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A Review on Development of Online Code Editor

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Abstract : It is often seen that the Program Developer, who writes the code of a particular project, has to carry the whole environment for the particular project to present it in front of anyone. This particular environment includes the particular software on which the code runs and also the databases. So the developer has to be equipped with all the necessary resources even if he wishes to test his code by himself. To his rescue here we present a Web Based IDE which solves his many problems. The Developer just needs a web browser and an internet connection to access, modify and test his code. Thus saving his time and reducing the cost to create the environment wherever he goes.

Key words: Online Compiler and editor, web IDE , Browser-based code editors

INTRODUCTION

Online code editors are compilers that allow users to write, compile and execute source code online. The online code editor allows users to store their source code files in a database and access them from anywhere.The online code editor is used to run multiple programming languages; however, many programmers who need to edit the source code urgently may not be able to access a convenient resource without installing any software on their computer or notebook. In our project, programmers can compile and run source code through a web browser, and the code is generated on the server. The output of the compilation will then be displayed in the client-side browser. Online code editors are designed to run on small resources such as PCs, tablets, Android devices, notebooks, and laptops. To edit program source code, computer operator must have at least one computer. If a programmer wants to run multiple languages, they must install the software for each one. However, if they use an online code editor, they can run all languages on the same platform, which eliminates the need for the programmer to install software for each language. Browser-based code editors and compilers significantly reduce both the hardware and software required by programmers when working on any given project by storing and executing source code online, allowing programmers and development teams to quickly begin projects for a wide range of platforms, devices, and operating systems. Code chef and code pad are two well-known online compilers. The generally accepted operation of our website is that users can write or copy paste code into the Code editor and then use the submit button, which compiles the program in the backend and displays the result in the output window. In addition, users can add files that can be compiled using the backends' compiler.

LITERATURE REVIEW

Nishant, Neetu Raj Bharati, "Online code editor using React" – International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering – 5, May 2022

In this research paper authors focused on Online code editors are designed to run on small resources such as PCs, tablets, Android devices, notebooks, and laptops. To edit program source code, computer operator must have at least one computer. If a programmer wants to run multiple languages, they must install the software for each one. However, if they use an online code editor, they can run all languages on the same platform, which eliminates the need for the programmer to install software for each language. Browser-based code editors and compilers significantly reduce both the hardware and software required by programmers when working on any given project by storing and executing source code online, allowing programmers and development teams to quickly begin projects for a wide range of platforms, devices, and operating systems.

Sahil Pandita, Aswanth Surendran, Rishiraj Thadeshwar, Ashish Nahak, Prof. Ujwala Gaikwad, "Browser based code editor" – International Research Journal of Engineering and Technology (IRJET) – 5, May 2020

Authors of this study concentrated on A common occurrence is when the program developer, who writes the code of a particular project, must carry the whole environment for the project to present it in front of anyone. This environment includes the software on which the code runs and the databases. So, the developer must be equipped with all the necessary resources even if he wishes to test his code by himself.

Mayank Patel, "Online Java Compiler Using Cloud Computing" – International Journal of Innovative Technology and Exploring Engineering (IJITEE) – 2, January 2013
The primary goal of this study paper's writers, who concentrated on online compilers and code editors, was to construct code such that it could be immediately built and executed without the need to install a compiler on the machine. As it is a competitive world and very fast world, everything in the universes is to be internet. In this internet world all the things are on-line. So we created software called On-line java compiler. The main aim of this project we can easily to write a java program and compile it and debug in on-line. The client machine does not have java development kit. The paper aims to describe an online compiler which helps to reduce the problems of portability and storage space by making use of the concept of cloud computing. The ability to use different compilers allows a programmer to pick up the fastest or the most convenient tool to compile the code and remove the errors. Moreover, a web-based application can be used remotely throughout any network connection and it is platform independent. The errors/outputs of the code are stored in a more convenient way. Also, the trouble of installing the compiler on each computer is avoided. Keywords— Cloud Computing, Compiler, Online Compiler.

H. B. Salameh and C. Jeffery, "Collaborative and social development environments for software development" - International Journal Computer Applications in Technology – 2011
In this research paper authors focused on the technological development trend in software engineering has been improving, where the design of software began move from the desktop to the web. Nowadays, many IDE (Integrated Development Environment) applications has been made, such as Eclipse, Visual Studio, etc., but IDEs which based on desktop still have significant disadvantages such as long time for configuration and installing the plug-in needed for IDE to run the project. This problem could be a huge waste of time when there are many devices that must be configured. Many software applications have been run in the cloud, and use a web browser as a user interface that allows ubiquitous access, instant collaboration, and avoid installation and configuration on desktop computers. One of the technologies used for instant collaboration is single IDE (like pair programming). Pair programming is the practice of having two programmers' access and work on the same code in a single development environment.

L. C. L. Kats, R. G. Vogelij, K. T. Kalleberg, E. Visser, "Software development environments on the web" - Association for Computing Machinery -2012
The writers of this study work centered on The Web provides a generic user interface that allows ubiquitous access, instant collaboration, integration with other online services, and avoids installation and configuration on desktop computers. For software development, the Web presents a shift away from developer workstations as a silo, and has the promise of closer collaboration and improved feedback through innovations in Web-based interactive development environments (IDEs). Moving IDEs to the Web is not just a matter of porting desktop IDEs; a fundamental reconsideration of the IDE architecture is necessary in order to realize the full potential that the combination of modern IDEs and the Web can offer. This paper discusses research challenges and opportunities in this area, guided by a pilot study of a web IDE implementation.

Aditya Kurniawan, Christine Soesanto, Joe Erik Carla Wijaya, "CodeR: Real-time Code Editor Application for Collaborative Programming" – International Conference on Computer Science and Computational Intelligence (ICCSCI) – 2017
This paper presents a server-based code editor for java code. in other code editors they provide facility to run languages such as HTML, CSS, JavaScript. These languages are web-based languages those code editors are enable to run the programming languages that's why programmers face many difficulties to run programming languages such as JAVA, PHP etc. but in our project, we add programming language which is java .by using server-based code editor programmer can run programming language i.e., JAVA .it is a good tool to run multiple programming languages on same platform

M. Goldman, G. Little, R. C. Miller, "Real-time Collaborative Coding in a Web IDE" - Association for Computing Machinery – 16, October 2016
By Storing and executing source code online, browser-based code editor and compiler significantly reduces both the hardware and the software required by programmers when working on any given project, it allows programmers and development teams to quickly begin projects for a wide range of platforms, devices, and operating systems. Some famous online compilers are Code chef, code pad. The generally accepted working of our website would be that the users can write or copy paste a C-code in the Code editor and then use the submit button which will compile the program in the backend and show the result in the output window. In addition to this, users can also add files which can be compiled using the gcc compiler in the backend.

D. Sun, S. Xia, C. Sun, and D. Chen, "Operational Transformation for Collaborative Word Processing" - Association for Computing Machinery -2010
Authors of this study concentrated on A common IDE (Integrated Development Environment) applications has been made, such as Eclipse, Visual Studio, etc., but IDEs which based on desktop still have significant disadvantages such as long time for configuration and installing the plug-in needed for IDE to run the project. This problem could be a huge waste of time when there are many devices that must be configured. Many software applications have been run in the cloud, and use a web browser as a user interface that allows ubiquitous access, instant collaboration, and avoid installation and configuration on desktop computers. One of the technologies used for instant collaboration is single IDE (like pair programming).

Klein, N. Vehring, and M. Kramer, "Introducing Real Time Code Compiler Environment"- International Journal Computer Applications in Technology – 2009
This paper presents a server-based code editor for java code. in other code editors they provide facility to run languages such as HTML, CSS, JavaScript. These languages are web-based languages those code editors are enable to run the programming languages that's why programmers face many difficulties to run programming languages such as JAVA, PHP etc. but in our project, we add programming language which is java .by using server-based code editor programmer can run programming language i.e., JAVA .it is a good tool to run multiple programming languages on same platform.

METHODOLOGY

Node.JS:
Node.JS is an asynchronous event-driven JavaScript runtime, Node.js is designed to build scalable network applications. This is used to develop the backend for the application. It also used to create the file system for the application.

Express.JS:
Express.JS is a minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications. This helps to establish the connection between Node.JS backend and MongoDB.

MongoDB:
MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. This database helps to store the user data.

ReactJS:
React is a JavaScript library for building user interfaces. React is used to develop the dynamic user interface for the application which is easy to use and flexible.

HTML, CSS, JavaScript:
HTML, CSS, JavaScript are the core technologies used for the web development. This is used to build some core parts in the application.

HackerEarth API:
The API provides endpoints for compiling and running code in several languages. It can be accessed via an API key-based authorization process. The HackerEarth API provides with the functionality to view, edit, run, and debug any type of code on the web.3.4Statistical tools and econometric models

CORE FEATURES OF A ONLINE CODE EDITOR

1. User Module:
The user module is a set of features that you can use to create, edit, and manage your content. It also has a dashboard where you can see all user content in one place. This module is designed to help you create, edit, and manage your content. You can also see all user content in one place on the dashboard.

2. File System Module:
A file system module for cloud-based code editor is a module that provides functionality of a file system to the user in the code editor. The main purpose of this module is to provide an interface which can be used by the user to interact with files and folders in the cloud storage.

3. Compiler Module:
A code compiler module is a program that translates code written in one programming language to another, typically more readable, programming language. The purpose of a code compiler module is to translate the code written in one programming language to another, typically more readable, programming language.

WHY SHOULD YOU CHOOSE A ONLINE CODE EDITOR?

Mobility or Portability :
Similar to an online office suite, such as Google Docs, for example, an online code editor offers the chance to work from anywhere around the world. Regardless of where you are — home, office, or traveling — if you have a strong internet connection, you can code as much as you like

Simpler Collaboration :
One of the greatest advantages of online code editor is the way that such editors can help your teammates. You can consistently share your code, and, in addition, create applications as a group utilizing a cloud environment.

Open Source :
A Online code editor such as ICE coder, for example, is open source, which means that users are permitted free access to the source code. So, if you require a specific component added to the product, and don't wish to sit tight an additional two years for the designers to think of it, you can simply contribute yourself.

Speed :
For the most part, web coding enables you to find issues and address them faster, compared to offline coding. A webbased IDE can help you code and send your applications and sites swiftly from anywhere to anyone. This way, it improves the speed of the development workflow.

No System Constraints :
You needn't bother with a megaton of RAM or superpower processor speeds in order to take a shot with an Online code editor. The lack of hardware constraints makes this type of coding much more agile and accessible. Furthermore, it reduces maintenance expenses and minimizes other technical issues that may create setbacks.

No Operating System Issues :
Windows, Mac, or Linux, regardless of which OS you are on, at the end of the day, it is your web program and it will not cause any operating system issues

WHAT ARE THE DRAWBACKS OF ONLINE CODE EDITOR?

• Online code editor and code editors are dependent on your internet connection. Although you can get Wi-Fi or mobile networks pretty much anywhere nowadays, there is still a risk that you find yourself cuffed by the absence of features.

• While this is easy to refute, some engineers feel that online code editors are good only for HTML and CSS and small to medium-sized projects. Any greater venture including a lot of complex code may gag the life out of an online code editor. If your project is too vast, utilizing an online code editor would bring about a great deal of data exchange and handling, and an offline option will plainly be more practical for this reason.

CONCLUSION
Conclusions and Future Work Through much time and effort, we have successfully created a full stack web application for online programming, built with MARN stack . This application is used for online coding. After selecting the programming language, you can start to write code. Below are the highlighted features.

1 Five programming languages are supported, including C, C++, java, JavaScript and python.

2 Syntax highlighting for different languages.

3 Compilation and execution are supported. The proper result or error message will be displayed.

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