Lab-2: Course Project Kick-Off

Group number: 20

Project Topic: A platform for creating and managing online crosswords.

Need for the project:

1. Platform should be accessible by everyone over the internet

2. Users should be able to create crosswords and provide questions and one word solutions. The user will be able to manually design the crossswords with a given set of questions and solutions.

3. The users should be given access to hints. The users should be able to view the solutions. Platform must provide a score to users based on their correct answers, time used and hints used.

4. Platform should monitor the time taken by the user to solve the crossword puzzle.

5. Platform should record previous attempts/history of the user.

6. The users should be able to give feedback after solving the crossword puzzle.

7. The users can easily share the crossword and their score with one another.

8. Users should be able to subscribe to crossword creators.

9. Users should be notified by crossword creators when they create a new crossword.

10. Platform should allow the user to organize crossword contests and they must be ranked based on their performance.

11. There should be a crossword of the day feature in the platform.

12. There should be an option to sort crosswords into categories based on topic and difficulty. Users can filter the crosswords based on these categories.

13. The users should be able to view analysis and their statistics of their games.

14. Users can view documented tutorials on how to create or solve a crossword puzzle.

Features:

1. The platform will have a login option which will help in tracking user activity like their history, performance, etc. There should also be a forget password feature. (Login feature provides login through email or gmail)

2. There will be an administrator login feature that provides access to the internal database and can remove unwanted puzzles or users from the platform. This feature will help to monitor the entire platform.

3. There should be a button to toggle between light mode and dark mode.

4. There will be a navigation bar to navigate between different pages like home page, problem page, create crossword page, contest page, user profile page, etc.

5. There will be a filter to sort crosswords based on difficulty and topics. This filter will be shown on the problem page.

6. There will be a timer feature that tracks time spent by the user on solving the puzzle.

7. The users will have a profile page with their information and their performance statistics and analysis. It will include their rating graph over a time period, strong and weak topics, average time, streak of crossword of the day and number of questions solved of each difficulty. It will also show the crosswords created by the user and its statistics.

8. The users will be able to create their own puzzles manually or automatically by providing questions and word solutions. The puzzle should be autosaved at regular intervals.

9. There will be a crossword of the day feature that randomly chooses a crossword puzzle.

10. There will be a feature to see the documented tutorial for creating and solving crosswords on the tutorial page.

11. Users will be able to see the meaning of unknown words in the dictionary directly by clicking on the solution word. This will be done by redirecting the user to a different page like a dictionary.

12. The user will be able to subscribe to the crossword creators. After subscribing, users will receive email notification of the new crosswords created by that creator.

13. There will be a page listing upcoming, active and past contests.

14. There will be a button that users can use to access hints while solving crosswords. This feature will be disabled during the contests.

15.   Users will be able to like and dislike puzzles (popularity scaling)

16.   Users will be able to see the list of people they have subscribed to.
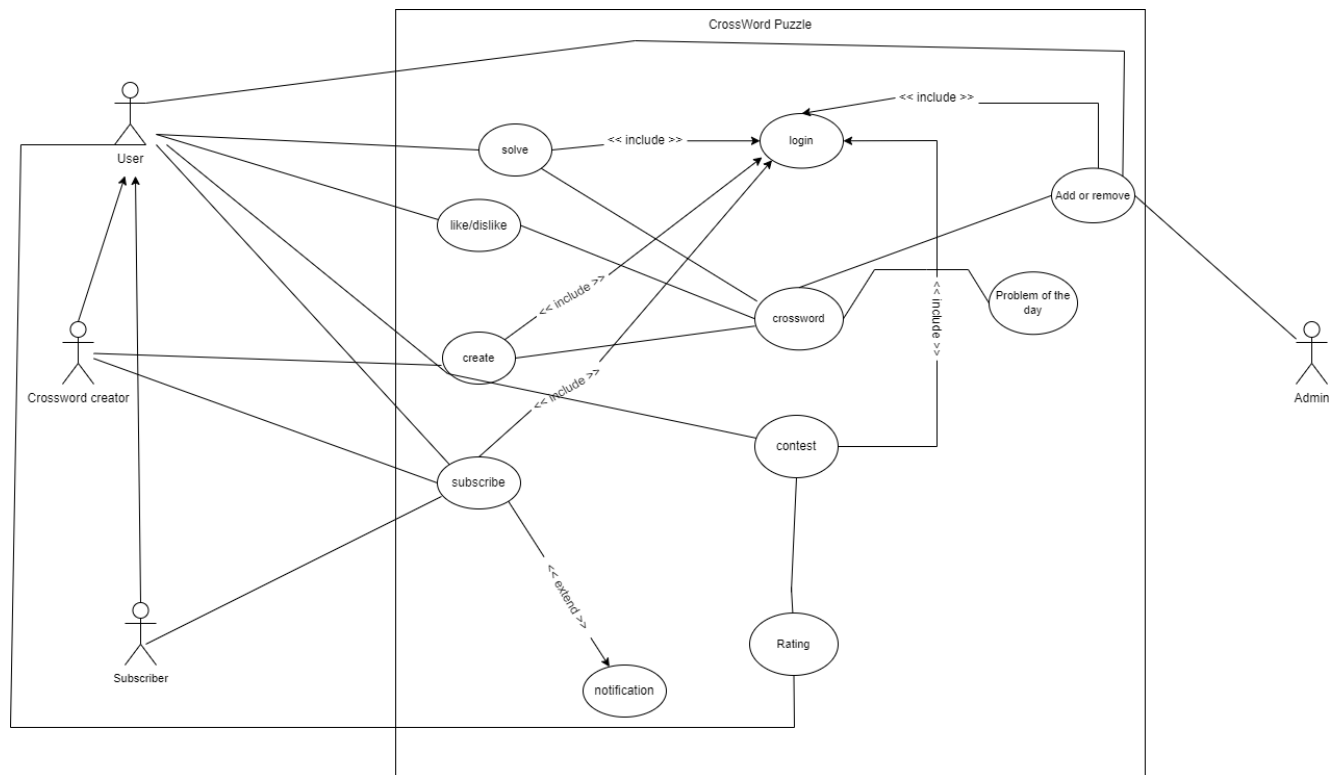
Functional requirements:

1. **User account**: Users must be able to create an account, log in, and save their progress.

2. **Crossword Creation**: Creator should be allowed to input clues and answers, alter the layout, and choose the grid size when creating crossword puzzles.

3. **Removing puzzles:** Admin or the creator should be able to remove the unwanted puzzles from the platform.

4. **Puzzle library**: Users should have access to a library of available crossword puzzles.

5. **Like / Dislike:** Users should be able to like or dislike puzzles.

6. **Puzzle filtering :** Users should be able to filter puzzles based on the difficulty level, popularity and different topics.

7. **Puzzle solving**: Users should be able to solve crosswords online, with features such as the ability to fill in answers, check progress, and view hints of puzzles.

8. **Timer:** System should provide users with timers to keep track of the time they used for solving a particular puzzle.

9. **Rating**: Each player's contest rating should be tracked by the platform and saved which should also be accessed from the user profile.

10. **Profile Access:** Users should be able to view their profile from the profile button available in the navigation bar. The profile should contain data like the user's performance analysis, contest rating, average solving time, number of puzzles solved, etc.

11. **Social Sharing**: Users should be able to share crossword puzzles by email, social media, or a special URL.

12. **Word Meaning:** User should be able to see the meaning of the unknown words just by clicking on it.

13. **Notification:** Users should be notified about the upcoming contests via email or text message on the phone number.

14. **Daily puzzle:** There should be a daily puzzle selected randomly from the available puzzles or it should be newly created by any creator. Users should be able to maintain a streak by solving daily puzzles.

15. **Subscribe:** Users should be able to subscribe to the puzzle creators and can see who they have subscribed to on a different page.

Non - Functional requirements:

1. **Accessibility:** The platform should be accessible by everyone over the internet.

2. **Scalability:** Website should be able to handle multiple users at the same time.

3. **Compatibility:** Website should be compatible with all the browsers.

4. **Security:** Users' data should be highly confidential.

5. Website should have a user-friendly interface.

6. Website can be viewed in multiple themes.

7. Daily puzzle (problem of the day) should be unique as far as possible.

8. **Data storage:** The platform should have a secure and efficient storage solution for user data, such as crosswords, scores, and history.

9. **Data backup:** The platform should have a backup and recovery mechanism to ensure the protection of user data.

Use case diagram:

Process Model:

Here we use an **incremental model** for our project development. The reasons are:

→ In an incremental model project is divided into various modules which we can implement in parallel and can merge later. Different modules will include crossword creation, crossword solving, organizing contests, etc.

→ In an incremental model we can even change our requirements later.

→ As we cannot have much interaction with the client we cannot use an agile model.

→ This model is used when a project is complex and many developers are implementing it simultaneously. Breaking the project into smaller modules

allows multiple users to work on the project simultaneously. This also makes project development faster.