**Online Judge**

An online judge refers to a website that has a library of coding problems, with test cases and expected outputs for each problem (preferably hidden from the user), where the user has the option of writing code for a particular problem and submitting it. Upon submission, the output of the user code will be compared to the expected output and a verdict will be displayed to the user.

Expected Features:

1. Users should be able to login by providing username/email and correct password.
2. Users should be able to submit their code through either file upload or writing in an in-built text editor.
3. Problem Library should display a list of problems.
4. Users should receive a verdict for each of their submissions.

High Level Design:

1. Database Schema:
   1. Problem Library JSON structure:
      1. Problem Title : string
      2. Problem Statement : string
   2. Test Cases JSON structure:
      1. Input : string
      2. Output : string
      3. Problem link : link to problem JSON document
   3. Submissions JSON structure:
      1. Verdict : string
      2. Submission Time : DateTime
      3. Problem link : link to problem JSON document
   4. User Authentication JSON stricture:
      1. User ID : string
      2. Password : string
      3. Email : string
      4. Username : string
2. Front End Structure:
3. Home Screen :
   1. Login/SignUp screen
   2. Problem Library
4. Problem Screen:
   1. Text editor section
   2. Language select section
   3. File upload section
   4. Submission log section.
5. Submissions Screen:
   1. Past Submissions section (with verdicts)
   2. Links to past submission code.

3. Security Flaws and solutions:

1. Flaw: Large number of users submitting simultaneously.

Possible Solution: Implementing a submission queue, which might increase waiting time for users but will prevent server from crashing due to too many requests.

1. Flaw: User submitting a solution that takes very long to finish running.

Possible Solution: Implementing a Time Limit Exceeded verdict, which prevents user code from running longer than a fixed duration the length of which would depend on the problem setter.

1. Flaw: User submitting a very large solution file, causing slowdowns.

Possible Solution: Implementing a size limit for user submissions, which prevents users from submitting files larger than a specified memory size.

1. Flaw: User submitting a solution that uses too much memory upon running.

Possible Solution: Implementing a Memory Limit Exceeded verdict, which prevents user code from using more server resources than necessary.