

CS-235 Software Engineering 2

Assignment 6 report

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My application is build on my last group assignment, nah2A5, which is done by nah1 initially.

Compiling the code

To compile the application run javac on GameSelector.java with the following files in the same folder as GameSelector.java

AlEasy
ConnectFour
ConnectFourAI
ConnectFourLoader
ConnectFourSaver
Controls
Coordinate
Drawing
EndDisplay
FileManager
Game
GameBoardControls
GameBoardGraphics
GameSelector
GameWindow
Grid
Human
Loader
Othello
OthelloAI
OthelloLoader
OthelloSaver
Player
PlayerSettings
Saver
TicTaeToe
TicTacToeAI
TicTacToeLoader
TicTacToeSaver
Timer

Features

The application contains the following original features from A5

- The ability to select a colour which decides which player goes first
- The ability to have custom names for each player
- The ability to create two human players.
- The ability to create two AI players both hard and easy for connect four and othello.
- The ability to have Player vs. AI or AI vs. Player, AI vs. AI
- The users are able to play a game of connect four to completion, with a winner declared at the end.
- The users are able play a game of Othello to completion, with a winner being declared at the end
- The users are able to start a new game or restart the current game at any point during a game.
- Information is provided to the player indicating:
 - What colour piece they are.
 - Which players turn it currently is
 - The number of pieces of each player
- Users are able to select a new game when a game has completed.
- Users are able to pass their move to the next player when no moves are available to them (Othello only)
- User feedback for Othello showing valid moves and marked with 'X'
 - User feedback for an incorrect Othello move of the selected box being marked with a red 'X'
- Users have the ability to Save a game for Othello and Connect Four
- Users have the ability to Load a game for Othello and Connect Four
- Animation for both Othello and Connect Four
- Timer on Othello and Connect Four using the specified format HH:MM:SS
- Users have the ability to change the design of both boards
- Users have the ability to change the speed of the gameplay

New Features

The application contains the following new features implemented in A6

- The ability to select between the three games, Othello, Connect Four or Tic Tac Toe2.
- The ability to select cross or noughts in Tic Tac Toe 2
- The ability to create hard AI in Tic Tac Toe 2 which performs logical move, it blocks the opponents when the opponents has a chain of two pieces and AI itself only has one.
- The ability to have Player vs. Player, AI vs. Player or AI vs. AI in Tic Tac Toe 2
- The users are able to play a game of Tic Tac Toe 2 to completion, with a winner declared at the end
- Information is provided to the player indicating (Tic Tac Toe 2):
 - They have chosen X or O.
 - Which players turn it currently is
 - The number of pieces of each player
- Users have the ability to Save and Load a game for Tic Tac Toe 2
- Timer on Tic Tac Toe 2 using the specified format HH:MM:SS
- New implementation for save game and load game, user can load any game that was previously saved instead of last game only in nahA5.
- Display invalid move message on Connect Four and Tic Tac Toe 2

New Classes in A6

The application contains the following new classes introduced for A6

TicTacToe - main class containing game rule of TicTacToe2

TicTacToeAI - a hard AI in TicTacToe2, making logical move, take the defensive approach for blocking when the opponent has at least two pieces in a row and only one for AI itself

TicTacToeLoader - Loader for TicTacToe2, necessary when loading a TicTacToe2 game

TicTacToeSaver - Saver for TicTacToe2, necessary when saving a TicTacToe2 game

Modified Classes in A6

The application contains the following modified classes from nahA5

AIEasy - throws IOException

ConnectFour - throws IOException

ConnectFourAI - throws IOException

ConnectFourLoader - modified for alternative load function

ConnectFourSaver - modified for alternative save function

Controls - throws IOException

Drawing - edit the sidebar for showing TicTacToe2 piece icons as player information

EndDisplay - display winning piece icons for TicTacToe2, throws IOException

Game - throws IOException

GameBoardGraphics - create graphics for the TicTacToe2 pieces and board, show the winning pieces

GameSelector - TicTacToe2 option with new button and icon

GameWindow - create filechooser for load function, edit save window, displayInvalidMove message for TicTacToe2 and ConnectFour, throws IOException

Human - throws IOException

Loader - handle the data while loading a TicTacToe2 game

Othello - throws IOException

OthelloAI - fix bug (AI vs Human, Human passes turn to AI, AI does not move)

OthelloLoader - modified for alternative load function

OthelloSaver - modified for alternative save function

PlayerSettings - edit player information page to fit TicTacToe2. modified resume button for alternative load function.

Additional Information

All features are working properly with sufficient tests and there is no missing feature. The difficulty of this assignment is the compatibility of playing the three games, implementing features of Tic Tac Toe 2 without affecting the other two games. Similarity between Tic Tac Toe 2 and the other two games makes the implementation easier to start with. To make sure what code segment can be reused, I need to read through the specification from the customer carefully. There are some challenges in A6, one of the unexpected problem is to handle the image file. I have decided to use two image files to representing cross and nought on the sidebar instead of using the draw method from the graphics class. However I need to throw IOException in about half of the classes, as many of them have collaboration. It costs a lot of time. It is important to analysis the affect before making a decision.