IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, May 2022
Impact Factor: 6.252

Online IDE for Web Based Learning

Prajyot Burbure[1], Shreyash Mohod[2], Om Sonone[3], Sanket Tikar[4], Faizan Khandwani[5]
Project Group Leader, Department of Information Technology[1]
Project Group Member, Department of Information Technology[2, 3, 4]
Project Guide and Assistant Professor, Department of Information Technology[1]
Shri Sant Gajanan Maharaj College of Engineering, Shegaon, Maharashtra, India

Abstract: *A atmosphere of program-based mobility could have numerous advantages. For instance, a substantial online application is wanted, and the client needs persuading clarification to finish difficult. instrument installation and update procedures. This project will also eliminate the need for expensive and imaginative standard programming equipment's, such as workspaces or workstations, because clients can do so with the help of our foundation Cloud IDE, which requires only a working web affiliation and a standard web program and is accessible on a variety of devices, including phones, tablets, and computers. With security layers, denial of unauthorized access, and data debasement, the stage will be completely safe. In this paper we present a web-Application, Website utilizing which IT jobseeker's/understudies will actually want to rehearse information construction and calculation in organized and proficient way. Site will comprise of an IDE(Integrated Development Environment) utilizing which individuals will run their program(related to DSA) in any dialects like java, c/c++, Go and JavaScript and so on..*

Keywords: Multi Language Cloud IDE, E-Mentoring, Online Learning Platform, Data Structures and Algorithms

I. INTRODUCTION

Site will comprise of three significant parts. Initial one is all the problems(related to DSA) statements and test-cases related with the issue for that we need to make a Database which comprises of all information that is connected with that problem, and second one comprise of IDE(Integrated Development Environment) which will compile code in various languages(like C/C++ ,Java, Go, JavaScript and so forth) for that we gone use Joodle/Sphere api service to get the results in various languages , and third one comprise of data of client structure site. datalike how many problems are solved by the user and what contributions are made by the user and what blogs are published by the user.

Cloud Based Integrated Development Environment

On a more fundamental level, IDEs provide customers with interfaces via which they may write code, coordinate message groupings, and automate programming redundancies. IDEs, on the other hand, combine the benefits of several programming methods into a single package. Some IDEs are focused on a single programming language, such as Python or Java, while many are multilingual. When it comes to content editing, IDEs often include or allow the insertion of structures and component libraries to extend base-level code. Throughout the creative process, one or more clients create progressive systems in the IDE and distribute code to their designated district. Groupings can be strung together, gathered, and constructed from these. Most IDEs come with built-in debuggers that operate on the form. Visual debuggers are a valuable feature of many IDEs. Clients are shown which sections of code have difficulties if any bugs or errors are found.

Advantages of Integrated Development Environments

There are several reasons to use an IDE, the most of them are on programming development. Most engineers use source code editors, debuggers, and compilers; therefore, this step puts them all together. This allows users to write, test, and cycle code in a single environment..

Bringing together these instruments likewise makes it simpler to explore the source code being referred to. Many incorporate extra capacities to test, put together and refactor code. Extra highlights, for example, autocomplete, alongside construct and arrangement capacities, fundamentally extend a designer's abilities and further develop their improvement speed.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, May 2022
Impact Factor: 6.252

The board's improved association and source code can reduce errors and enhance turnaround time. After the forms are completed, clients can calibrate the apps. In the event that they need to return a software, they can typically save versions of it. In the end, organizations use their built-in rendition control system to examine in and sections of the program from their code archive. Finally, once all projects have been changed and the application is performing as expected, the project may be packaged and transmitted from either the IDE or another integrated tool.

IDE Common Features

- **Text editor:** Almost every IDE will feature a content tool for composing and controlling source code. While some devices offer visual components for moving front-end components, the majority have a simple connection point with language-specific syntax highlighting.
- **Debugger:** Clients can use debugging tools to identify and correct errors in source code. They routinely reproduce real-life scenarios to evaluate its utility and implementation. Before the application is released, developers and programs may typically test different sections of code and identify errors.
- **Compiler:** Compilers are components that convert a programming language into a machine-processable format, such as binary code. To ensure that the machine code is accurate, it is inspected. The compiler then optimizes the code by parsing and improving it.
- **Code completion:** Software programs benefit from code complete capabilities because they intelligently recognize and incorporate regular code components. These features save engineers time while writing code and reduce the likelihood of grammatical errors and defects.
- **Programming language support:** Although the majority of IDEs are developed for a single programming language, a few do support several languages. The first step in this capacity is to choose which languages you'll be programming in and narrow down your IDE selections accordingly. Examples are Ruby, Python, and Java IDE instruments.

II. LITERATURE SURVEY

We have studied and surveyed several documents and research papers that are associated with our problem statement.

Automated Source Code Generation and Auto-Completion Using Deep Learning: Comparing and Discussing Current Language Model-Related Approaches.' by Sanjay Vishwakarma, Juan Cruz-Benito, Francisco Martin-Fernandez. This paper tells us Some products and research initiatives promise to be able to generate language that can be read as human writing, opening up new possibilities in a variety of fields. The processing of programming languages is one of the more famous applications of this form of modelling among the several domains related to language processing. For years, the Machine Learning community has been investigating Big Code, with goals such as using various ways to auto-complete produce, correct, or analyze code written by humans. The usage of Deep-Learning-enabled language models is one of the ways used in recent years to achieve these goals. Given the growing popularity of this strategy, we discovered a dearth of empirical articles comparing various methodologies and deep learning architectures for creating and using language models based on computer code. We evaluate alternative neural network (NN) architectures, such as AWD-LSTMs, AWD-QRNNs, and Transformer, while applying transfer learning and different tokenization to observe how they behave in generating language models using a Python dataset for code generation and filling mask tasks in this research. We explore the many merits and disadvantages of each approach and strategy, as well as the gaps we discover in evaluating language models or applying them in a real-world programming scenario with humans-in-the-loop." [1]

Report on Automatic Code Completion (get details and analysis about code completion)' by Chu Luo This report gives a historical overview on Automatic code completion, it has become a prominent topic in software engineering over the last 10 years. Various ways to automatic code completion are offered in order to make code reuse easier. This paper provides a timeline of automatic code completion. This report examines five exemplary automatic code completion articles in order to assess current research findings. Relevant structural models and machine learning techniques are provided and compared in these publications based on various hypotheses. This report then assesses the feasibility and validity of these articles' research techniques using objective tests and user studies. The results suggest that these research methods are effective, however there are several critical flaws, such as limited sample sizes and ignoring user studies." [2]

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, May 2022
Impact Factor: 6.252

Application of the Online Judge Technology in Programming Experimental Teaching' by Hua Zhang, Miao Zhang, Fan-chao Meng, Xue-quan Zhou, Dian-hui Chu. The Experimental instructor of Programming courses has a difficult and overburdened work of code validation. To address this issue, an online judging-based experimental education platform with functionalities such as online arrangement experiment for teachers, online coding, and automatic assessment for students has been developed. The use of online judge technology in the experimental teaching of data structure and other courses not only improves students' problem-solving abilities, but also assists teachers in quickly and accurately reviewing experiments, greatly reducing teachers' workload and clearly improving the quality of experimental teaching." [3]

Online Compiler as a Cloud Service' by Arjun Datta, Arnab Kumar Paul. Many compilers must be installed on the same machine to compile programs in multiple languages at the same time. The goal of this work is to solve the problem of compiler storage and portability. The user must submit the program into the user interface supplied without needing to install any compiler. Depending on the load on the backend compilers, the controller will decide which compiler server the program should be allocated to compile. The program will be compiled and run by the compiler server. After then, the user receives the output. Calculating the entire reaction time of the programs in both serial and parallel program allocation to compilation tier also tests the controller's load distribution." [4]

Research paper on compiler on cloud' by Ansari Mohd. Arshad, Khan Arshiya, Shaikh Sana, Mirza Zainab. Clouds have emerged as a computing infrastructure that enables rapid delivery of computing resources in scalable and virtualized manner. Cloud computing is delivery of computing resources as a service rather than a product, whereby shared resources, software and information are provided to computers and other devices over a network (typically the Internet).We explore the Cloud Computing area and evaluate several of its capabilities by developing a web based application for compilation of codes written in different languages like Java, C++, C# etc. by deploying the compilers of these languages on a private cloud. This application reduces the problems of portability and storage space by making use of the concept of cloud computing. Moreover, a web- based application can be used remotely throughout any network connection and it is platform independent." [5]

III. STATEMENT

- On all the current online website we observed that the content is not available in structured manner.
- If someone wants to learn some kind of data structure like graph so right now, we don't have the data in structured format (like firstly notations then Analysis then recurrence relations next divide and conquer etc.)
- So, by the help of our website students will able to learn and Practice problems related to graph and Data Structures and Algorithms topics in structured Manner.
- At first, we should start with Data Structures and Algorithms; later on, we will include topic like OOPS, problem solving, DBMS etc.

IV. IMPLEMENTATION

The illustrator/online judge and the user can communicate computer code over the web browser, which was produced utilising web technologies. If a user in an online programming course needs assistance with code errors, the illustrator/online judge can start an online IDE session, and the user can join to exchange code. The processes for building and starting an IDE session are shown in Figure 1.

The online judge begins by creating a new session with the Set-Session function. This function will preserve session information such the online judge ID, user ID, session ID, shared code storage location, session time, and session status (open or closed). After saving the session ID, the SetSession method will open a code editor for the teacher.

The session ID can then be sent by the online judge to the individual who sought assistance. After obtaining the session ID, the user can enter the session by validating the student and session ID with the SessionEntry function. After the verification, the SessionEntry method will open the code editor in the same session as the online judge. The online IDE session may be used in one of two ways after both participants have entered it. The first is that the student may enter the code into the editor, and the website will flag any incorrect areas of the code and offer suggestions on how to fix them.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, May 2022
Impact Factor: 6.252

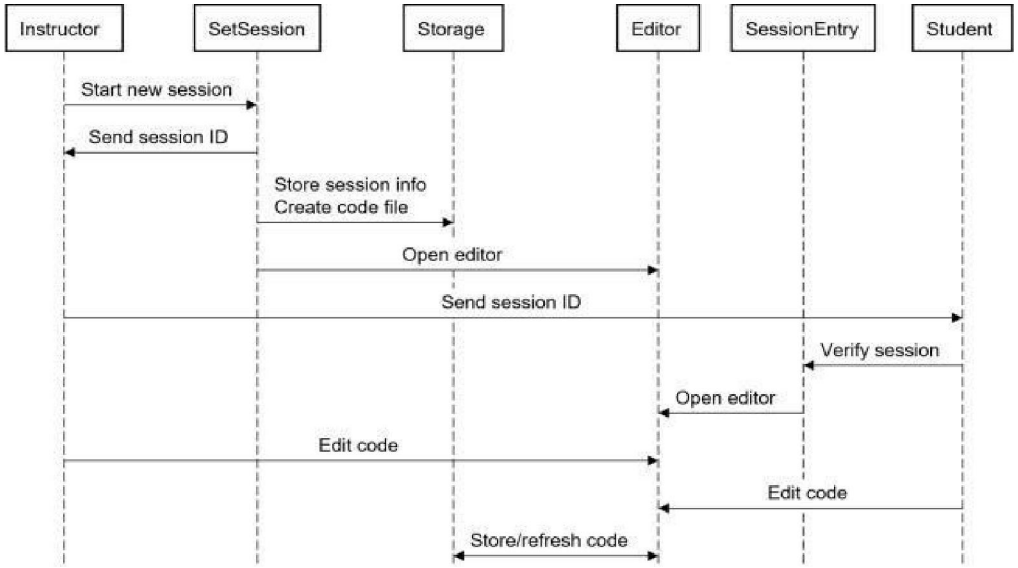

Fig 1. Sequence Diagram for creating a new session

The second option is for an online instructor to offer a student an example code via an editor in order to explain the query. Via order to promote successful code sharing in an online IDE, a messenger module is being developed for real-time code changes and code marking alerts. Figure 2 depicts the sequence diagram.

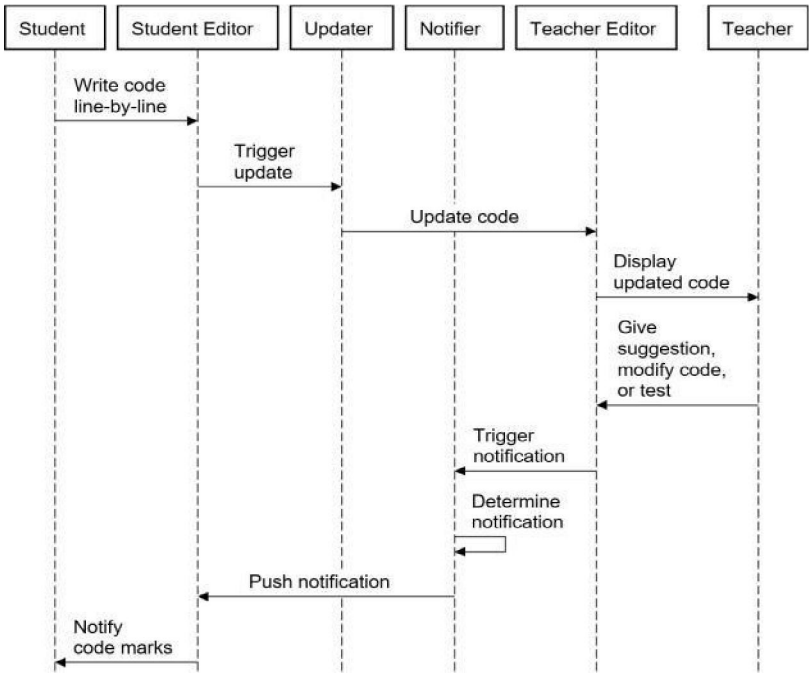

Fig 2. Sequence Diagram for automatic code update and notification

After each line of code written by the user, the code change is automatically executed. The Updater function will be called by the user frontend ide to update the code in the online judge. In addition, the online judge can do things like mark the wrong code, make suggestions, and test the program for compilation and execution with input data.

The Notifier function will detect the type of activity for each of the activities and display the appropriate notice as an alert box in the user Editor. By confirming the notice, the student may verify for changes such as marked code, compiled results, and execution output. The code is updated often. Save and send code (1), refresh the code editor (2), ask and answer

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, May 2022
Impact Factor: 6.252

questions (3), compile the program (4) to check the syntax (5), create sample input data (6) to execute the program (7), check the output of the execution (8), submit the code to the online judge (9), download the source code file (10) and close the IDE session (11).

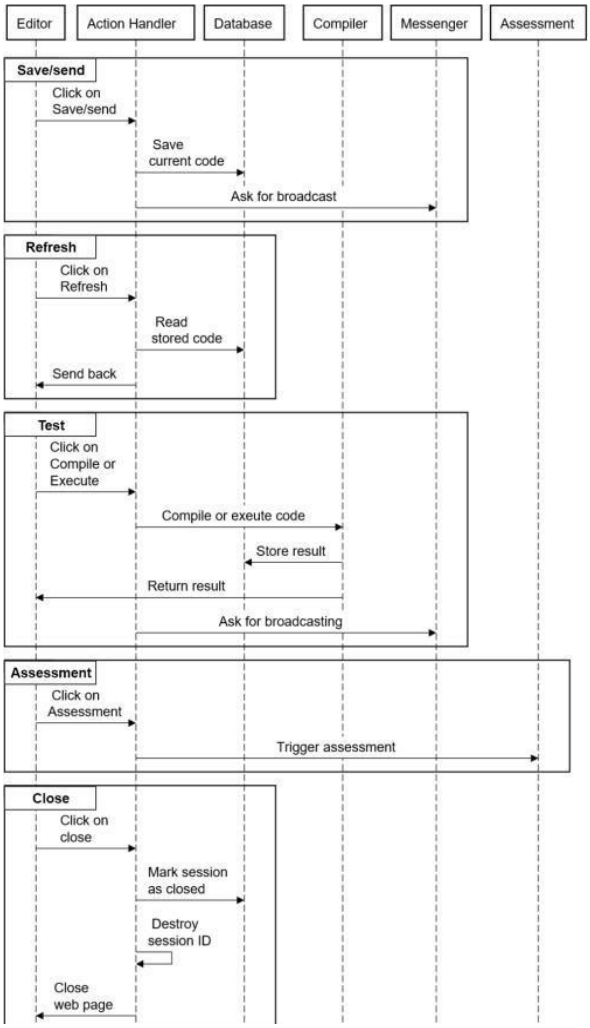

Figure 3: Sequence diagram for action Handling

Figure 3 depicts how the IDE handles actions involving multiple modules. After hitting the Save/Send button, the Action handler saves the code in the editor into the system database. Following that, the handler sends a message to the messenger module, which publishes the changes.

The handler analyses the stored code from the database when the Refresh button is pushed to determine if the other participant's code has changed. In the second, the handler returns the code to the editor.

Before testing, the code should be compiled and run. The code in the editor is transmitted to the back-end compiler when you click the Compile button, and the result of the compilation is returned to the editor.

After the Execution button is pressed, the code including the input data written by the participants will be run, and the output will be returned back to the editor. Both the compilation and execution results will be conveyed to the other participant through notification. Once the Submit option for assessment is pressed, the code in the editor will be sent to the online judge for a correctness check. Because this operation launches the judging system as an external module, the accuracy check feedback will be delivered on the newly launched assessment web page. The handler ends the current session in the database before removing the session ID from the browser cookie when the Close button is pushed. The handler shuts the editor and exits the IDE in the second.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, May 2022
Impact Factor: 6.252

V. CONCLUSION

The paper presents a web-Application, fully functional Website utilizing which IT jobseeker's/understudies will actually want to rehearse information construction and calculation in organized and proficient way. Site will comprise of an IDE(Integrated Development Environment) utilizing which individuals will run their program(related to DSA) in any dialects like java, c/c++, Go and JavaScript and so on.

REFERENCES

[1]. Code-Helper: A Web-Based Lightweight IDE for E-Mentoring in Online Programming Courses by Xiao Liu from Department of Information Convergence Engineering Pusan National University Busan, Republic of Korea and Gyun Woo Department of Information Convergence Engineering Pusan National University Busan, Republic of Korea.

[2]. CIRANO: An integrated programming environment for multi-tier cloud-based applications by George Fylaktopoulos, Georgios Goumas.

[3]. Robbes, Romain, and Michele Lanza. "Improving code completion with program history." Automated Software Engineering 17.2 (2018): 181- 212.

[4]. Online Code Compilation using Cloud Computing Jasmeet Chhabra, Shubham Bhatia, Vaibhav Kamal Nigam, Rashik Bhasin.

[5]. Improved Interaction in Web-Based Cloud IDE Rajesh Hegde, Karunakara K.

[6]. Integrated Development Environment as a Service (IDEaaS) - Models and Architecture part of the Google Cloud Core Services Orges Cico Canadian Institute of Technology Rr. Andon Zako Cajupi, Zayed Center, Tirana, Albania Zamir Dika South East European Univeristy SEEU, Ilindenska 335, Tetovo 1200, Macedonia (FYROM).

[7]. RESTful API Automated Test Case Generation Andrea Arcuri Westerdals Oslo ACT, Oslo, Norway and SnT, University of Luxembourg, Luxembourg.

[8]. Web Based Integrated Development Environment Mala Dutta, Kamal K Sethi, Ajay Khatri. IJITEE: ISSN: 2278-3075, Volume-3, Issue-10, March 2018.