

CS307

System Practicum

Project on Online coding judge
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What is online judge

An online platform where users can view coding questions and then submit their solutions to the website which will judge their solutions on several test cases and give the results to the user instantaneously.

Features in existing similar systems

- Users can view problems of different categories – according to difficulty and type of algorithm.
- Users can create an account on the website and thus save their progress on the website.
- Users can submit solution program to any given problem on the website. The submission can be made through a file or user can type code on a simple code editor provided in the website.

Existing features(contd.)

- The submitted code will be tested against several test cases and the user will be provided a report which will include:
 - Whether code compiled successfully and if not report the compile-time error.
 - Whether the program generated any run time error.
 - Whether each test case was passed successfully.
 - Time taken to pass each test case.
 - Total time and space taken by the program.

New features we are implementing

- Plagiarism Checker
- Detailed report for each submission.
- Submitted code analysis:
 - Time complexity of the code
 - Space complexity of the code
- Send an email to user sending detailed report of the submission made.

Other potential features

- Recommendation of the suitable problems to the user based on past problems solved.
- Online debugger.
- Form teams online.
- Hosting online coding contests.

Challenges

- Handling multiple requests simultaneously.
- Allocating equal amount of resources to each code submitted for fair relative judging of codes.
- Limiting system resources per submission(i.e. CPU time, Memory, Disk Usage)
- Limit access to filesystem so that the program can't read submission from other users.
- Disable network access so that program does not try to send data over the network.

Relevance of the project

The project can be continued to develop a full-fledged personalized online judge for IIT Mandi. Problems can be categorized semester-wise in sync with the knowledge of the students. A whole community can be developed around it!