

# CODEZONE

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**Abstract -** In this competitive and fast world, everything in the universe works on and due to Internet. Operations and other activities are performed On-line. Having an online compiler will add to the advantage of easy and fast access and running of programs without having the particular software. CodeZone is an online compiler and debugging tool which allows you to compile source code and execute it online. CodeZone provides the scoring system which enables programmers to know what their percentile is and which rank they obtained. This abstract aims at giving an overview about an online compiler which will help to reduce the problems of portability, storage space and will assess them with the grading system. 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 —** CodeZone, Compiler, Complexity, Online Compiler, Ranking System, Server

## I. INTRODUCTION

Online compiler is new approach for designing and coding of simple C, C++ and JAVA websites with integration of compiler in website itself. The advantage of having an online compiler is the faster and easier access and running programs without having the proper software for running it. It will allow the end user to access the website from any corner around the world with the help internet connection. The end user can code and compile the code from anywhere around the world. Code Zone is an online compiler and debugging tool which allows you to compile your source code and execute it online. This structure follows a client- server architecture. The user simply has to type in the code and then click on the compile button. The code will be sent to the Web server for compiling and the result will be sent back to the client. If the code is correct, it will compile and the user will have desired output. If there is a compile time error, there will be a compiling error displayed. If there is a run time error, then the code will be compiled and there will be a run time error displayed and the output will not be shown. User can write code on their application and after execution of code output will be display on same window. The files or data can be saved on server so that the users can easily get their data from anywhere using this application. The programmer can also check his/her percentile based on the written program. The percentile will be used to generate a rank that will be amongst all the programmers.

The 3 languages in which the user can code are<sup>[6]</sup>:

- C
- C++
- JAVA

Moreover, a web-based application can be used remotely throughout any network connection and it is also platform independent<sup>[7]</sup>. Also, the trouble of installing the compiler on each computer is avoided.

Some of the characteristics that an online compiler provide are <sup>[1]</sup>:

1. It is elastic, meaning a user can have as much or as little of a service<sup>[7]</sup>.
2. The service is fully managed by the provider. The consumer needs nothing but a personal computer and Internet access<sup>[7]</sup>.
3. Application Programming Interface (API): Accessibility to software<sup>[7]</sup>.
4. Cost
5. Device and Location Independence: Provides users service to enable access systems using a web browser regardless of their location<sup>[7]</sup>.
6. Maintenance
7. Multi-tenancy: Enables sharing of resources and cost across a large pool of users<sup>[7]</sup>.
8. Security: Can improve due to centralization of data<sup>[7]</sup>.

## II. RELATED WORK

The basic principles of online compiler is to assigned service to distributed computers [3]. This article also introduces that it do not need users high level equipment, so it reduces the users cost. It provides secure and dependable data storage centre so user is avoided to do the awful things such storing data and killing virus, this kind of task can be done by professionals [3]. This online compiler proves a platform where programmers can compete and get statuses based on their skills. There are also big companies who provide service of compiler such as Google App Engine and Microsoft. There are many online compiler projects under constructing or fully run.

Codepad.com and compiler.com website who provide this compiler service currently.

TABLE I.

Sr. no	Parameter	Java	C++,C
1	Implemented	Yes	Yes
2	Platform status	Independent	Dependent
3	Interface	Not good	Not good
4	Login module	Yes	Yes
5	OS	Linux, Windows	Linux, Windows

## III. SYSTEM DESIGN

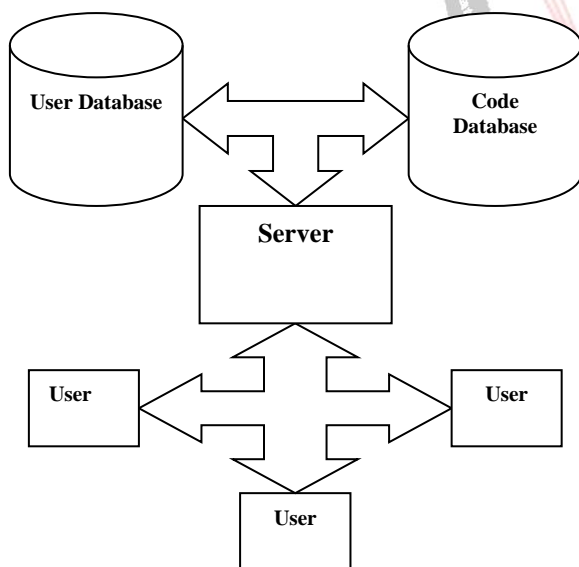
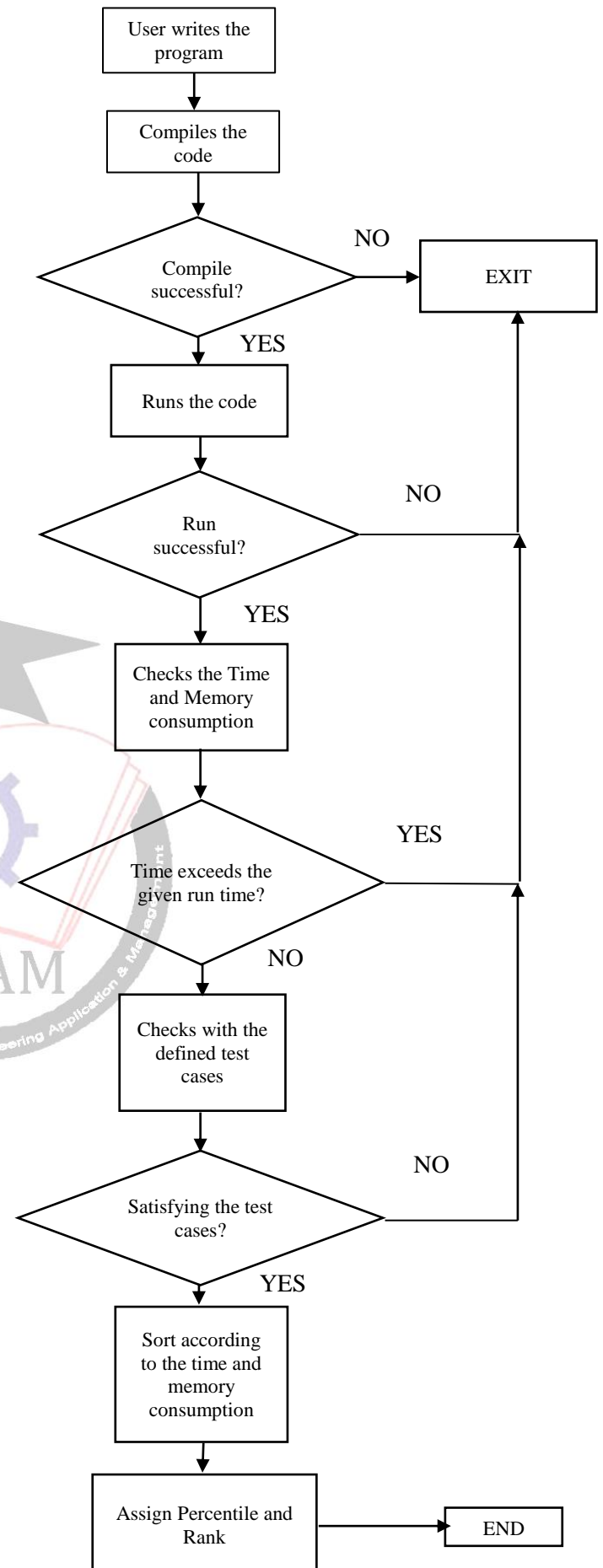


Fig 1. Compiler Architecture

The flow of the system for calculating the Ranks of the programmer based on the complexities is as follow:



Technology is applied to generate online java compiler in 3 tier architecture.

**A. Back End:** Available in the Web Server which contains account information about the user<sup>[4]</sup>. It also keeps the data of the user's code<sup>[8]</sup>.

**B. Front End:** User Interface that shows data to the user, getting input from the user<sup>[4]</sup> and also show what all activity users have perform<sup>[7]</sup>.

**C. Compile Option:** This would take the code in the text box to the server side for its compilation and at the server side the compiler package has been imported<sup>[4]</sup>.

**D. Execute Option:** The user is provided with the links of all the executable files that were present in their folder<sup>[4]</sup>. Also the percentile and the rank of the programmer is displayed<sup>[9]</sup>.

The user will write the code and compile it. If the code is correct and is running, the system will check the run time and the memory consumption of the program. If the runtime of the program is more than the predefined runtime, the program is rejected. Else the predefined test cases are checked upon. If the program satisfies all the test cases, then the user is sorted according the time and memory consumption of other users. Accordingly the Percentile and Rank is assigned to a particular user.

#### System Design:

**User Database:** User database will consists of user login information such as username and password and also the user personal information when user will register into Codezone.

**Code Database :** Code database is for saving the code that user writes in compiler and is also used for checking the complexity factor by comparing the code written by the user and used for result analysis

**User:** User us any entity that work in Codezone.

## IV. IMPLEMENTATION

Code Zone is basically a web based application to compile code online. Our main aim is to provide service on our server so user can use it. The basic operation of Code Zone is the programmer will write code in his or her language in a text editor window and for the result programmer will click on the execute button and at the backend the code will synthesis and it will provide result in the result window.

Although the front end is designed to be as simple as possible with only a few commonly used options, it is sufficiently functional and can be used quickly. Checks whether the text area is empty or not. If it is empty, displays warning message<sup>[9]</sup>. Otherwise the result is displayed that is returned from a compiler, Compiler Error class to represent a compiler error or warning and Compiler

Parameters class to represent the parameter to invoke the compiler. After successful compilation compiler generate either .class file. This class file produce the desired output for the given source code<sup>[9]</sup>.

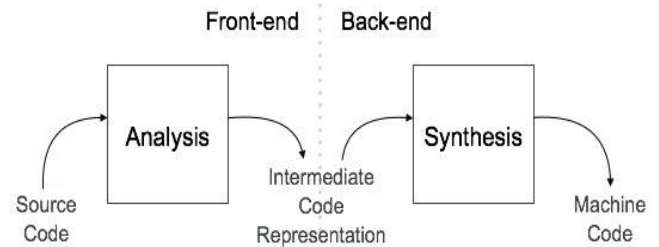


Fig 2. Basic operation of compiler

#### The Ranking System:

The rankings of the programmer depending on the code are based on the complexity of the code. The two types of complexity based on which the scores are derived are time complexity and space complexity.

**Time Complexity:** The time complexity of an algorithm quantifies the amount of time taken by an algorithm to run as a function of the length of the string representing the input<sup>[10]</sup>.

**Space Complexity:** Space complexity is a measure of the amount of working storage an algorithm needs.

CodeZone acts as a system that judges the program. An online judge is an online system to test programs in programming contests<sup>[11]</sup>. They are also used to practice for such contests<sup>[11]</sup>. The system can compile and execute code, and test them with pre-constructed data. Submitted code may be run with restrictions, including time limit, memory limit, security restriction and so on. The output of the code will be captured by the system, and compared with the standard output. CodeZone judges program based on the run time and the memory consumption of the program.

The factors that will decide the rank of the programmer are as follows:

1. A particular run time will be allocated to a program which is supposed to be implemented by the programmer. If the run time of that program written by programmer exceeds the decided time, the program will be rejected.
2. The programmer with the least run time and the least memory consumption will be given the highest rank and the highest percentile. The ranks and percentiles of all the other programmers/students will be decided accordingly.

**Test Case:** A test case is a set of conditions or variables under which a tester will determine whether a system under test satisfies requirements or works correctly. The process of developing test cases can also help find problems in the requirements or design of an application.

Here we are designing various test cases like checking for negative values, checking for special characters, checking for symbols, etc. that will decide if the program designed by the programmer is logically right.

TABLE II.

Will implement:-

Language	C, Java, C++
Interface	Will provide better interface
Available	Will provide publically on server
OS	Linux, windows
IDE	Will provide IDE for our languages
Debugging	Will provide
Hints	Will provide
Front-end	Will use Bootstrap for GUI
Back-end	The code will be scripted using PHP.
Database	Will use PHP database connectivity
Server	Apache Web Server
Applicable areas	For academic purpose or any industry

TABLE III.

Various Compilers Input and Output:-

SR No	Compiler name	Input	Output
1	C Compiler	# include <stdio.h> Void main () { printf(“ Welcome to Online Compiler“); }	Welcome to Online Compiler
2	C++ Compiler	#include<iostream.h> Void main() { Count<<”Hello World“; }	Hello World
3	Java compiler	System.out.print (“ Welcome to the world of Java”);	Welcome to the world of Java

### V. ADVANTAGES

Some of the advantages/benefits of an online compiler are:

1. Online compilers can reduce the geographical barriers. Compilers that compile on internet can allow users all over the world to create programs together [2].
2. Online compilers can reduce the need on having compilers on machine, thus managing the memory.
3. As being platform independent they are self-contained. Because they are already compiled into machine language there is no second application that the user has to keep up-to-date [2].
4. Saving the files and project for future access: - The files and projects will be saved on the server itself and will be easily available to the users from anywhere and at any time.
5. Easy development, testing and debugging of applications: - The IDE have tools for easy development of the applications. It will also ease users to employ the breakpoints in their code in order to debug the code.

6. Sharing projects with peers: - The IDE will allow users to share the projects with peers.

### VI. CONCLUSION

We have implemented the web based IDE to code online. As compared to the current scenario where each compilers required to be installed separately on each and every machine will now eliminate the need to install compilers separately. Users can do programming in various languages like C, C++ and Java. Users can also get their ranks and percentile amongst other different users/programmers. It can be accessed from anywhere, at any time and from various devices like smartphones, desktops and also from laptops.

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