**Project Proposal: Code Royale - Online Coding Challenge Platform**

**1. Introduction:** Code Royale is an online platform that aims to bring together coding enthusiasts to participate in coding challenges, solve problems, and compete in 1 vs 1 matches. The platform will have a comprehensive user system, a challenge mechanism, a rating system, clan features, and an interactive chat system. It will be developed using React for the frontend, Express.js for the backend, and incorporate machine learning for various functionalities.

**2. Objectives:** The main objectives of Code Royale are as follows:

* Create a user-friendly platform for coding enthusiasts to showcase their skills and improve their problem-solving abilities.
* Implement a robust challenge system with both rated and unrated options to accommodate different preferences.
* Establish a fair rating system that reflects the performance of individual solvers and clans.
* Provide a social aspect by enabling users to form and join clans, communicate through a chat system, and build connections with other participants.

**3. Features:**

**3.1 Solver Profile:** Each solver will have a profile with the following attributes:

* Global Score: Represents the overall performance of the solver on the website.
* Badges: Recognition of achievements and milestones earned by the solver.
* Number of Solved Problems: Indicates the solver's progress and activity level.
* Show Submissions: A record of the solver's previous code submissions.
* Clan: Displaying the solver's current clan affiliation.
* Friends: A list of friends added by the solver on the platform.

**3.2 Problem Solving:** Solvers can request and solve problems through a dedicated interface. The platform will provide a diverse range of coding challenges to cater to varying difficulty levels and programming languages.

**3.3 1 vs 1 Challenge:** Solvers can challenge each other in 1 vs 1 matches, which can be rated or unrated. The challenges will be automatically timed and rated challenges will affect the solver's global rating.

**3.4 Clan System:** Solvers can create or join clans, which are groups of participants that can collaborate and compete together. Each clan will have a unique logo, achievements, bio, and rank based on their collective performance.

**3.5 Friends and Online Status:** Solvers can search for friends, add them to their favorites, and view their online status to facilitate better communication and social interactions.

**3.6 Chat System:** Clan members can communicate through an interactive chat system. The chat will support reactions, replies, and emojis to enhance user engagement.

**3.7 Cheating Detection:** The platform will employ machine learning techniques to detect cheating attempts during challenges. This includes paraphrasing detection and identifying multiple taps or IDEs in screenshots.

**3.8 Unrated Challenge Customization:** Solvers can host unrated challenges with customizable options such as the number of participants, team formation, match duration, problem difficulty, points system, public/private room, and invitation options.

**4. Rating System:** The platform will maintain a global rating system for individual solvers and clans. The rating will be updated based on performance in rated challenges and the difficulty of the challenges faced.

**5. Technology Stack:** Code Royale will be built using the following technologies:

* Frontend: React
* Backend: Express.js
* Machine Learning: To implement the cheating detection system and potentially assist in problem generation or evaluation.

**6. Conclusion:** Code Royale aims to be a feature-rich and interactive online coding challenge platform, encouraging users to improve their coding skills, compete in challenges, and foster a sense of community through clans and social features. With a dedicated and skilled development team, we are confident in delivering a high-quality platform that will be a valuable resource for coding enthusiasts.