Introduction to Frameworks

In this recitation you will create a TicTacToe plug-in for a simple framework that facilitates the implementation of 2D grid games. To make grid game development straightforward, the game plug-ins must only implement the game's logic. Everything else (plug-in registration, player management, GUI implementation, etc.) is done by the framework.

The framework's core implementation is located in the `edu.cmu.cs.cs214.rec09.framework.core` package and provides you with a `Player` class, a `GamePlugin` interface, and a `GameFramework` interface defining the methods `Plugins` can call on the framework. Grid game plug-ins must implement the `GamePlugin` interface in order to be registered with the framework. The `GamePlugin` interface contains several lifecycle methods that are called at various times throughout the period of a game (See Figure 1). It also has a few getter methods that the framework will call to obtain the name of the plug-in game, the width/height of the plug-in game's board, etc.

Two example plug-ins, "Rock-Paper-Scissors" (a classic grid-based game, seriously) and "Memory", are already implemented for you in the `edu.cmu.cs.cs214.rec09.plugin` package. You can see the behavior by running `Main.java` from Eclipse or `gradle run` from the command line.

Concepts

- Discuss similarities and differences shared between grid-based games. What common functionalities does the framework provide, and what decisions are left up to the plug-ins?
- Pair programming is a software development technique where two teammates collaboratively write software. At any point in time, one partner, the "driver", is using the computer, focusing on syntax and physically writing the code. The other partner, the "navigator", will guide the driver, focusing on higher level concepts. The two programmers switch roles frequently.

Instructions

- Read the framework implementation you were given to familiarize yourself with what it provides you.
- Read the already implemented example plug-ins to get an idea of how you can implement your own plug-in.
- Read the documentation for the `GamePlugin` interface; in addition to the Javadoc comments, we have provided a lifecycle diagram for framework plugins and several interaction diagrams in this document. For each lifecycle method, be sure you understand when and why it is called.
- In the `edu.cmu.cs.cs214.rec09.plugin` package and working with a partner using pair programming techniques, implement a simple TicTacToe plugin. Note that you will need to update the `edu.cmu.cs.cs214.rec08.framework.core.GamePlugin` file in `src/main/resources/META-INF/services/` to register your plugin. ServiceLoader will then instantiate your plugin with Java reflections and register it to the framework.

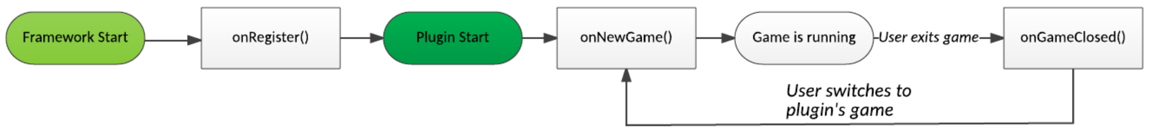
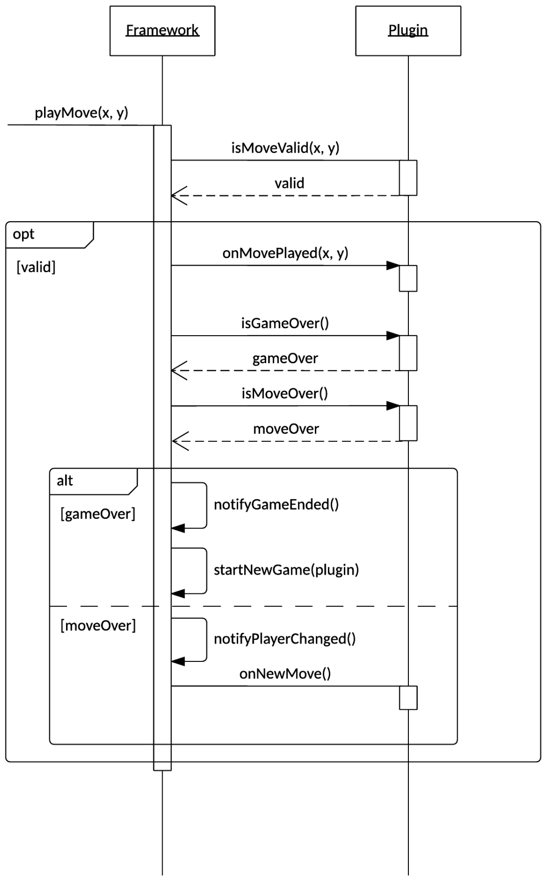
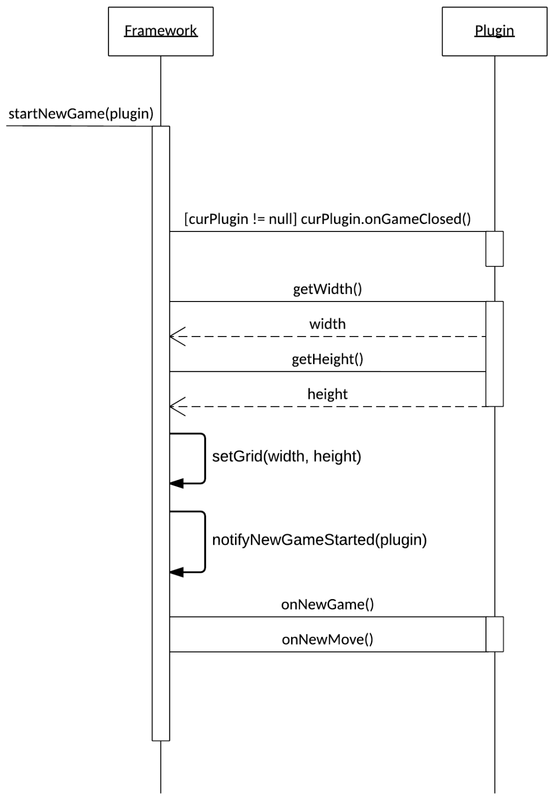


Figure 1: Framework Lifecycle



(a) Playing a Move



(b) Starting a New Game

Figure 2: Framework Sequence Diagrams