IT314 - Software Engineering

Lab 6
Group: 20

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

202001178	RUDRA P GOHEL
202001233	BHAVSAR JAINAM MAYANKBHAI
202001225	PATEL DHYAN DINESHBHAI
202001194	DARJI RUCHIR SHAILESHKUMAR
202001181	CHAUDHARY JILL KIRITKUMAR
202001207	DARSHAN KISHORBHAI GOHEL
202001227	MAHERIYA JATIN BHARATBHAI
202001201	TANK NANDANI JAGDISHBHAI
202001205	AASHKA ARVINDBHAI THUMAR
202001234	HARSORA VIVEKKUMAR MANISHBHAI

Domain Analysis modeling:

- **Entity Objects:**

  1. **Crossword creator:** A person wishing to build a crossword either manually or automatically through the crossword creator website.
  2. **Crossword solver:** A person wishing to solve new crossword puzzles through the crossword creator website.
  3. **Admin:** A person who manages user accounts and permissions, keeps track of user activity, troubleshoots technological problems, and maintains website design
  4. **Subscriber:** A user who has an account on the website is free to subscribe to crossword creators of their choice. They will get notified when a new crossword is created.
  5. **Crossword:** Puzzles that consist of a grid of squares, with some squares containing a letter or a word and other cells blocked.
  6. **Hints:** The player may seek hints when in doubt or is unable to think of a solution.
  7. **Notification:** It is an entity object that represents a notification sent to the user about a new crossword puzzle or a subscription update.

- **Attributes:**

  1. **Crossword Creator:** Name, Age, no of puzzles created, country, subscribers
  2. **Crossword Solver:** Name, age, country, no of puzzles solved, highest-rated solved puzzle
  3. **Admin:** Name, email, country
  4. **Subscriber:** Name, Date of joining, number of channels subscribe, age, country
  5. **Crossword:** Name, difficulty, rating, number of times solved, created by
  6. **Hints:** Number of times used, Total number of hints
  7. **Notification:** target user email, subject, the content of the email
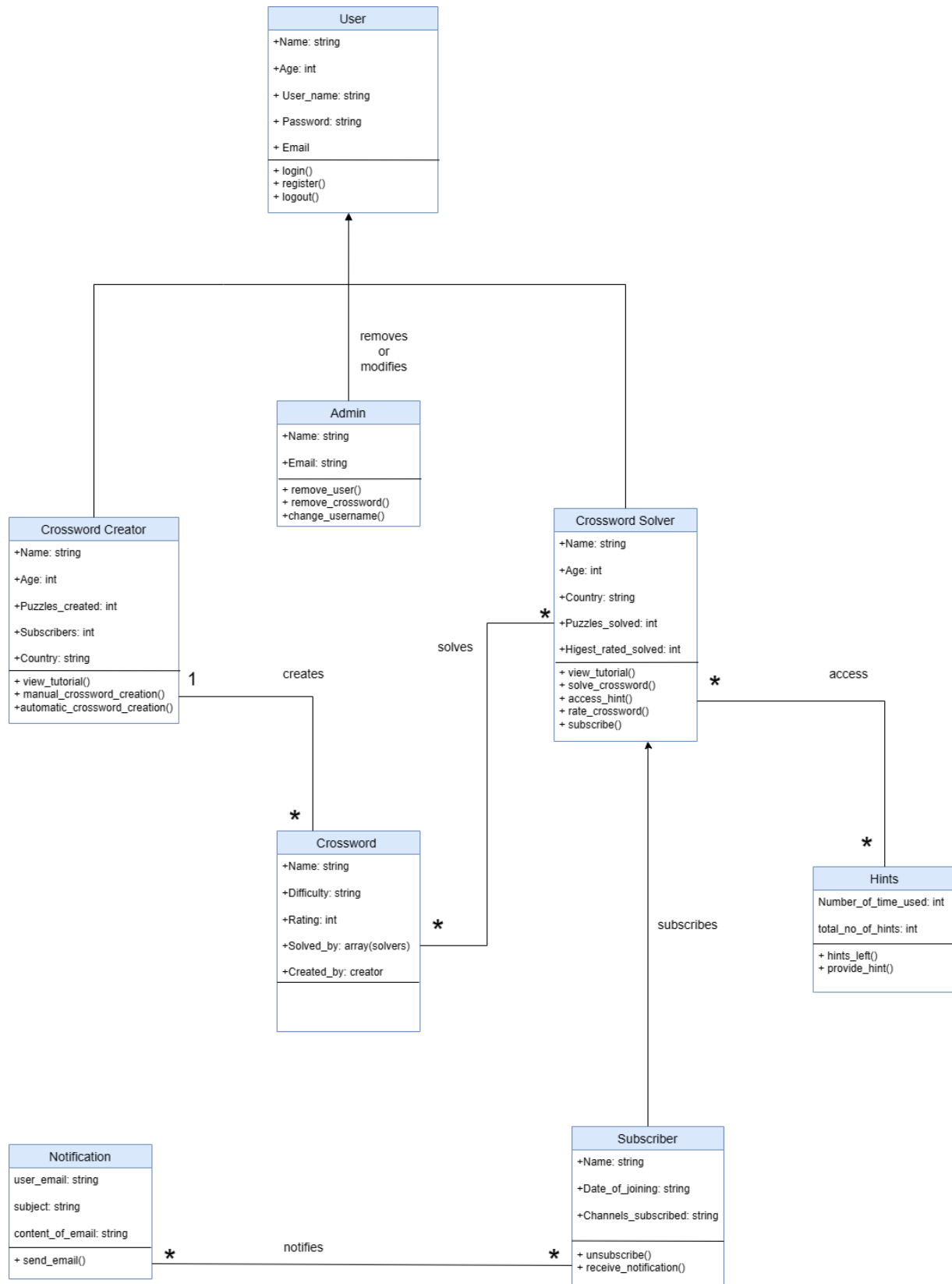
- **Boundary Objects:**

1. **User sign-in Form:** This is an input boundary object which captures information provided by the user when logging into an existing account. It contains a username and password field.
2. **User sign-up Form:** This captures information provided by users when creating an account. It contains fields of first name, last name, username, country, password, and email.
3. **Crossword creation interface:** This boundary object takes words, clues, and criteria or preferences from the user while creating crossword puzzles.
4. **Crossword-solving interface:** This is an input boundary object that captures input that is provided by the solver. it contains words and characters while solving crossword puzzles by the solver.
5. **Rating a crossword interface:** This input boundary object records the crossword ratings provided by various people.
6. **Subscribe crossword creator:** This is an input boundary object which captures subscribe crossword creator provided by the user who likes the crossword.
7. **New crossword notification**: This is an input boundary object that notifies the crossword solver when their subscribed crossword creator creates a new crossword.
8. **Crossword tutorial:** This is an input boundary object that records the platform's tutorial. It includes a detailed explanation of how to do the crossword puzzle step by step.
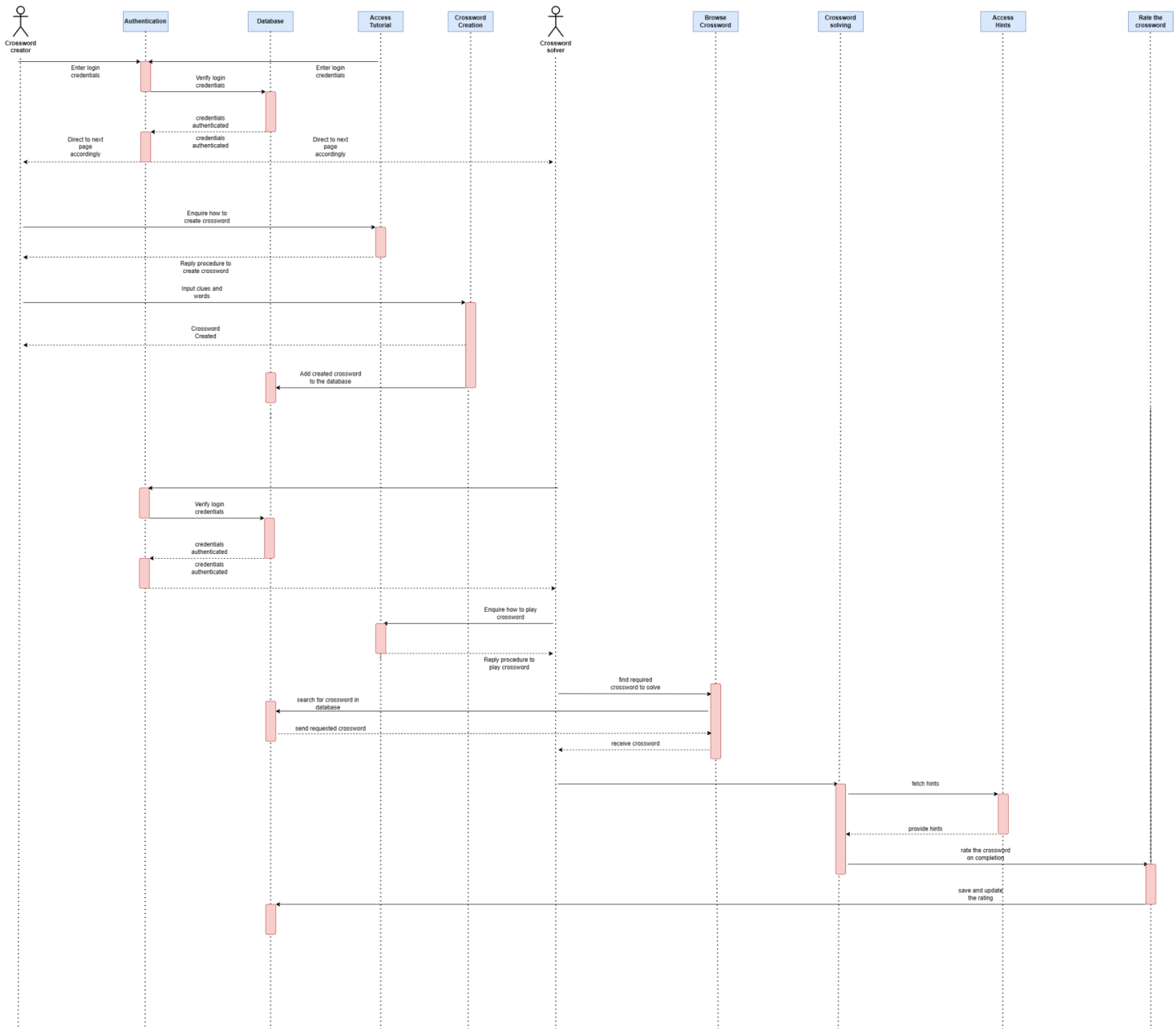
- **Control Objects:**

  1. **User sign-in manager:** This control object is responsible for managing user accounts on the website. It handles user registration, login, and password management and ensures that only authorized users can access certain features of the site.
  2. **Automatic crossword creation**: This control object is responsible for generating crossword puzzles automatically. It may use algorithms or other techniques to create crosswords based on user preferences or other criteria.
  3. **Manual crossword creation:** This control object allows users to create crossword puzzles manually. It provides tools for inputting words and clues and arranging them on the puzzle grid.
  4. **Notification Manager:** This control object is responsible for managing notifications sent to users. It may handle notifications related to new puzzles or other important information. It controls notifications regarding new crosswords created by the subscribed creator and daily puzzles.
  5. **Account Manager:** It controls the accounts of all the players across the internet that have been created on the website.
  6. **Crossword of the day handler:** It handles the release of daily crossword puzzles every 24 hours.
  7. **Subscription handler:** It manages the creators that players have subscribed to and the subscribers of the creator.
  8. **Email notifier:** it handles all the email notifications about daily challenges, subscriptions, etc.

Class Diagram ([link](#)):

User
+Name: string
+Age: int
+ User_name: string
+ Password: string
+ Email
+ login()
+ register()
+ logout()

Admin
+Name: string
+Email: string
+ remove_user()
+ remove_crossword()
+change_username()

removes
or
modifies

Crossword Creator
+Name: string
+Age: int
+Puzzles_created: int
+Subscribers: int
+Country: string
+ view_tutorial()
+ manual_crossword_creation()
+automatic_crossword_creation()

Crossword Solver
+Name: string
+Age: int
+Country: string
+Puzzles_solved: int
+Higest_rated_solved: int
+ view_tutorial()
+ solve_crossword()
+ access_hint()
+ rate_crossword()
+ subscribe()

1   creates

solves   *

*   access

Crossword
+Name: string
+Difficulty: string
+Rating: int
+Solved_by: array(solvers)
+Created_by: creator

*   *

Hints
Number_of_time_used: int
total_no_of_hints: int
+ hints_left()
+ provide_hint()

subscribes

Notification
user_email: string
subject: string
content_of_email: string
+ send_email()

notifies

*   *

Subscriber
+Name: string
+Date_of_joining: string
+Channels_subscribed: string
+ unsubscribe()
+ receive_notification()

● **Sequence Diagram** (link)

**Design Goals:**

Maintenance and Dependability criteria:

1. **Functionality:** The website must be capable of allowing the user to solve and surf through the crossword puzzles and the creators to upload new ones and be able to view the attempts.
2. **Customizability**: The platform should allow users to customize their crossword puzzles according to their preferences, including puzzle size, difficulty level, and thematic content.
3. **Availability:** The website must be available to users 24x7 with very less time for maintenance and upgrade.
4. **Security:** This platform offers phone or email-based authentication and does not permit the use by unauthorized users**.**
5. **Scalability:** The platform should be scalable and able to handle large numbers of users and puzzles.
6. **Robustness:** The website must be able to handle errors, exceptions, and unexpected inputs without crashing or losing data. It should have a robust error-handling mechanism that can recover from failures and prevent data loss.
7. **Flexibility:** The website needs to be adaptable enough to support a variety of crossword puzzles, including thematic, cryptic, and fast puzzles. Users should be able to alter the puzzles by selecting the grid size, degree of complexity, and other options.

PERFORMANCE CRITERIA:

8. **Response time:** For a fluid and easy-to-use customer experience, the website must have quick response times. To speed up website loads, it should have a low latency network architecture, efficient code, and caching technologies.
9. **Throughput:** The website must be able to process a large number of user queries quickly and efficiently. It ought to have a high throughput design that can deal with several queries at once.

END-USER CRITERIA:

1. **Usability:** This platform has a user-friendly interface. Although the platform provides tutorials, it could be novel to beginners.
2. **Utility:** The data of solvers, creators, and users ought to be handled conveniently by this platform.

- **High-Level System Design** ([link])
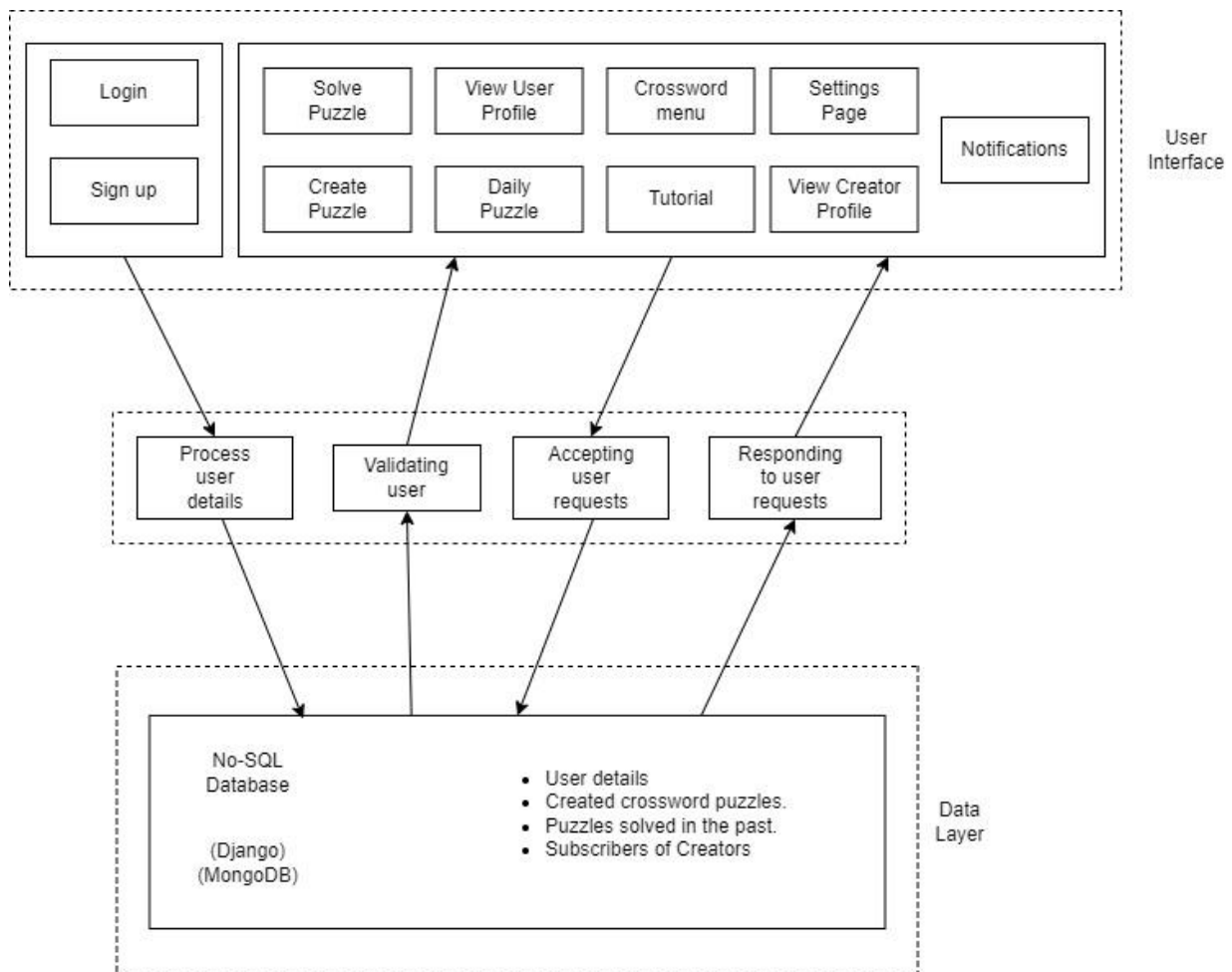
Architecture:

The architecture used is a layered architecture. It consists of 3 layers.

The upper layer is the layer that interacts with the user. It consists of the sign-in/sign-up page, crossword creation, crossword solving, rating a crossword, subscribing a creator, and viewing a profile.

The application's backend, or intermediate layer, handles user requests and provides the proper replies. Example - Crossword creation, authentication of the user, etc.

The third layer contains the database of the system. The database used here is NOSQL MongoDB. It stores information related to the credentials of a user, crosswords, subscribers, etc.