ADARSH

Online Judge

Problem Statement :
A coding platform can be used for both individual problem solving or as a competitive platform where people can solve the questions on the platform in the given amount of time or this platform can also be used to develop something in groups in a given amount of time which could be long or short. Based on the type of contest different scores can be allocated to groups or individuals.

Overview :
Designing a Full stack Online Judge using Mern Stack. The App will take codes from different users and evaluates it as accepted or not accepted.

Features:
User Registration: The User will have to register if he is visiting the platform for the first time and if the user had already registered then the user will have to login after the token expires.

Solution Submission : Users can submit the solution for the evaluation.

Profile Management : Users can view the number of problems they solved.

Practice Problems : Users will be able to solve the practice problems which will be provide from the backend.

Solution Evaluation : The platform will be able to evaluate the submitted code against the provided test cases.

Challenges: 1. Ability to let platform used by thousands of people at a given time .
2. Plagiarism check .
3. Unauthorized person should not be able to manipulate the vertices.

Solutions: To tackle these problem we can use queue in which we can store the events to execute the code file at some time in future.
We will also be using Docker that will make containers and each containers will have a set amount of memory. And we also be isolating the core logic using custom isolation.

High Level Design :

1. Database Design
   1.1 Collection 1 : Problems
   Document structure :
   Title: string
   Description : string,
   Problem id : number,

   1.2 collection 2 : solutions
   Document structure:
   Problem id:number,
   Verdict : string,
   Submitted at: date and time,

   1.3 collection 3: test cases
   Document structure
   Input :Array,
   Output :Array,
   Problem id: number

   1.4 collection 4 : login and sign up:
   Document Structure
   Name: String,
   Email:string,
   Password: string,
   userId: number,

2. Web server:
   1. UI :
   Screen 1 : Login / Signup
   Home screen
   Problem list

   2. Specific Problem :
   Language selection
   File selection
   Verdict

3 Evaluation System
Docker : Containers running on machine with high CPU to run the submitted code.