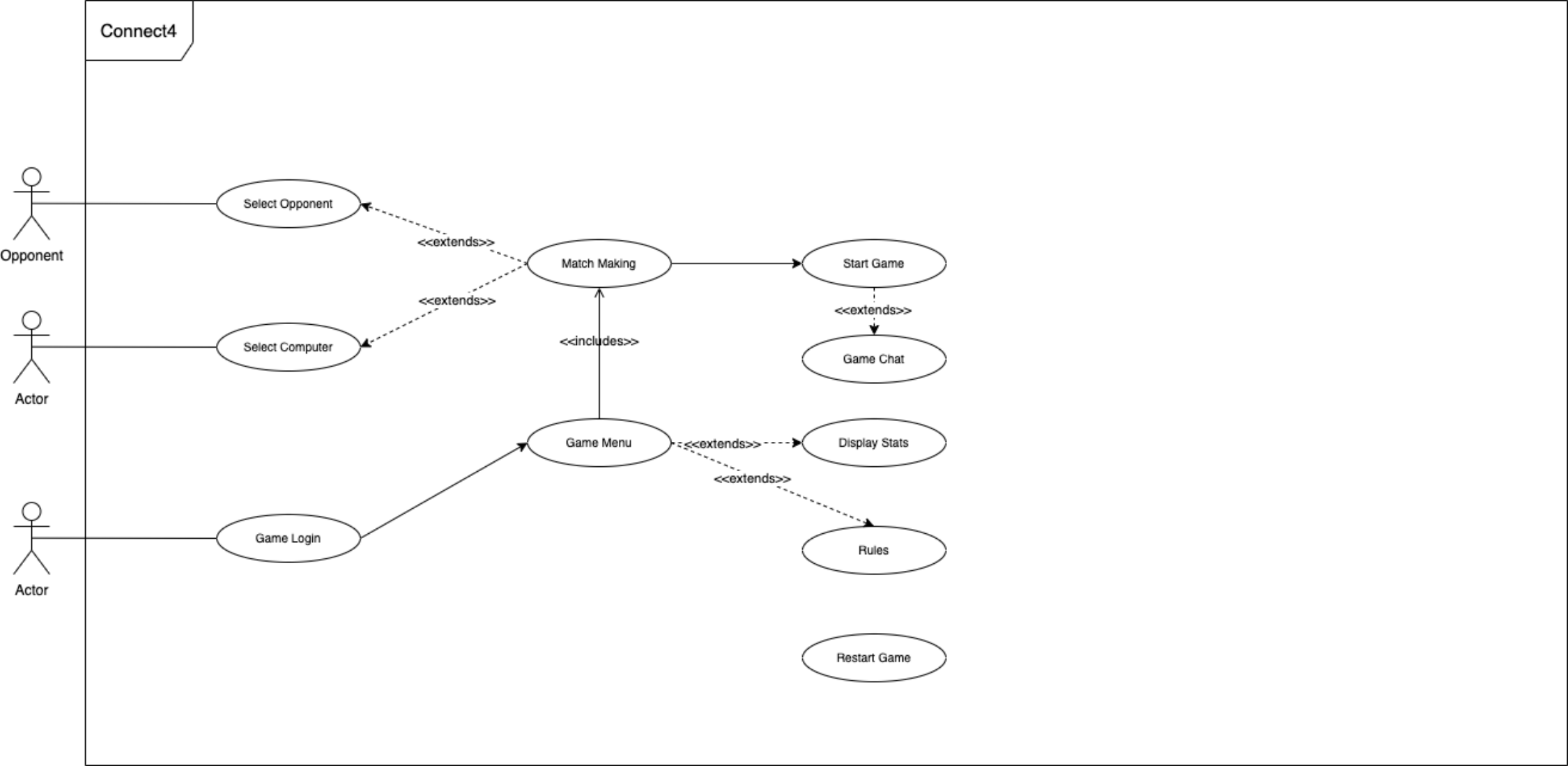
Connect4
Opponent
Actor
Actor
Select Opponent
Select Computer
Game Login
Match Making
Game Menu
Start Game
Game Chat
Display Stats
Rules
Restart Game
<<extends>>
<<extends>>
<<includes>>
<<extends>>
<<extends>>
<<extends>>

Use Case 1: Launch Connect Four Game

Actors:

- Player (Primary)
- GameWindow (Supporting)
- ConnectFourGame (Supporting)

Preconditions:

- The player is logged in and on the main menu.
- The CONNECT4 module is available and initialized.

Trigger:

- The player selects “Connect Four” from the main menu.

Main Flow:

1. The main menu instantiates a ConnectFourGame object.
2. The GameWindow is initialized with the ConnectFourGame instance and the current user profile.
3. GameWindow calls the setupConnectFourBoard() method to render the 7x6 grid and drop buttons.
4. The game session starts, and the UI displays the game title “Connect Four” along with necessary controls.

Alternative Flows:

- **Initialization Failure:** If the ConnectFourGame fails to initialize, an error message is displayed, and the player is returned to the main menu.

Postconditions:

- The Connect Four game is launched and visible within the GameWindow, ready for gameplay.

Use Case 2: Make a Connect Four Move

Actors:

- Player (Primary)
- GameWindow (Supporting)
- ConnectFourGame (Supporting)

Preconditions:

- A Connect Four game session is active.
- The game board is rendered and visible.

Trigger:

- The player clicks a “Drop” button for a specific column.

Main Flow:

1. The player clicks the drop button for the chosen column.
2. GameWindow’s event handler calls the makeConnectFourMove(int column) method.
3. ConnectFourGame validates the move (e.g., checks if the column is not full) and updates the board state.
4. GameWindow re-renders the board to display the newly dropped piece.
5. The system checks for win/draw conditions.
6. If the game continues, the turn switches (with the UI updating the turn indicator).

Alternative Flows:

- **Invalid Move:** If the selected column is full, the player is notified and prompted to select a different column.
- **Game Over Detected:** If a win or draw is detected, the game session is terminated with an appropriate message.

Postconditions:

- The board state is updated, and the game progresses to the next turn or ends if a terminal condition is met.

Use Case 3: Exit Connect Four Game

Actors:

- Player (Primary)
- GameWindow (Supporting)
- ConnectFourGame (Supporting)

Preconditions:

- A Connect Four game session is active.

Trigger:

- The player clicks the “Exit Game” button on the top bar.

Main Flow:

1. The player selects the “Exit Game” option.
2. GameWindow displays a confirmation dialog warning that exiting will forfeit the current game.
3. If the player confirms, the game session is terminated, and the player is returned to the main menu.

Alternative Flows:

- **Cancellation:** If the player cancels at the confirmation dialog, the game continues without interruption.

Postconditions:

- The active Connect Four session is terminated, and control returns to the main menu.

Use Case 4: Offer a Draw in Connect Four

Actors:

- Player (Primary)
- GameWindow (Supporting)
- ConnectFourGame (Supporting)

Preconditions:

- The Connect Four game session is active and both players (or the AI simulation) are engaged.

Trigger:

- The player selects the “Offer Draw” button.

Main Flow:

1. The player clicks the “Offer Draw” button in the bottom bar.
2. GameWindow shows a confirmation dialog for offering a draw.
3. Upon confirmation, the draw offer is sent to the opponent (or simulated if playing against AI).
4. If the opponent accepts (or the simulation confirms), the game session ends in a draw and an informational dialog is displayed.

Alternative Flows:

- **Draw Declined:** If the opponent declines the draw offer, the game continues as normal.

Postconditions:

- If accepted, the game session ends with a draw; if declined, the game remains active.

Use Case 5: Resign from Connect Four Game

Actors:

- Player (Primary)
- GameWindow (Supporting)
- ConnectFourGame (Supporting)

Preconditions:

- The Connect Four game session is active.

Trigger:

- The player clicks the “Resign” button on the bottom bar.

Main Flow:

1. The player selects the “Resign” option.
2. GameWindow displays a confirmation dialog asking the player to confirm resignation.

3. If confirmed, the system terminates the current game session and marks the game as a loss for the resigning player.
4. GameWindow shows a game over dialog with a “Defeat” message and then returns the player to the main menu.

Alternative Flows:

- **Cancellation:** If the player cancels the resignation confirmation, the game continues normally.

Postconditions:

- The game session ends, and the player's record is updated to reflect the resignation (loss), returning the player to the main menu.

Use Case 6: Initiate Rated Matchmaking and Update Leaderboard

Actors:

- Player (Primary)
- Matchmaking System (Supporting)
- Leaderboard System (Supporting)

Preconditions:

- The player is logged in and has a valid rating for the selected game (e.g., Connect Four, Checkers, Tic Tac Toe).
- Both the matchmaking system and leaderboard system are operational.
- The player is on the main menu and selects a game mode that supports rating-based matchmaking.

Trigger:

- The player selects “Find Rated Match” from the matchmaking interface.

Main Flow:

1. **Game Selection:**
    a. The player chooses a game (e.g., Connect Four) to play in rated mode.
    b. The system retrieves the player's current rating for that game.

2. **Matchmaking:**
    a. The matchmaking system uses the retrieved rating to search for an opponent within a similar rating range.
    b. If a matching opponent is found, the system pairs the players and starts a game session.
    c. If no opponent is found immediately, the player is placed in a game-specific matchmaking queue, with the system gradually expanding the acceptable rating range if needed.
3. **Game Session:**
    a. The paired players engage in the game session.
    b. During gameplay, the system monitors moves, turns, and game state transitions.
4. **Post-Match Processing:**
    a. At the conclusion of the match, the system calculates new ratings for both players based on the match outcome (win, loss, or draw) using a defined algorithm (e.g., Elo).
    b. The updated ratings are stored in the players' profiles.
5. **Leaderboard Update:**
    a. The leaderboard system retrieves the new ratings.
    b. The leaderboard display is refreshed to reflect the updated standings and rankings for the game.

Alternative Flows:

- **No Opponent Found:**
    - If no suitable opponent is found within the current rating range, the system either expands the range gradually or notifies the player of a delayed match.
- **Player Cancels Matchmaking:**
    - If the player cancels the matchmaking request before an opponent is found, they are removed from the matchmaking queue.
- **Game Abortion or Forfeit:**
    - If the match is aborted or a player forfeits, the system applies forfeit rules to adjust ratings accordingly, and the leaderboard is updated to reflect these changes.

Postconditions:

- The player is either actively engaged in a game session or remains queued for matchmaking.
- After match completion, both players' ratings are updated, and the leaderboard accurately reflects the new rankings.