CS4530 Final Project: "Daily Coding Challenge"

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Our Feature: Daily Coding Challenge

Stack Overflow is a key platform for developers, but its current Q&A format doesn't support hands-on skill-building. Our feature introduces a Daily Coding Challenge directly within Stack Overflow, allowing users to solve algorithm and data structure problems using an embedded web editor. Solutions are evaluated against test cases, and users are ranked on a live leaderboard. This interactive feature encourages ongoing engagement and learning without leaving the platform.

Demo and Source

Demo Site: https://cs4530-s25-401.onrender.com/
Source Repo (private):
https://github.com/neu-cs4530/spring25-team-project-spring25-project-group-401

Our Technology Stack & Design

Frontend: React + React-Tooltip Library, @monaco-editor/react (for web-based code editing)
Backend: Node.js, Express, MongoDB, TypeScript
Real Time Communication: Socket.IO for live leaderboard updates
Testing & Deployment : Continuous Integration via GitHub Actions (Jest), Continuous Deployment through Render.com; MongoDB database hosted in the cloud using MongoDB Atlas

Key design decisions included embedding a Monaco Code editor to simplify user interaction, using Socket.IO for real-time leaderboard updates, and structuring our data with MongoDB schemas for efficient storage and retrieval of coding challenges, user solutions, and leaderboard data. Admin capabilities were carefully designed to provide secure, efficient management of content and user activity.

Future Work

Future work could enhance the project's interactivity and engagement by adding an advanced leaderboard with scoring brackets and visual analytics to track user progress over time. Automated scheduling could streamline daily challenge releases, while integrating social features such as commenting, discussions, and progress sharing would foster community interaction and collaborative learning. Additionally, refactoring the codebase to improve modularity and maintainability could support these expansions seamlessly.
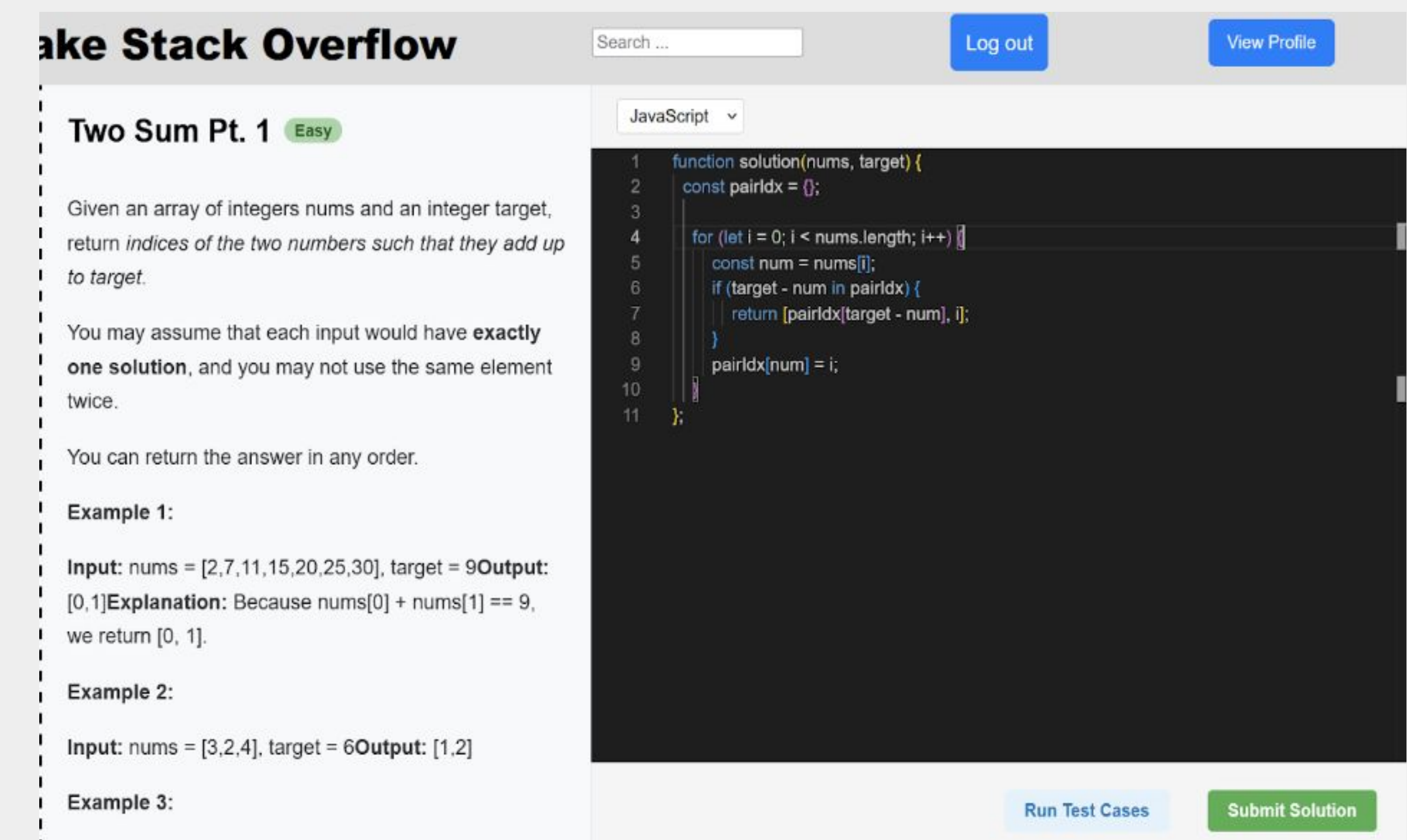
Problem Description and Code Editor: clearly outlined problem descriptions and a built-in code editor allow participants to quickly understand and implement their solutions
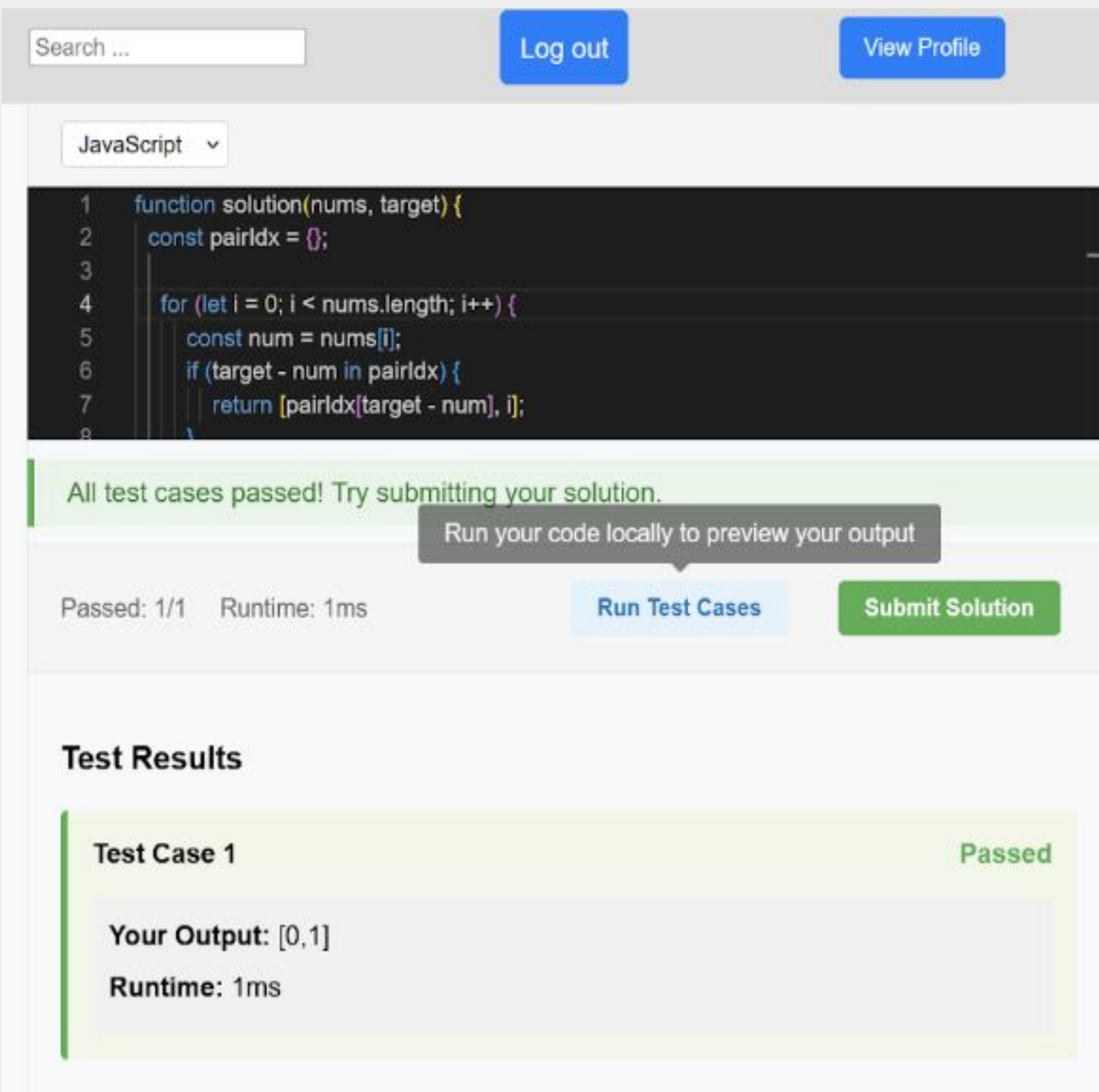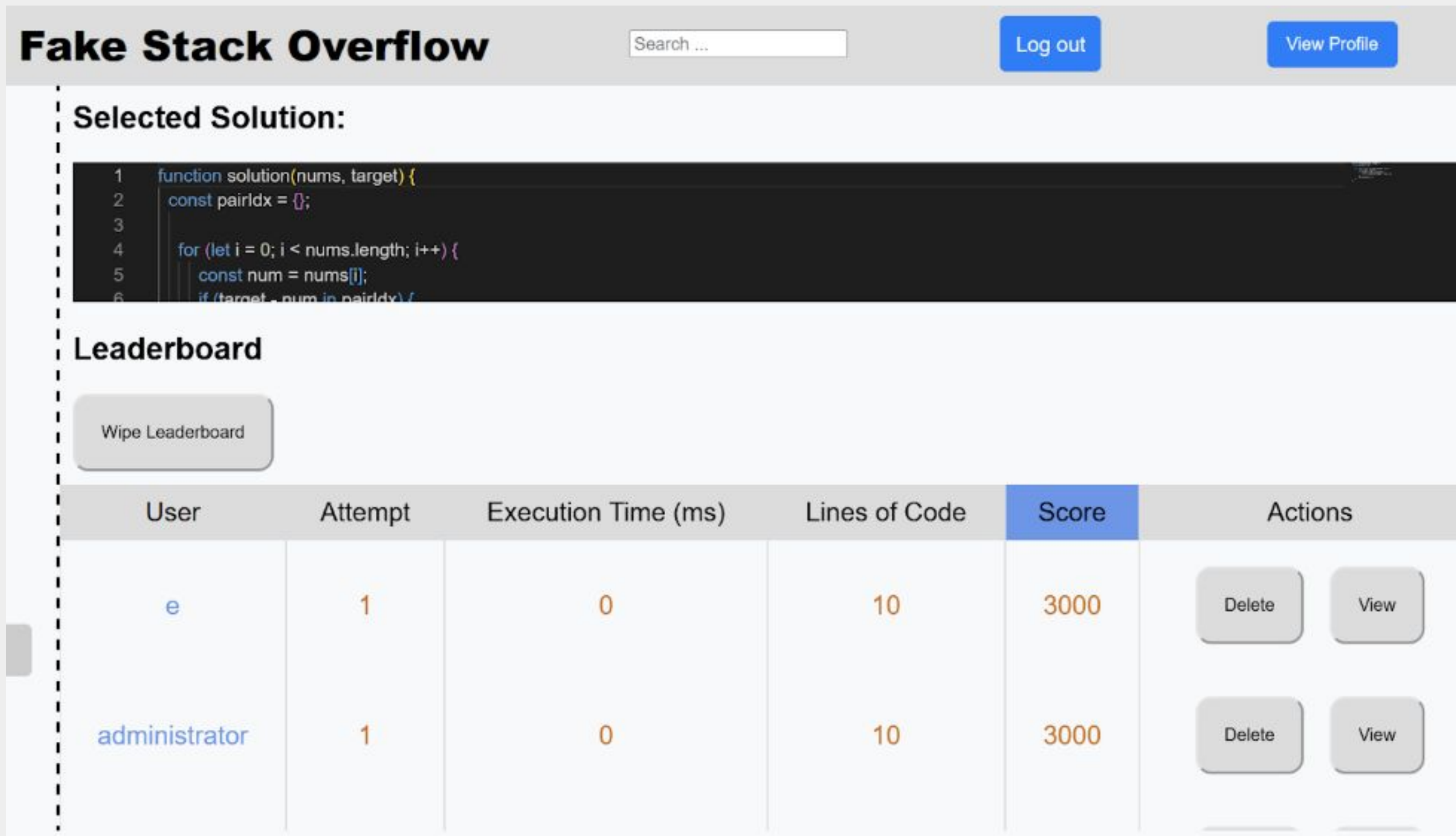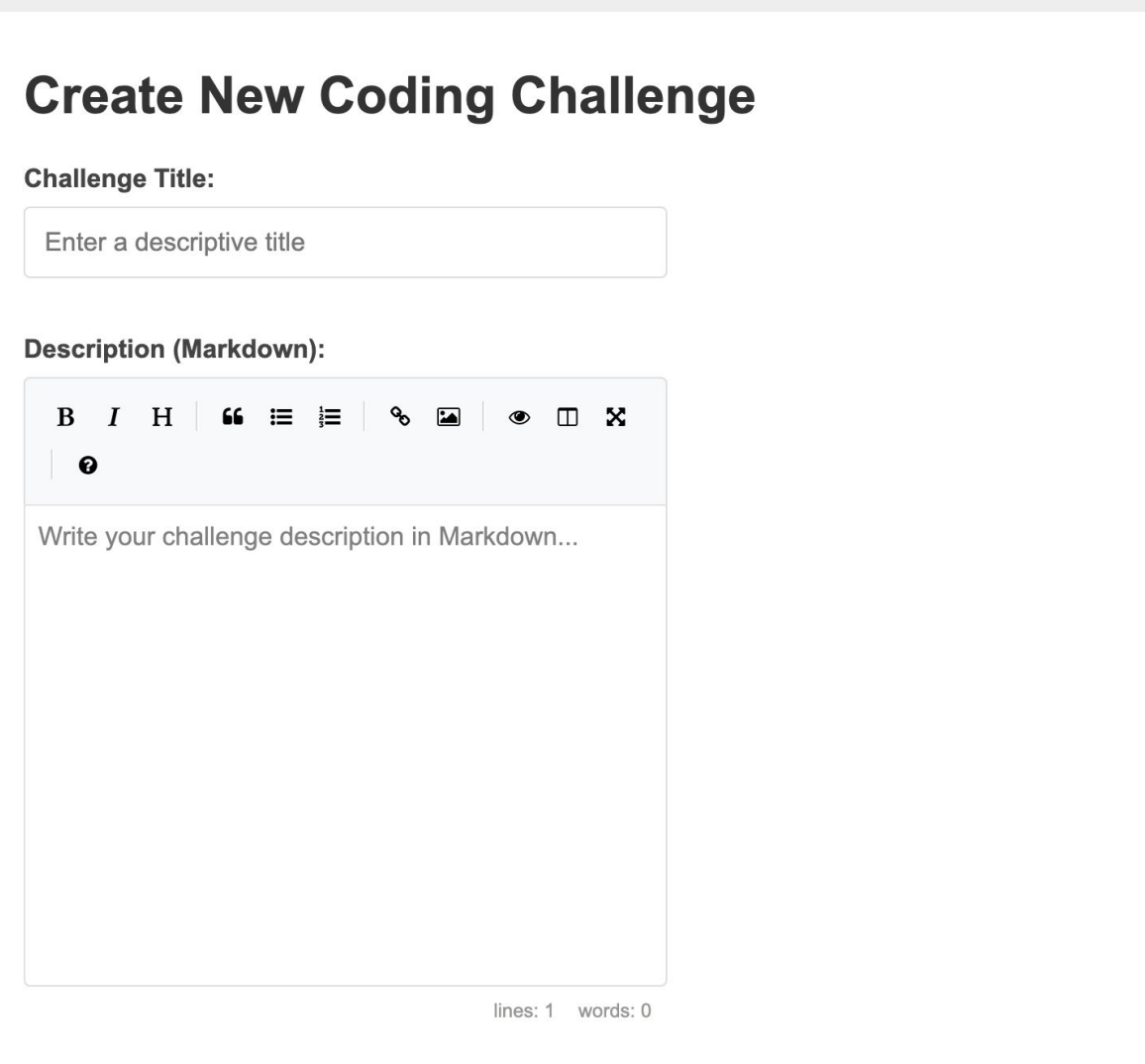

Code submission and testing interface
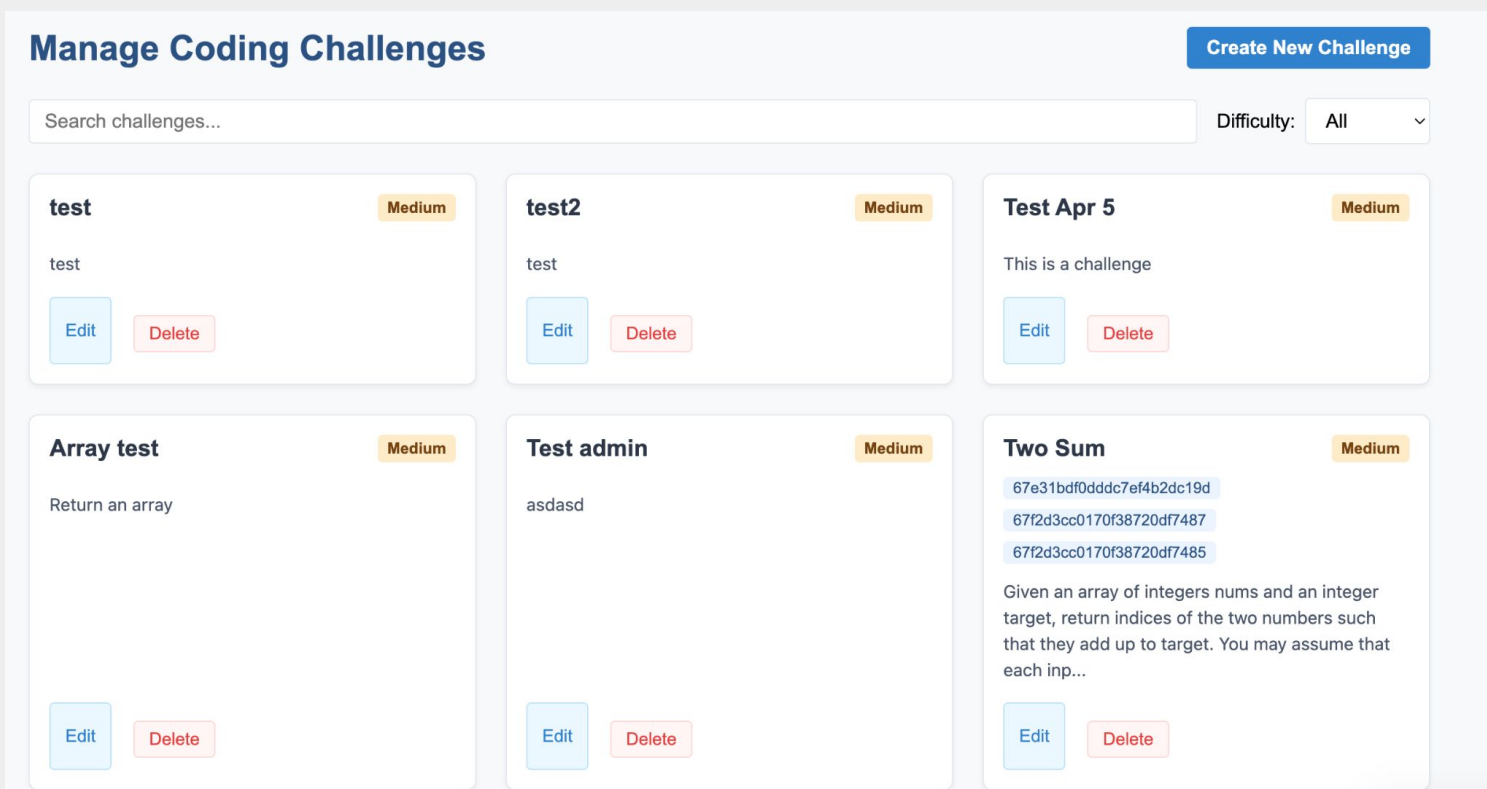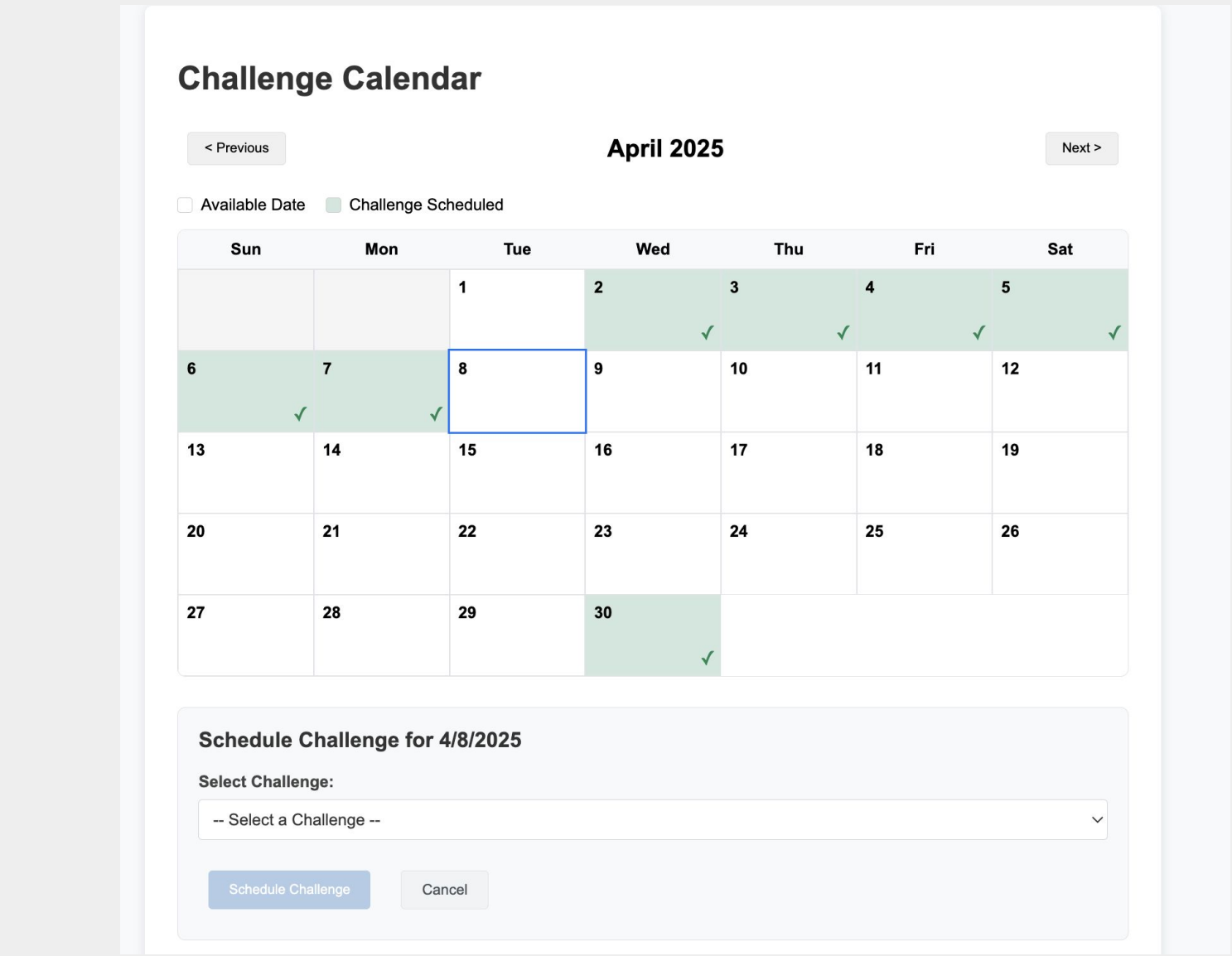
Admin tools for creating and scheduling a challenge

Leaderboard (with Admin permissions): Admins can review all submissions at a glance, manage entries, and maintain challenge integrity with built-in moderation tools.