CPSC2150 – Checkers

Team Member 1: Liam Cassidy

Team Member 2: Isaac Beres

Team Member 3: James Schvaneveldt

Team Member 4: Nicolas Lozano

Functional Requirements: As a <userRole> I <what/need/can> <goal> so that <reason>

Functional Requirement User Stories:

1. As a player, I want to see the current state of the board, including displaying my pieces, my opponent's pieces, and which squares are 'white' and 'black' so I am aware of the game state and can know what move I want to make
2. As a player, I want to be able to move my pieces diagonally so I can play the game of checkers
3. As a player, I want to be able to jump enemy pieces to capture enemies
4. As a player, I need jumped pieces to be removed from the board so that I know they have been captured.
5. As a player, I want to be able to 'king' my pieces once they reach the last row so that I can move it in both directions.
6. As a player, I want to be able to know if I can't move a piece in a certain direction so that I don't try to move out of bounds or over multiple pieces.
7. As a player, I want to reach an end state and either win or lose so I can determine the outcome of the game
8. As a player, I want to be able to play again so I can have even more fun
9. As a player, I want to be able to see which pieces are mine and which pieces are my opponents so I don't get confused and have to keep track of it all
10. As a player, I want to see whose turn it is so I know if I need to make a move or not
11. As a player, I want to see which of my pieces are kings so that I can keep track of them.
12. As a player, I want to be able to enter a row and column so that I can specify which piece I selected.
13. As a player, I want the game to make me choose a new piece if I choose one that doesn't belong to me so that I can move my pieces correctly.
14. As a player, I want the game to make sure I enter inputs correctly so that I don't put in an out-of-bounds input or an input that doesn't have a function.

15. As a player, I want to be able to choose between a memory conscious version of checkers and a fast version of checkers, so that I can play based on my needs
16. As a player, I want to be able to choose the size of my board, so that I have options of ways to play checkers
17. As a player, I want to be able to choose which character represents my pieces, so that I can have more options of characters to use

Non-Functional Requirements:

1. Checkers must run and display all user prompts on the terminal
2. The program should keep track of the board and the location of all pieces
3. The program should display the board and prompt the correct user for their turn
4. The program should validate user input for moves, including invalid moves and garbage input
5. The program should implement the user's input quickly
6. The program should be written in Java 17.
7. The program should be able to run on Windows and Linux.
8. The system shouldn't crash
9. The program should have an option to have a more memory conscious version of the game, using a hashmap instead of a 2d array
10. The program should have an option to have a faster version of the game, using a 2d array instead of a hashmap
11. The program should allow users to choose which characters represent their pieces
12. The program should be resizable, allowing the user to choose the board size from the options of 8x8, 10x10, 12x12, 14x14, and 16x16
13. There must be two rows of 'no man's land' empty positions for each game, no matter the size
14. The game should have 2 players