

**CodeKataBattle project by Russo Mario
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Requirement Analysis and Specification Document

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1 Introduction

1.1 Purpose

The motivation behind the existence of the CodeKataBattle platform is to provide students with a dedicated platform for practicing their programming skills. The platform aims to create a competitive environment where teams of students can participate in programming tournaments and solve programming challenges.

By offering a platform specifically designed for programming practice, CodeKataBattle aims to provide students with a structured and engaging way to improve their coding abilities. The competitive nature of the platform adds an extra layer of motivation and excitement, encouraging students to push their limits and strive for excellence.

Overall, the motivations behind the existence of the CodeKataBattle platform are to create a dedicated space for programming practice, foster healthy competition among students, and provide a means for tracking and improving programming skills.

1.1.1 Goals

- G1 Educator can create a tournament
- G2 Educator can set up battles for a tournament
- G3 Student can compete in a tournament
- G4 Team of students can compete in a battle
- G5 Educator can evaluate the performance of a student in a battle
- G6 CKB notify the student about upcoming tournaments
- G7 CKB notify the student about upcoming battles

1.2 Scope

The scope of CKB is to provide a platform for programming practice. The platform will allow students to participate in programming tournaments and solve programming challenges. The tournaments consist of a series of battles. In order to participate to a battle a student must be subscribed to the tournament in which the battle takes place. In each battle the students have to form teams by inviting other students to join. The platform will allow educators to create tournaments. For the single tournament, the educator is able to invite other educators to join the tournament as educator. The educator is able to create battles for the tournament by uploading the code kata composed by the description and software project. In addition, he should be able to upload a set of configuration for scoring. For each battle the educator is able to set restrictions such as the minimum and maximum number of team members, the registration deadline and the submission deadline. The educator is also able to set a time limit for the battle. CKB will assign the scoring for each team of the battle based on some automated tests regarding the functional aspects, timeliness, quality of the code and the set of configuration for scoring provided by the educator for the battle. In addition to this automated scoring the educator will also be able to assign a manual scoring for each team of the battle. In order to submit the solution for a battle, CKB provides a GitHub repository. The teams must fork the repository and work on their solution in the forked repository. For each push to the remote repository CKB will be informed through an API call made with GitHub Actions which teams must set up.

1.2.1 World phenomena

WP1 Student wants to compete in a tournament

WP2 Educator wants to create a tournament

WP3 Educator wants to manually evaluate the performance of a student in a battle

WP4 Educator wants to set up a battle for a tournament

1.2.2 Shared phenomena

Phenomena controlled by the world and observed by the machine:

SP1 Student push the solution of the battle to the forked repository

SP2 Educator sets deadlines for tournaments and battles

SP3 Educator sets the configuration for scoring

SP4 Educator uploads the code kata for a battle to CKB

SP5 Educator sets the restrictions for a battle

Phenomena controlled by the machine and observed by the world:

SP6 CKB notifies the student about upcoming tournaments and battles

SP7 CKB notifies about the students about the results of the battle and the tournament

SP8 CKB shows information about the scoring of the battle and the tournament

SP9 CKB provides a GitHub repository for each battle

1.3 Definitions, Acronyms, Abbreviations

1.3.1 Definitions

1.3.2 Acronyms

1.3.3 Abbreviations

1.4 Revision history

1.5 Reference documents

1.6 Document structure

This document is structured as follows:

- **Introduction:** it provides a general description of the product, its purpose and the goals that the project aims to achieve. It also contains the scope of the product, the phenomena that the product will interact with and the shared phenomena between the product and the world. Finally, it contains the definitions, acronyms and abbreviations used in the document.
- **Overall Description:** TODO
- **Specific Requirements:** TODO
- **Formal Analysis:** TODO
- **Effort Spent:** TODO
- **References:** it contains the list of the documents used to redact this document.

2 Overall Description

2.1 Product Perspective

2.1.1 Scenarios

1. Educator creates a battle for a tournament

The educator who wants to create a battle in a tournament for which he is the creator, or for which he has the permission to create battles. The creation of a battle consists of in:

- Set the deadline for registration of teams
- Set the deadline for the submission of solutions
- Set the minimum and maximum number of students per team
- Upload the code kata to the CKB platform

Once the battle is created, the students registered at that tournament are notified by CKB about the upcoming battle. The CKB platform will also create a new repository on Github for the battle, and will invite the students to fork it.

2. Student invite other students to join the team

Roberto is a student who wants to participate in a battle. He has already registered in the tournament in which the battle has been created, and he has been notified about the upcoming battle. He wants to invite other students to join his team for the battle. He can do this by sending an invitation to the other students, who will receive a notification about the invitation. The other students can accept or decline the invitation. If they accept, they will be added to the team and they will be able to compete as a team in a battle. Even if the students invited have accepted the invitation the participation to the battle is not guaranteed since the educator could have set a maximum number of students per team.

3. Student push the solution of the battle to the forked repository

The team A have been working on the solution for the battle for a while and it seems to be passing all the tests provided in the code kata. Since the time being is before the submission deadline the team push the solution to the forked repository. This will trigger the CKB platform to evaluate the solution and update the score of the team in the battle. In the case that the submission date is after the submission deadline the push will not trigger another evaluation of the solution by the CKB platform.

4. Educator manually updates the score of a team

Giacomo is an educator who has created a battle for a tournament in which he has been invited by another colleague. Once the submission deadline is expired he wants to manually assess the score of a team to cover all the aspects that the CKB platform cannot evaluate. To do this he access through the CKB platform the battle page and he can see the list of teams that have submitted a solution. He can then manually update the score of a team by clicking on the 'Update score' button. This will open a form where he can modify the current score of the team previously evaluated by the platform. Once he is satisfied with the score he can click on the 'Save' button to save the new score for the team. The new score will be visible to the team and to the other students subscribed to the tournament.

5. CKB notifies students about the result of the tournament

When an Educator closes a tournament, the CKB platform will notify all the students subscribed to the tournament about the result of the tournament. The notification will contain the list of the teams that have participated in the tournament and their final score.

2.1.2 Domain class Diagram

In Figure 1 is shown the domain class diagram of the CKB platform. This diagram shows the main entities of the system and their relationships.

- **User:** is the main entity of the system. It represents a user of the CKB platform. It can be either a student or an educator.
- **Student:** is a user of the CKB platform. It can participate in tournaments and battles. It can also create teams and invite other students to join them.
- **Educator:** is a user of the CKB platform. It can create and manage tournaments and battles. He can also invite other educators to join a tournament. He also uploads the code kata to the CKB platform for a battle.
- **Tournament:** is a competition between teams of students. It is created by an educator and it can be joined by students. It can contain multiple battles.
- **Battle:** is a competition between teams of students. It is created by an educator and it can be joined by students. It is part of a tournament and it can contain multiple teams.
- **Team:** is a group of students that compete together in a battle. It is created by a student and it can be joined by other students.
- **Invitation:** is a request sent by a student to another student to join a team. It can be accepted or declined by the receiver.
- **Code Kata:** is the code that the students have to implement in a battle. It is uploaded by an educator to the CKB platform.
- **Submission:** is the code that a team of students have implemented for a battle. It is pushed to the forked repository of the battle on Github by the students. The CKB platform will evaluate the submission and update the score of the team.

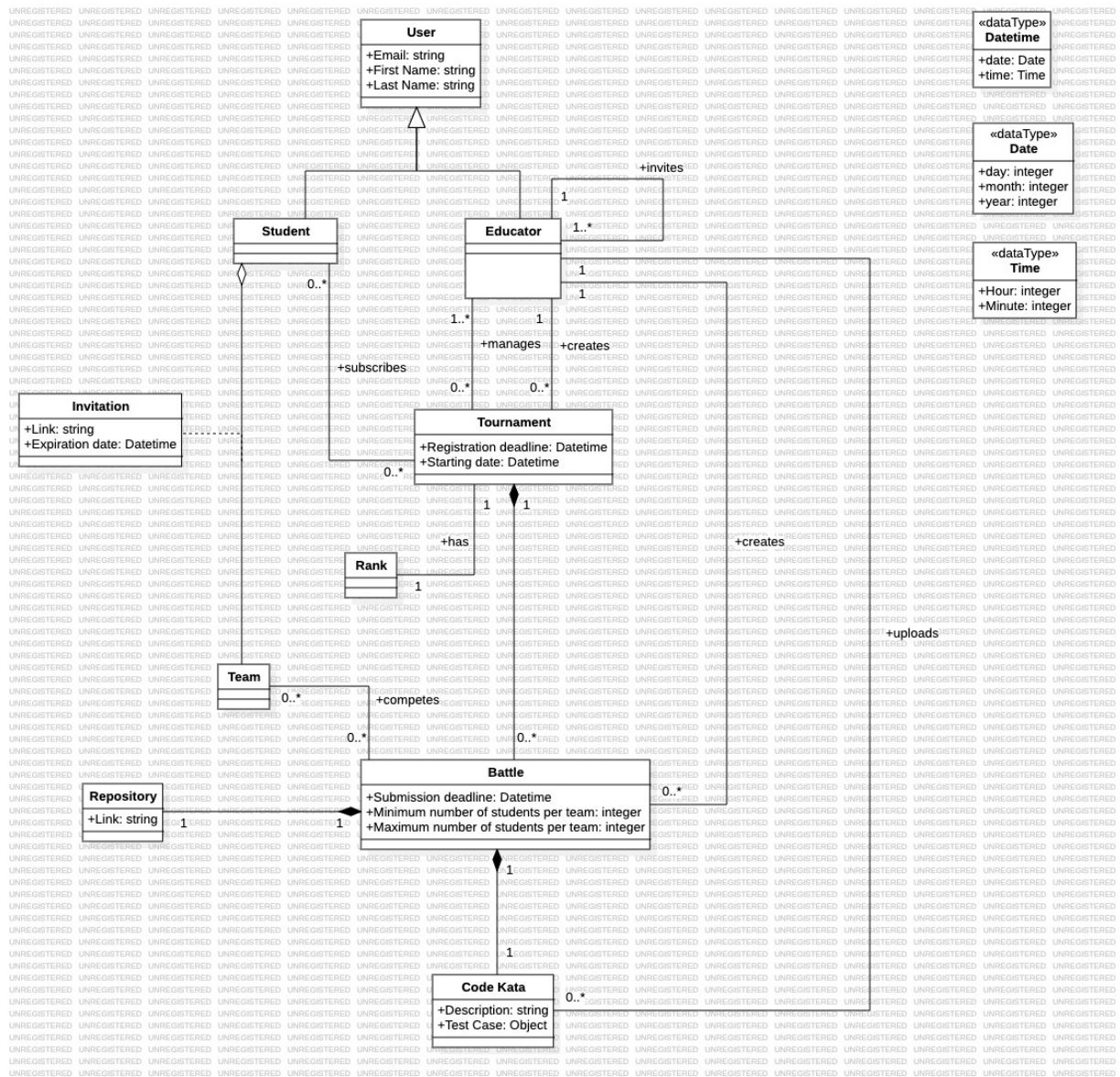


Figure 1: Domain class diagram

2.1.3 Statecharts

Statechart of a Tournament



Figure 2: Statechart of a Tournament

Statechart of a Battle

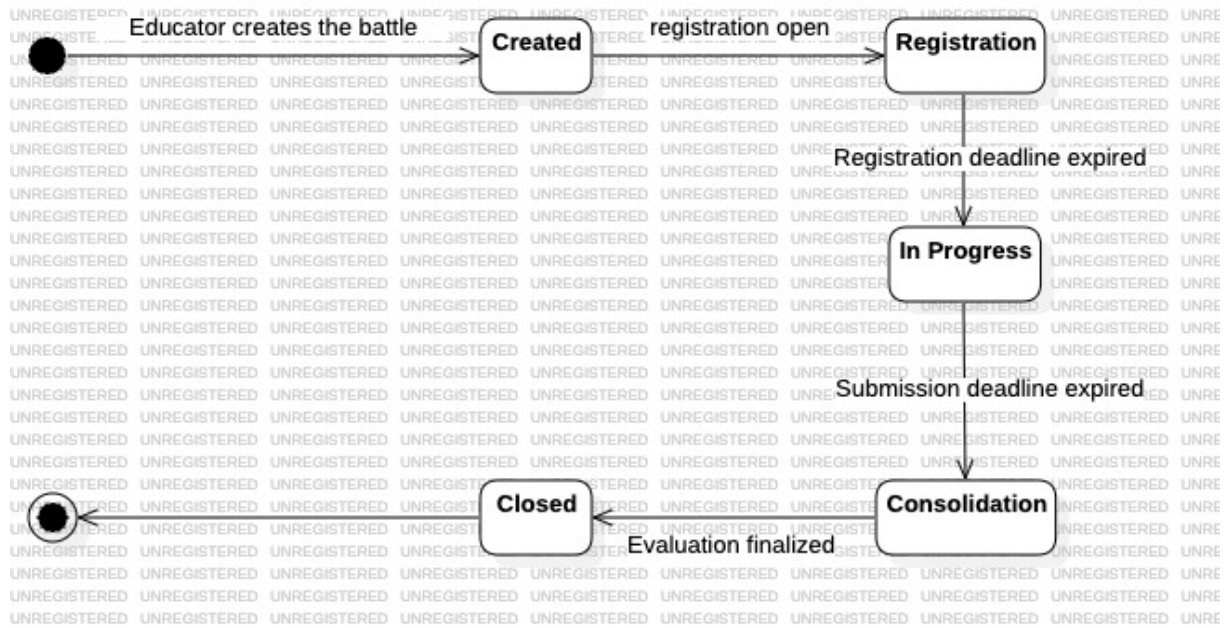


Figure 3: Statechart of a Battle

3 Specific Requirements

Organize this section according to the rules defined in the project description.

4 Formal Analysis Using Alloy

Organize this section according to the rules defined in the project description.

5 Effort Spent

Provide here information about how much effort each group member spent in working at this document. We would appreciate details here.

References