4-Player Ultimate Tic Tac Toe QOL Scenario
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The first iteration of our 4 player Tic Tac Toe game has been released and is functional. The first iteration has the ability for 4 players to join a server and play a 4 player game of Tic Tac Toe.

The second iteration focuses on the AI and quality of life improvements like chat, player database and GUI design changes. The player will be able to select three difficulties of AI to play with. They will be able to chat with other players. The game will keep track of player statistics like Username, games won, points earned etc. The GUI will be redesigned to be more visually pleasing and accommodate the new changes

Scenario "Quality of Life"

AI:

There will be three different difficulty levels for AI players:
- Easy: The AI will place its symbol at a completely random location on the 9x9 board, as long as the given location is unoccupied at the time that the AI makes its turn.
- Medium: This AI will look at all of the spaces on the 9x9 board, and effectively do whatever it can to block other players from achieving a three-in-a-row. It will focus on the larger 3x3 set of smaller boards first, and then once it finds the most threatening board of the set, it will try to block any three-in-a-row attempts made within that individual board. If there is no noticeable threat (e.g. the board is empty), the AI will act exactly the same as the easy AI.
- Hard: The hard AI should be nearly impossible to beat. It will implement a Tic-Tac-Toe algorithm on both the large scale, and the small scale. This means that it will use the algorithm to find the best individual board to attempt to win, and then use the algorithm again to attempt to win the board that it found.

Player Database (login and stat tracking):

To access the Main screen of the game, Users will have to login with a username and password. There will be a button to login and there will be a button to register. This information will be stored in a relational database and will be stored when the user registers for the game. The password will be checked to make sure the user types in the password that they want correctly. If the user types in 2 different passwords when registering, they will be shown an error message Once registered, they can login, which will access the database to confirm that the user has filled in the fields correctly. Once logged in users will be able to access the main screen where they can read the directions and join a server. If the user types an incorrect password or username, they will be shown an error message and prompted again.

The client's username will be used to identify their points, games they have won, games they have lost, etc. When a client registers, The database will initialize the tables with initial empty values, and set up the login table which will assign their username and password with an ID. That ID will then be used to access the Player table which holds the players statistics. So each time they login they will be able to see their win loss history. In the main screen they can press a button which will lead them to a screen where they can access their statistics.

Player Chat:

Once a player joins a lobby, they will be connected on a server port with 4 other clients. At this point they can see the other 4 players but not really interact with them in any meaningful way aside from the tic tac toe board. The chat function seeks to fix this issue. The players will be able

to send messages to each other while waiting in the lobby and playing the game. This will increase player engagement by integrating a social aspect into the tic tac toe boards. Friends will be able to talk to other friends. Strangers will be able to become friends

GUI changes:

We will add improvements to each scene of the application. It will be visually appealing so that players enjoy the game. We will add a leaderboard scene so that players can see how they rank compared to others. There will be big improvements added to the gameplay screen. We will add improvements to the game board so it is easier to see. It will look more interesting to keep players engaged. We will change the background so it goes with the rest of the theme of the application. We will also add a section in the gameplay scene that shows whose turn it is.

Player-ID	Username	Password
405	Player-123	Password123
300	Cookie12	Mrcookies12

Player-ID	Wins	Loses	Points
405	13	5	34
300	2	13	40