

CSC 520 Fall 2010 Assignment 4, Dr. Dale Parson, due by 11:59 PM on November 5.

Refactoring ScrabbleAI and adding dynamic class loading (adding plumbing).

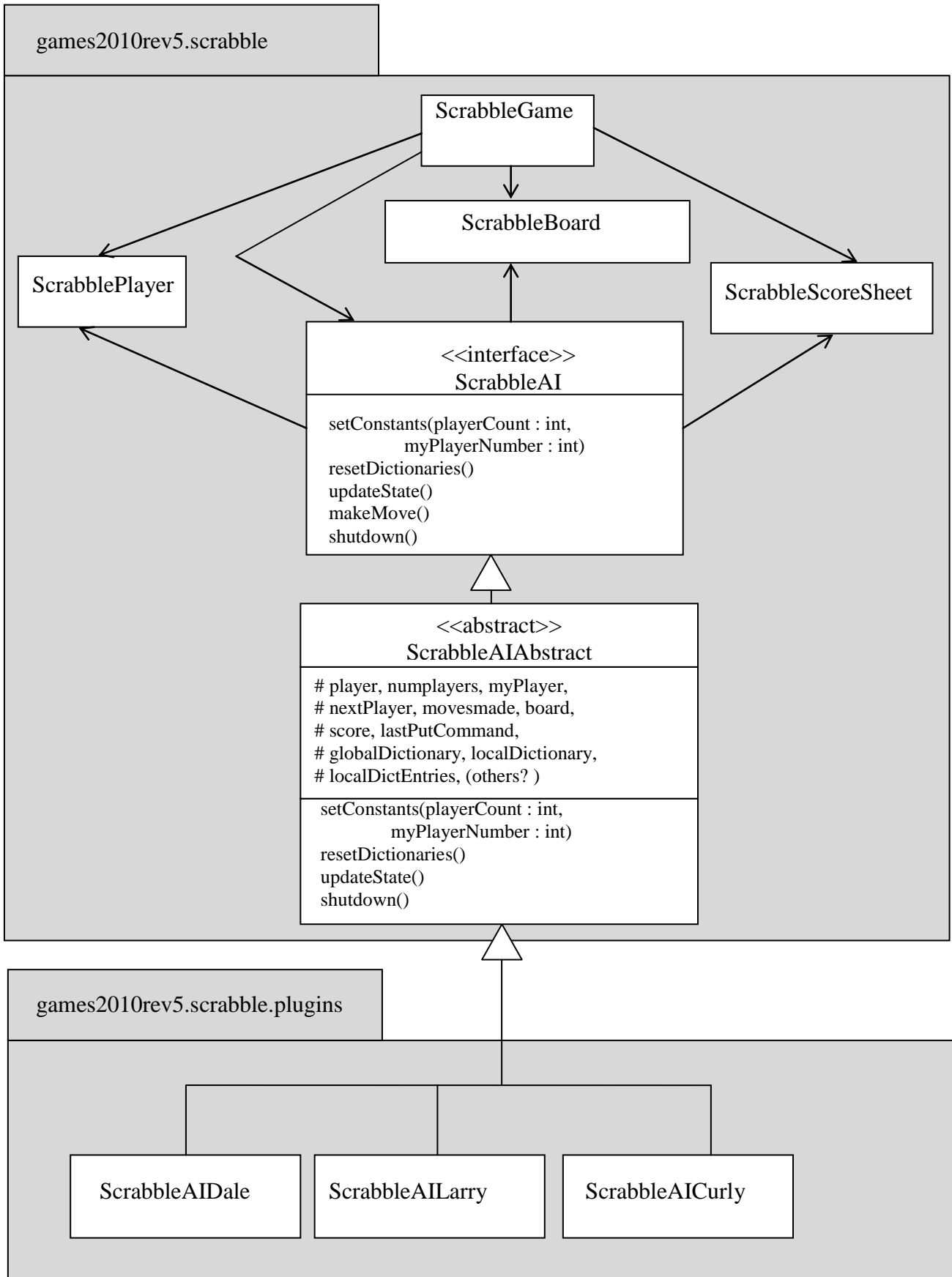
Page 2 has a class diagram that summarizes much of the work of this assignment. *ScrabbleAI* becomes an interface that specifies the operations in this class diagram. Operation *setConstants* is the only new operation. It replaces the ScrabbleAI constructor in providing a means to pass *playerCount* and *myPlayerNumber* values to an AI. The signatures for the remaining operations are identical to the ScrabbleAI class methods of the last assignment.

ScrabbleAIAbstract is an abstract class that stores fields that I provided in my handout of ScrabbleAI for assignment 3. It provides methods to set those fields in accordance with the interface. The fields in the class diagram all have protected access visibility so that subclasses can use the fields. You must write interface ScrabbleAI and abstract class ScrabbleAIAbstract in package `games2010rev5.scrabble`, including Javadoc comments.

You must take my solution class ScrabbleAI for assignment 3 and refactor its methods among ScrabbleAIAbstract and ScrabbleAIDale, the latter class in the new package `games2010rev5.scrabble.plugins`. You can also create a concrete class for your AI in this package if you like. The goal is to create a library of plugins in this new subpackage. I will post file `gamestomidi2010rev5.assn4.zip` to `~parson/JavaLang` on October 23. It will be the starting point for assignment 4, containing my solution to assignment 3.

You must update the makefile in `games2010rev5/scrabble` after copying it to `games2010rev5/scrabble/plugins`. The plugin's copy will have "include .././makelib" and of course the PACKAGE and SUBPACKAGES variables must change. The SUBPACKAGES variable in `games2010rev5/makefile` must also add the new package. Testing "gmake javadoc" from `games2010rev5` on bill will ensure that these definitions are correct; "gmake javadoc" in makelib uses these makefile variables. The makejar file looks OK; I don't think it requires any changes. Test by running the generated jar file by invoking "java -jar games2010rev5.jar" after "gmake clean build" on bill – it should work OK with the AI plugin package. You can run a JAR file generated on bill on any platform (not JDK 1.5 on old mac OSXes at present).

You must also modify ScrabbleGame's move method (the part that interprets the "AI" command) and help method (the part that documents the "AI" command). The AI command now has this syntax: "AI [RUN | (PLAYERNAME studentname|OFF)" where example studentname values in the class diagram below would be "Dale" or "Larry" or "Curly". You must not hard code these names. ScrabbleGame must look them up in the file system. For example, if a user types "AI player1 Dale", then, if there is not already an AI object for player1 (otherwise throw a GameException), load and construct an AI of class ScrabbleAIDale and use it in the game. ScrabbleGame.ScrabbleGameState currently has field "ScrabbleAI [] AIs" along with int *aicount*. These declarations should not change.



The code that replaces “AI PLAYERNAME ON” with “AI PLAYERNAME studentname” must change. It must load the correct class from the plugins package and construct an instance by invoking its zero-parameter constructor. Take a look at GameMain’s main() method near the bottom to see how to implement a class loader. We will go over that in class.

This leaves the matter of the GUI. I will modify the AI ON|OFF button in the GUI to a combo box that looks for AIs in a scrabble/plugin subpackage. If it finds any, it will offer OFF or the studentnames as alternatives. It will not try to load the files as ScrabbleAI subclasses. If it does not find the package or any student AIs, it will offer ON as a choice. Eventually ON as a choice will go away.

When you have this working, including execution from the JAR file and correct javadoc via gmake javadoc from the games2010rev5 directory, then execute gmake turnitin from the games2010rev5 directory before the deadline.

Have fun!