CS 414 Object Oriented Design
Fall 2017
Project 1.0: Let the games begin!

Due date: 09/18/2017

1 Introduction

In this project, you are to develop a software system to play online a specific board game[1], henceforth refer to as the *X game*. Besides allowing users to play the *X game*, there are some other features that the system should provide.

Remember that this is an iterative project. There will be four iterations along the semester plus a final delivery. The requirements are always prone to change.

Read carefully this document before proceeding!

2 The *X game* system

The *X game* system to be developed is a platform that allows a user to play the *X game* online against other players. The system should provide the features described next.

2.1 Core features

The *X game* system must at the least provide the following set of core features by the end of the project.

2.1.1 Game system features

1. Any person can register to the system. The registration requires an email (which is unique), a password, and a nickname (which is also unique).
2. A registered user can create a new game. The registered user becomes a player of the created game.
3. A registered user can invite another registered user (or set of registered users) to join a created game.
4. A registered user can accept or reject an invitation to join a game. If the user accepts the invitation, she becomes a player of the game.
5. A registered user can be part of different games at the same time.
6. A registered user only has access to the games she is a player of.
7. A player can quit a game at any time.
8. A registered user can unregister from the system.
9. The system must record the history of games played by a user. The record of a game includes the opponent, start date and time, end date and time, and the end result of the game (i.e., win, loss, tie, draw, abandoned, etc.)
10. A registered user has a profile, which consists of her nickname and history of played games. User profiles are only visible to other registered users.

[1] Find out which game board was assigned to you team by following this link.

2.1.2 Gameplay features

The *X game* has a well-defined set of rules. Section 7 provides a starting list of resources for the *X game*. Remember that the rules of the game itself do not change. The next features apply at game time.

11. A game cannot start until the minimum number of players required for the game have joined.
12. Once a game starts, new players cannot join.
13. The systems must determine which player starts the game according to the rules of the *X game*. If there are no specific rules, the user who has created the game is the one making the first move.
14. The system determines whose turn it is according to the game rules.
15. A player can only make moves in her active games.
16. A player can only make moves if it is her turn to play.
17. Players can only make allowed moves. Allowed moves are given by the game rules.
18. The system saves the state of active games. Players can play asynchronously but following the turn rules.
19. The system must determine when a game is over. The system must also determine who is the winner and the loser of each game, when there is a tie, or when there is a draw according the game rules.

2.2 Extra features

Once the set of core features has been implemented in the *X game* system, you will choose to implement any of the following features.

20. A registered user can start a new game against a bot player. The bot is an AI player who automatically decides the best move to play.
21. A registered user can start a tournament. Registered users can join the tournaments without invitation. A tournament starts with eight games between unique players. The hierarchy of the matches is randomly determined by the system before the first round of games starts. The winner of the tournament receives a gold badge. The second place receives a silver badge. The badges become part of the user profile. The system must provide a public rank of the players according to their badges.

3 Requirements analysis

As a development team, you are to flesh out the requirements listed above. You are to analyze and model the requirements as use cases, and to identify actors, preconditions, main and alternate scenarios, and any other unit of information you think appropriate to provide complete use cases. The use case analysis will be done **only for the set of core features**.

You must provide an overview diagram of all your use cases, as well as a detailed version of each one of them. Follow the format used in Larman's text when you write them up.

4 Development environment setup

There are only a few restrictions in the tools and technologies used to develop the project.

- The project must be stored in a **GitHub** repository. Name the repository after your team's name as follows: `cs414-f17-301-teamname`. The repository should be used to

store and track changes to the source code and any other document generated during the development of the project (i.e., development artifacts, presentation slides, etc.).
- The project must be written in Java.
- Testing is mandatory!
- Extra points are given for using continuous integration technologies.

5 Deliverables

There are two deliverables for this assignment:

1. **Use case document**. The document should be uploaded to the respective GitHub repository. The document should report all the use cases in fully-dressed form.
2. **Presentation**. The progress on the project is to be presented during class. Besides presenting of the use cases, you are to present a brief description of the *X game*, as well as any process/product decision you have made.

The grades for this assignment will apply to the deliverables uploaded to the GitHub repository before class (i.e., 3:00pm).

6 Notes

- Deadlines associated with deliverables will be verified in the repository. Late work policies apply. Once the repository has been created, add the instructor (GitHub account: lmorenoc) and TA (GitHub account: xiwei26) as collaborators.
- Grading criteria:
  - Document: 50%
  - Presentation: 50%
- Points will be deducted if:
  - The submission requirements are not met.
  - The instructor and TA are not added to the GitHub repository.
  - You are late with the submission.
- You will not receive credit for this assignment if:
  - You do not submit the deliverables.
  - You do not present during class.

7 Board game resources

7.1 Hnefatafl

- Hnefatafl – The strategic board game, Sten Helmfrid
  Available: http://hem.bredband.net/b512479/#Chap9
- Rules of the game Hnefatafl, Dragonheel's Lair
  Available: http://www.dragonheelslair.com/en/ruleshnef.php
- Fetlar Hnefatafl, Cyningstan
  Available: http://tafl.cyningstan.com/page/88/fetlar-hnefatafl

7.2 Banqi

- Banqi, Wikipedia
  Available: https://en.wikipedia.org/wiki/Banqi

- Banqi, Woody Thrower
  Available: https://woodpress.org/banqi/

7.3 Jungle

- Jungle, Wikipedia
  Available: https://en.wikipedia.org/wiki/Jungle_(board_game)
- Shou Dou Qi – The battle of the animals, Chess variants
  Available: http://www.chessvariants.com/other.dir/animal.html
- How to play Dow Shou Qi "The jungle game," Ancient Chess
  Available: http://ancientchess.com/page/play-doushouqi.htm
- Dow Shou Qi ("Game of fighting animals), Jonathan K. Vis
  Available: http://liacs.leidenuniv.nl/~visjk/doushouqi/about.html

7.4 Rollerball

- Rollerball, Wikipedia
  Available: https://en.wikipedia.org/wiki/Jungle_(board_game)
- Rollerball, A world of chess
  Available: http://history.chess.free.fr/rollerball.htm
- Rollerball, Chess variants
  Available: http://www.chessvariants.com/40.dir/rollerball/index.html

7.5 Chad

- Chad, Wikipedia
  Available: https://en.wikipedia.org/wiki/Chad_(chess_variant)
- Chad, MindSports
  Available: http://www.mindsports.nl/index.php/arena/chad/
- Chad, Chess variants
  Available: http://www.chessvariants.com/ms.dir/chad.html