques employed in the construction of the Egyptian pyramids.
3. Analyze the trade routes and economic interactions of the Indus Valley Civilization with neighboring regions.
4. Explain the concept of the dynastic cycle in ancient Chinese political history. How did it shape governance and leadership?
5. Explore the sophisticated calendar systems used by Mesoamerican civilizations, such as the Aztecs and Maya.
6. Compare and contrast the political structures of two ancient Greek city-states, such as Athens and Sparta.
7. Highlight significant engineering achievements of ancient Rome, such as the construction of aqueducts and roads.
8. Discuss the challenges and current status of deciphering the script of the Harappan Civilization.
9. Examine the writing system of the Maya civilization, focusing on the use of hieroglyphics.
10. Explore the religious beliefs and practices of the Sumerian civilization, including the role of temples and gods.

Ancient Civilizations Rubric:

Criteria	Excellent (5 points)	Proficient (4 points)	Competent (3 points)	Developing (2 points)	Inadequate (1 point)	Absent (0 points)
Historical Accuracy	Exceptionally accurate and detailed information presented with precision.	Mostly accurate with a few minor errors that do not significantly impact understanding.	Generally accurate, but with some notable errors or omissions.	Inaccuracies that detract from overall understanding.	Major inaccuracies or significant omissions.	No response provided.
Analytical Depth	Provides a nuanced and insightful analysis that goes beyond surface-level information.	Presents a solid analysis, demonstrating a good understanding of the topic.	Offers a basic analysis but may lack depth or clarity.	Limited analysis with unclear or vague points.	Minimal analysis or no attempt at providing insight.	No response provided.
Organization & Clarity	Well-organized with clear and logical structure; ideas flow smoothly.	Organized with some clarity, but transitions may be lacking.	Adequate organization but may be somewhat unclear or disorganized.	Disorganized; difficult to follow.	Extremely unclear and lacks any discernible organization.	No response provided.
Use of Examples	Integrates relevant and well-explained examples effectively.	Includes examples, but they may lack specificity or relevance.	Offers basic examples, but they may not effectively illustrate points.	Limited or inaccurate examples; may not be relevant to the topic.	No or irrelevant examples provided.	No response provided.

Critical Thinking	Demonstrates advanced critical thinking skills, examining various perspectives thoroughly.	Shows good critical thinking, though some perspectives may be overlooked.	Demonstrates basic critical thinking skills but may lack depth or overlooks key perspectives.	Limited critical thinking with inaccuracies or oversights.	Fails to apply critical thinking to the topic.	No response provided.
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