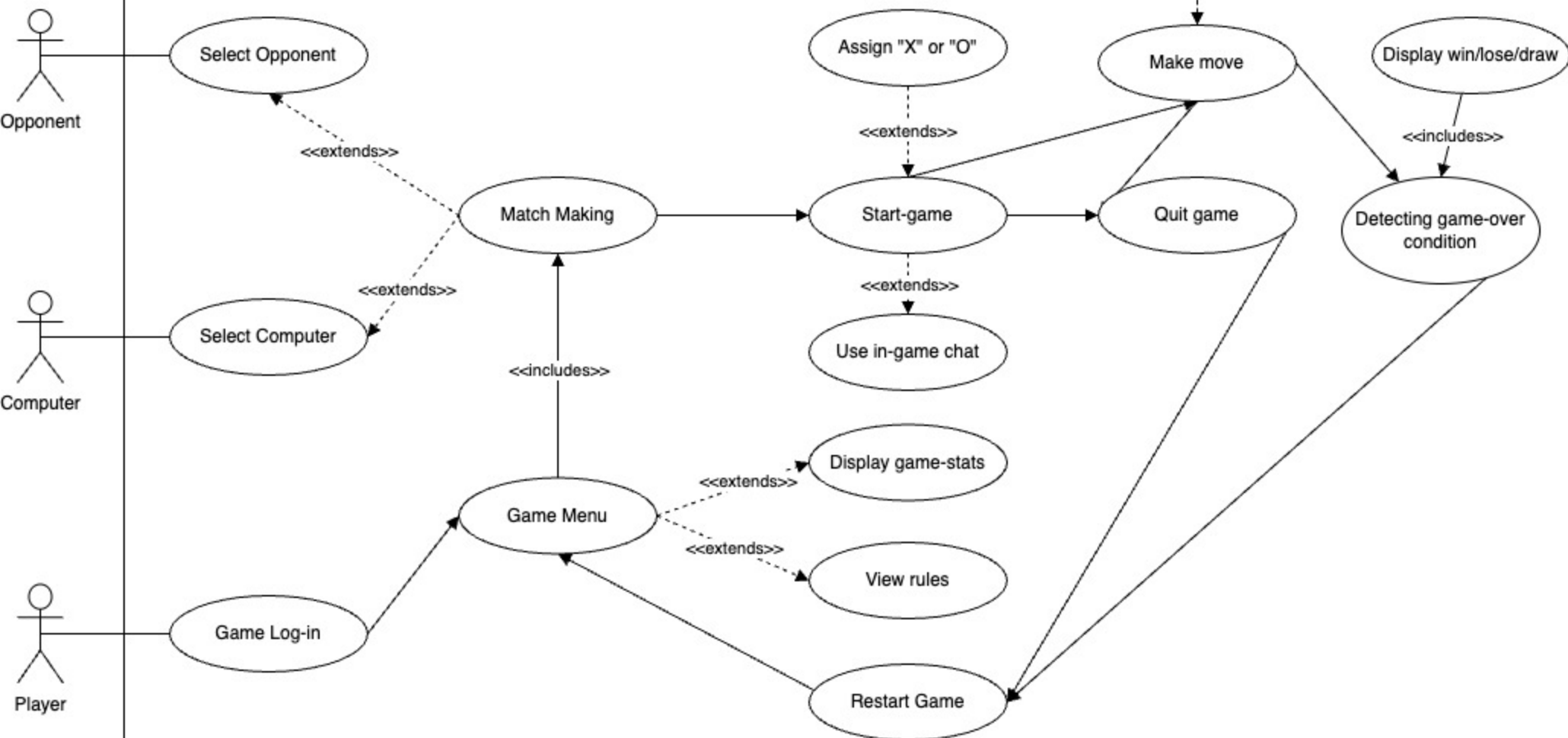


## TicTacToe Use Case Diagram



## Use Case Descriptions (Tic-Tac-Toe Game)

### Use Case 1: Start a new tic-tac-toe game

Iteration: 1, start a new tic-tac-toe game

**Primary actor:** Player

**Goal in context:** To start a new session of tic-tac-toe game

**Preconditions:**

- The player must be successfully logged into the system
- Gui already exists

**Trigger:**

- Player clicks on the “new game” button

**Scenario:**

- The player clicks on the new game button.
- Server connection establishes
- Match making takes place
- System initializes a new game board
- System assigns either “X” or “O” to the player
- System waits for the first move from the player

**Exceptions:**

- If the system is unable to initialize a new game.
- Not enough players on the platform
- Matchmaking fails
- System runs into an unexpected error

**Priority:**

- High

**When available:**

- After final testing and review has been done

**Frequency of Use:**

- Multiple times per session

**Channel to actor:**

- Graphical User Interface

**Secondary actors:**

- AI, computer and second player

**Channels to secondary actors:**

- Matchmaking, server connection

**Open Issues:**

- How long should the matchmaking system wait before trying?

**Use Case 2: Make a move**

**Iteration:** depends on how many moves have previously been made

**Primary actor:** Player

**Goal in context:** To successfully make a move on the tic-tac-toe board

**Preconditions:**

- The game session must be active
- There should be an opponent player
- Multiplayer connection should successfully be established
- There should be blocks on the board to make a move

**Trigger:**

- Player wants to select a cell on the board

**Scenario:**

- Player selects an empty cell.
- The system validates the move is in accordance with the rules
- The system recognizes the player's mark ("X" or "O")
- The system checks for a win, draw or lose condition
- The system switches to the opponent player for their move

**Exceptions:**

- If the system loses connection mid-game, the game "enters" a waiting state.

**Priority:**

- High

**When available:**

- After final testing and review

**Frequency of Use:**

- Multiple times per game

**Channel to actor:**

- GUI

**Secondary actors:**

- Opponent player, computer or AI

**Channels to secondary actors:**

- Matchmaking, server connection and GUI

**Open Issues:**

- Should there be a time limit per move before system detects for any inactivity.

**Use Case 3: Handle invalid moves**

**Iteration:** 2, first move is usually valid because of empty cells

**Primary actor:** Player

**Goal in context:** To prevent a player from making an invalid move

**Preconditions:**

- A game session is already active
- The player must attempt to make a move

**Trigger:** The player attempts an invalid move

**Scenario:**

- The player selects a cell that is already occupied with their cursor
- The system recognises the cell is occupied
- The system doesn't allow the player to make a move
- The system displays a message "cell already occupied" when cursor is hovered on an occupied cell

**Exceptions:**

- If the player doesn't select any move at all

**Priority:**

- Medium

**When available:**

- After final testing and review

**Frequency of Use:**

- Occasionally (when player tries to make an invalid move)

**Channel to actor:**

- GUI

**Secondary actors:**

- Opponent player, computer or AI

**Channels to secondary actors:**

- Matchmaking, server connection and GUI

**Open Issues:**

- Should the system display an error message prompt if the player repeatedly makes an invalid move.

**Use Case 4: View Rules****Iteration: 1****Primary actor:** Player

**Goal in context:** To click a button "Rules" to view rules to the tic-tac-toe game

**Preconditions:** None

**Trigger:** Player wants to view game rules

**Scenario:**

- Player selects "Rules" option from the main menu.
- The system opens a dialogue box with rules for the tic tac toe game
- The player closes the dialogue box with "x" button

**Exceptions:**

- If the rules page fails to load, should the system display an error message

**Priority:**

- Low

**When available:**

- After final testing and review

**Frequency of Use:**

- Rare

**Channel to actor:**

- GUI

**Secondary actors:**

- System

**Channels to secondary actors:**

- None

**Open Issues:**

- Should the players be able to view rules during an active game session
- If a player views rule during an active game session how long should the system wait before next turn or inactivity.

**Use Case 5: Detect condition for game over**

**Iteration:** depends on the number of moves

**Primary actor:** Player

**Goal in context:** To determine when the game ends

**Preconditions:**

- A game session must be active
- A player played a move

**Trigger:** A move is made by the player

**Scenario:**

- Player makes a move.
- System checks whether a player has three consecutive matching cells in a row
- If no win condition and the board is full, system declares a draw

- If no win condition but the board has empty cells, next player takes a turn.
- If win condition detected the system declares the player has won the game.

**Exceptions:**

- If an error encounter while the system is checking win condition, the system retries.

**Priority:**

- High

**When available:**

- After final testing and review

**Frequency of Use:**

- Very frequent

**Channel to actor:**

- GUI

**Secondary actors:**

- Opponent player, computer or AI

**Channels to secondary actors:**

- Matchmaking or GUI

**Open Issues:**

- How should stats be handled if game crashes while checking a win condition.

## **Use Case 6: Display a winner/lose or draw**

**Iteration:** Depend on moves during an active game session

**Primary actor:** Player

**Goal in context:** The display game results whether win/lose or draw

**Preconditions:** The game must have ended in win/lose or draw

**Trigger:** The system detects for a win/lose or a draw condition

**Scenario:**

- The player makes a move.
- The system checks whether the player won/lost or ended in draw.
- The system opens a dialogue box and displays “Player X wins”, “Player O wins”

or draw.

**Exceptions:**

- If any error occurs while displaying message, the system retries showing the message.
- What if the system shows wrong results.

**Priority:**

- High

**When available:**

- After final testing and review

**Frequency of Use:**

- Once per every tic-tac-toe game

**Channel to actor:**

- GUI

**Secondary actors:**

- System, opponent player

**Channels to secondary actors:**

- GUI

**Open Issues:**

- Should the system save results to be viewed later?

## **Use Case 7: Quit Game**

**Iteration: 1**

**Primary actor:** Player

**Goal in context:** To exit an ongoing game session

**Preconditions:** A game session must be active

**Trigger:** Player clicks on the quit game button

**Scenario:**

- The player clicks on the quit game button
- The system shows a prompt asking the player if they are sure they want to quit the game



- The player confirms their selection
- If player selects no, the game resumes
- If player selects yes, the game returns to main menu

**Exceptions:**

- If the game crashes or an unexpected error occurs

**Priority:**

- Medium

**When available:**

- After final testing and review

**Frequency of Use:**

- Occasionally

**Channel to actor:**

- GUI

**Secondary actors:**

- Opponent player

**Channels to secondary actors:**

- Server connection, Matchmaking

**Open Issues:**

- How the stats should be handled if a player exits mid-game?

## **Use Case 8: Restart Game**

**Iteration:** Depends on how many games played so far

**Primary actor:** Player

**Goal in context:** To restart a game after finishing one

**Preconditions:**

- A game session must have come to an end
- There should be a restart option available to the player

**Trigger:** Player clicks on the restart game button

**Scenario:**

- Player finishes an existing game session
- The system opens a dialogue box with two prompts restart game or quit game
- The player clicks on restart game
- The system reconnects matchmaking
- The player enters a new game with new opponent

**Exceptions:**

- If the system cannot reconnect match making
- if the system fails to restart a game

**Priority:**

- High

**When available:**

- After final testing and review

**Frequency of Use:**

- Frequently

**Channel to actor:**

- GUI

**Secondary actors:**

- System, opponent player

**Channels to secondary actors:**

- Server connection

**Open Issues:**

- What if the player wants to restart the game but wants to play with the same opponent?

**Use Case 9: Use In-Game Chat****Iteration: 1****Primary actor:** Player

**Goal in context:** To send and receive messages from your opponent using in game chat

**Preconditions:**

- The player should be in a multiplayer session
- A tic tac toe game should be active
- The player should have an online multiplayer opponent

**Trigger:** The player sends a message

**Scenario:**

- The player types a message in the chat window
- The system sends the message to the client server
- The client server forwards the message to the opponent
- The opponent receives the message in their chat window

**Exceptions:**

- If the chat server encounters an error or is down
- If the opponent disconnects the messages are in queue until they reconnect

**Priority:**

- Medium

**When available:**

- After final testing and review

**Frequency of Use:**

- Frequently

**Channel to actor:**

- GUI

**Secondary actors:**

- Opponent player

**Channels to secondary actors:**

- Server connection

**Open Issues:**

- What if the player or opponent uses offensive language should they be given a warning or be banned

## **Use Case 10: Display Stats**

**Iteration:** 1

**Primary actor:** Player

**Goal in context:** To view a player's game statistics

**Preconditions:**

- The player should be in main menu
- The player should have had at least played 1 game

**Trigger:** The player clicks on the view statistics button

**Scenario:**

- The player clicks on the view statistics button on main menu
- The player views the statistics according to the games
- The player can filter the statistics according to the game
- the player closes the view statistics button

**Exceptions:**

- If the stats fail to load

**Priority:**

- Medium

**When available:**

- After final testing and review

**Frequency of Use:**

- Occasionally

**Channel to actor:**

- GUI

**Secondary actors:**

- System database

**Channels to secondary actors:**

- Remote storage

**Open Issues:**

- Should the system allow the stats to be reset.