

Advanced Programming

Season 2024-III

Report of Final Project

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User Stories:

1. User Registration

As a new user, I want to create an account so that I can log in and track my progress over time.

2. Cube selection

As a casual cuber, I want to choose the type of cube so that I can time my solves for different type of cubes.

3. Scramble Generation

As a speedcuber, I want to receive a random scramble for my selected cube so that I can practice under standard competition conditions.

4. Start and Stop timer

As a user, I want to start and stop the timer so that I can record the time it takes me to solve the cube.

5. Automatic Statistics Update

As a user, I want my statistics to update automatically after each solve so that I can track my performance easily

6. View Past Performance

As a user, I want to see a history of my past solves so that I can measure my improvement over time

7. Log Out

As a user, I want to log out of the app so that my session is securely closed

8. Error Handling

As a user, I want the app to notify me if I make a mistake (e.g., enter the application incorrectly) so that I can correct it quickly and continue using the app.

Object-oriented principles analysis:

For this project we took into account some different things about OOP designs, that we thought were the important things.

1. ABSTRACTION:

- We started thinking about a real timer and some different cubes, from there we did the timer class and interface class, which could work as a common class for all cubes.

2. INHERITANCE:

- After seeing that we could do an interface class, then we applied inheritance for having all the son classes.

3. ENCAPSULATION:

- People who solve cubes most of the time don't want to share their times to everyone, so we have to encapsulate that part of the attributes.

CRC cards:

API Class

responsibilities	collaborators
Connect to external API for generating scramblers	Cube 2x2
	Cube 3x3
Fetch scramble data for different type cubes	Cube 4x4

Timer

responsibilities	collaborators
Start, finish and reset the chronometer	User
Store and display timing results.	

User

responsibilities	collaborators
Manage user profile and settings	Timer
Keep track of personal best times and averages	Register
	Interface Class

Cube 2x2

responsibilities	collaborators
Request an scramble of 2x2 from API Class	API class
Represent 2x2 cube and its state	Interface Class

Cube 3x3

responsibilities	collaborators
Request an scramble of 3x3 from API Class	API class
Represent 3x3 cube and its state	Interface Class

Cube 4x4

responsibilities	collaborators
Request an scramble of 4x4 from API Class	API class
Represent 4x4 cube and its state	Interface Class

Interface Class

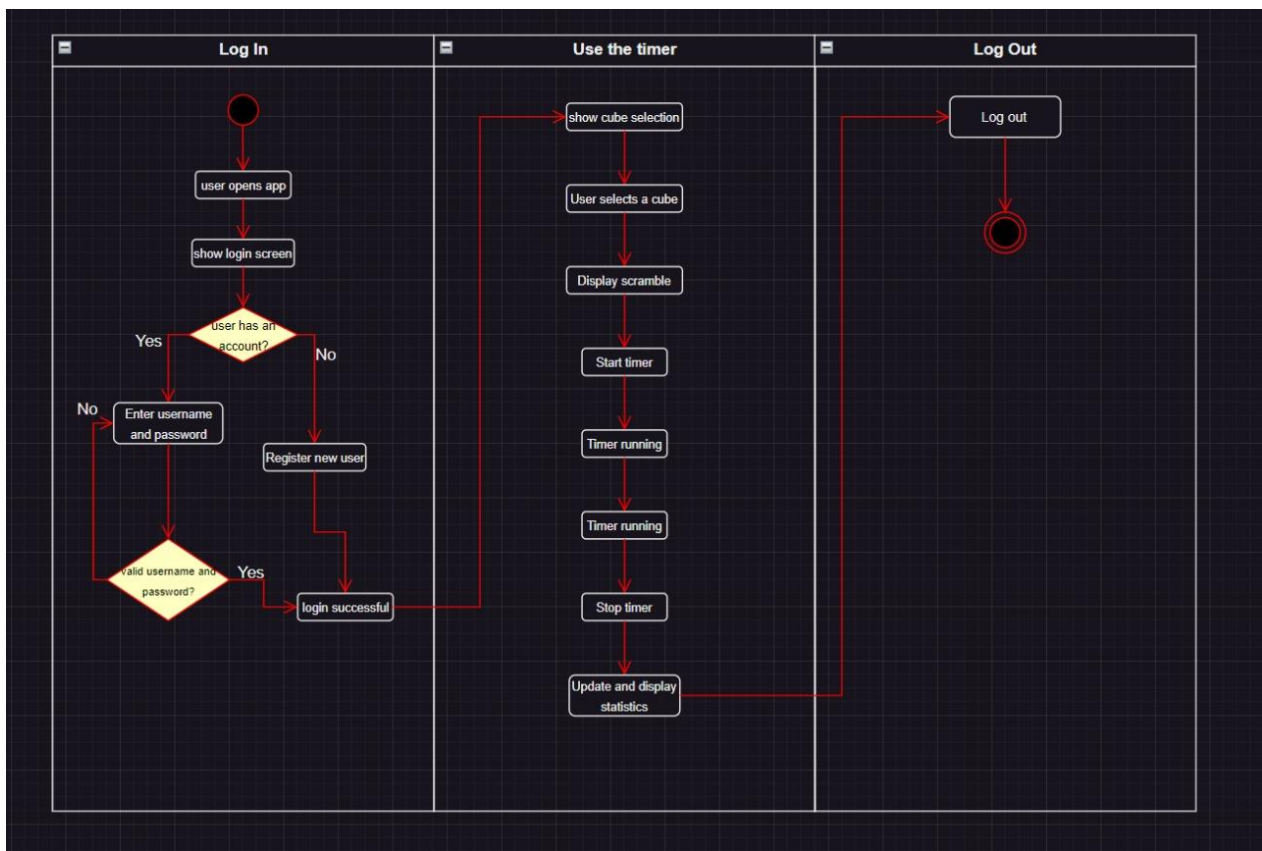
responsibilities	collaborators
Allow the user choose between Cube 2x2, 3x3 and 4x4	Cube 2x2
	Cube 3x3
Display the scramble and timing information	Cube 4x4
	User

Register

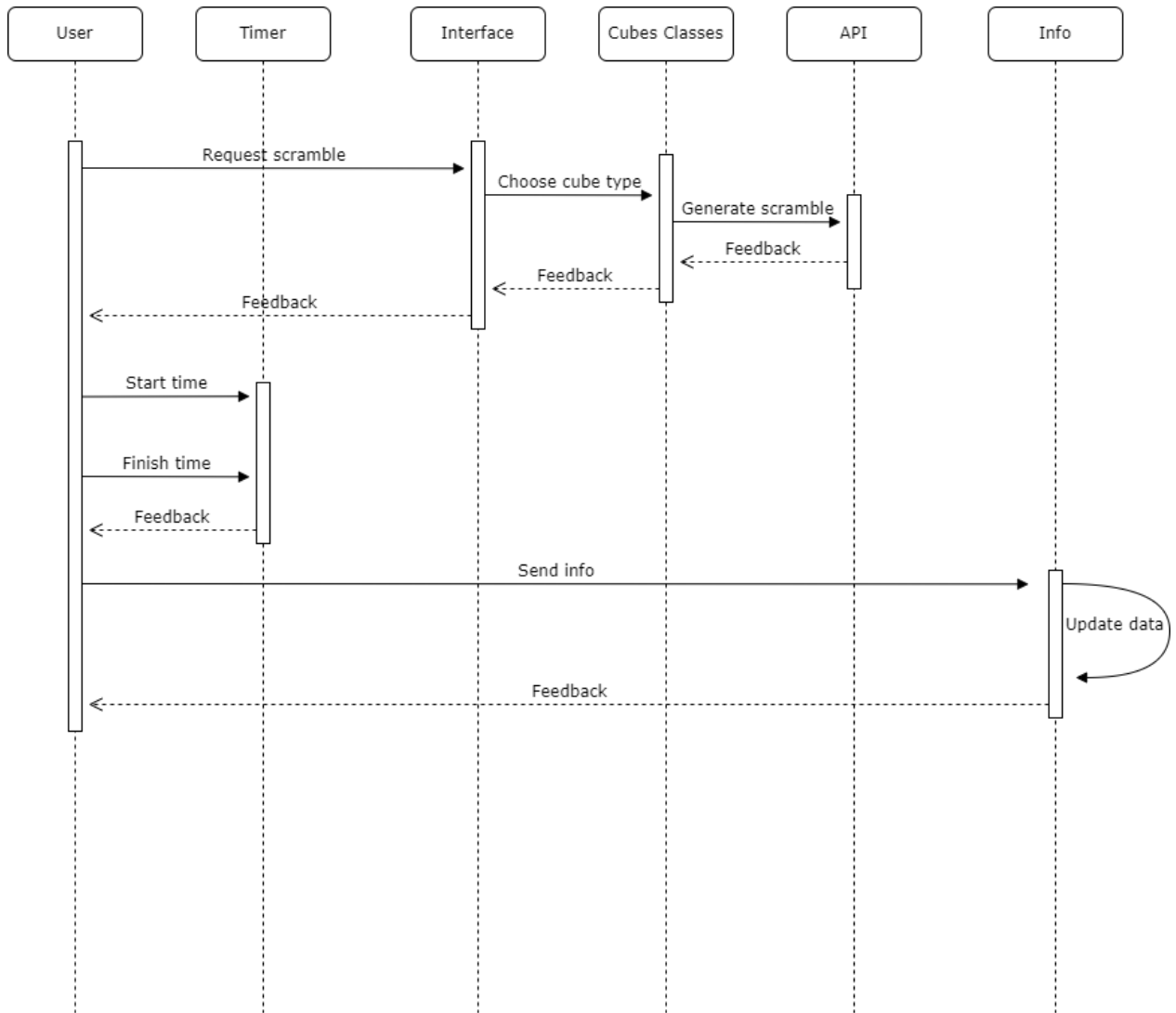
responsibilities	collaborators
Handle user registration and authentication processes	User
Manage user data such as credentials	



Activity Diagram:



Sequence Diagram:



Class Diagram:

