

**FIGHTING PLAGIARISM IN A WORLD OF FAST-GROWING AI-  
DRIVEN CONTENT CREATION**

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## **CERTIFICATION**

This is to certify that ODIGIE UYIOGHOSA ERNEST carried out this project work with Matriculation Number PSC1908899 under my supervision. It is adequate and satisfactory, both in scope and content, for the award of a Bachelor of Science (B.sc) Degree in Computer Science from the University of Benin.

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Eng. Prof. F.A.U. Imouokhome

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DATE

## **APPROVAL**

This project work is at this moment approved in partial fulfillment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science in the University of Benin.

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Engr. Prof. F.A.U. Imouokhome

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DATE

## **DEDICATION**

Firstly, this project is dedicated to God Almighty, who willed that I would be alive to complete my journey through Uniben and even attempt this project. I also want to dedicate it to my Parents, Mr. and Mrs. Odigie, who have been there for me all my life to help and support me, and to my siblings, who advised me on the importance of pushing forward even though University life was tough. To my friends who were always there to answer any question I had about my project or any other thing, their support was immeasurable.

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## **ABSTRACT**

With the consistent improvement in information Technology, especially artificial intelligence, many sectors have benefited from it. Education has an immense role to play in the quality of the individuals who will drive the world to the next stage in each generation.

The implementation of AI in education aims to equip the student with a plethora of resources from which information and knowledge can be attained. Though it boasts about potential to revolutionize the educational sector, the danger of over reliance on it still exists, aside from that, role of a teacher isn't one that should be replaced by AI, because human interactions are a necessary part of being a human being as outlined by UNESCO.

The report emphasizes the need to discourage students from using generative AI as a shortcut to completing tasks, assignments, and even projects. The aim of teaching students is not for them to just produce answers but to learn how to produce them by working hard and dedicating themselves to the pursuit of knowledge. This is the goal that the educational institutions hope to achieve, and creating a system that would increase the chances of achieving that goal should be embraced and utilized.

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# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 WHAT IS PLAGIARISM**

Artificial intelligence has affected a lot of areas of the world. Through its applications, it has revolutionized many industries like agriculture, logistics, health, energy, even banking and finance. It also has a lot of applications in education, content creation, and creative writing. Amidst all these great benefits, it also is at risk of misuse and abuse, and tackling its misuse in the area of education would be the objective of this project.

In education, AI can help simplify the process of tutoring, grading, and even personalization of the curriculum to fit the students based on information and analytics with the use of artificial intelligence, but it can also be abused by the students who use generative AI for assignments, reports, and other educational tasks. In the end, their final result will not be a statement of their actual knowledge and capabilities, and they may not be able to defend the results or certificates that they possess, which will give a bad image to the schools they come from and the entire educational system at large.

To tackle the issue of abuse of generative AI by students, particularly within the University of Benin, this project presents a solution that leverages cutting-edge technology and innovative methodologies to present a solution which should help reduce the reliance of students on generative AI and the educator's ability to verify it's authenticity and originality. By leveraging the functionalities provided by Originality.ai (an AI-powered plagiarism and AI content checker), This research intends to provide a solution that will tackle the issue of Plagiarism and abuse of generative AI solutions for educational works.

## **1.2 BACKGROUND**

Plagiarism tests usually involve inserting a string of texts into software, which searches online to find websites, blogs, and other sources from which the contents of the texts were taken. The aim is to check how much of the work came from the student/researcher and how much was copied and pasted.

With the University of Benin in mind, a technology similar to this is implemented, but it is only used to check the project thesis for final-year students. This means that it only checks one work and not the cumulative work that the students have been doing before the project thesis, such as essays and assignments, which are vital to their education.

## **1.5 PROBLEM STATEMENT**

This University of Benin currently lacks a dedicated system for detecting and countering the issue of AI-generated content and Plagiarism present in works done by students or researchers (tests, assignments, essays, reports, etc.). This would threaten the University's academic integrity, and the impact on the quality of education will no longer be verifiable.

### **1.5.1 EXPLANATION:**

For a large class, manual plagiarism checks will be both accurate and time-consuming, especially for departments with a large number of students.

Online plagiarism checkers often fall short as they lack the capabilities to detect content created by genie platforms.

The absence of a dedicated and centralized system would lead to inconsistencies across different departments, semesters, and even courses, as the algorithms used by various AI plagiarism checkers may vary.

### **1.5.2 CONSEQUENCES:**

With how easy and accessible genAI platforms are, the temptation to use them to take shortcuts to achieve success may arise, which would hinder their academic growth.

u Inability to check for the use of plagiarism tools and genAI platforms to achieve success with minimal effort would create an unfair learning environment, especially for those who create their works genuinely.

Utilizing various online plagiarism platforms would lead to inconsistencies due to differences in the algorithms used by platforms; for instance, when checking different students using different tools, one tool may flag a work for a particular action, but another may not. This creates unfairness in the checking process as a whole.

As a result of the current system's inadequacies, the culture of plagiarising using genAI tools as a shortcut to success has been on the rise. This could ultimately diminish the value of the certificate presented by the University and even affect the competence of the graduating students as a whole.

This problem statement highlights the shortcomings of the current system, and thus shows how developing a new system to tackle those problems would benefit the University and the educational system as a whole. By improving fairness in the grading process, rewarding hardworking students for their efforts and instilling the need for originality and creativity, the overall quality of the educational experience would be greatly improved.

## **1.4 MOTIVATION**

The motivation for this project stems from the desire to uphold the accountability and integrity that the educational system is trying to achieve. The purpose of the educational system is to equip students with knowledge about different disciplines. It is the goal of educational institutes to produce capable and independent individuals who are capable of defending and communicating the knowledge that they have been fed by going through the University when the need arises.

The increase in the use of generative AI (genAI) for assignments, reports, and other works, is taking away the desire to research and extensively look for information from multiple verifiable sources, which will limit the student's ability to research and search for information without expecting a genAI software to tell you everything (when not everything that will be displayed by the AI can be verified to be completely accurate).

## **1.5 AIM AND OBJECTIVES**

This project aims to discourage the abuse of generative AI in the creation of works used for educational purposes, particularly in the University of Benin.

Some specific objectives are:

1. To develop an interface that can harness the power of AI detection tools in a platform that instructors of the University of Benin can easily access.
2. To develop a feature that can be seamlessly integrated into the workflow of educators regarding grading and evaluating submitted works.
3. To reduce the time it will take for lecturers to manually check the student's works especially for large classes.
4. Create a centralized system that can be used to handle the checks for Plagiarism across the different departments and reduce inconsistencies that come with using multiple tools.
5. To promote originality, the need to research and teaching the importance of citation, while discouraging the abuse of genAI for these works.

## **1.6 SCOPE OF THE PROJECT**

The project focuses on creating a feature that can leverage the functionalities of the Originality.ai plagiarism checker through a simple and easily accessible interface, which can be easily used by educators at the University of Benin.

The main areas that it hopes to tackle are:

1. Use of generative AI for assignments without researching and reading (copying and pasting)
2. Use of generative AI during tests and examinations to answer questions.
3. Use of GenAI to write reports and projects for their final year theses
4. Plagiarism of content without credit to the original creator of the work

## **1.7 SIGNIFICANCE OF THE PROJECT**

As hinted in different areas throughout the report so far, the project is meant to be a means of upholding the standard of education that the University of Benin is striving to uphold. With the feature available to educators, they would be able to better understand the content that is being submitted to them and thus grade the students more accurately based on their input and not based on the works of a generative AI.

It will also discourage Plagiarism by encouraging students to use their own creativity and research capabilities to produce original works rather than copying and pasting already produced works. This will improve the student's ability to search for, filter, and utilize information that is obtained from the internet and other research sources, which is helpful for their education and competence as a student of a university.

## CHAPTER TWO

### 2.0 LITERATURE REVIEW

This chapter gives an overview of the capabilities of the project as well as how it compares to the already existing system of doing things, infrastructure and how the grading system is seeming to be as of now. It will discuss the traditional methods of plagiarism checks, where they fall short and how the new system could benefit them when implemented.

### 2.1 OVERVIEW OF PLAGIARISM

The University of Oxford defines Plagiarism as presenting or incorporating a work or idea belonging to another author without full acknowledgment. (University of Oxford, 2024). Plagiarism doesn't just stop at copying someone else's statements word-for-word; it could also mean copying someone's ideas and duplicating their works (Henson, 2024). Plagiarism as a whole can be traced to long before the internet was created, even to medieval times, where it was known to be a violation of academic integrity, and it has presented itself in multiple forms, which include:

- ◆ Direct Plagiarism: Also known as "clone plagiarism," which means copying someone's statement "word-for-word" without appropriate citation or use of quotation (Henson, 2024).
- ◆ Self Plagiarism: This involves persons reusing their already submitted work as a part of a new work without appropriate permission from the educator. It is usually found in a school or college setting (Henson, 2024).
- ◆ Mosaic Plagiarism: This is when statements are taken from an already existing work, and then some words are changed using synonymous words or phrases while still possessing the same meaning as the original. In this case, citations or quotations are not used (Henson, 2024).
- ◆ Accidental Plagiarism: This occurs when the student/writer fails to cite the sources from which they got their content or mistakenly uses words or phrases with a similar meaning (Henson, 2024).

- ◆ Complete Plagiarism: This involves submitting someone else's work as if it were your own. It may involve paying the individual to write the work for you, and you submit it with your name on it, without giving credit to the original producer of the work (Karmer, 2022).

Overall, Plagiarism is a threat to originality, and using someone's work without giving them credit for their effort is disrespectful to the original creator of the work. This is why when students utilize information from sources they should involve appropriate citation and use quotations when necessary.

## **2.2 PLAGIARISM DETECTION**

In the olden days, before the internet, Plagiarism was a problem, but it was somehow handled due to the limited amount of resources available to the general public. That is, there wasn't as much text available for everyone to utilize (DerProfessor, 2017), and schools didn't have relatively large populations, so lecturers found it somewhat easier to spot plagiarized works from students because if there were limited sources of text, it also reduces the search radius and thus makes it easier to identify plagiarized texts from textbooks and publications.

But after the internet, content availability increased massively and so did chances to plagiarize. Fortunately, new measures became available to check Plagiarism such as online plagiarism checker like turnItin and others.

# Introduction to AI-powered content plagiarism detection



Figure 2.1: How AI can affect plagiarism detection (fastercapital, 2023) – This shows different areas that AI-powered plagiarism can be applied.

## 2.3 HOW PLAGIARISM DETECTION WORKS

Plagiarism detectors use a lot of methods to detect Plagiarism, and many of their methods aren't publicly shared so as not to expose their methods, which will weaken the detection process as a whole. However, based on how they function, there are a few possible methods that can be used to achieve it, some of which are as follows:

**Fingerprinting:** This is the process of breaking the text into smaller units using complex mathematical processes. These units follow distinct patterns, and by simplifying these patterns, we get what is called a "fingerprint" (Bailey, 2016). These fingerprints can be used to detect other files possessing the same pattern as them.

String Matching: This involves taking a string of texts from a document, such as words, phrases, and sentences, and comparing them with the strings present in other documents. This method would require an extensive database to work with and would require adequate infrastructure to be efficient.

## **2.4 PLAGIARISM DETECTION IN THE UNIVERSITY OF BENIN**

As of now, in April 2024, lecturers are not widely using plagiarism detectors to check assignments, tests, or even exams. Lecturers focus mainly on the work written by the students and not necessarily on how it was gotten or if credit was given to the sources. The idea of giving assignments or related works is to make the students search through various works and information sources, gain an understanding of the concepts, and then tackle the question given. A lot of students just search for the answers and then copy them directly without actually understanding them, paraphrasing or rewriting them in their own words. Tackle this is one of the motivations for engaging in this project.

The only time plagiarism detection is really used in the University of Benin is when checking the project thesis for final year students or people searching for higher degrees like Masters e.t.c. Upholding the integrity of the educational system is simply not enough; hence, there is a need for a solution that will aid the lecturers in tackling the issue of Plagiarism during the course of the teaching process and not just when submitting theses.

## **2.5 WHAT IS ORIGINALITY.AI**

Originality.ai is an artificial intelligence-powered platform that uses sophisticated processes and steps to accurately parse written works through large databases to detect if the text was gotten from an already existing source (plagiarised) or if it was generated by AI.

What it does is to accept a string of text and then scan them, when the scan is complete, it displays a score which shows the percentage of likeliness that the content was written by an AI tool and the likelihood that it was written by a human. This is then scored over 100%.

The tool is capable of detecting the content that is generated by different Large Language Models (LLM) Like GPT-2, GPT-J, GPT-NEO, GPT-3, and even GPT-4. Basically, it is capable of distinguishing content created from the LLMs, which a good number of Gen AI tools of today base on content from. Not only does it display the percentages of the likelihood that the content is AI-generated or plagiarized, but it will also point to the lines that were copied and display the sources they were obtained from. This will give a more accurate view of why the score is as it is.

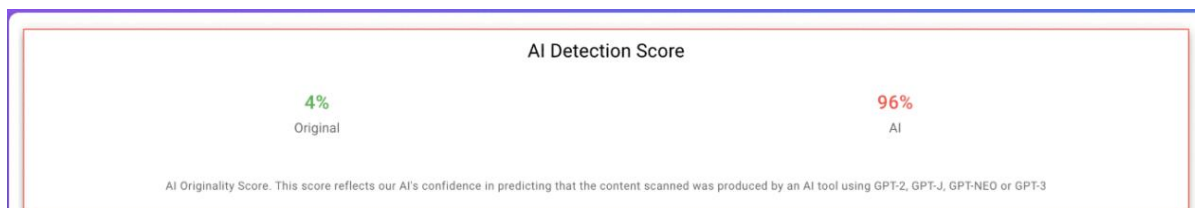


FIGURE 2.2 of Originality.ai Detection Score (Gluska, 2023) - This shows the detection score assigned to a document after it has been scanned

## 2.6 ADVANTAGES OF USING AN AI/PLAGIARISM DETECTOR AT THE UNIVERSITY OF BENIN

The following are some of the advantages that implementing an AI/plagiarism detector in the workspace of lecturers at the University of Benin will provide:

1. It will improve the quality of the grading system, as lecturers would be able to approach marking and scoring students knowing their information sources and how they applied them.
2. It will help the educators have a better understanding of the student's grasp of the concepts being taught and how reliant on gen AI

3. With the existence of an in-house AI plagiarism detector, the concept of Plagiarism, citation, and proper research techniques can be taught to the students even in their early years at the University, and practical experiences can be drawn.
4. Implementing an AI plagiarism detector in the University of Benin would boost its academic integrity rating and overall quality score.

## 2.7 DISADVANTAGES OF USING AN AI/PLAGIARISM DETECTOR AT THE UNIVERSITY OF BENIN

- Cost of implementation: Reliable detectors usually require a lot of infrastructure implementation, and leveraging an already-made system may be costly for a university scale.
- It would take a while to fully implement it across all the lecturers and academic staff, and teaching them how to fully utilize the system may be costly.
- Continuously maintaining and updating the system would require a team of professionals.  
e.t.c

**Table 2.1: Summary of Blog posts and Resources**

S/N	Article or Book Name/Year	Objective
1	Artificial Intelligence - Its use and misues.  Ashesh, 2019	Highlights the strengths of AI technology as well as potential cyber security issues it may cause.
2	Measurement and Evaluation in the schools  Worthen et al, 1993	Provides insight on methods which teachers can use to grade and assess students.
3	Generative Artificial Intelligence in Education: UNESCO  Giannini, 2023	Advises that schools should be careful how they integrate AI technology into teaching. Stating that it should not be used as a replacement for teachers.
4	Originality.ai Review- The Harsh Gpt-4 AI Detection Tool  Gluska, 2023	Explains the functionalities of Originality.ai, it's price, and provisions.

5	Benefits of Using AI for Content Plagiarsim Detection.  FasterCapital	Discusses the use of generatively very broadly and it's application in various sectors ranging from education to accounting and even law.
6	Welcome to the Plagiarism Guide.  Henson, 2024	It explains the types of plagiarism and highlights a few instances where they apply.
7	How Do Plagiarism Checkers Work?  George et al, 2022	Highlights some techniques used by plagiarism checkers to scan texts, as well as the idea behind them.

## CHAPTER THREE

### 3.0 SYSTEM ANALYSIS AND DESIGN

This chapter gives an idea about the current system, its strengths and weaknesses, how it affects educators and students alike, and how the new system might be of benefit to them.

#### 3.1 ANALYSIS OF THE EXISTING SYSTEM

The process of scoring and grading students over the years has been based on their ability to research, gather information, and present it in a suitable format as required by the question provided by the educator. The popularity of generative AI skyrocketed with the release of ChatGPT in 2022, and just as it made searching much more accessible, it also came with the risk of misuse. Lecturers at the University of Benin still do not have a dedicated platform for checking the assignments and tests submitted by the students for AI involvement. Tackling the misuse of genAI will be the focus of this project.

##### 3.1.1 LIMITATIONS

Below are the limitations of the current system:

- 1. Lack of a centralized system:** There is no in-house platform that can be used as a standardized system for checking AI-generated content and Plagiarism in works submitted by students and researchers at the University of Benin. Using multiple platforms across multiple department, courses, or even students would lead to inconsistencies in the overall results as different platforms have different databases from which they check, and utilize different algorithms to perform their tests. Not all lecturers utilize online plagiarism platforms, and some choose to check manually. Thus, the effectiveness of the final Scoring across multiple lecturers in the same department or course would vary.
- 2. Manual checks:** manually checking all the works of the students for Plagiarism would be so stressful and time consuming for the lecturers especially if they have to deal with a large number of students. The resources to comprehensively check for Plagiarism at the University of Benin are very limited and would definitely not be able to cover content

generated by AI, which may be paraphrased or modified, not to mention the numerous resources that students can plagiarise. Manual checks are error-prone, and sometimes a non-offender may be accused of plagiarising.

3. **Shortcoming of basic online plagiarism tools:** a lot of free plagiarism tools online may have limited functionalities and only have the capabilities of detecting works that have been copied word-from-word. A lot of them lack the ability to detect modified or paraphrased text as well as AI-generated content.
4. **Scalability issues:** Manually checking for Plagiarism can be an option if the number of works to check is relatively few and not bulky. But with the presence of gene tools, and even with the number of blogs, websites, and information sources available today, the workload becomes much more. Furthermore, with the continuous increase in the number of students in classrooms, checking for Plagiarism would massively slow down the marking and scoring process.
5. **Issues of favoritism may arise:** With the current system where there is no dedicated platform and not enough awareness to use them, it would lead to inconsistencies as some lecturers may want to rigorously check the works submitted for any faults, and some lecturers in other departments or handling other courses would not even bother and score the students like that. This brings unfairness as a lot of the unchecked works may be faulty but will not be checked and verified.

Overall, the absence of a centralized system for checking for the existence of Plagiarism with the use of gene tools in works submitted by students and researchers, the use of manual checks for verifying originality, and the inconsistencies that exist with some lecturers leveraging online tools and some not; brings about many inconsistencies which pose a threat to academic integrity and the standard of education which the University is trying to achieve.

### **3.2 ANALYSIS OF THE PROPOSED SYSTEM**

The feature intends to serve as a means by which educators can verify the originality of the submitted documents, thereby helping them better know the areas of the student's weakness and helping them strategize on methods to improve their lecturing.

Overall, if students' actual abilities are reflected in the work they can provide, then the goal of the educational system will be fulfilled. This is because the role of a teacher is to evaluate the capabilities of students, guide them through their inadequacies, and impart knowledge upon them which they would be able to defend as "their own." If this is compromised as a result of the use of GenAI, then the entire educational system will be compromised and lose its fundamental value; this is why this project seeks to provide a solution to the problem.

Following the analysis of the current system and revealing its shortcomings, the new system intends to be an AI-powered content analysis platform that has the following core functionalities:

### **3.2.1 CORE FUNCTIONALITIES:**

The new system will be a centralized platform that will leverage the state-of-the-art functionalities of Originality.ai to provide a system where submission of works such as tests, reports, projects, and even research papers; can be parsed and checked for the existence of Plagiarism using genAI.

Thanks to the robust functionalities brought together by advanced AI algorithms and NLP techniques, it will be able to perform not just essential text matching but also more advanced methods of scanning, like fingerprinting. These techniques will enable it to spot both paraphrased text and AI-generated modified content. To utilize these capabilities, users would have to possess credits which can be purchased on the Originality.ai website. These credits would be consumed when checks are made using the API.

There would be two main ways of inputting content into the system for scanning which are:

Copying and pasting a string of texts: This method would involve copying and pasting them directly into the text area available on the interface.

Uploading a document: An area will be provided for document upload, the format for the checking would be limited to only PDF file format as for the first version of the project.

### **3.2.2 ADVANTAGES OF THE PROPOSED SYSTEM**

It leverages sophisticated AI-powered content checking methods, which would be able to surpass basic online checkers. It would be able to check for AI-generated content in documents and paraphrased texts.

Having a single go-to platform for checking the documents and submissions for originality will greatly reduce the stress that comes with having to do manual checks, especially for large submissions or classes.

The system could scale adequately to handle multiple submissions from different users concurrently without trouble.

Implementing the system will discourage students from plagiarising and enforce originality as a whole.

It would serve as a boost to the University's reputation, as possessing an in-house plagiarism check would imply that they take the originality of works seriously and that they are trying to uphold the standard of the educational system. Other universities could emulate this standard.

### **3.2.3 POTENTIAL CHALLENGES AND CONSIDERATIONS**

The proposed system will have limited functionalities and will not possess features like a database, user authentication login, etc.

The system would require investment and extra infrastructure to be able to serve all the potential users. Points would need to be purchased before the system can be utilized. The new system would require training for the lecturers and users so that the functionalities can be effectively utilized with minimal wastage.

Though the system boasts of providing state-of-the-art functionalities, it should be noted that potential biases can arise in the algorithm. This means it should be used as a guide rather than the sole means of verifying a student's work.

### **3.2.4 BENEFITS OF THE PROPOSED SYSTEM**

Overall, implementing the proposed system would provide a variety of benefits, such as:

Upholding the value of hard work and creating a level playing field for students.

Relieving the stress of manually checking submitted works for Plagiarism

Identifying the existence of AI-generated content in a submitted work

Promoting creativity, proper self-expression through writing, and the awareness of the importance of citation in a document.

Upholding the standard of education by producing students who are non-reliant on AI and can defend the certificates given to them by the school elsewhere when the need arises.

### 3.3 METHODOLOGY

This involves the steps it took to create the proposed system. Though the system is not a fully functional university-scale solution at the moment, the concept exists. The goal of the project is to create awareness of the need for and usefulness of this generative AI and plagiarism detection tool. In light of this, the development life cycle would not be complete, but there is room for improvement and completion, depending on whether the school decides to implement the proposed system. The phases include:

**1. Preliminary Planning:** This stage involves looking for a problem to solve or a need to satisfy. In this section, picking a project that can be accomplished with the limited amount of resources and time available is important. This is because if a suitable topic is not chosen and during the course of the project stages, it is noticed that it is not feasible, then there would be a problem.

**2. Planning Stage:** After the preliminary planning, a couple of possible project topics were chosen. These project topics were the ones that were guaranteed to be achievable from the result of the preliminary stage. Here, the project of choice was selected, and a proper requirement analysis was carried out. This requirement analysis was to find out what the build blocks of the project would be, the programming languages that would be used, the libraries that would be imported, the platform that it would run on, etc.

**3. Design Stage:** In this stage the core functionalities are defined and a flow logic is drawn. Here the architecture of the system is established and all the components are highlighted. Also a design of how the user interface (UI) is drawn, this would show how the users would interact with the system and would describe all the buttons and items that would be present on the interface.

**4. Development Stage:** In this stage, the actual coding takes place. Here all the functionalities that were described in the project design blueprint will be built using programming languages and coding concepts.

**5. Testing Stage:** Here the various functionalities that were developed are tested. The file upload, the text input, API requests and response, and even how outputs of the scan to be displayed are

tested. This is to ensure that all the functionalities are working and no bugs are present which could affect the user experience.

**6. Deployment:** For the deployment and continuous improvement of the system, it would depend on if the system is accepted as a viable option to solve the issue of genAI abuse in the University. If it is approved, then it can be hosted on the University's platform and its functionalities would be available for all the desired lecturers.

**7. Maintenance:** This would involve fixing bugs that arise after the deployment stage or even ones that arise during use. Updates can also be made to add more functionalities that would better improve the user experience, such as user account creation for personal access to the resources and the ability to purchase and use credits at will, a database that could store the works that were uploaded, etc.

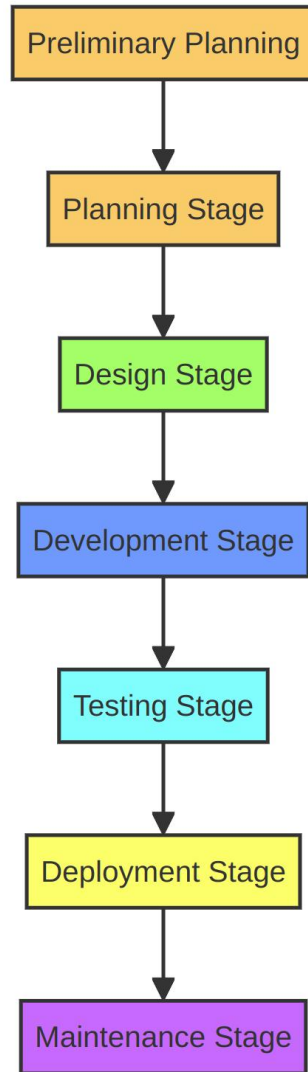


FIGURE 3.1: System Development Life cycle - This shows the different stages that a system passes through from conception to when it is deployed and in use.

## CHAPTER FOUR

### 4.0 OVERVIEW OF THE SYSTEM DESIGN

This chapter gives an in-depth view of the system's AI and plagiarism detection functionalities, how they work, and the steps it takes to ensure accurate detection.

#### 4.1 PLAGIARISM CHECKING

This feature works by leveraging the Originality.ai API for plagiarism tests to check the user's inputs.

##### 4.1.1 USER INPUT:

The user can upload a PDF file using the file upload functionality or input texts in the text area provided. The number of words scanned for Plagiarism is limited to 3000 words. This means that the file must contain 3000 words or less. Likewise, the user can enter a maximum of 3000 words, and if the input exceeds this, then the upload will be unsuccessful.

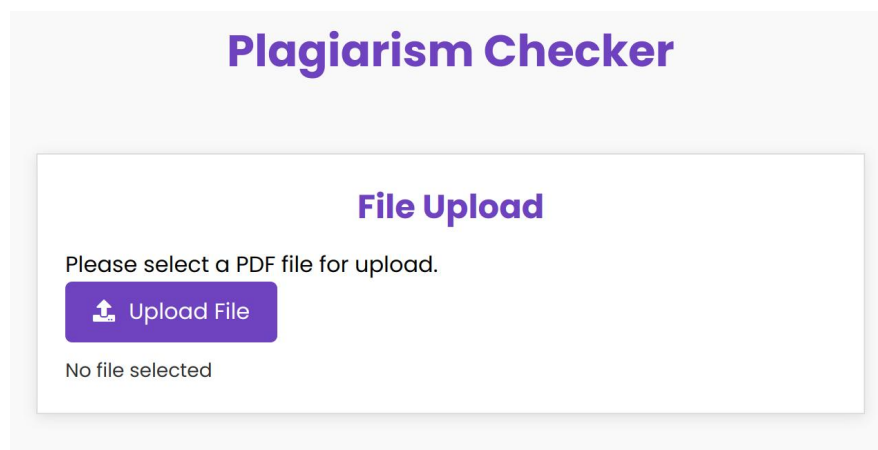


Figure 4.1 shows The file uploader for receiving PDF files from the user

## 4.1.2 Preprocessing:

### PDFs:

First, the library "pdf.js" is used to extract the contents of the pdf file's pages. The contents are then processed and formatted; in this case, the required content is just text, which means that all the other contents, like headers, footers, page numbers, unnecessary whitespaces, etc., are removed. The unnecessary whitespaces in the files are then removed, and the font sizes and cases are generalized. This would enable all the words in the document to be counted as a long string, with a single whitespace separating them.

After the formatting, then the resulting string is scanned and counted for the number of words it possesses. If the number exceeds 3000 (which is the word limit for the plagiarism checker), an error is thrown, and the upload is rejected. If the number of words is below 3000, then the file is accepted.

### Text Input:

you A text box is provided for the users to type in text, or paste the text that they wish to scan. It also has the same word limit as the file upload feature.

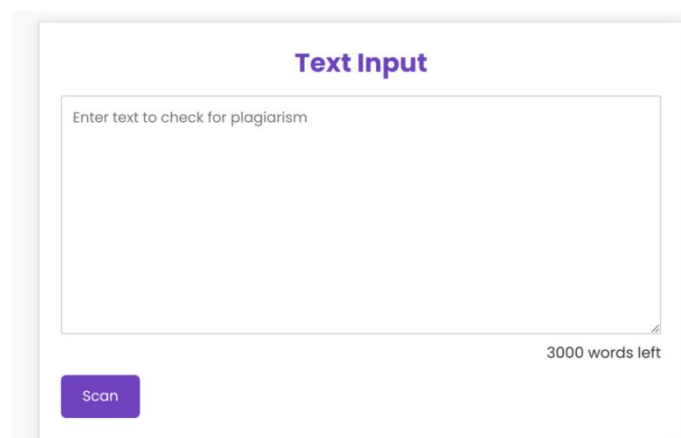
The image shows a web interface titled "Text Input" in purple. Below the title is a large text input area with the placeholder text "Enter text to check for plagiarism". In the bottom right corner of the input area, it says "3000 words left". Below the input area is a purple button labeled "Scan".

Figure 4.2 shows the Text area for entering content for scanning

### **4.1.3 API Request**

A Javascript function requests functionality to check the text it carries. For this call to be made, an API key from Originality.ai API integration must be present, and a request can be made through this. If it is unsuccessful, a prompt will appear that shows an error.

### **4.1.4 API RESPONSE FROM ORIGINALITY.AI**

After a successful request, the system waits for a response. This response is a JSON is usually an object containing the information requested. The system parses this object and collects the score, which is the likelihood of the content being plagiarised. It also returns details of the sources from which the plagiarism matches were detected, giving the user more insights about the scan's result.

### **4.1.5 SCORING**

The resulting score is displayed user-friendly as a circular progression bar, which animates based on the score. Based on the score, the user can judge how much of the contents of the text or document are plagiarised and the sources they copied from.

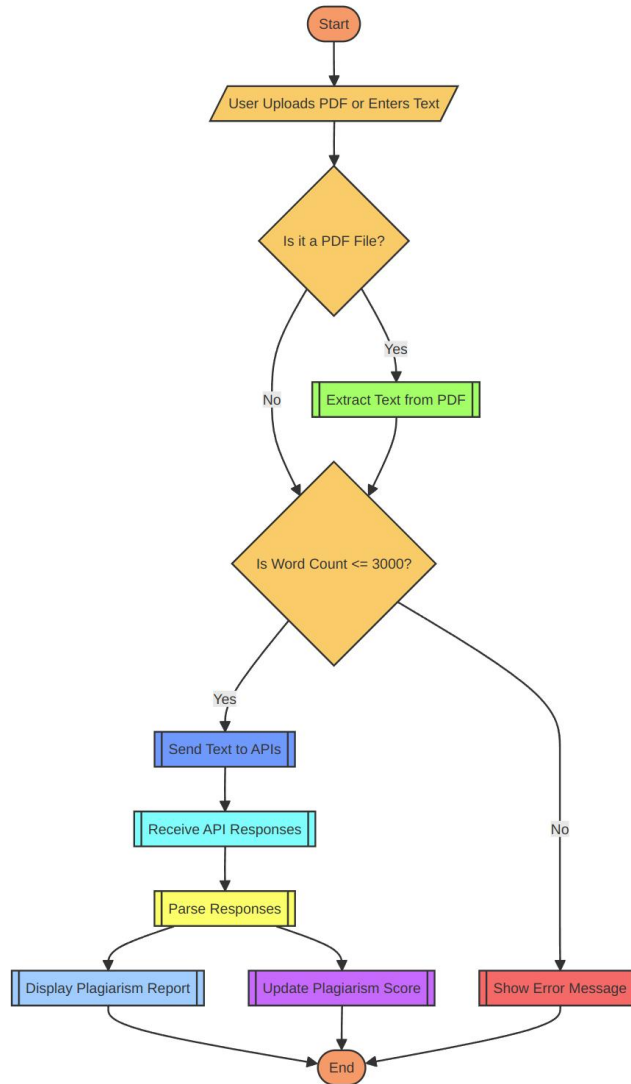


Figure 4.3: Flowchart for the plagiarism checker feature - This shows the different process that are involved in the plagiarism checker feature, from receiving the input to producing an output.

## 4.2 AI CHECKING

Selecting the AI checker button on the sidebar to the left of the screen would take the user to the AI checker page. Unlike the plagiarism checker, no text box is required, and the plagiarism checker's 3000-word limit does not affect it. The AI checker follows a process similar to the plagiarism checker; the only difference is that the checks are made before the request is sent.

In this case, the file is only tested if it is in PDF format, and considering that there is no word limit, there is no need to check for that. The request is sent, and the result is received. This result is then displayed in a manner similar to that of the plagiarism checker.

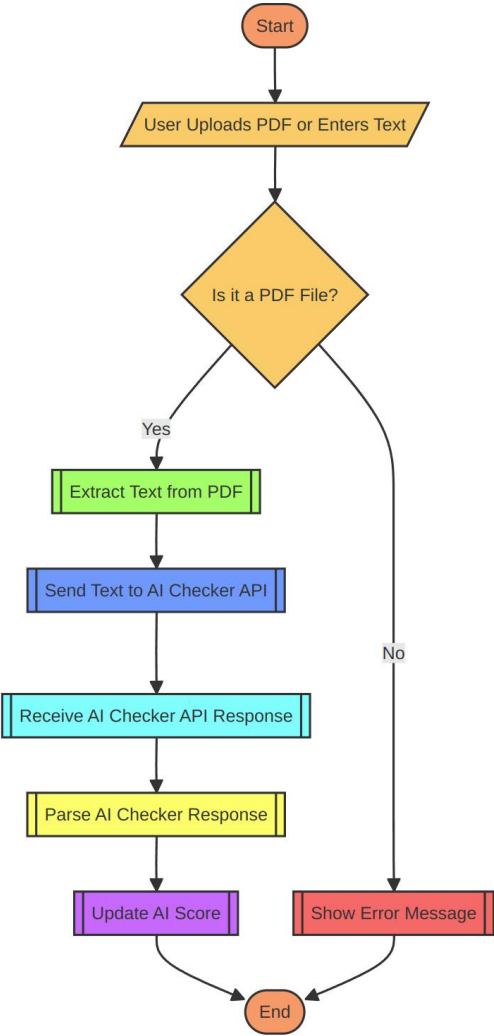


Figure 4.4 shows the Flowchart of the AI detection feature

### 4.3 PRICING

Utilizing the tool doesn't cost money, but it is the points (credits) consumed for the checking functionality of Originality.ai that cost money. The credits can be seen as consumables; for every

check made using the API call, a certain amount of points is consumed based on the volume of the content being checked.

Every 100 words consumes one credit, meaning \$0.01 is spent to scan 100 words. These points are consumed based on the functionalities used; if you scan for only Plagiarism, then only one credit would be consumed for every 100 words. However, if the AI scanning functionality is included, it would cost two credits for every 100 words. These credits are the basic requirements for utilizing the system's functionalities (to have access to premium service, you must pay a premium).

Credits can be purchased on the Originality.ai website. The rates are as follows: \$20 for 2000 credits, \$50 for 5000 credits, \$100 for 10,000 credits, \$250 for 25,000 credits, and \$500 for 50,000 credits (Gluska, 2023).

## **CHAPTER FIVE**

### **SUMMARY AND CONCLUSION**

#### **5.1 SUMMARY**

With the advancement in AI technology and with the advent of a lot of generative AI tools, users have taken advantage of these tools to make their work more accessible and more organized. Today, we have access to insights that are obtained from the cumulative information from blog posts, google searches, and documents available online, and these make researching much easier and more interactive. Although it has been a massive help to many consumers in various fields and professions, It also brings about the issue of Plagiarism. That means that due to unlimited access to resources online, they are compiled together to create the results generated by the tools.

The main focus of this project was to reduce this misuse of GenAI tools in the educational sector, specifically in the University of Benin, by implementing a feature that the lecturers can use as a guide to check how much of the works submitted by the students are AI-generated. Using the insight from the system, the lecturers can make informed decisions on how to score the students, knowing if the students originally wrote the works.

The system would have two core functions: a plagiarism checker and an AI checker, which can be toggled using a sidebar to the left. The Plagiarism checker would allow the user to upload a PDF document or a string of text which are no more than 3000 words; after verifying they meet the conditions, it performs a scan and returns the result, which is a score of the likelihood of it being plagiarised. For the AI checker feature, there is no word restriction, so as long as it is a PDF document, it will be accepted, and the result can be generated.

#### **5.2 CONCLUSION**

The project "Fighting Plagiarism in a World of Fast-growing AI-driven Content Creation" highlights the issues associated with manual checking, the inconsistencies that arise if multiple systems are used, as well as the bias that can arise if not all the lecturers utilize the testing platforms. With that in mind, the new system is meant to help solve this issue, bring awareness of the risks and effects of Plagiarism, and maintain the standard of the educational system as a whole.

## REFERENCES

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## APPENDIX

### SOURCE CODE

#### INDEX.HTML

```
<!DOCTYPE html>
<html lang="en">

<head>
<meta charset="UTF-8">
<title>AI/Plagiarism Scanner</title>
<link rel="stylesheet" href="styles.css">
<link rel="stylesheet" href="//use.fontawesome.com/releases/v5.0.7/css/all.css">
<script src="config.js"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/pdf.js/2.10.377/pdf.min.js"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/pdf.js/2.10.377/pdf.worker.min.js"></script>
</head>
<body>
<header>
<nav class="navbar">
<div class="nav-left">
<a href="#Logo" class="logo"></a>
<h3 navText>Uniben AI-Plagiarism Checker</h3>
</div>
<div class="nav-right">
<a href="#Home">Home</a>
<a href="#Plagiarism Checker">Plagiarism Checker</a>
<a href="#AI Checker">AI Checker</a>
<a href="#Support">Support</a>
<a href="#About">About</a>
</div>
<span class="nav-highlight"></span>
</nav>
</header>
<div class="main">
<div class="left-sidebar">
<div class="item1" style="width: 100%; align-items: center; justify-content: center; margin: 0; padding: 0;">
<button id="menuItems" onmouseover="this.style.backgroundColor='rgb(0, 0, 0, 0.2)'"
onmouseout="this.style.backgroundColor='rgb(111, 66, 193)'"
onclick="showContent('plagiarismDiv', event)"
class="menuItems firstItem">
```

```

style="background-color: rgb(111, 66, 193); width:100%; min-height: 150px; border: hidden;
font-size: 24px; text-align: center; color: rgb(230, 230, 230); transition: background-color 0.3s
ease;">Plagiarism
Scanner</button>
</div>
<div class="item2" style="width: 100%; align-items: center; justify-content: center; margin: 0;
padding: 0;">
<button id="menuItems-2" onmouseover="this.style.backgroundColor='rgb(0, 0, 0, 0.2)'"
onmouseout="this.style.backgroundColor='rgb(111, 66, 193)'" onclick="showContent('aiDiv',
event)" class="menuItems"
style="background-color: rgb(111, 66, 193); width: 100%; min-height: 150px; border: hidden;
font-size: 24px; text-align: center; color: rgb(230, 230, 230); transition: background-color 0.3s
ease;">AI
Scanner</button>
</div>
</div>
<!-- Main content -->
<div class="main-content1">
<div id="plagiarismDiv" class="items plagiarismDiv">
<div class="header">
<h1>Plagiarism Checker</h1>
<p class="subheader"> You can either upload a file or copy the content of a file and paste into
the text box for scanning.</p>
</div>
<div class="plagiarism">
<div class="file_container">
<h2>File Upload</h2>
<p>Please select a PDF file for upload.</p>
<form class="fileUploadForm" method="post" enctype="multipart/form-data">
<div class="upload-wrapper">
<input type="file" id="uploadFile1" name="uploadedFile"
onchange="handleFile('uploadFile1', 'filePreview1')">
<label for="uploadFile1"><i class="fas fa-upload"></i>Upload File</label>
</div>
<div class="filePreview" id="filePreview1">No file selected</div>
</form>
</div>
<div class="pscanner-button"><button type="submit" disabled>Scan</button></div>
<div class="container">
<h2>Text Input</h2>
<form id="uploadForm">
<textarea id="textInput" name="text" rows="10"
placeholder="Enter text to check for plagiarism"></textarea>
<div class="word-count" id="wordCount">3000 words left</div>
</form>
<div id="result"></div>

```

```

</div>
<div class="pscanner-button"><button type="submit" disabled>Scan</button></div>
</div>
</div>
<div id="aiDiv" class="items aiDiv" style="display: none;">
<div class="header">
<h1>AI Checker</h1>
<div class="file_container">
<h2>File Upload</h2>
<p>Please select a PDF file for upload.</p>
<form class="fileUploadForm" method="post" enctype="multipart/form-data">
<div class="upload-wrapper">
<input type="file" id="uploadFile2" name="uploadedFile"
onchange="handleFile('uploadFile2', 'filePreview2')">
<label for="uploadFile2"><i class="fas fa-upload"></i>Upload File</label>
</div>
<div class="filePreview" id="filePreview2">No file selected</div>
</form>
</div>
<div class="pscanner-button"><button type="submit" disabled>Scan</button></div>
</div>
</div>
</div>
<div class="right-sidebar">
<div id="plagiarismDiv" class="items AI-container">
<h2>Plagiarism Score</h2><br><br>
<div class="circular-progress">
<span class="progress-value">0%</span>
</div>
</div>
<div id="aiDiv" class="items AI-container" style="display: none;">
<h2>AI Content Score</h2><br><br>
<div class="circular-progress">
<span class="progress-value">0%</span>
</div>
</div>
</div>
</div>
<div id="footer">
<p>&copy; 2024 Uyioghosa Odigie. All rights reserved.</p>
</div>
<script src="script.js"></script>
</body>
</html>

```

## CSS

```
/* styles.css */
@import
url('https://fonts.googleapis.com/css2?family=Poppins:wght@300;400;500;600;700&display=sw
ap');

* {
margin: 0;
padding: 0;
box-sizing: border-box;
font-family: 'Poppins', sans-serif;
}
body {
font-family: Arial, sans-serif;
background-color: #f9f9f9;
margin: 0;
padding: 0;
display: grid;
}
#header {
grid-row: 1/2;
}
nav {
position: fixed;
width: 99%;
height: 100px;
background: linear-gradient(45deg, #6f42c1, #dc3545);
border-radius: 8px;
display: flex;
justify-content: space-between;
align-items: center;
padding: 0 20px;
margin: 1.5% 2% 0% 0.5%;
z-index: 1000;
}
nav a {
/* position: relative; */
color: #fff;
text-decoration: none;
font-size: 1em;
font-weight: 500;
padding: 0 20px;
z-index: 1;
transition: color 0.3s ease;
}
```

```

nav a:hover {
color: #777;
}
.nav-highlight {
position: absolute;
top: 0;
left: 0;
height: 100%;
background: #ffdc00;
transition: all 0.3s ease;
border-radius: 8px;
z-index: 0;
}
nav a:hover~.nav-highlight {
transform: translateX(var(--translate));
}
nav a:nth-child(1):hover~.nav-highlight {
--translate: 0;
}
nav a:nth-child(2):hover~.nav-highlight {
--translate: 100px;
}
nav a:nth-child(3):hover~.nav-highlight {
--translate: 200px;
}
nav a:nth-child(4):hover~.nav-highlight {
--translate: 300px;
}
nav.navbar .logo img {
height: 40px;
margin-right: 20px;
vertical-align: middle;
}

.nav-left {
display: flex;
align-items: center;
}
.nav-right {
display: flex;
align-items: center;
gap: 20px;
}
.main {
display: grid;
grid-template-columns: repeat(5, 1fr);

```

```
grid-gap: 10px;
min-height: 1000px;
width: 99%;
grid-row: 2/3;
margin-top: 150px;
margin-left: 0.5%;
margin-right: 0.5%;
}
.left-sidebar {
display: grid;
grid-template-rows: repeat(5, 1fr);
grid-gap: 5px;
grid-column: 1/2;
background-color: #f1eef5;
}
.item1 {
grid-row: 1/2;
}
.item2 {
grid-row: 2/2;
}
.right-sidebar {
grid-column: 5/5;
width: 100%;
display: grid;
background-color: #f1eef5;
}
.main-content1 {
display: grid;
grid-template-rows: repeat (2, 1fr);
grid-column: 2/5;
background-color: rgb(241, 243, 237)
}
.plagiarismDiv {
grid-row: 1/2;
width: 100%;
}
.plagiarism {
width: 100%;
}
.container {
max-width: 80%;
margin-left: 100px;
margin-bottom: 0;
padding: 20px;
background-color: #fff;
```

```

border: 1px solid #ddd;
box-shadow: 0 2px 10px rgba(0, 0, 0, 0.1);
}
.pscanner-button {
width: 80%;
margin-left: 100px;
margin-top: 0;
margin-bottom: 50px;
padding: 20px;
cursor: pointer;
}
.aiDiv {
grid-row: 1/ span 2;
width: 100%;
}
.file_container {
max-width: 80%;
margin-left: 100px;
padding: 20px;
margin-bottom: 0;
background-color: #fff;
border: 1px solid #ddd;
box-shadow: 0 2px 10px rgba(0, 0, 0, 0.1);
}
.main_content {
margin-left: 20px;
}
.header {
margin-top: 20px;
}
.score-sidebar {
margin: 200px 5%;
position: fixed;
top: 0;
right: 0;
height: 29%;
width: 15%;
color: #fff;
z-index: 1000;
box-shadow: 0 0 10px rgba(0, 0, 0, 0.2);
border-radius: 8px;
}
.score-sidebar .text {
color: #6f42c1;
font-size: 18px;
margin-top: 10px;
}

```

```

text-align: center;
}
h1,
h2 {
text-align: center;
color: #6f42c1;
margin-bottom: 12px;
}
h3 {
color: #fff;
}
.subheader {
text-align: center;
margin-bottom: 12px;
}
textarea {
width: 100%;
padding: 10px;
border: 1px solid #ccc;
border-radius: 2px;
}
.word-count {
text-align: right;
color: #333;
font-size: 14px;
}
input[type="file"] {
display: none;
}
.upload-wrapper {
position: relative;
cursor: pointer;
display: inline-block;
}
.upload-wrapper label {
display: inline-block;
padding: 10px 20px;
background-color: #6f42c1;
color: #fff;
border-radius: 5px;
cursor: pointer;
}
.upload-wrapper label i {
margin-right: 10px;
}
.upload-wrapper:hover label {

```

```

background-color: #594f8d;
}
.filePreview {
margin-top: 10px;
font-size: 14px;
color: #333;
}
button[type="submit"] {
background-color: #6f42c1;
color: white;
border: none;
padding: 10px 20px;
border-radius: 5px;
cursor: pointer;
margin-top: 10px;
}
button[type="submit"]:hover {
background-color: #594f8d;
}
.AI-container {
grid-row: 1/2;
width: 100%;
padding: 20px;
margin-right: 20px;
background-color: #f1eef5;
border-radius: 8px;
box-shadow: 0 2px 10px rgba(0, 0, 0, 0.1);
align-items: center;
justify-self: center;
}
.circular-progress,
.circular2-progress {
margin-left: 25px;
position: relative;
height: 200px;
width: 200px;
border-radius: 50%;
background: conic-gradient(#7d2ae8 3.6deg, #ededed 0deg);
display: flex;
align-items: center;
justify-content: center;
box-shadow: 0 2px 10px rgba(0, 0, 0, 0.1);
}
.circular-progress::before,
.circular2-progress::before {
content: "";

```

```
position: absolute;
height: 110px;
width: 110px;
border-radius: 50%;
background-color: #fff;
}
.progress-value,
.progress2-value {
position: relative;
font-size: 600;
color: #7d2ae8;
}
```

## JAVASCRIPT

```
// scripts.js
const maxWords = 3000;

// Function to handle text input and update word count
const textarea = document.getElementById('textInput');
const wordCountDisplay = document.getElementById('wordCount');
textarea.addEventListener('input', () => {
  const text = textarea.value.trim();
  const words = text.split(/\s+/).filter(word => word.length > 0);
  const currentWordCount = words.length;
  const wordsLeft = maxWords - currentWordCount;
  wordCountDisplay.textContent = wordsLeft >= 0
  ? `${wordsLeft} words left`
  : `Word limit exceeded by ${-wordsLeft} words`;
  wordCountDisplay.style.color = wordsLeft < 0 ? 'red' : '#333';
});
//
function handlePlagiarismFile(inputId, previewId) {
  const fileInput = document.getElementById(inputId);
  const filePreview = document.getElementById(previewId);
  const file = fileInput.files[0];
  let pageText;
  if (file) {
    if (file.type === 'application/pdf') {
      const fileReader = new FileReader();
      fileReader.onload = async function () {
        const typedarray = new Uint8Array(this.result);
        const loadingTask = pdfjsLib.getDocument(typedarray);
        const pdf = await loadingTask.promise;
        let totalWords = 0;
        for (let i = 1; i <= pdf.numPages; i++) {
          const page = await pdf.getPage(i);
          const textContent = await page.getTextContent();
          pageText = textContent.items.map(item => item.str).join(' ');
          totalWords += pageText.split(/\s+/).filter(word => word.length > 0).length;
        }
        console.log('Total words:', totalWords);
        console.log(pageText);
        if (totalWords > 3000) {
          alert(`Word limit exceeded! The document contains ${totalWords} words.`);
          fileInput.value = ""; // Clear the file input
          filePreview.textContent = 'No file selected'; // Clear the file preview
          return; // Stop further processing
        }
      }
    }
  }
}
```

```

// Display file name preview
filePreview.textContent = `File Name: ${file.name}, Total Words: ${totalWords}`;
var scanButtons = document.getElementById('.pscanner-button');
scanButtons.forEach(function(button) {
button.disabled = false;
});
});
fileReader.readAsArrayBuffer(file);
} else {
alert('Please upload a valid PDF file.');
```

```

fileInput.value = ""; // Clear the file input
filePreview.textContent = 'No file selected'; // Clear the file preview
}
} else {
alert('No file selected.');
```

```

}
}
function handleAIDivFile(inputId, previewId) {
const fileInput = document.getElementById(inputId);
const filePreview = document.getElementById(previewId);
const file = fileInput.files[0];
if (file) {
if (file.type !== 'application/pdf') {
alert('Please upload a valid PDF file.');
```

```

fileInput.value = ""; // Clear the file input
filePreview.textContent = 'No file selected'; // Clear the file preview
} else {
// Display file name preview
filePreview.textContent = `File Name: ${file.name}`;
var scanButtons = document.getElementById('.pscanner-button');
```

```

scanButtons.forEach(function(button) {
button.disabled = false;
});
}
} else {
alert('No file selected.');
```

```

}
}
function previewFile(inputId, previewId, handler) {
const fileInput = document.getElementById(inputId);
const filePreview = document.getElementById(previewId);
handler(inputId, previewId);
// const file = fileInput.files[0];
// if (file) {
// filePreview.textContent = `File Name: ${file.name}`;

```

```

// } else {
// filePreview.textContent = 'No file selected';
// }
}
document.getElementById('uploadFile1').addEventListener('change', function () {
previewFile('uploadFile1', 'filePreview1', handlePlagiarismFile);
});
document.getElementById('uploadFile2').addEventListener('change', function () {
previewFile('uploadFile2', 'filePreview2', handleAIDivFile);
});
let circularProgress = document.querySelector(".circular-progress"),
progressValue = document.querySelector(".progress-value");
let progressStartValue = 0,
progressEndValue = 0,
speed = 5;
// let progress = setInterval(() => {
// progressStartValue++;
// progressValue.textContent = `${progressStartValue}%`
// circularProgress.style.background = `conic-gradient(#7d2ae8 ${progressStartValue * 3.6}deg,
#ededed 0deg)`
// if (progressStartValue == progressEndValue) {
// clearInterval(progress);
// }
// }, speed);
// Show menu contents
function showContent(contentId, event) {
// Prevent default button behavior (page refresh)
event.preventDefault();
// Hide all content first
document.querySelectorAll('.items').forEach(function(el) {
el.style.display = 'none';
});
// Show the selected content
// document.getElementById(contentId).style.display = 'block';
var elements = document.querySelectorAll("[id=\"" + contentId + "\"]");
elements.forEach(function(element) {
element.style.display = 'block';
});
}
// Style selected Menu Item
document.addEventListener('DOMContentLoaded', function() {
var firstItem = document.querySelector('.firstItem');
firstItem.style.color = '#F1A004';
var buttons = document.querySelectorAll('.menuItems');
// Reset text color
function resetTextColor() {

```

```

buttons.forEach(function(button) {
button.style.color = 'rgb(230, 230, 230)';
});
}
buttons.forEach(function(button) {
button.addEventListener('click', function() {
resetTextColor();
this.style.color = '#F1A004';
});
});
// Function that sends plagiarism scan request to Originality.ai and returns the result
var scanButtons = document.getElementById('.psscanner-button');
scanButtons.forEach(function(button) {
button.addEventListener('click', function() {
var myHeaders = new Headers();
var fileContent = pageText;
var plagiarismScore, plagiarismSources, plagiarismText;
myHeaders.append("Accept", "application/json");
myHeaders.append("X-OAI-API-KEY", config.apiKey);

var raw = JSON.stringify({
"content": fileContent,
"title": "your title",
"excludedUrl": "cnet.com",
"storeScan": "\"false\""
});
var requestOptions = {
method: 'POST',
headers: myHeaders,
body: raw,
redirect: 'follow'
};
fetch("https://api.originality.ai/api/v1/scan/plag", requestOptions)
.then(response => {
plagiarismScore = response.total_text_score;
plagiarismSources = response.sources;
// Display result
progressEndValue = plagiarismScore;
let progress = setInterval(() => {
progressStartValue++;
progressValue.textContent = `${progressStartValue}%`
circularProgress.style.background = `conic-gradient(#7d2ae8 ${progressStartValue * 3.6}deg,
#ededed 0deg)`
if (progressStartValue == progressEndValue) {
clearInterval(progress);
}
}
}

```

```
}, speed);  
})  
.then(result => {  
  plagiarismText = result;  
})  
.catch(error => console.log('error', error));  
});  
});  
});
```