

ONLINE JUDGING SYSTEM

Gade Ashwini D.

Deshmukh Madhuri R.

Sahare Sareeka V.

Jadhav Madhuri B.

**Department of Computer Engineering Government
College of Engineering and Research Awasari,
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(Computer Engineering, Gcoeara Pune University,India,Ashwinigade8@gmail.com)
(Computer Engineering, Gcoeara Pune University,India,sarika.sahare@gmail.com)
(Computer Engineering, Gcoeara Pune University,India,Jadhavmadhuri52@gmail.com)
(Computer Engineering, Gcoeara PuneUniversity,India,deshmukhmadhu57@gmail.com)

Abstract

This documentation describes and evaluates the implementation and applicability of an automatic programming grading system we named it as online judging system. An Online Judging system is an online system to test programs in programming contests automatically. Firstly, we introduce the affinity algorithm to improve the precision of the user programs processing time. Al so we are going to use Genetic algorithm (GA) for generating the test cases automatically.

This online judge system can help to hold programming like examinations, exercises, contests, and provide the functions of teaching assistant. It not only adds interests of programming for students, but also helps teaching assistant for teachers.

The core content of the system is that it can compile and run user-submitted programs dynamically, and test whether the programs are correct by using testing data automatically. Furthermore, the system provides user-friendly Web UI and strong backend management functions, in order to implement the managements of questions base, contests, examinations, discussions, Q & A and information release etc.

Introduction

An online judge is such a computing resource that is designed for human users only. Students from anywhere in the world can submit their program source codes to the online judge, which will compile the submitted source codes to check whether there are any errors in them or not. If there is no error in a submitted program, the online judge will run the executable code of the submitted program and compare the output data from this running procedure with predesigned test

Data. The results of the judgment will be displayed on a web page and result statistics are sent back to students whenever a student asks the online judge for the test results of his or her Submitted programs.

Keywords:

Online judge , programming assignments, programming contests, programmers profile , ranking etc.

Problem Definition

Online Judge is an online system used to test correctness and efficiency of programs written in various programming languages. They are used on programming competitions held online as well as onsite. Most importantly they are used to practice for programming contests. These systems are used by lots of people, particularly students, to learn issue related to programming languages, algorithms, data structures and to improve programming skills through training and competing in several programming contests. There are a lot of online judge systems. However, none of them have been able to provide an environment that will boost the knowledge sharing, expert help and social interaction. In this project we are planning to build an environment that will help users to interact, practice and improve their programming skills via social interaction, expert guidance and by organizing live online competitions. Another motivation that leads to build this project is to have a system that will help the IT companies to choose the right candidate for their companies. Online Judge will play a crucial role in organizing competition among university students and will provide a social environment.

System Architecture:

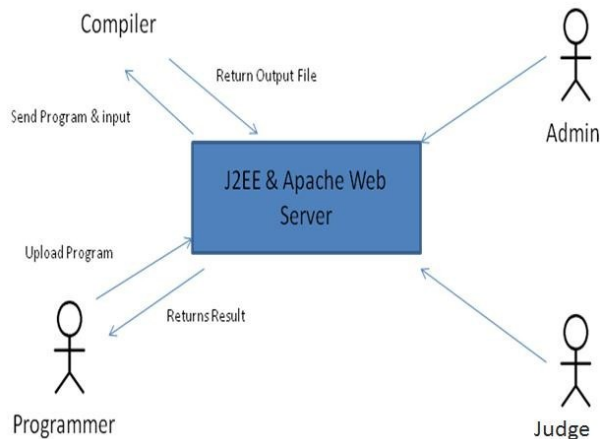


Fig. System Architecture

Features

- Programmer Profile
- Output Match Percentage
- Ranking of Programmer
- Multiple Language Support
- Real time Results

Live Programming Contests :-

Judges / Experts can organize live programming contests. They can propose new problems. The system will receive the submissions only for a determined period of time, only within contest duration. The format of the contest and the rating of the problems will be set by the judges.

Tutorials / Articles :-

Judges can write tutorials related to algorithms, data structures and programming languages. Moreover, students can use this environment on programming courses related to learning programming, algorithms and data structures at schools, universities, colleges, etc.

Training / Practice :-

Solving problems on the site. The coders can send their solutions of problems at any time. Each problem has its own statistics. It is more useful for the purpose of training and practices.

Mathematical Model

1. Set Theory:

Let S be the system,
 $S = Q, P, R$.
 Where,
 $Q = \text{Set of inputs}$.

$P = \text{Set of Processing statements}$.

$R = \text{Set of Result}$.

Where,

1. Input: (Q)

1. Class files (.class) java files.

2. Test Cases.

3. Expected Results .

2. Processing (Functions) Statements: (P)

1. Running Test Case.

2. attaching output with expected results

3. Output: (R)

Result is either Pass or Fail.

2. Function

Mapping: Q,C,T,E,R

$P : (C \text{ x or } T) E R-R R P, F$

Where ,

C=Class Files.

T=Test Cases.

ER = Expected Results. R=Actual Result

P = Pass . F=Fail.

Conclusion

In this paper, we describe our online judging system which is used to support the online programming contests. System has good support to online contests. Online Judge aims to build an environment for the people, specifically students, around the world to interact, practice and improve their programming skills.

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