CPSC 2150 Project 1

Checkers

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Requirements Analysis

Functional Requirements:

1. As a player, I need to be able to move the pieces in order to get them to the other side of the board.
2. As a player, I need to be able to jump the other player's pawns in order to get rid of the pieces.
3. As a player, I need to be able to move all of my pieces diagonally so I can move my pieces around the board throughout the game.
4. As a player, I need to be able to choose which diagonal direction to move in so that I have control over where I move my pieces in the game.
5. As a player, I need to be able to identify an empty space so that I can jump my opponent’s pieces when it is an option.
6. As a player, I need to have the ability to king my piece when it gets to the other side of the board in order to have advanced moving abilities with that piece.
7. As a player, I need access to the rules of checkers in order to play the game correctly and beat player 2.
8. As a player, I need to be able to identify which pieces are the opposing player’s in order to avoid moving the opposing player’s pieces.
9. As a player, I can move one piece per turn in order to eventually get rid of the opposing player's pieces and win the game.
10. As a player, when my piece is kinged, I need to be able to differentiate between the kinged piece and the regular pieces in order to avoid being confused.
11. As a player I need to be able to identify pieces that are already kinged so I don’t try to king them again.

12. As a player I need to be able to select only one piece to move on my turn in order to avoid moving multiple pieces at once during my turn.
13. As a player, I need to be able to identify the black tiles that are unplayable to avoid moving a piece into that spot.
14. As a player, I need the option to play again so I can play a new game after someone wins the last game.
15. As a player, I need access to the coordinate system of the board in order to locate the piece I want to move.
16. As a player, I can input a row and column so that I can select which piece to move.
17. As a player, I need to win or lose the game when either all my opponents' pieces are captured or I lose all my pieces so that the game has a clear ending.
18. As a player, I want to be notified if I select a position that does not have my piece or does not have a piece I can move so that I can choose a valid position and continue the game.
19. As a player, I need to see the updated game board at the start of every turn so that I can choose where to move my pieces.
20. As a player, I need the board to update and display after every move so that I can see the changes I made during my turn.
21. As a player, I want the system to tell me if I enter an invalid input (such as putting a string instead of an int) so that I can correct my input and keep playing the game.
22. As a player, I can choose what piece I want to play with so that I can use what I prefer and identify which pieces are mine.
23. As a player, I can choose the size of the board so that I can customize the game to what I prefer.
24. As a player, I can choose to play a fast game so that I can enjoy a quicker game.
25. As a player, I can choose to play a memory efficient game so that I can play the game without using much memory.

Non-Functional Requirements

1. This program must be able to run on the terminal without errors.
2. The game board must be a grid with the same number of rows and columns.
3. The game board’s rows and columns must be even.
4. The game board must be resizable with a minimum size of 8 x 8 and a maximum size of 16 x 16.
5. The game board must always have two empty rows of species between player one and player two.

6. The starting number of pieces each player has, must depend on the size of the game board so that the game is scaled correctly.
7. The program must prompt the user to reenter an input when the player enters an invalid input.
8. This program needs to be able to run on all operating systems.
9. The program must be able to identify which pieces were jumped in order to remove them from the board.
10. This program needs to be able to identify when a piece has been kinged and allow that piece to move in 4 directions.
11. After each player's turn, the current state of the board must be printed out to see the status of each player's pieces.
12. The program must re-prompt the player to choose a different piece to move if they try to move the opposing player piece.
13. The program must prompt the player to choose a different piece to move if the player tries to move a piece that has no possible space to move to.
14. The program needs to give the players a chance to play again by re-prompting them once the game is over.
15. The program must re-prompt the player to choose a valid direction if the player tries to move a piece in a direction other than NE, NW, SW, or SE.
16. The program must prompt the player to choose a different piece to move if the player chooses coordinates that are outside of the board.
17. The program must give the player the option whether or not to jump the opposing player's piece when the option arises.
18. The program must allow the player to only jump a piece once per term if the ability to jump the piece is an option for the current player.
19. The program must prompt player one to start each game to keep consistency in the beginning of each game.
20. This program needs to be written in Java 17.
21. This program must not crash to ensure the game can be played without interruptions.

System Design – (UML diagrams)