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Scalable Software

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Project 2 Use Cases: Multiplayer Tic-tac-toe

* Use Case 1: Connect to a game
  + Primary Actors: 2 players
  + User Goals: Connect to a game with another player for multiplayer tic-tac-toe
  + Minimal Guarantee: User can receive a message saying that a connection to another player could not be made
  + Success Guarantee: Two players are connected for a multiplayer game of tic-tac-toe
  + Precondition: One player is acting as the game “host”
  + Main Success Scenario:
    - 1. “host” player starts a game
    - 2. Second player uses joins the “host’s” game
    - 3. Connection is made between “host” and second player
    - 4. Game can now start
* Use Case 2: Making a move within the game
  + Primary Actors: player who has made a move in their turn
  + User Goals: Have their turn’s move updated to the game state and sent to the connected player
  + Minimal Guarantee: Player will be notified if their turn’s move was not successfully sent to the other connected player
  + Success Guarantee: Player makes move and the game state is updated and updated game state is sent to other player
  + Precondition: A game has been started
  + Main Success Guarantee:
    - 1. Player is notified that it is their turn
    - 2. Player selects a non-occupied square to make a move in
    - 3. Player’s symbol set to occupy selected block
    - 4. Game state is updated
    - 5. Game state is sent to the other connected player
    - 6. Game state is updated for the other player to view and then make their own turn’s move
* Use Case 3: Ending a game
  + Primary Actors: Game winner and game loser
  + User Goals: Have game end at correct time and have the winner/loser notified of their loss or win
  + Minimal Success Guarantee: Game will be exited, and a new game can be started
  + Success Guarantee: When a winning/losing or draw game state has been reached, each player is notified of the ending game state and the game exits, allowing for a new game connection to be made
  + Main Success Scenario:
    - 1. Game state reaches a win/loss or draw
    - 2. Each player is notified of the ending game state
    - 3. Game state is reset and both players exit the game
    - 4. New game connection can now be made
* Use Case 4: Player leaves unexpectedly
  + Primary Actors: Player still left within the game
  + User Goals: Be notified if opposing player leaves prematurely and have the game exit
  + Minimal Success Guarantee: None
  + Success Guarantee: Remaining player is notified that their opponent left before the game was over. Game ends and a new game connection can now be made
  + Main Success Scenario:
    - 1. Player leaves the game prematurely
    - 2. Remaining Player receives a message saying that the game has ended prematurely
    - 3. Game state is reset
    - 4. New game connection can now be made

Slides Presentation: <https://docs.google.com/presentation/d/1Uz-TAzuHfNJHX0Bz7Zzgxk-KpQVZm0pbpR8mQ3mYBag/edit?usp=sharing>