SOFTWARE ENGINEERING
IT314

Group: 20

Software Requirements Specification

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A platform for creating and managing online crosswords

1. Introduction

1.1 Purpose

A platform for creating and managing online crosswords is a web-based application designed to allow users to create crosswords and play online crosswords. The platform provides an intuitive and user-friendly interface that allows users to easily create and customize crossword puzzles using various features and tools. Overall, This platform offers a complete method for creating and managing online crossword puzzles.

1.2 Intended Audience and Reading Suggestions:

Intended Audience:

Users that enjoy solving puzzles make up the bulk of this website's audience. Therefore, individuals who are interested in solving crossword puzzles are the majority of this online application's audience.

Reading Suggestions:

This application shall be beneficial for anyone and everyone who is looking to develop a crossword puzzle game. This document is made realistic by referring to the available prototypes with a similar purpose. This is done in order to help the organization understand the demands of the consumers and customers. Having this information in hand is vital as it plays an important role in decision-making.

Decisions like the features shall be added in order to achieve an application working in the most optimal state.

1.3 Product Scope:

This application is responsible for the creation and management of crossword puzzles. This application is capable of allowing the user to create puzzles manually and automatically. The user can also use the interface and participate in solving the puzzles. The user can browse through the puzzles page and select from the available options. Moreover, it also assist the user in

1.4 User Requirements:

- Users should have two options to create crosswords By manually or generate crosswords automatically by the website. Users will be able to create crosswords manually using enter the grid size and words.
- Users should be able to subscribe to crossword creators.
- Users should be able to give ratings to crossword puzzles.
- Users should be able to see documented tutorials on how to solve crosswords and create crosswords.
- Users should be able to maintain a history of the solved crosswords.
- There should be an option to sort crosswords into categories based on topic and difficulty. Users can filter the crosswords based on these categories.
- Users should be able to solve the puzzle of the day's crossword.

1.5 Description:

The application is made keeping in mind the fact to make it easily understood by the audience. UI (s) and prototypes of similar software and analyzed the features that were common among them. Those features were further brainstormed by the team on how they can be optimized and added to the application with the technologies that we use.

3. Functional and Non-Functional Requirements

3.1 Functional Requirements:

- **User account:** The user must be able to create an account, login into a crossword website using username and password.

- **Crossword Creation:** Users can create crosswords using manually crossword creation and automatic crossword creation. In manual crossword creation, Creator should be allowed to input the grid size and words manually at the time of creating the crossword puzzle.

- **Puzzle library:** Users should have access to a library of available crossword puzzles and be able to filter the puzzles based on the categories.

- **Crossword Rating:** Users should be able to rate the puzzle based on experience.

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

- **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.

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

- **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.

- **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.

3.2 Non-Functional Requirements:

- **Accessibility:** This platform should be accessible by everyone over the Internet.

- **Scalability:** Websites should be able to handle multiple users at the same time.

- **Compatibility:** Websites should be compatible with all browsers and any version of Windows.

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

- **Interface:** Websites should have a user-friendly interface.

- **Consistency:** Daily puzzle (problem of the day) should be unique as far as possible.
- **Data storage:** The platform should have a secure and efficient storage solution for user data, such as crosswords, scores, and history.

4. User Privileges

Depending on the particular duties and responsibilities of each user, multiple levels of user privileges are frequently involved in creating and operating an online crossword platform. The following are some potential user rights for designing and running an online crossword platform.

- **Administrator**: The platform's administrator has the most access and power. They are in the role of managing user account management, managing the creation of content, and ensuring the platform's general functionality. They might be able to add and remove users, make and update puzzles, and handle system upkeep.

- **Crossword Creator:** Crossword puzzles must be created and published by a crossword creator in order to be accessible on the site. They might be able to maintain puzzle archives and other content in addition to creating and editing puzzles.

- **Subscriber**: A user who has signed up for the platform is referred to as a subscriber and has access to puzzles and other content. They might be able to connect with crossword creators and solve puzzles.

5. Assumptions

6. Business Constraints

- **Quality of the crossword:** We need the quality of the crossword puzzle to maintain the interest of the user. so the Crossword creator is able to create the crossword puzzle based on user difficulty and interests.

- **Technical Person:** There is a need for a technical skilled person who is able to manage the website and database of the user data.

- **Competition:** There are many websites available for solving online crossword puzzles.so This may require unique features to attract more users.

7. Use Cases and User Stories:

- **Actors:**
  →Users
  →Crossword Creators
  →Subscribers
  →Admin

- **Use Cases:**
  →Create Crossword
  →Solve Crossword
  →Login
  →Subscribe
  →Rate Crossword
  →SendNotifications
  →View solution
  →Sorting and Filtering Crossword list
  →Access Hints
  →Acess Tutorial

Use Case Descriptions

1. Create crossword

Actor: crossword creator

Goal: The primary goal of this use case is to allow the crossword creator to create a custom crossword puzzle that can be shared or published on the crossword-creating website.

Precondition:
→ The user must have an account with a crossword-creating website.
→Users must be logged in.
→Users must have a basic understanding of how to create a crossword puzzle, including rules for creating clues and answers.

Description: In a crossword-creating website, the "create crossword" feature allows users to create their own custom crossword puzzles. there are two options for creating a crossword like play online or create manually.

Main flow:

1. The user logs into their account on the crossword-creating website.
2. The user clicks on the "Create New Crossword" button to start the puzzle creation process.
3. The user can choose two options after clicking on the "Create New Crossword" button, first “Create Manually” or “Auto Generate”.
4. If a user clicks on “Auto-generate,” the website automatically creates a crossword for the user. (jump to 6)

5. The user chooses a manual option to create a crossword.

5.1 The website presents a blank crossword grid with a list of numbered Squares.

5.2 The user fills in the numbered squares with letters to create the puzzle grid.

5.3 The user enters the clues and answers for each square on the crossword puzzle grid.

5.4 The website may provide features such as spell-check, word count, or other useful tools.

6. The user can preview their crossword puzzle to ensure it looks correct and is functioning properly.

Postcondition:

→ The user has successfully created a custom crossword puzzle on the website.

→ puzzle can be accessed, solved, and shared by other users on the website.

→ The user can edit or delete the crossword puzzle at any time through their account settings.

2. Solve Crossword

Actors: User, Subscribers, Creators

Goal: To be able to access and attempt the crossword puzzle

Preconditions:

→ The user must have an account and must be logged in to the system.

Description:

The main aim is to allow the user to solve puzzles and save their history. Through this, the admin, as well as the user, can view the solved, unsolved puzzles under various categories.

Main flow:

1. The user logging in will be directed to a home page.
2. User selects the filter or sort option.
3. The user selects a topic of their choice and selects a crossword puzzle under that which it wants to attempt.
4. User reads and questions and writes answers in the grid provided.
5. User clicks submit and checks if he solved correctly. The user will be provided an evaluation report after solving i.e. the time taken, the number of hints accessed, and the score.

Alternate flow:
4.a. The user can access hints when needed.

Postconditions:
→That particular puzzle will be shown attempted on the user's page.

3. Login

Actors: User, Admin

Goal: Allows the user to log in to the system.

Precondition:
→User must have an account.
Description: This feature allows users to login to the system and perform further tasks.

Main Flow:
1. Type the username in the space provided.
2. Type the password in the space provided.
3. Click on the login button.

Alternative flow:
2.a. If a user forgets password
2.a.1. Redirect user to forget password page
3.a. If the user does not have account
3.a.1. Redirect user to register page.
3.b.1. If username and password don't match
3.b.1. Display message
3.b.2. Redirect user to login page

Post Condition:
→User account will be created and he will be able to access all the features.

4. Subscribe

Actor: User, subscriber, crossword creator

Goal: To subscribe or unsubscribe crossword creator

Precondition:
→The user has a valid account and has already logged in to the website.

Description: The user wants to follow their favorite creator and get notified when a new crossword will be added.

Main flow:
1. The user searches for the creator they wish to subscribe to on the platform. 2. User navigates to the creator's profile page.
3. The user clicks the "Subscribe" button to follow the creator.

Alternate flow:

1.a If the user does not have a valid account

1.a.1 The platform prompts them to create one or log in before proceeding with the subscription process.

3.a. If a user has already subscribed and wishes to unsubscribe

3.a.1 One has to click the Unsubscribe button.

Postcondition:

→Subscribe button changes to unsubscribe. Notification will be sent to the user

5. Rate a Crossword

Actors: User

Goal: Users can rate a particular crossword to share his/her experience and help others to make a decision whether they want to play that crossword puzzle or not based on rating.

Preconditions:

→Users must be logged into the system.

→User should have solved that crossword puzzle before he/she rated it.

Description:

This functionality allows the users to rate a crossword based on their experience. This will allow other users to decide if they wish to solve that puzzle or not.

Main Flow:

1. User logs in to his/her account with the correct credentials.
2. User clicks on the “rate” button to give his/her rating.
3. The website shows a rating scale between 1 to 5 for that crossword puzzle. 4. Users can select any number between 1 to 5 that he/she wants to give as a rating for that crossword puzzle.
5. The website stores the new given rating.

Alternative Flows:

2.a If the User does not want to give a rating

2.a.1 Skip the rating and redirect the user to the home page.

Postconditions:

→Rating for that particular crossword puzzle must be updated on the website.

6. Add or remove crossword or member

Actor: Crossword creator, Administrator

Goal: To add or remove crossword puzzles or members from the system who violate guidelines.

Preconditions:

→TheCrossword creator or Administrator must be logged in to the system. →The administrator must have appropriate privileges to add or remove the crossword puzzle or member.

Description: The administrator wants to add or remove crosswords or members.

Main flow:

1. Admin logs into his system.
2. The crossword creator selects the add crossword puzzle button on the website interface.
3. The admin selects whether to add or remove a crossword or member.
4. The admin selects the “Remove crosswords/Members” button on the admin interface.
5. The system displays the current list of crosswords and members.

6. If removing a member or crossword, the admin must select the items to be removed and confirm the removal.
7. The administrator exits the add/remove feature and continues using the admin interface.

Alternate Flow:

1.a. If the admin is not logged into his system
    1.a.1. The system will ask him for logging in.

Post Condition:
→ The system updates the list of crosswords or members accordingly.

7. Send Notifications

Actor: Subscriber

Goal: Send notifications to subscribers about updates of new crosswords by their subscribed crossword creators.

Precondition: →Toget notification users must be subscribed to the respective crossword creator.

Description:
The system will give notifications regarding new crosswords uploaded by the subscribed crossword creator and they will also get notifications for daily crossword puzzles.

Main flow:

1. Users must have to login into their account.
2. Users must be subscribed to crossword creators for their new crossword notifications.
3. Notification gets from the system to the user notification section.
4. To see the notification user have to click the see notification button which is available on the platform.

Alternate flow:

1. a. If the user is not logged into his account, the system will ask him to log into his account.
2. a If the user is not subscribed to crossword creators, he will not get notifications.

8. Viewing solution of crossword puzzle

Actor: User Goal: To view the complete solution of a crossword puzzle .

Preconditions:

→ The user must have an active account in the system.
→ The user must have an existing puzzle open.
→ puzzle must have been attempted at least once.

Description: The system shows the solution of the crossword puzzle.

Main flow:

1. The user selects the “View Solution” button on the crossword puzzle interface.
2. The system verifies that the user has an active account and that the puzzle is open.
3. The system displays the complete solution of the puzzle.
4. The user examines the solution and learns how to solve the puzzle.
5. The user closes the solution and continues using the puzzle interface.

Alternate flow:

1.a If the solution does not exist

1.a.1 Display no solution available message.

Postcondition:

→ The user has viewed the complete solution of the puzzle.

→ The system records that the user has viewed the solution of the puzzle.

9. Sorting and filtering Crossword List

Actors: User

Goal: To be able to sort or filter out the crossword puzzles on different parameters.

Preconditions:

→ The user must have an account and must be logged in to the crossword puzzle software.

Description: The user will be allowed to pick crosswords of their choice through sorting and filtering. Hence, it will not require searching one to search for different categories separately and then make a selection.

Main Flow:

1. The user logging in will be directed to a home page.
2. It then has to look for the “topics” option and click on it.
3. On the page it is redirected to, one must click on the filter and sort option.

4. The user must then make a selection from the available options according to their preference.
5. All the crosswords falling under the categories will be displayed.
6. The user can then make a selection from the results and proceed to solve.

Alternate Flow:

5. a If no puzzles appear under the preferences made by the user

5.a.1 User will have to add a set of new preferences and try out another combination.

10. Access hints

Actor: User

Goal: The user should be able to find a hint for the given word.

Precondition:

→ The user should already open a crossword and currently solve a crossword.

→The hint section will show how many hints are left for the user to use. Description: The user will use this use case for asking help for a particular word if the user can't solve or answer the word in the crossword and be able to see the hint until the user solves the problem.

Main flow:

1. The user select a cell of the given word.
2. The Users press the hint button.
3. A hint pops up in the hint section.

Alternate flow:

2.a The User presses the hint button without selecting a cell. The hint will not generate.

2.b The user does not have hints left for asking for hints. It will not show hints and show that no hints are left.

3.a The user has already solved the crossword. It will show that the crossword has already been solved.

Postcondition:

→The hint will be saved for the user, and it will show every time the user selects any cell of the word.

→ The number of hints will decrease by one after the use of a hint.

11. ACESS TUTORIAL

Actor: User

Goal: The user should be able to access the tutorial for creating crosswords and solving crosswords.

Precondition:

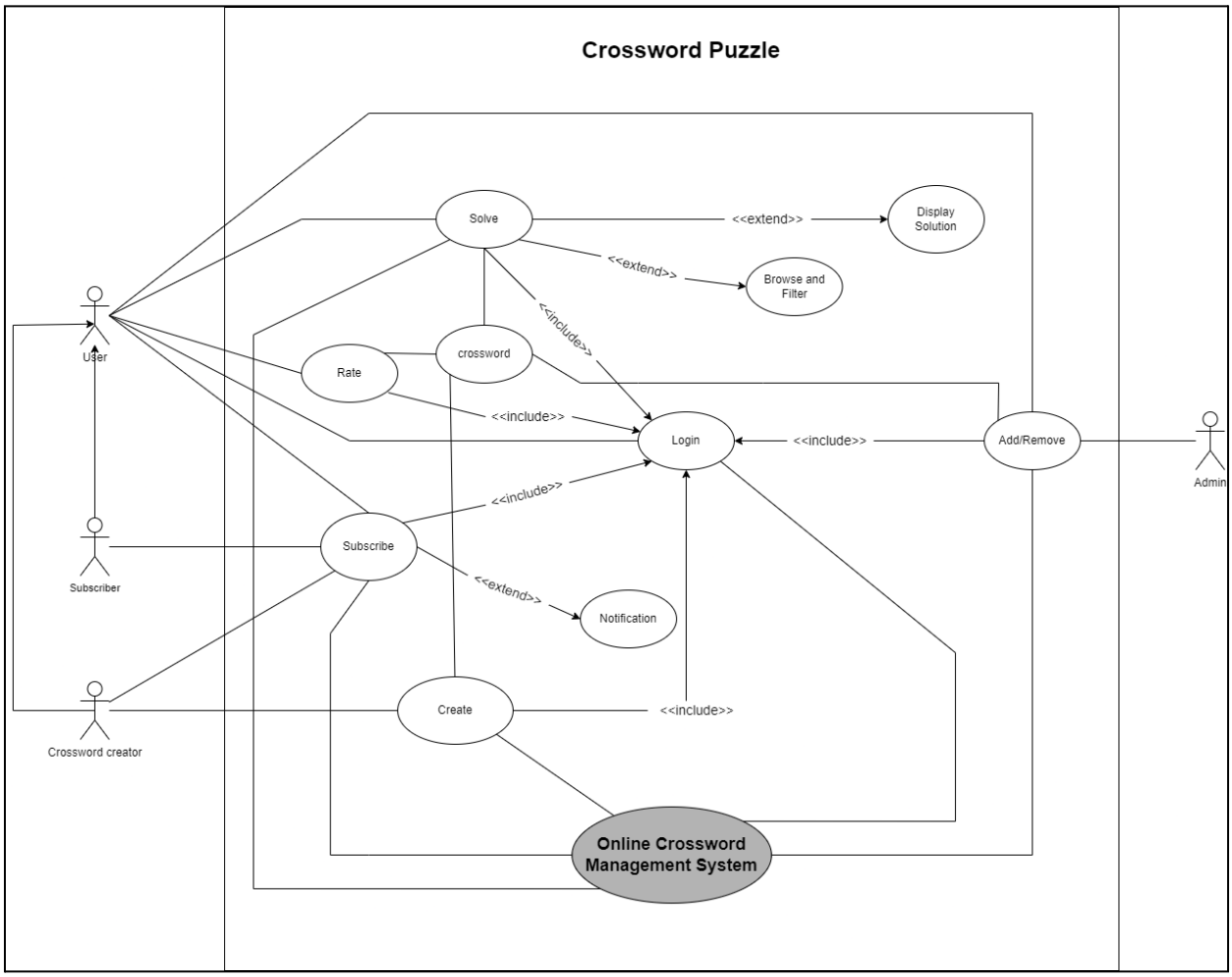
→ The user should have an active account in the crossword platform.

→The tutorial page is documented page which shows the steps of how to solve crosswords and how to create crosswords manually.

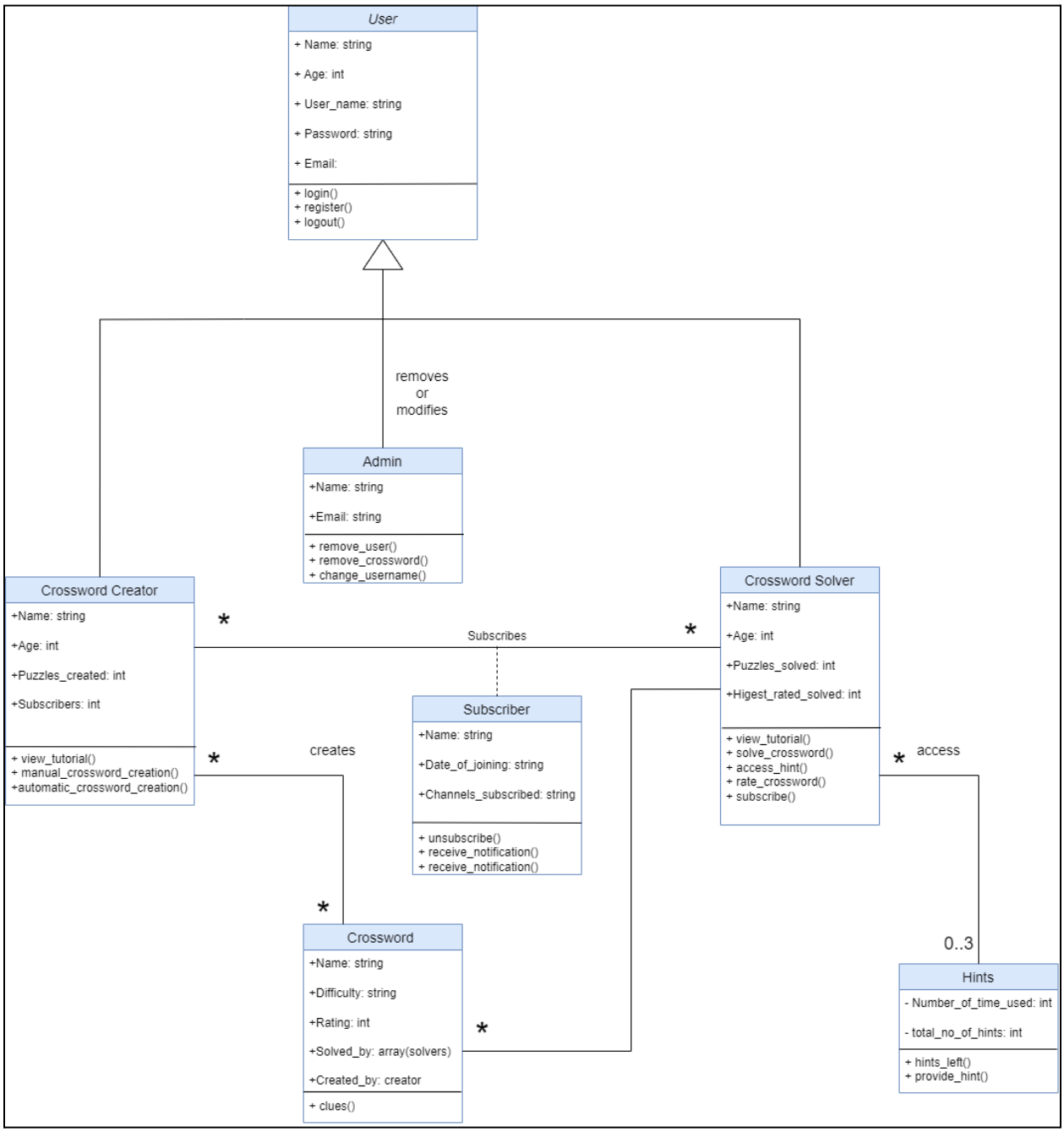
Main flow:

1. The user selects the Tutorial button on the home page
2. The Users press on create crossword button.
3. A documented tutorial section opens on the webpage.

8. Use case Diagram:

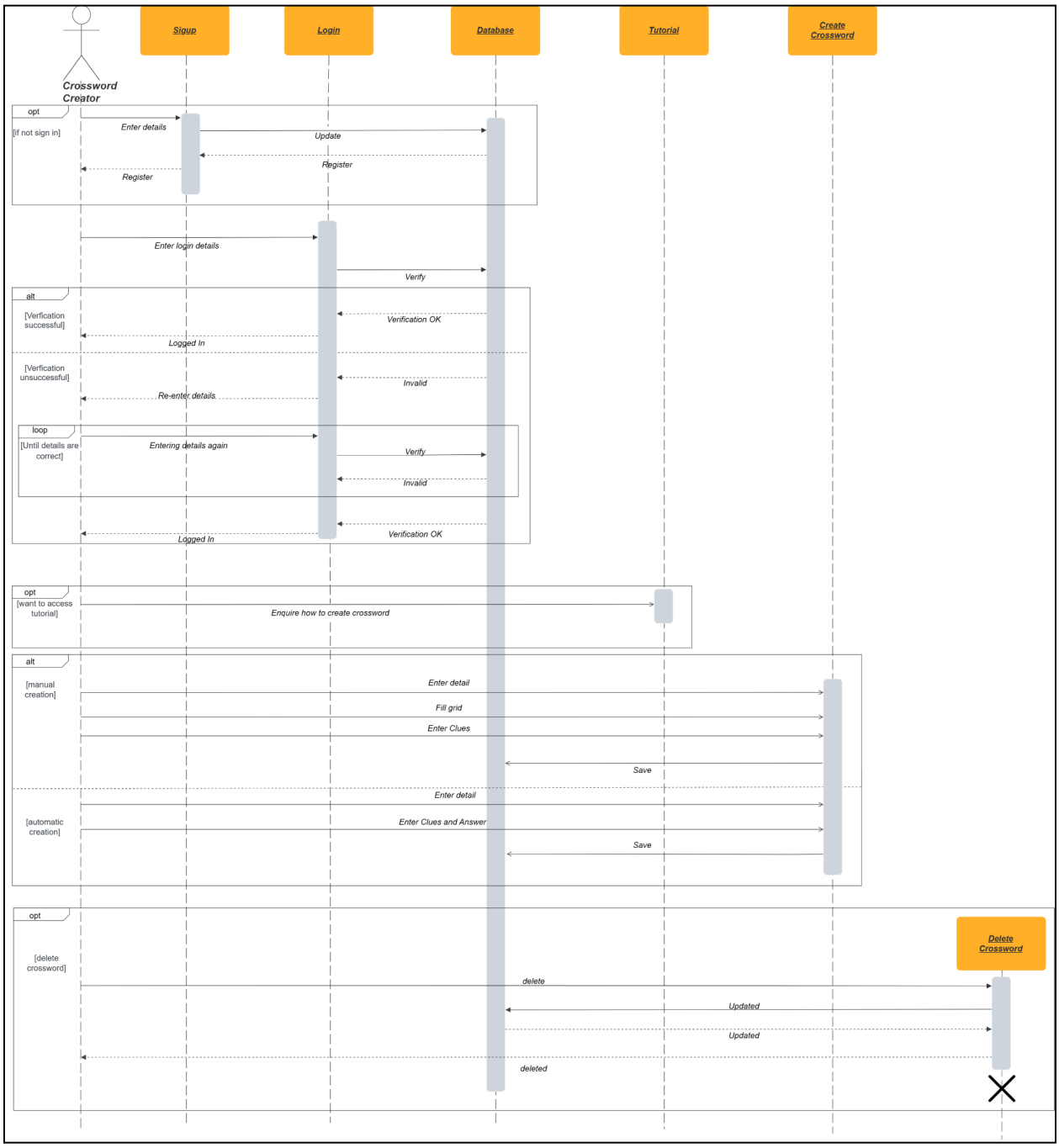


9. Class Diagram:

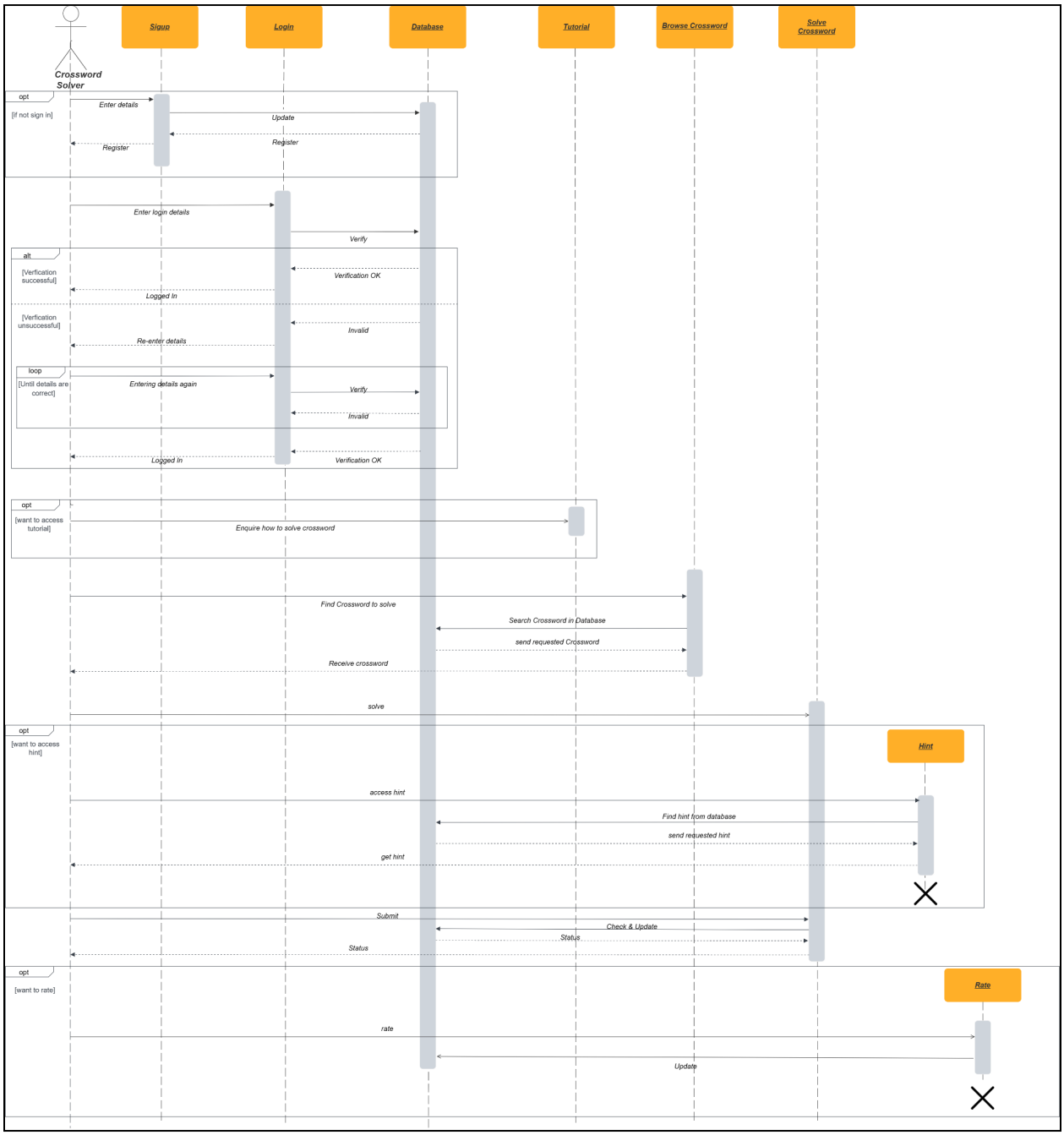


10. Sequence Diagram:

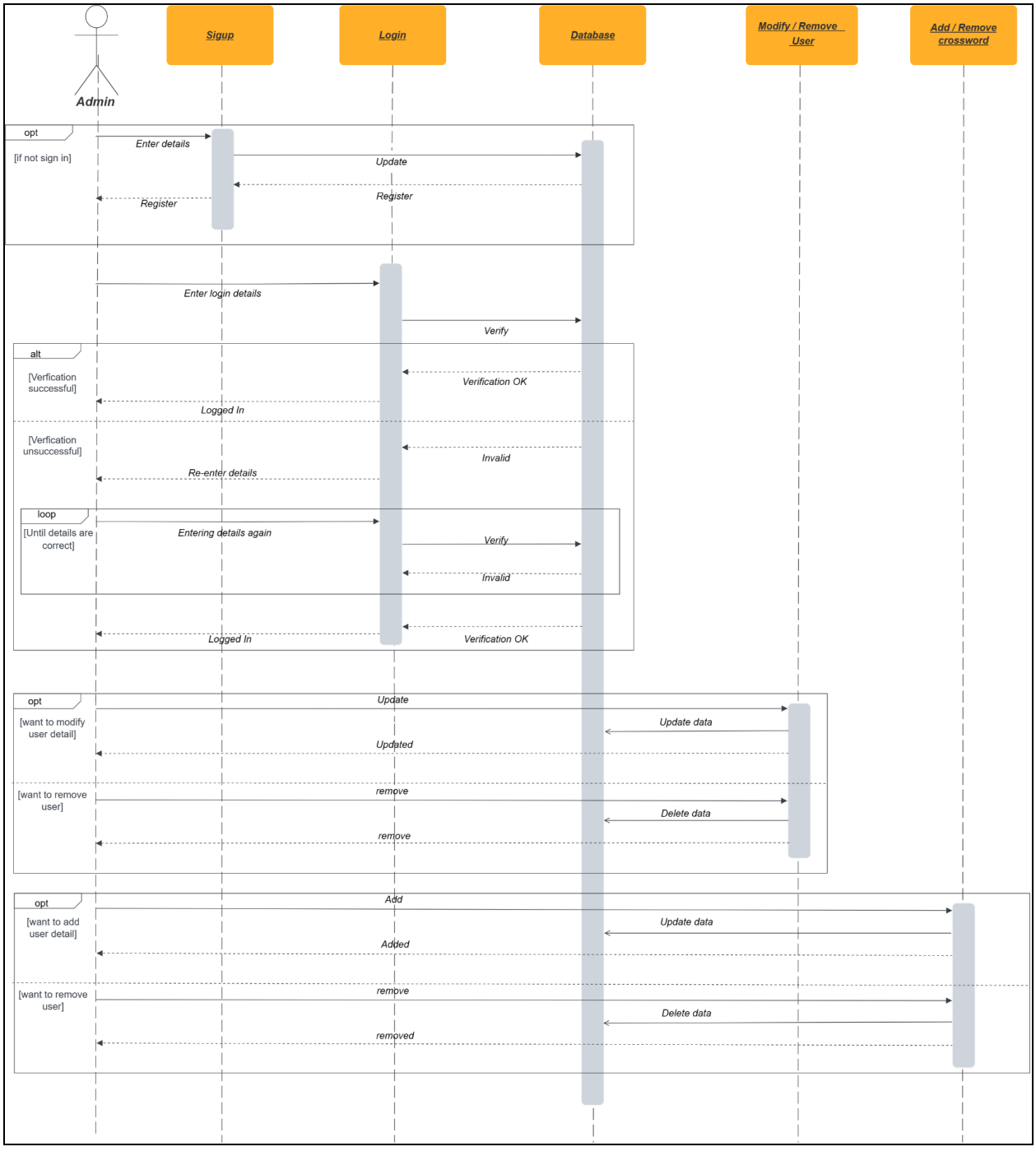
Sequence Diagram Creator:



Sequence Diagram solver:



Sequence Diagram Admin:



11. Tools and Technologies Used

11.1 Tools Used:

- Pycharm
- VS Code
- MongoDB compass
- Github copilot

11.2 Technologies and Frameworks Used:

- Django
- pymongo

11.3 Database

- MongoDB