

ONLINE COMPILER USING CLOUD COMPUTING

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ABSTRACT

In today's fast and competitive world everything is available on internet, and on web. So, we developed an online compiler using cloud computing. The main objective of this project is to develop a centralized compiler that helps to reduce problems like portability storage, cost, and space. It is the most convenient tool to compile code, remove errors and debug code. Moreover, we can run the web-based application remotely from any network connection that is independent of platform. The challenge of installing a compiler on each machine is also avoided and therefore, these all benefits make this application suitable of cloud based online compiler make it suitable for performing online exams.

I. INTRODUCTION

The idea for the Online Compiler came out of a need for a tool to give a successful use of web-based interface to compilers. A compiler physically requires a lot of space and time to manually configure and install on each system. Although all necessary software is installed in user's computer, most users prefer to work on their computers at home or workplace and connect to the organization network. That situation creates unnecessary burden either for the network administrators who must install additional software on many machines of non-standard configuration, or in case of students who must purchase and install on their own several software packages along their full course of study.

When a program is compiled, it becomes platform dependent. Evidently, it is also not easy to carry the same program code to multiple machines if it does not permit the usage of a single system. Another drawback reveals that we would need to install different compilers for different programming languages on which its task is desired. These challenges impose the online compiler for multiple programming languages. To solve the problem at least partially in the area of programming,

we proposed an approach of online compiler using cloud computing which allows the programmer to compile and store their code online. They can also create, open, save, share, and delete their source and compiled code based on online.

In this project, we are including most demanding programming language compilers by the software developers mainly C, C++, Python, Java and C-Sharp. This web-based software will contain a system that has a text editor and terminal. The user would be given an option to select the languages in which he/she wants to write the source code and compile it. The software compiles the program and returns the output to the users.

II. LITERATURE REVIEW

Following research papers are the few of the research paper where we discovered the literature related to cloud compiler of different languages and are described below.

A. Science of Computer Programming: The basic concept of compiler is to produce machine understandable code from the human readable code (source Code). Even though the source code is free of syntax errors and compiler is generated successfully, it may still not do what is expected to do. Therefore, we must create test inputs for finding semantic errors while applying the inputs to the compiler for target expectation.

B. Multi-language cloud-based compiler: The author primarily focused on the compiler which executes the codes written in multiple languages. Traditionally you must install the compiler in the system for respective language and then execute the code.

Compiler for the languages are provided by the cloud because it is a centralized compiler. Everyone loves to get work done faster without spending money and without losing much space. The author made it all

possible by centralized compiler by saving the time and work of installing the compiler on the physical machine.

The portability is the main intention of the product. The web application can be supported by all the browser, so the developer has to use such libraries, files, and tools. The cloud compiler must provide the compatible platform to compile and execute the code in any browser with respect to the necessary constraints and dependencies.

III. PROJECT REQUIREMENTS

A. Functional Requirements:

- The primary function of the system is to take the code and the input from the user for compilation.
- Users must select the compiler in which he wants to compile the code.
- After compilation, it returns the appropriate output if the code is executed successfully.
- Error message will be displayed if there is an error while compiling the code.

B. Usability Requirements:

- User interface will be used to compile the code as well as give the input to the code.
- The output window will be used to display the output of the compiled code.
- The login and registration are not required to compile the code
- If the user wants to share the code or to create and save the project, the user must register.

C. Technical Requirements:

- The compiler is a web-based compiler and so user interface will also be web based.
- Web-based application would be developed in JavaScript where the backend of the application which is the compiler will be deployed in the cloud.
- The backend will be built in the docker containers where the individual languages will have individual containers, and once the compiler is requested, the container will be allocated, and the container will be destroyed until the work is done.
- The plugins of the compiler are going to be used in the container for the compilation.
- Database connectivity is required when a unique identification is created for registration of the system and when user create, open, and delete the existed project in the system.

- The SQL database is going to be used where the schema is based on the information required.
- The User DB is storing the registration and login data.
- The Access DB and project DB is going to be accessed by the File Module for the access to the stored projects and files. Logs DB will be storing the logs of logins, logout, sharing, creating projects, Deleting projects etc.

IV. SOFTWARE REQUIREMENTS

A. Python Flask: Flask is a web framework written in Python. It does not require any tools or libraries. Hence, it is considered as microframework. It has no database abstraction layer, type validation, or any other components where common functions are given by pre-existing third-party libraries. We will be developing our webapp using Python Flask with HTML and CSS for front-end. We are going to import the programming language plugins for the compilation of the code in Flask.

B. Google Cloud Platform: Google Cloud Platform (GCP), offered by Google, is a suite of cloud computing services that run on the same infrastructure that Google uses internally for its end-user products, such as Google Search, Gmail, file storage and YouTube. It offers a variety of modular cloud services, including computing, data storage, data processing, and machine learning in addition to a set of management tools. In this project, we will use GCP to create containers in which our webapp will be hosted. As the number of connections to the webapp exceeds the limit, new container will be automatically created to handle the connections.

C. MySQL: MySQL is an open source relational database management system (RDBMS). A relational database organizes information into one or more data tables in which data types may be connected to each other, helping to arrange the information. (RDBMS). A relational database organizes information into one or more data tables in which data types may be connected to each other, helping to arrange the information. We are going to use MySQL as our primary database. We will use it primarily to store codes and project files. In addition, we will use it to store registration and authentication data. Also, we will be creating tables for storing logs of the user activities.

V. SYSTEM ARCHITECTURE

An architecture of our implementation of the Online Compiler using Cloud Computing model is a prosperous and specific diagram, formed using to be had standards,

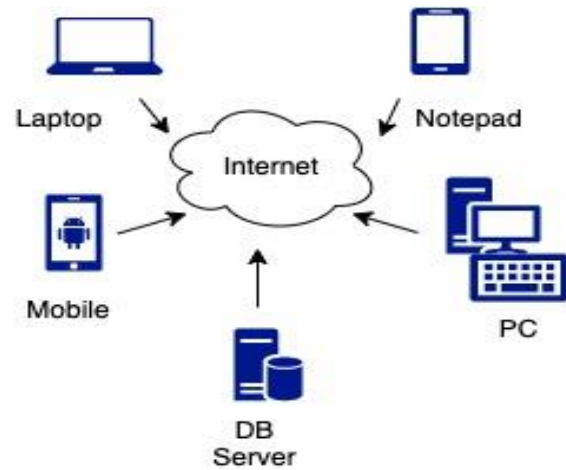
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Following are the modules used in this system:

- **Coding Module:** User can perform various operations like create, delete, upload the source code. GUI/IDE is provided to the user for coding.

- **Compilation module:** In this module, user compiles, debug and run his/her program.

Cloud assemblies have digital compilation or built in the non-public cloud or externally hosted, promising digital compilation for all cloud computing assistance. Using cloud technology, clients using already present compilers, if getting rid of unneeded software program exemption from their circumstances. With no open financing, clients who set up Cloud compile compiler to decrease their month-to-month prices with the aid of using 50%, throughout the time accomplish extra structures controls, improved flexibleness, and the competence to quickly scale with minimum knowledge.



In Compilers, Cloud customers ought to now no longer download the compilers and upgrade the numerous instances of their systems. So that it enables us to investigate a couple of compilers, smooth to use. Using a software program as a provider can offer a couple of compilers together with C/ C ++, Java and python, etc. It gives online help, and error messages, and debug applications for consumer convenience.

A common front end is used for all compilers in the form of a HTML page. This HTML page allows for selecting a language in which the user wants to compile his code. User uses manual writing or copy and paste commands to enter the source code into the compiler front end.

There is a drop-down menu located at the top of the page, using that menu we can change the programming language. Currently, the Online Compiler's package supports C, C++, C#, Java, and Python languages.

The process of compilation is performed after setting the desired language option and pasting the source code into the appropriate text area. The user must press the **COMPILE** button which is in the middle of the two text areas. As a result, the user can see the compiled code in the second text area.

After successful compilation, user can share his code by clicking on the share button in the menu bar. It will create a sharable link which user can send to anyone.

Everybody can inspect and utilize the Online Compiler by visiting the web site. There is no need for registration if the user wants to only compile his code. Any user can access the web site and compile/debug his code. If the user wants to save his code online, only then he must register. By doing this, the user can save his source code and access the previous compiled source codes associated with his account.

VIII. CONCLUSION

Thus, we have shown that how our project can be used to eliminate the necessity of a separate compiler for every other language the user wants to compile and run. Another benefit of such a project is that if the compiler package is to be updated it can be easily achieved without installing it again on each machine. It also helps user to integrate the code and eliminate the errors on our application itself.

IX. FUTURE SCOPE

- **Including more compilers:** The application can be added with more compiling abilities for other languages such as COBOL, C#, FORTRAN etc.
- **Shared editing:** Multiple people can work on a single project using this application in a simple way.
- **Including meter for efficiency:** The application can specify the user about the complexity of the code which will enhance their coding skills.
- **Providing security:** Security is a major concern on online platform. Security measures can be improved to keep the user data safe from any malicious activities.

X. REFERENCES

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