CPSC 2150 Project 4 Report

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Requirements Analysis

Functional Requirements:

1. As a player, I can choose where I can move so that the game can be played properly.
2. As a player, I need to see the gameboard after every turn so that I can follow along with the game.
3. As a player, I need the game to alternate between all players so that I can play with friends if I want.
4. As a player, I need to see different identifiers for each player's moves on the board so that I know who made what move.
5. As a player, I need to see if I attempt to make a move into a non-existent column, so that I can choose again to make my move valid.
6. As a player, I need to see if there is a tie so that I can know if the game is over.
7. As a player, I need to see if there is a winner so that I can know if the game is over.
8. As a player, I can choose that I want to play again after a game so that I may keep playing if I want.
9. As a player, I can choose to not play again after the game is finished, so that I can terminate the program.
10. As a player, I need to see whose turn it is so that I know who needs to make a move in the game.
11. As a player, I need to see what to input for a move so that it works with the program.
12. As a player, I need to see if a column I want to make a move into is full, so that I may choose another move.
13. As a player, I want the gameboard to be cleared when a new game begins, so that we may start the game from the beginning.
14. As a player, I want to win the game if I have the chosen number of tokens adjacent to each other horizontally, so that I may win the game.
15. As a player, I want to win the game if I have the chosen number of tokens adjacent to each other vertically, so that I may win the game.
16. As a player, I want to win the game if I have the chosen number of tokens adjacent to each other diagonally, so that I may win the game.
17. As a player, I want to be able to choose a fast game or a memory efficient game so that I can choose the version that meets my needs.
18. As a player, I need to be able to choose the number of rows on the gameboard that I will play on so I can play different versions of the gameboard.

19. As a player, I need to be able to choose the number of columns on the gameboard that I will play on so I can play different versions of the gameboard.

20. As a player, I need to be able to choose the number of players so that I can play with as many friends as I want.

21. As a player, I want to be able to choose the number of rows on the board again when I restart the game, so that I may play the game with a different number of rows.

22. As a player, I want to be able to choose the number of columns on the board again when I restart the game, so that I may play the game with a different number of columns.

23. As a player, I want to be able to choose the number needed in a row to win again when I restart the game, so that I may play the game with different rules.

24. As a player, I want to be able to choose the number of players again when I restart the game, so that I may play the game with a different number of people.

25. As a player, I want to be able to choose the move tokens for each player again when the game restarts, so that I may play the game with different move tokens.

26. As a player, I want to be able to choose between a fast or memory efficient game again when I restart the game, so that I may try a different version of the game.

27. As a player, I can set the move tokens for each player, so that I can set them to whatever characters I choose.

28. As a player, I need to see if a move token character I choose for a player is invalid, so that I may choose a valid move token character.

29. As a player, I need to see if the number of rows I choose for the board is invalid, so that I may choose a valid number of rows.

30. As a player, I need to see if the number of columns I choose for the board is invalid, so that I may choose a valid number of columns.

31. As a player, I need to see if the number in a row to win I choose is invalid, so that I can choose a valid number in a row to win.

32. As a player, I need to see if I type the wrong input when choosing whether I want a fast or memory efficient game, so that I may provide valid input.

Non-Functional Requirements

1. The game is programmed in java.
2. The game is facilitated through a command line interface.
3. The program needs to be reliable and not crash.
4. The board size is chosen by players.
5. Player 1 is always the first to make a move in the game.
6. The maximum number of rows and columns is 100.
7. The minimum number of rows and columns is 3.
8. The minimum number of tokens to win is 3.
9. The maximum number of tokens to win is 25.
10. Number of tokens to win must be less than number of rows.
11. Number of tokens to win must be less than number of columns.
12. Number of players must be 2 or more.
13. Number of players must be less than 11.
14. (0,0) is at the bottom left of the board.
15. There is a memory efficient version of ConnectX.
16. There is a fast version of ConnectX.

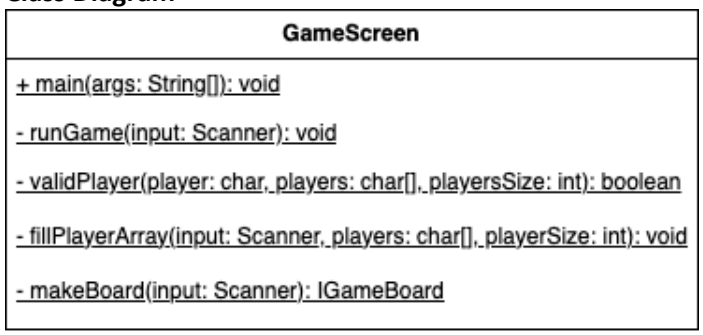
Makefile Instructions

1. make/make default -> compile the program
2. make run –> run the program
3. make test -> compile test files
4. make testGB -> run GameBoard.java Junit tests
5. make testGBmem -> run GameBoardMem.java Junit tests
6. make clean -> remove all .class files

System Design

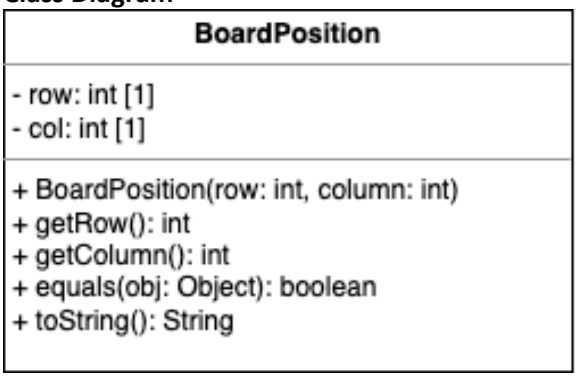
GameScreen:

Class Diagram



BoardPosition:

Class Diagram



IGameBoard (Interface Diagram), AbsGameBoard (Class Diagram), GameBoard (Class Diagram) and GameBoardMem (Class Diagram):

Diagram