Tic Tac Toe GUI - Documentation

1. Project Overview

The **Tic Tac Toe GUI** project is a Java-based desktop game that allows users to play Tic Tac Toe in both Single Player (against AI) and Two Player modes. The game features a graphical user interface (GUI) built with Java Swing and includes customizable themes, score tracking, and game state management.

2. Features and Functionalities

- **Game Modes:** Single Player and Two Players.

- **AI Opponent:** AI uses a random move generator (can be upgraded to Minimax).

- **Custom Themes:** Classic, Dark, and Light themes with customization options.

- **Leaderboard:** Tracks player scores.

- **Game State:** Save and load game progress.

- **Responsive GUI:** Built with Swing components for user interaction.

3. Code Structure

The main class TicTacToeGUI.java is responsible for the entire game logic and UI. Key components include:

- **Frame and Panels:** JFrame as the main window and JPanel for the game board and controls.

- **Buttons:** JButton components represent game cells and controls.

- **Event Listeners:** ActionListener for button clicks.

4. Class and Method Descriptions

Class: TicTacToeGUI

- **Purpose:** The main class that initializes the GUI and handles game logic.

Constructor: TicTacToeGUI()

- Initializes player names, mode selection, board, and control panel.

Methods:

- initializePlayerNames(): Prompts players to enter their names.

- initializeModeSelection(): Allows players to choose Single Player or Two Players mode.

- initializeBoard(): Creates a 3x3 grid of buttons.

- initializeControlPanel(): Adds control buttons and theme selector.

- applyTheme(String theme): Applies selected theme to the GUI.

- buttonClicked(int row, int col): Handles player moves and checks game status.

- aiMove(): Generates AI moves.

- checkWin(): Checks if the current player has won.

- resetBoard(): Resets the game board for a new game.

- saveGameState(): Saves the current game state to a file.

- loadGameState(): Loads a saved game state from a file.

- saveLeaderboard(): Updates the leaderboard file.

- showLeaderboard(): Displays the leaderboard in a dialog box.

5. How to Compile and Run

Compilation:

javac TicTacToeGUI.java

Execution:

java TicTacToeGUI

6. Customization

- **Themes:** Customize background, button colors, and fonts using openThemeCustomization().

- **Game Settings:** Modify AI behavior and scoring rules directly in the code.

7. Deployment Instructions

1. **Export as JAR File:**

jar cvfe TicTacToe.jar TicTacToeGUI *.class

2. **Host on Website:**

- Upload the .jar file to /portfolio/tic-tac-toe on your website.

- Embed a download link or use Java Web Start for online play.

8. Conclusion

The **Tic Tac Toe GUI** project demonstrates the use of Java Swing for building interactive applications. It provides a great example of integrating game logic with a user-friendly interface and customizable features. For further development, consider adding advanced AI using the Minimax algorithm, networked multiplayer, or additional themes.