

# Intra-Campus Coding Exam System for Testing and Evaluation

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**Abstract**— In today's technical world, technology is growing rapidly making every day work easier. So, there is a demand to build a whole new way for utilizing the technologies we have with us. This innovation relates to a method and supporting tools for conducting a coding exam. In one aspect, it enables to conduct coding exam which includes uploading a coding problem for students, receiving the code created by a student in response to the problem, determining the output of the code to test inputs, and evaluating the output of the same to the test inputs. In another aspect, it provides a method to evaluate the excellence level of the student which includes uploading a test, receiving a program code in response to the test problem from the students, evaluating the received program, analyzing students' results based on the received program, and determining a rating for the students for the exam on the basis of the grade scored by the student.

**Keywords**- Evaluating outputs, Rating

## I. INTRODUCTION

Intra-Campus Coding Exam System for Testing and Evaluation is a Server based examination system that can be used for academic purposes. It is a new approach for conducting coding examinations and designing of simple JAVA, C and C++ website along with an integrated compiler in website itself. Here the students can login through their usernames, i.e., unique id. The teachers/staff can take tests on programming in different languages and can check the students' grades and percentile. The Admin/Staff can set questions for the exam, their difficulty and check each student's performance. The students can write-in their programs in the area given or can upload the program file in the respective file format. The main aim of developing an integrated compiler is to solve the problem of portability and storage. In this system, the admin also puts in his/her solution to the problem and the system checks and compares the code written by the student and based on the complexity gives appropriate ranks and percentile to the student. The student as well as the admin can view his/her past records.

An integrated compiler within the website enables compiling and executing codes without the need to possess a proper software additionally to run the same. It will allow the end user to access the website from any system within the network with the help LAN connection or Wireless LAN. It provides compiler and debugging tool which enables the user to compile and execute the source code. This system follows a client-server architecture. The student/user must type in the

desired code and then click compile button. After clicking compile, the code will be sent to the server where the compiler is located, the code will be compiled, and the output will be sent back and displayed on the user's screen. If code that is submitted is error free, it will be compiled, and the user will get desired result. If a compile time error is encountered, a compile error will be displayed. If a run time error is encountered, the code will be compiled but a run time error will be displayed, and the result would not be provided. The students/admin can make use of the IDE for writing and testing a code on this application and after executing the code, result can be viewed on the same window. All the data and code files related to the individual users will reside on the server's storage so that the users can conveniently access their data from any system over the network using this application. The user can also check his/her rating which depends upon the results. The rating will be used to generate a rank that will be amongst all the programmers.

The application supports 3 compilers: C, C++, JAVA. So the users can code in these 3 languages only. Also being a network based web-application, it can be accessed remotely from any system joined over the network. This application being developed in Linux makes it platform independent. The need of separately installing the compilers on different systems will no more be necessary.

## II. LITERATURE SURVEY

There are techniques widely used to provide similar functionalities by different authors.

### A. Compiler Services

- Aamir Nizam Ansari [5] and his team members found an approach for executing program on different type of source code by one editor. It also provided a well configured compiler that would provide compiling services by contacting server. Their application analyses the syntax of high level code as well as it's semantics. This would require a lot of storage space and suffered issues with portability.
- To overcome obstacles in Ansari's approach, Harshal Suryawanshi and his team members [4] have put forth a system wherein they provide an online compiler which helps to overcome the drawbacks of portability and storage space in Ansari's model by making use of the concept of cloud computing.

### B. Coding Competitions

- Michael Lydon and John M.Hughes [1] in their research work have invented a system that provides methods and apparatus for conducting coding competitions. User can submit the code online, get their code evaluated and get the results for the server.
- Michael Lydon and John M.Hughes [2] in their further research suggested addons for the same system that would increase its functionalities. The functionalities involve the generating and assignment of score and rating on the basis of score.

### PROBLEM OF EXISTING SYSTEM

The Existing system is not cost effective when it comes to be used by a small organization or colleges. Moreover, it works only over the internet. Also, there are issues with respect to portability and storage management.

### PROPOSED ALGORITHM

In the proposed system, our main aim is to provide service over a server within the network, so user can use it. There are two basic operations of system. The programmer can login and appear for the exam in response to the test uploaded by the teacher/admin. Either the programmer will write code in his or her language in a text editor window/IDE and for the output, the programmer will click on the compile button and at the server end, the code will be compiled using the integrated compiler and it will provide result in the same window and then the user can save and submit the code. Or, the user can write and compile the code separately and then upload the file. [1][3][4]

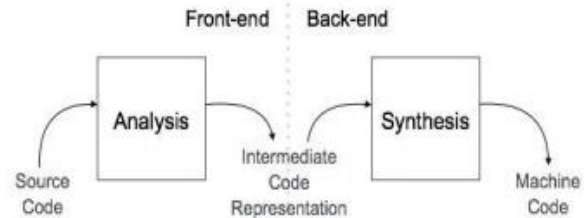
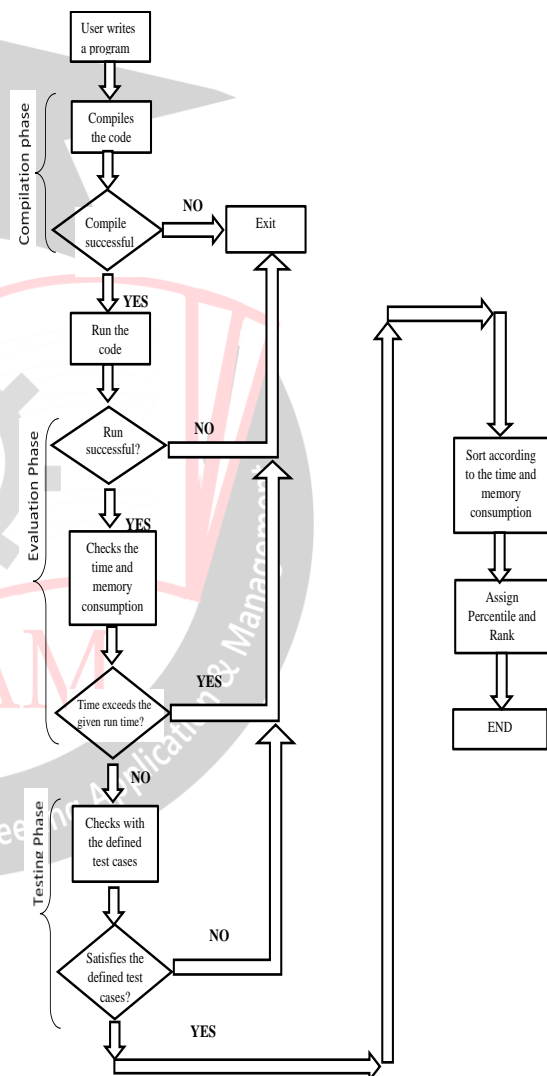


Fig 1: Basic Operation of Compiler

Although the front end is designed simple, it is sufficiently functional, user friendly and quick. It Checks whether the text area is empty or not. If empty, a warning message will be encountered by the user. Otherwise the result is generated by the compiler and displayed. After successful compilation compiler generate either .class file. This class file produces the desired output for the given source code.



## III. IMPLEMENTATION

We have implemented the project using Python programming language, Bootstrap, PHP, CodeIgniter. Python is a powerful high-level, object-oriented programming language created by Guido van Rossum. It has simple easy-to-use syntax, making it the perfect language for someone trying to learn computer programming for the first time. An interpreted language, Python has a design philosophy which emphasizes code readability (notably

using whitespace indentation to delimit code blocks rather than curly braces or keywords), and a syntax which allows programmers to express concepts in fewer lines of code than possible in languages such as C++ or Java.

**PHP:** PHP (recursive acronym for PHP: Hypertext Pre-processor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.

What distinguishes PHP from something like client-side JavaScript is that the code is executed on the server, generating HTML which is then sent to the client. The client would receive the results of running that script but would not know what the underlying code was. You can even configure your web server to process all your HTML files with PHP, and then there's really no way that users can tell what you have up your sleeve.

**CodeIgniter:** CodeIgniter is a powerful PHP framework with a very small footprint, built for developers who need a simple and elegant toolkit to create full-featured web applications. CodeIgniter was created by Ellis Lab, and is now a project of the British Columbia Institute of Technology.

It is based on the Model-View-Controller (MVC) development pattern. MVC is a software approach that separates application logic from presentation. In practice, it permits your web pages to contain minimal scripting since the presentation is separate from the PHP scripting.

**Bootstrap:** Bootstrap is the most popular HTML, CSS, and JavaScript framework for developing responsive, mobile-first web sites.

#### IV. CONCLUSION

The existing system is based on online coding competitions and also it lacks performance. Our aim to undertake this project is solely to create a Server based Coding exam system that can be used for educational purposes in small organisations, universities and colleges as well and to improve this system for better efficiency and accuracy. We are implementing the web-based IDE and integrated compiler to code online. Unlike the traditional requirements, where the compiler is required to be installed separately on all the individual machines over the network, the requirement of installing a compiler separately will be eliminated. Users can do programming in 3 languages: JAVA, C and C++. Users can view their ranks and rating in comparison to all the participants/programmers. It can be accessed from any device over the network, at any time and from devices like desktops, laptops and also from mobile phones.

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