

Hybrid Smart Compiler Using Cloud Computing

Sejal Atul Kadam, Verma Yashika Anil, Shaikh Anam Parvez, Sayali Avinash Bhavsar,

Name of Department: Information Technology,

Name of organization: Nashik District Maratha Vidya Prasarak Samaj's Karmaveer Adv. Baburao Ganpatrao Thakare College of Engineering, Nashik, India

Abstract— Cloud has emerged as a computing infrastructure that enables rapid delivery of computing resources in scalable and virtualized manner. In today's era, organization of system with compiler installed, unavailability of highly configured system to run the program, necessary resources needed such as OS and plugins are not available. To resolve these issue we come across the need of online compiler nested in cloud which can compile the code online and which can be accessed from any device, no high configuration is required and multiple language can be used in single platform. The ability to use different compilers allows the programmer to pick up faster or the most convenient tool to compile the code. The study evaluates its multidimensional capabilities by developing a web based application for compilation and conversion of codes written in different language like Java, Python and C++ etc.

Index Terms—Cloud Computing, Online Compiler, Online Converter

I. INTRODUCTION

Compilers are used to run program and convert them from a text format to executable format. A compiler that is to be installed manually on every system physically requires a lot of space and also need to be configured and installed. When a program is compiled it becomes platform dependent. It is also not easy to carry the same program code to multiple systems if situation doesn't permit the usage of a single system. Another drawback reveals that we would need to install a different complier on each language on which is desired task. These challenges imposes the study of the online compiler for multiple languages.

A. Cloud Computing

Cloud Computing is an internet based computing where the consumers are provided with resource like high performance computation, power, storage, security, development environment, software, on demand usage, memory bandwidth etc.

National Institute of Standards and Technology (NIST) defined that "Cloud computing is a model for enabling ubiquitous, convenient, on demand network access to shared pool of configurable computing resources like networks, servers, storage, applications and services that can be rapidly provisioned and released with the minimal management effort or service provided interaction".

Cloud Computing is broadly classified into three services namely: "Software as a Service", "Platform as a service" and "Infrastructure as a service".

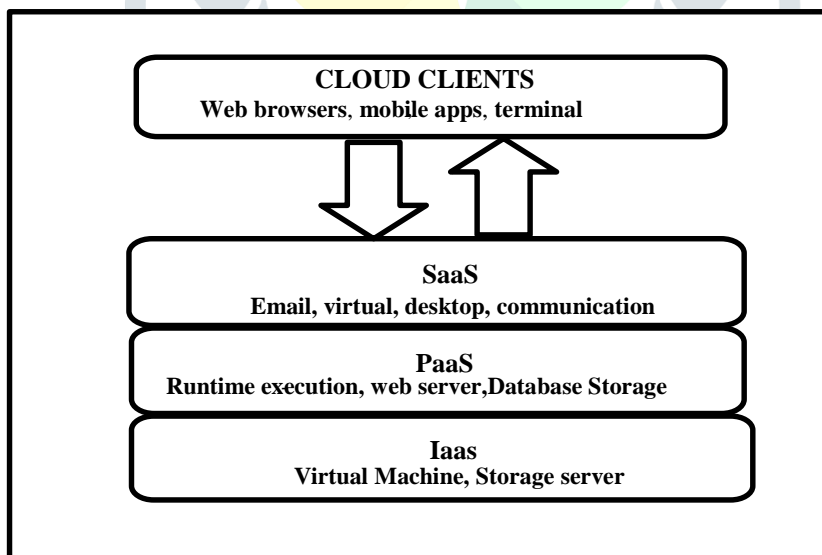


Fig. 1. Types of models in cloud

B. Compiler

Compiler is software that converts the source code into object code it convert the high-level language to low-level, machine level language. Compiler converts the source code, object code or assembly language into executable files. Following are classes of compiler .

1. *Native Code Compiler:* This compiler costumed to compile a source code for identical type of platform only.
2. *Cross Compiler:* The Cross compiler is mainly used to compile the object code for the different type of platform.
3. *Source to source Compiler:* The compiler that proceeds high-level scripts as input and output source script of another high-level.

II. MOTIVATION

In today's world, everything is on web. Everyone can use a services online, instead of storing data on hard disk. But still the organizations buys licensed software of compiler and it should be manually installed on every system. Some companies even buy the server and database to store the data. Due to this, project estimation cost of company increases. The project cost can be reduced with use of cloud and its services. There are many online complier available today but none of those give storage facilities. They can convert the code from one programming language to another but the code converter for widely used programming languages such as python, R language, Perl etc. are not available online. In this research work, we proposed an approach of online compiler which allows user to compile their code online and to store their code. They can also create, save, open, update, delete, their source code and compile code. The proposed approach transforms source code from a higher level language to a lower, machine level language. This is preferably done in order to create executable files which can then be run in order to execute the program and its instructions. The users can even convert the source code from one programming language into another.

III. LITERATURE SURVEY:

Sr.No	Published Year	Author Name	Paper Title	Limitations	Our Advantages
1	02, Feb 2017	Shubham Chourasiya, Sneha Gadhawe, Renuka Kulthe, Tushar Bhatt	Online Java Compiler with security editor	It can only compile java language	We can add C language in it for compilation.
2	09, Aug 2016	Nishant Rao, Dr.P.Jayanthi,Ketan Ketu	A cloud based java compiler for smart devices	Compiles java language for smart devices only.	We can add different languages for smart devices.
3	29, April 2015	Parag Chaudhari, Ritesh Manjarkar, Akhilesh Kulkarni, Sawre Vellaswami	Multi-Language Cloud Based Compiler	Need more dependencies	Needs low dependencies.
4	20, Jun 2014	Arjun Datta, Arnab Kumar Paul	Online Compiler as a Cloud-Service	It supports only C++ language	We can add other languages.
5	09, Sep 2013	Anari Mohd Arshad, Khan Arshiys, Shaikh Sana,Mirza Zainab	Complier On Cloud	It has single platform.	It supports multiple platform.
6	23, Nov 2013	Sajid Abdulla, Srinivasan Iyer,Sanjay Kutty	Cloud based Compiler	It supports limited libraries.	We can merge more libraries.
7	2011	Aamir Nizam Ansari, Siddhart Patil, Arundhati Navada, Aditya Peshave, Venkatesh Borole	Online C/C++ Compiler Using Cloud Computing	It compiles C and C++ language only.	We can add Java language.

IV. MATHEMATICAL EXPRESSION:

1. $U = \{S, I, O, \emptyset, \infty\}$
2. $S = \{M1, M2, M3, M4, M5, M6, M7\}$
Where,
M1=Master, M2=Learn programming module, M3=Report a bug module, M4=Registration module, M5=Login module, M6=Compilation module, M7=Conversion module
3. $I = \{I1, I2, I3\}$
Where,
I1=C, I2=C++, I3=Java
4. $O = \{O1, O2, O3\}$
Where,
O1=C, O2=C++, O3=Java
5. Time complexity
Best case= $O(n)$
Worst case= $O(\infty)$
Average case= $O(n/2)$

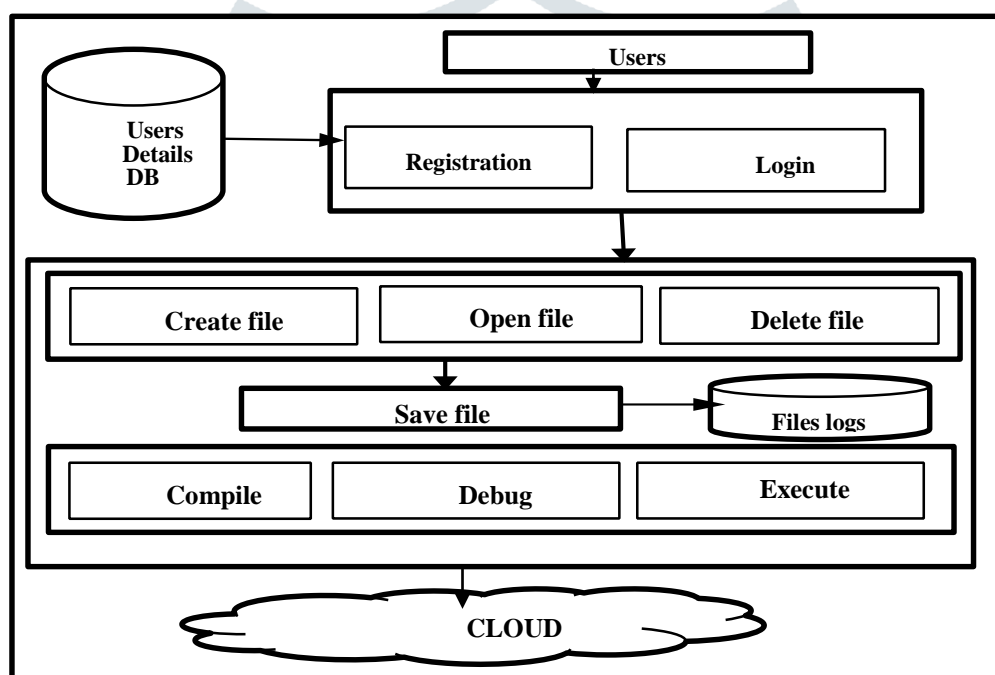
V. SYSTEM DIAGRAM:

Fig. 2. System design of Online Compiler

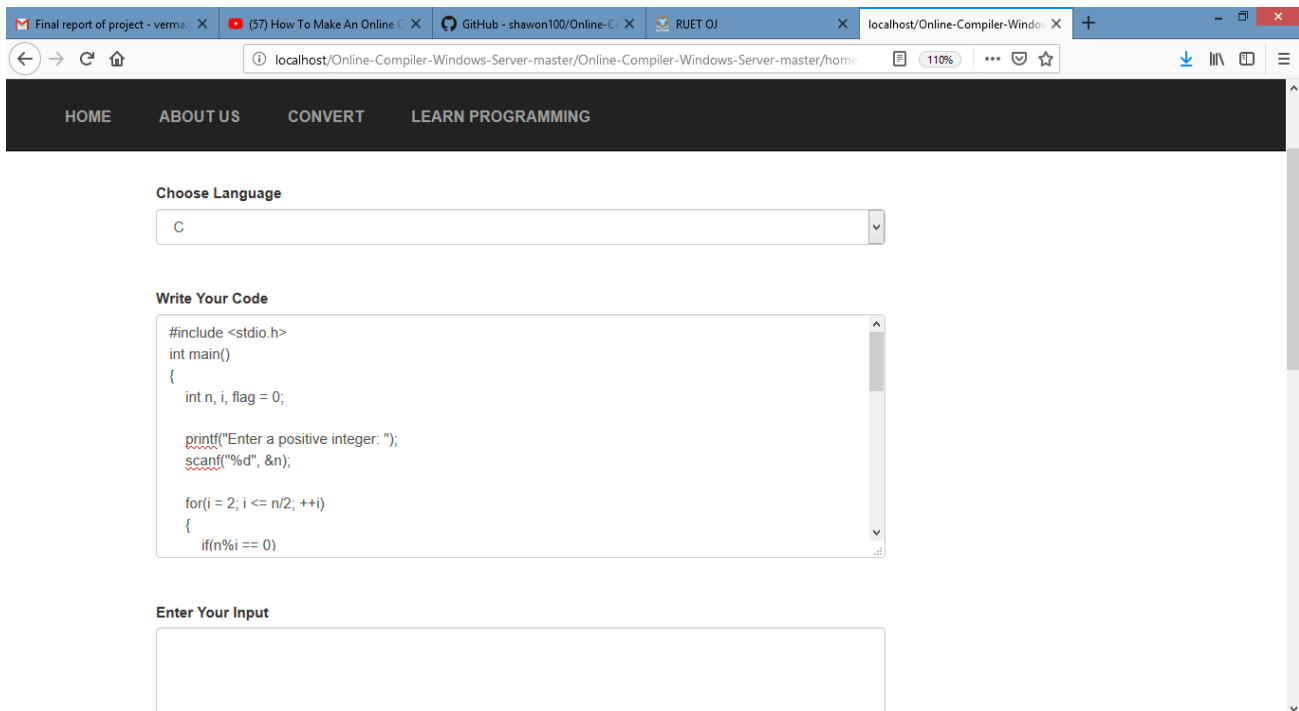
WORKING

In the above fig of system architecture it illustrate that there are different services where one can go with the procedure.

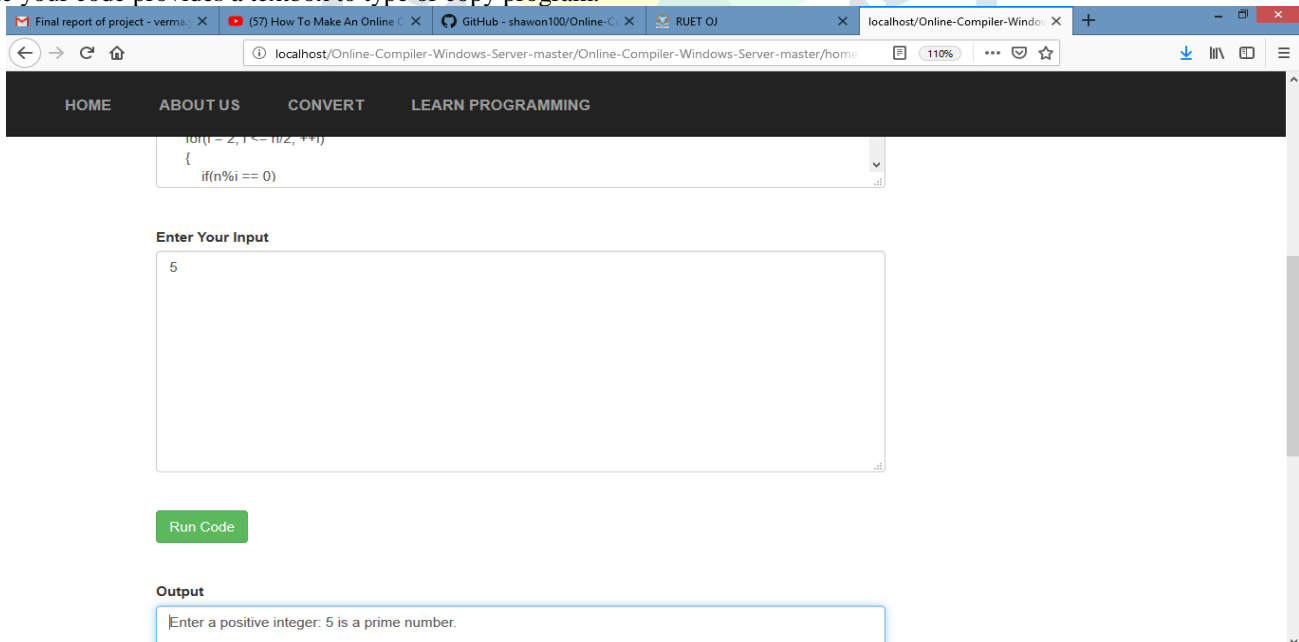
- User detail database: The database is used to save the abundant amount of data of distinct users. It maintain the records and store the detail information regarding the users in a wide capacity. It's help to identify the detail of particular user who is authorized and can easily retrieve the data.
- Registration and login: Here if the user are not registered for the particular software then one must have to register their selves by filling the form of registration. After the successful registration the user will get the access to write the program as per there convenient. If the user is already a registered user than he/she must login into there account by means of user id and password.
- Create file, open file and delete file: After the successful login into the software the user will have the option to create the file where one must create the file for writing the source code into file. If the user wants to open the file from its desktop or from any other directory the user have the open file option where they can browse there file directly. If user is intend to delete the particular file if he/she wants then by using delete option the file will get deleted.
- Compile: A compiler is a computer program that transforms computer code written in one programming language (the source language) into another programming language (the target language). Compilers are a type of translator that support digital devices, primarily computers. The name compiler is primarily used for programs that translate source code from a high-level programming language to a lower level language to create an executable program. The user will write the program and compile to check whether the program exists errors or not. If yes ,then user will get a message of error and if No error the program will run successfully.

- Debug: Debugging is the process of finding and resolving defects or problems within a computer program that prevent correct operation of computer software or a system. this will help the user to find out the errors in a program.
- Convert: The convert is use to convert the one language code(C language) into another multiple language codes(C++ language, python language). This happens as per the users wish if particular user is unaware about the python language but he/she knows the C language then the user will write the code in C language and the user will select the convert option where there are multiple options. The user will select python language and hence he will get the converted code of python language.

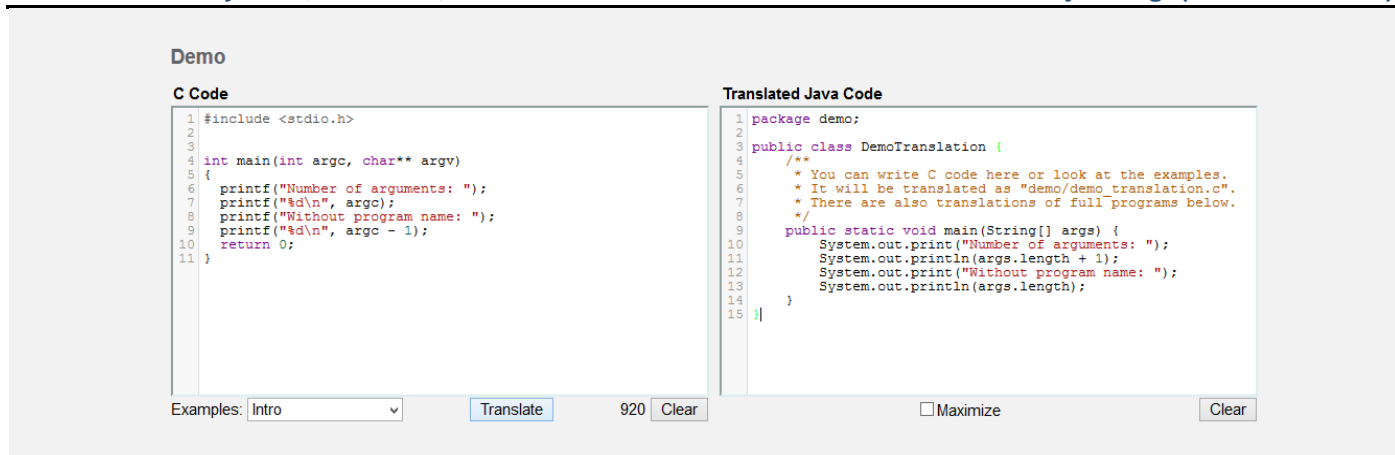
VI. RESULTS:



This above snapshot describes how one language is compiled. A dropdown list is provided which shows languages to choose. The write your code provides a textbox to type or copy program.



In this snapshot input can be given to a particular program if needed. The output textbox gives desired output of the program.



The above snapshot show the conversion of C programming language to java programming language by using translate button.

VII. ANALYSIS:

7.1. RESEARCH GAP:

1. Some of the compilers that we have studied are simple and offline which may need more time and space.
2. In some compilers only one language is been compiled which may not be cost effective.
3. In offline compilers security can be found as an issues which may give a trouble in compiling programs.
4. The compilers for smart devices includes only one language Java for compiling programs.
5. The ability to convert the code of one language to multiple language.
6. All the studied compilers are not much user friendly so there is a need to provide a system which may be compatible for users to use.

7.2 COMPARATIVE ANALYSIS:

Table no1 gives comparative analysis of various online compilers which we have studied by considering various query type such as which languages are compiled by all studied compiler. Services used for constructing different compilers using of cloud. Services used for constructing different compilers using of cloud. The storage facilities provided by cloud. The efficiency of all compilers by considering factors such as total time consumption, accuracy, Performance, security etc.

Proposal	Language Compiler				Cloud Services used		Storage Provided	Performance	Execution Speed	Security	Architecture/ Approach/ Algorithm Used
	C	C++	Java	Python	SaaS	PaaS					
SAJ 13	N	Y	Y	N	Y	N	Y	M	H	H	Service Oriented Architecture
ANA 13	Y	Y	Y	N	Y	N	Y	M	M	L	Integrated Development Environment (IDE)
ARJ 14	Y	Y	Y	N	Y	N	N	H	H	L	Multithread approach
PAR 15	Y	Y	Y	Y	Y	N	Y	M	H	H	Service Oriented architecture
SHU 17	N	N	Y	N	NA	NA	N	M	M	H	MD5 Algorithm
AAR 18	N	N	Y	N	Y	N	Y	M	H	H	Service Oriented architecture

How to read table, in proposal are the given reference, and N represents no whereas Y represents Yes and H, M, L for high, medium, low respectively.

TABLE NO: 1. COMPARATIVE ANALYSIS OF ALL ONLINE COMPILER

VIII. CONCLUSION

Thus by referring all the papers we came to the conclusion that there are many compilers those compile various programming language code into other but only one language is been compiled to another. Some of them requires centralized compiling scheme. Every Compiler is needed to be installed on the individual system in order to compile the code. Which results into wastage of memory. Few Compiler we studied are online but can compile only one particular programming language. Thus we proposed a smart hybrid compiler which are compile multiple language on a one platform and even can convert code one language into another language.

REFERENCES

- [1] [NIC 13] Nico Krebs, Lothar Schmitz, "Science of Computer Programming", Volume 79, 1 January 2014.
- [2] [SAJ 13] Sajid Abdulla, Srinivasan Iyer, Sanjay Kutty, "Cloud based Compiler", International journal of student research in Technology Management, vol1(3), May 2013.
- [3] [ANA 13] Anari Mohd Arshad, Khan Arshiys, Shaikh Sana, Mirza Zainab, "Complier On Cloud", International Journal of Engineering Reasearch and technology(IJERT), ISSN:2278-0181, Vol-2, Issue 9, September 2013.
- [4] [ARJ 14] Arjun Datta, Arnab Kumar Paul, "Online Compiler as a Cloud- Service ", International Conference on Advanced Communication Control and Computing technologies (ICACCCT), IEEE 2014.
- [5] [PAR 15] Parag Chaudhari, Ritesh Manjarkar, Akhilesh Kulkarni, Sawre Vellaswami "Multi-Language Cloud Based Compiler", International journal of informative and futuristic Reasearch review paper, vol2, Issue8, April 2015.
- [6] [JAK] J.Akeret, L.Gampera, A.Amara, "Astronomy and computing", 10 (2015)
- [7] [NIS] Nishant Rao, Dr.P.Jayanthi, Ketan Ketu, " A cloud based java compiler for smart devices", International Journal Of Pharmacy and Technology, ISSN:0975-766X CODEN:IJPTFI,(2016).
- [8] [SHU 17] Shubham Chourasiya, Sneha Gadhave, Renuka Kulthe, Tushar Bhatt, "Online Java Compiler with security editor", International Research Journal of Engineering and Technology(IRJET), Volume :04 Issue :02, Feb 2017.
- [9] [AAR 18] Aarthi G.V, Abhishek Rajagopal, Mukundhan Lakshmanan, Kowshikkumar Arulprakasam, "Online Compiler with Plagiarism Checker", International Journal of pure and appiled Mathematics, 2018.
- [10] Nitin S. Ujgare, Swati P. Baviskar, "An Efficient Object Search in Video Using Template Matching", International Journal of Image, Graphics and Signal Processing(IJIGSP), Vol.11, No.3, pp.10-17, 2019. DOI: 10.5815/ijigsp.2019.03.02

