REQUIREMENT ELICITATION AND ANALYSIS

SYSTEM ANALYSIS AND DESIGN LAB

CSE 4408

CodeNex

Next Generation Coding platform

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1 Overview:

CodeNex is a next generation coding platform convenient for all type of coders as well as new learners. It promises a secure and user-friendly platform for skill enhancement through problem-solving and contest participation that comes with smart upsolve method, analysis curves and motivating rewards.

2 Goals and Objectives:

- Build a customised online judge convenient for all types of coders as well as new learners
- Lowering the tendency to miss online programming contests and live coding events
- Serve as a guide for coders to help them be consistent in problem solving
- Being connected with fellow coders in a community and create a platform for healthy competition

3 Key Stakeholders:

- Contestants and Participants
- Problem Setters
- Administrators

4 Current Processes, Workflows and Pain Points:

- Popular online judges lack up-solving benefits of a particular problem. Learning at the initial phase comes with memorizing and certain ad hoc problems require solving the same problem multiple times with spaced repetition.
- Existing platforms have plenty of problems that often lead users to fall into the "Beginners Learning Trap" where people focus on the same genre without pushing themselves to explore a new genre of problems.
- Current systems focus more on ratings and difficulties of problems rather than specific problem type based progress graphs. We will give feedback to the user based on his desired goals to achieve and current solved problem numbers to illustrate current progress.

5 Initial Hypothesis on Main Modules:

- **User Registration and Authentication:** Users should be able to register for an account with their handle and password. Google APIs can be used for signing up with a user email address.
- **Problem Repository:** Provide a vast repository of problems categorized by difficulty level, topic. Each problem should include a detailed description, input/output format, constraints, and sample test cases.

- **Contests and Practice Mode:** Host regular contests with predefined start and end times.
- **Solution Submission:** Users should be able to submit solutions in various programming languages (e.g., C++, Java, Python)
- **Submission History:** Solved Problems version tracking with given verdict of every encountered problems
- **Up-solving** panel with **Flashcard** Integration

6 User Roles and Scenarios:

1. **Administrator (Admin):**
   - Manage user accounts and permissions.
   - Add, edit, or remove problems from the problem bank.
   - Monitor and handle any issues during contests.
2. **Contestant:**
   - Login and logout to the system.
   - Submit code solutions.
   - Register for contest and access contest details and problems and View contest results.
3. **Problem Setter (Among Contestant):**
   - Create and submit problems for contests.
   - Define test cases and constraints for problems.
   - Review and edit problem statements.

7 Survey/Interview Planning:

Contestant (Regular Problem Solver)

User Goals and Tasks:

Close Ended Questionnaire:

- Which online platforms do you use regularly to solve problems or to participate in contests?
- What is your main concern between regular problem solving and dedicated contest programming?
- Are you aiming for short-term skill improvements such as mastering specific algorithms, or long-term goals, like advancing your overall coding proficiency?

Open Ended Questionnaire:

- How do you encounter and learn new problems and what techniques do you follow to aggregate new insights?

- How often do you upsolve problem and what methods do you follow?
- Elaborate problem solving in your eyes and what do you intend to accomplish by solving problems regularly?

Current Challenges:

Close Ended Questionnaire:

- Does your current platform experience align with your expectations and needs as a contestant?
- Is it challenging to track your progress and manage your problem-solving journey on existing platforms?

Open Ended Questionnaire:

- Can you mention some of the difficulties that you encounter while navigating and completing tasks on current platforms?
- How often do you upsolve problem and what methods do you follow?
- What are your thoughts on addressing those challenges and how effective have they been?

Expected Functionality:

Close Ended Questionnaire:

- Do you believe that features like smart upsolving, revision tracking, or performance analytics would enhance your contest experience?
- Do you think our proposed platform might address the challenges you face as a contestant or problem solver?

Open Ended Questionnaire:

- What specific functionalities or tools do you anticipate that would greatly enhance your experience?
- Would you prioritize improvements that streamline the problem solving process, contest participation or enhance your overall learning experience?

Sample Inputs and Outputs:

Close Ended Questionnaire:

- When solving coding problems, do you typically find input data as code snippets or test cases?
- Do you always find quality problems with constraints or think that they can be improved?

Open Ended Questionnaire:

- What type of rewards do you expect for contest successes or completing problem-solving quotas?
- Can you provide an example of a typical problem-solving task you might encounter on the platform?

UI Experience and Expectation:

Close Ended Questionnaire:

- Are you facing any UI issues on existing platforms? It can be any bugs, buffering problems, or other issues.
- What type of UI design do you think would suit you best: minimalist, visually rich, or other?

Open Ended Questionnaire:

- Can you describe any UI elements or interactions that you find intuitive or frustrating as a contestant?
- How do you believe UI enhancements could enhance or detract from your overall user experience?

Constraints and Policy:

Close Ended Questionnaire:

- Do you have any interest of exploring constraints and policies of coding platforms that you currently use?
- Are you satisfied with the policies of your currently used system?

Open Ended Questionnaire:

- According to you, in what ways do platform policies impact your overall user experience and participation in contests?
- How do you see any violations of platform policies or contest rules as a contestant/problem solver and how to defend these?
- Name of any one or more constraints or policies that you frequently encounter when registering for contests or accessing contest details on the existing platforms?

Problem Setter (Advanced Problem Solver)

User Goals and Tasks:

Close Ended Questionnaire:

- Which online virtual judge platforms do you currently use for problem-setting?
- Are you aiming for short-term improvements in problem quality or long-term enhancements in problem diversity?

Open Ended Questionnaire:

- Describe the main tasks or objectives you intend to accomplish as a problem setter on the platform.
- Are there specific features or functionalities you consider essential for achieving your goals as a problem setter?

Current Challenges:

Close Ended Questionnaire:

- Does your current platform experience meet your expectations and needs as a problem setter?
- Is it challenging to create and submit problems freely on existing platforms or they add any additional requirements on specific problem type?

Open Ended Questionnaire:

- Can you explain any frustrations or difficulties you encounter while defining test cases or reviewing problem statements?
- Have you developed any strategies to address these challenges, and how effective have they been?

Expected Functionality:

Close Ended Questionnaire:

- Do you believe features like problem recommendation or community feedback would enhance your experience as a problem setter?
- Do you think our proposed app might address the challenges you face as a problem setter?

Open Ended Questionnaire:

- What are the scope of improvement in streamlining problem-setting tasks or enhancing problem quality and diversity?
- What specific functionalities or tools do you anticipate would greatly enhance your experience?

Sample Inputs and Outputs:

Close Ended Questionnaire:

- Do you think that insights provided by platforms are enough while creating and submitting problems on the platform?

Open Ended Questionnaire:

- Can you provide examples of successful problem-setting experiences you've had on the platform?
- What types of inputs and outputs structure do you typically provide when creating and submitting problems on the platform?

UI Experience and Expectation:

Close Ended Questionnaire:

- Are you facing any UI issues on existing platforms? It can be any bugs, buffering problems, or other issues.

- What type of UI design do you think would suit you best: minimalist, visually rich, or other?

Open Ended Questionnaire:

- Can you describe any UI elements or interactions that you find intuitive or frustrating as a problem setter?
- How do you believe UI enhancements could enhance or detract from your overall user experience?
- Compare the choices and UI demand of yourself as a participant and as a problem setter

Constraints and Policy:

Close Ended Questionnaire:

- Do you follow predefined rules and policies for defining test cases and constraints for the problems you submit?
- Are you satisfied with the policies of your currently used system?

Open Ended Questionnaire:

- In what ways do platform policies influence your problem-setting process and the quality of problems submitted?
- Are there any constraints or policies you must adhere to when creating and submitting problems for contests?

8 Survey Mode:

- Online forms distributed via email or platform notifications (Google Forms, CickUp, TypeForms or any distributions)
- If feasible, on-person interviews are more interacting and insightful.

9 Conclusion:

This questionnaire will provide valuable insights into the diverse needs and expectations of users across various roles within our online judge platform. By understanding the specific goals, challenges, and desired functionalities of problem solvers, contestants, and problem setters, we can tailor our platform to better meet their needs, ultimately enhancing the overall user experience and fostering a more supportive and efficient coding environment.