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Software Models
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Connect Four Design Document Submission III

Overview

The game is traditional Connect Four, played by two users on the same machine. The rules of the game are the standard Connect Four rules, including the effects of gravity. The game should also include an optional timer which the user can toggle on and off before the start of the game. The application will also allow users to enter their names; it will store the number of victories for each player as well as the total moves in the current game and overall.

Detailed Rules

Players must take turns selecting a row from which to drop one colored disc (represented by '+' and 'o' in the command line version) into a 7x6 grid with #'s. The pieces will "fall" to the space above the highest occupied space in that row. If a row is filled, no further pieces can be dropped there.

Winning: The game ends when one player forms a horizontal, vertical, or diagonal line of four of their discs. If the board is filled before either player gets four in a row, then the game is a draw.

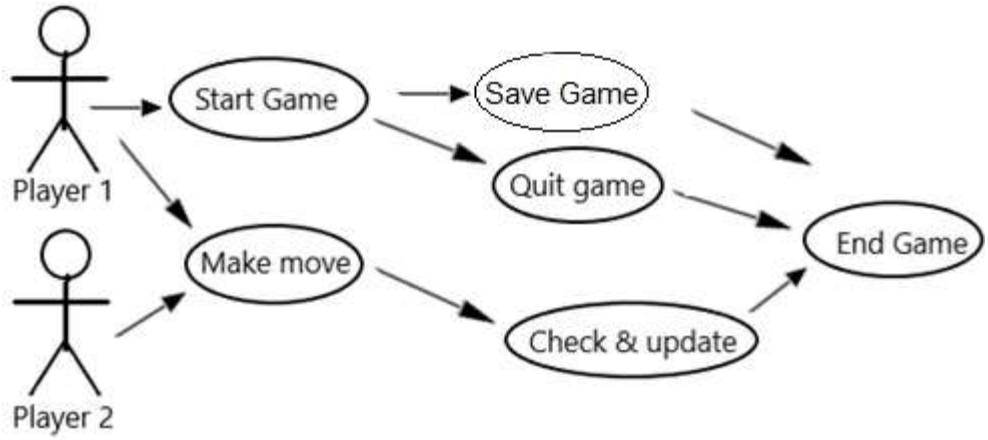
Class Hierarchies

The following UML diagrams explain the classes which will be used in this application. The GetStats{} function will return all the stored information about each player. The SelectRow{} function will be how each player makes their move. It calls the Drop{} function, which updates the 2D Spaces array that represents the game board. Check will examine the Spaces array to see if the game has been won. The Draw{} function draws the board. The ColumnIsFull{} function checks to see if the column that is trying to be used is full. User currently is not implemented, it will come when we start saving games will also start saving user stats.

Board
- Spaces - Check - Reset
+ Drop{} + Draw{} + ColumnIsFull{}

User
- Name - MovesGame - MovesTotal - Wins
+ SelectRow{} + GetStats{}

Use Case Diagram



Input

The command line version of this program required the users to use the keyboard to enter data. The GUI enabled application will allow the user to use the mouse to make moves and menu selections. The command line version used exception handling to prevent invalid input from crashing the program. The GUI version will primarily use buttons for input, thereby limiting the possibility of invalid input.

The input from the Command prompt version required the users to enter:

- Row selection (an integer between 1 and 7 inclusive)
- The letter ‘q’ or ‘Q’ as the command to quit the game
- The letter ‘s’ or ‘S’ to save the game

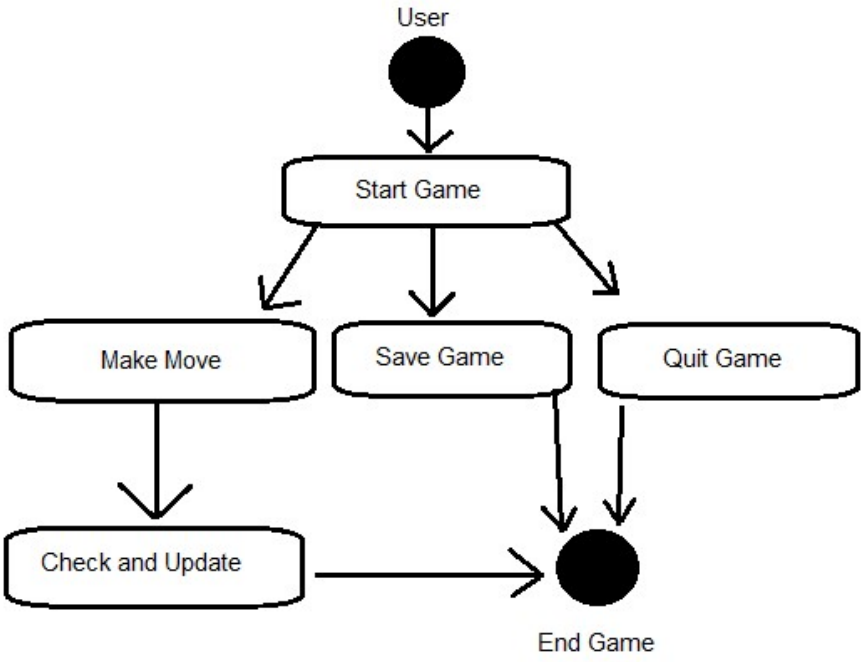
The input from the GUI version will include:

- Mouse clicks on the following buttons:
    - Save & Quit
    - Rows 1 through 7
- Names of players
- Timer limit (in seconds)

Output

After each turn, the board will be checked for win/draw conditions. Once this is completed, the program will display the refreshed game board. The program will be able to ouput the player stats. Upon the win/draw condition being met, the program will output a message indicating who won or if the game was a tie. The GUI version will also output the remaining time for each turn.

Activity Chart



Data Flow Diagram