PROJECT REPORT

ON

"Ideate and implement a system to enhance the quality of education in Emerging Technology (Online Compiler)"

Submitted to

Autonomous Institute,

Affiliated to The Rashtrasant Tukadoji Maharaj Nagpur University

Department of Emerging Technologies

Bachelor of Technology (B. Tech)

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(AN AUTONOMOUS INSTITUTION AFFILIATED TO RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAAC ACCREDITED WITH 'A' GRADE)

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S. B. JAIN INSTITUTE OF TECHNOLOGY, MANAGEMENT & RESEARCH, NAGPUR.
(An Autonomous Institute, Affiliated to RTMNU, Nagpur)
DEPARTMENT OF EMERGING TECHNOLOGIES (AI&ML and AI&DS)
"Become an excellent center for Emerging Technologies in Computer Science to create competent professionals"

CERTIFICATE

This is to certify that the project titled "**Ideate and implement a system to enhance the quality of education in Emerging Technology(Online Compiler)"** is bonafide work of **Ms.Vaishnavi Rahamatkar, Ms.Tanushree Sarode, Ms.Aboli Wankhede, Ms.Sakshi Mantri** carried out for the complete fulfilment of the requirement of the fir award of Degree Bachelor of Technology **in Emerging Technologies (AIML), Rastrasant Tukadoji Maharaj University , Nagpur.**

Mr. Ravi Asati
Project Guide

Mr. Ravi Asati
Project In-charge

DECLARATION

We, hereby declare that the Project Progress Report Titled "**Ideate and implement a system to enhance the quality of education in Emerging Technology(Online Compiler)"** submitted here in has been carried out by us in the Department of Emerging Technologies (AI&ML) of S.B. Jain Institute of Technology Management and Research, Nagpur under the guidance of Mr. Ravi Asati . The Submitted Project report is our original work.

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ABSTRACT

This paper outlines the enhancement of an online Python compiler for our department, specifically designed to support the educational needs of students and faculty. The online Python compiler aims to provide a streamlined and accessible environment for learning and teaching Python programming while also focusing on the usability and security of the platform.

The compiler features a user-friendly interface with an integrated code editor that supports syntax highlighting, auto-completion, and the execution of Python code. The platform is enhanced with a collection of tutorials, coding exercises, and projects that enable students to apply concepts and practice their programming skills in a controlled environment.

For students, the platform offers the ability to save code snippets and projects for future reference and continuity in their learning journey. Additionally, students can collaborate with peers on coding assignments and projects, fostering a sense of community and knowledge-sharing.

For faculty, the platform provides tools to create and manage course content, assignments, and assessments. Instructors can grade assignments and offer feedback asynchronously, helping students improve their coding skills and understanding of programming concepts.Security and privacy are prioritized in the design, with the Python code executed in a secure, sandboxed environment to protect against potential risks and unauthorized access. The platform is accessible to all students, including those with varying levels of experience and learning needs.

INTRODUCTION

The adoption of online learning tools and platforms has become a central aspect of modern education, particularly in the rapidly evolving fields of technology and programming. An online Python compiler specifically designed to cater to the needs of students and faculty can significantly enhance the learning and teaching experience in these areas. Python is one of the most popular programming languages due to its versatility, readability, and widespread use in various industries such as data science, artificial intelligence, web development, and automation.

An enhanced online Python compiler offers a user-friendly and accessible environment where students and faculty can write, execute, and test Python code directly from their web browser. This eliminates the need for complex local setups and provides a consistent coding experience for all users. By integrating features such as syntax highlighting, auto-completion, and built-in educational resources, the platform supports students in learning and applying Python programming concepts more effectively.

For students, the online Python compiler enables immediate practice and experimentation with coding exercises and projects, reinforcing their understanding and building confidence. It also facilitates collaboration among peers through code sharing and discussion forums, creating a supportive community of learners.

For faculty, the platform simplifies course management, allowing them to create and grade assignments efficiently while providing personalized feedback to students. The system's secure, sandboxed environment ensures safe execution of code, protecting against potential risks and ensuring the integrity of the learning process.

Overall, the enhanced online Python compiler provides a comprehensive and engaging learning platform for both students and faculty, fostering a deeper understanding of Python programming and its applications. This approach helps bridge the gap between theoretical knowledge and practical skills, ultimately preparing students for success in their academic and professional pursuits in emerging technology fields.

AIMS

Ideate and implement a system to enhance the quality of education in Emerging Technology(Online Compiler)

OBJECTIVES

Develop and implement an online education system.

1. Develop an online compiler for students and faculty to enhance practical coding skills in emerging technologies.
2. Create a user-friendly website with distinct roles for admin and users.
3. Enable seamless interaction between students and faculty through the online compiler platform.
4. Facilitate real-time code compilation, execution, and debugging for a variety of programming languages.

Provide a collaborative learning environment by allowing users to share code snippets and solutions

LITERATURE REVIEW

A Literature Review is a systematic and comprehensive analysis of books, scholarly articles, and other sources relevant to a specific topic providing a base of knowledge on a topic. A literature review is an overview of the previously published works on a specific topic. Literature reviews are designed to identify and critique the existing literature on a topic to justify your research by exposing gaps in current research. This investigation should provide a description, summary, and critical evaluation of works related to the research problem and should also add to the overall knowledge of the topic as well as demonstrating how your research will fit within a larger field of study. A literature review should offer a critical analysis of the current research on a topic and that analysis should direct your research objective. This should not be confused with a book review or an annotated bibliography both research tools but very different in purpose and scope. A Literature Review can be a stand-alone element or part of a larger end product, know your assignment. The key to a good Literature Review is to document your process. Mostly this phrase may refer to a full scholarly paper or a section of a scholarly work such as a book, or an article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. A good literature review can ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. In other words, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the Electronic copy available at: https://ssrn.com/abstract=3856547 2 DR. KAMAKSHAIAH MUSUNURU reader. Literature review is often a part of scholarly work, including in the preparation of a thesis, dissertation, or a journal article. Literature reviews are also common in a research proposal or prospectus.Literature reviews are secondary sources and do not report new or original experimental work. Most often associated with academic-oriented literature, such reviews are found in academic journals and are not to be confused with book reviews, which may also appear in the same publication. Literature reviews are a basis for research in nearly every academic field.

PROPOSED WORK

1. **Purpose of Work: Enhancing Education in Emerging Technologies through an Online Compiler**

   i. The primary purpose of developing an Online Compiler for Emerging Technologies is to revolutionize the way students and educators interact with and learn about cutting-edge fields such as artificial intelligence, blockchain, data science,

   and more. The system aims to bridge the gap between theoretical knowledge and practical application by providing a robust, user-friendly platform for coding, testing, and experimenting with code in real-time.

2. Key Objectives:

I. Hands-On Learning Experience:

a. Offer a virtual coding environment that allows students to write, compile, execute, and debug code directly from their web browsers.

b. Enable learners to gain practical experience in programming languages and concepts related to Emerging Technologies.

II. Instant Feedback and Guidance:

a. Provide real-time syntax highlighting to aid in code readability and error detection.

b. Offer immediate feedback on code execution, helping students identify and correct mistakes efficiently.

III. Versatility in Language Support:

a. Support a wide array of programming languages commonly used in emerging technology domains, ensuring relevance and versatility.

b. Allow students to explore and experiment with languages such as Python, JavaScript, C++, Java, and more.

IV. Customized Learning Paths:

a. Empower educators to create and share coding exercises, assignments, and quizzes tailored to specific emerging technology topics.

b. Enable the adaptation of curriculum content to match the rapidly evolving landscape of Emerging Technologies.

V. Collaborative Learning and Project Work:

a. Facilitate collaboration among students through shared coding environments and project spaces.

b. Foster teamwork and peer learning, essential skills for success in the tech industry.

VI. Accessibility and Inclusivity:

a. Democratize access to quality programming education by providing a platform that is accessible anytime, anywhere with an internet connection.

b. Remove geographical barriers and ensure that learners from diverse backgrounds have equal opportunities to excel in Emerging Technologies.

TECHNOLOGICAL BASE :

This Project can be implemented by using various technologies like

Front End:

- HTML
- CSS
- JavaScript

Back End:

- JavaScript

Database:

- Firebase

Hosting:

- GitHub

- **HTML**

  HyperText Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser. It defines the content and structure of web content. It is often assisted by technologies such as Cascading Style Sheets and scripting languages such as JavaScript.

- **CSS**

  Cascading Style Sheets is a style sheet language used for specifying the presentation and styling of a document written in a markup language such as HTML or XML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

- **JavaScript**

  JavaScript, often abbreviated as JS, is a programming language and core technology of the Web, alongside HTML and CSS. 99% of websites use JavaScript on the client side for webpage behavior. Web browsers have a dedicated JavaScript engine that executes the client code.

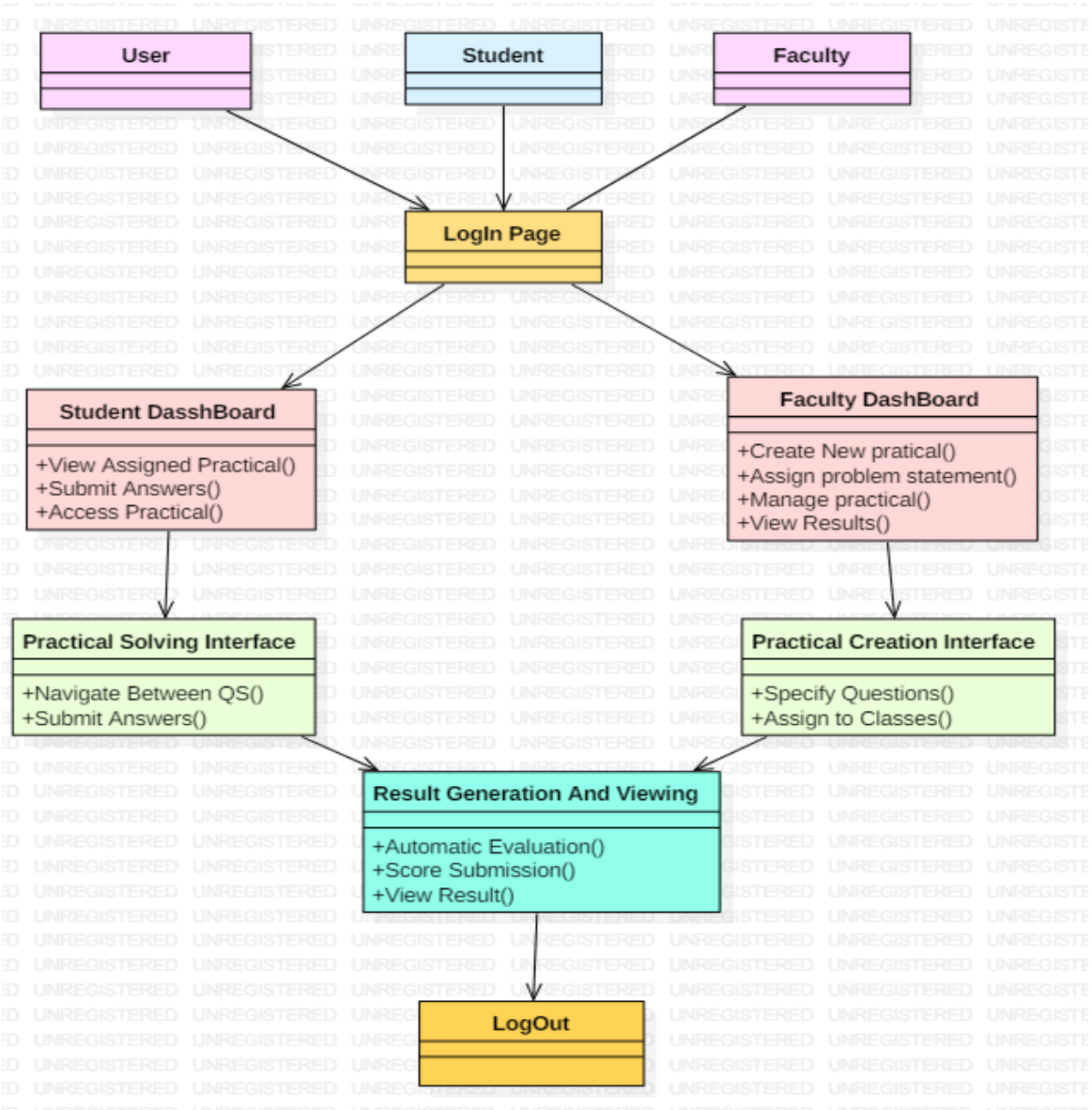
- **Firebase**

  Firebase, Inc. is a set of backend cloud computing services and application development platforms provided by Google. It hosts databases, services, authentication, and integration for a variety of applications, including Android, iOS, JavaScript, Node.js, Java, Unity, PHP, and C++.

- **GitHub**

  GitHub is a platform for hosting code that allows for version control and collaboration. It allows you and others to collaborate on projects from anywhere. This lesson will teach you the fundamentals of GitHub, such as repositories, branches, commits, and pull requests.

RESEARCH METHODOLOGY



- **Login Page**:
  - Faculty and students log in using their respective credentials.
  - Separate login interfaces for faculty and students.

- **Faculty Dashboard**:
  - Faculty can create new tests, manage existing tests, and view test results.
  - Interface for assigning tests to specific students or groups of students.
- **Test Creation**:
  - Faculty can create tests by specifying questions, options, and correct answers.
  - Ability to set time limits, assign test to specific classes or groups, and customize test parameters.
- **Student Dashboard**:
  - Students can view assigned tests and access them for solving.
  - Clear interface displaying test instructions and questions.
- **Test Solving**:
  - Students can attempt tests within the specified time limit.
  - Interface should allow for easy navigation between questions and submission of answers.
- **Automatic Result Generation**:
  - System automatically evaluates student responses against correct answers.
  - Generates test scores and provides immediate feedback to students upon completion.
- **Score Submission**:
  - After completing the test, students can submit their answers for evaluation.
  - Scores are automatically recorded and submitted to the faculty.
- **Result Viewing**:
  - Faculty can view test results for each student, including scores and detailed breakdown of answers.
  - Ability to export results for record-keeping or further analysis.

Conclusion

In conclusion, the enhanced online Python compiler for students and faculty significantly improves the educational experience and teaching effectiveness in emerging technologies. This advanced system provides seamless accessibility, enabling students and faculty to access the platform from anywhere, fostering flexible learning and teaching.

Students benefit from an interactive coding environment where they can write, execute, and test Python code in real-time, promoting active learning. Immediate feedback allows students to learn from mistakes and improve coding skills efficiently.

Faculty can create, manage, and assign coding projects, monitor student progress, and provide personalized feedback, streamlining the teaching process. Automated evaluation reduces faculty workload by automatically grading code submissions, freeing up time for instruction.

The system encourages collaboration among students and between students and faculty, enhancing the educational experience. By allowing continuous tracking of progress and performance, students and faculty can achieve continuous growth in coding skills and teaching methods. Overall, the online Python compiler empowers a more effective and enriching educational journey.

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