

Online Judge

What is an Online Judge ?

An online judge is a platform where programmers can solve algorithmic problems by writing code in various programming languages. Users submit their solutions, which are then compiled and tested against predefined input/output criteria to determine correctness. Based on the test results, participants are assigned scores. It provides immediate feedback on the code's execution, helping programmers improve their problem-solving skills and algorithmic understanding. E.g. Codeforces, Leetcode, Hackerearth etc.

Features :

- Participants should be able to register for the upcoming contests by their user id.
- Participants should be notified about upcoming contests and reminders about their registered contests via email.
- Participants should have the option to submit their code either by uploading a file or by writing directly in the code editor.
- Participants should be able to fetch the leaderboard of a particular contest.
- Participants should be able to ask some clarifying questions about a problem during a contest to the problem setter.
- Participants should be able to practice problems after the contest has concluded.

Security :

- Prevent the access of hidden test cases from the user.
- Protect User data through proper authentication.

- Prevent the application from malicious code.

High Level Design :

Frontend :

- Home Page with navbar containing Log In/Sign Up button, ProblemSet button, Contest button etc.
- Login page and SignUp Page
- Contest Page
- ProblemSet Page
- Specific Problem Page which consists of Problem, Language Selection, Code editor, Run and Submit button, Input, Output and Verdict section.

DataBase :

- Collection 1 : User
Schema :-

User ID	: String
User Email	: String
User Password	: String
Full Name	: String

- Collection 2 : Problem
Schema :-

Problem id	: String
Problem Name	: String
Problem Statement	: String
Editorial	: String
Difficulty	: String

- Collection 3 : TestCases
Schema :-

TestCase ID : String
Problem ID : String
Test Case Input and Corresoonding Output : String

- Collection 4 : Submission
Schema :-

User ID : String
Problem ID : String
TestCase ID : String
Code : String
Verdict : String
Chosen Language : String
Submission Time : Date and Time
Time used for execution : Time in ms
Memory Used : in KB

Backend :

Build Rest APIs for :

- Fetching Problem List and Problem id from database
- Post solution from frontend to database
- For Logging In, Logging Out, Submit the code etc

Other Features :

Plagiarism Check

Set Time Limit and Memory Limit for each problem

