Tic Tac Toe Game Mini-Project Report

Project Overview:

=> The Tic Tac Toe game is a two-player, turn-based board game implemented in Java, where players take turns marking cells on a grid. The game includes both single-player and multi-player modes, offering various advanced features such as AI opponents, dynamic board sizes, and more.

GitHub Repository:

Link: **https://github.com/Premkolte/Tic-Tac-Toe-Game---Java**

Features:

1. Multiplayer Mode:

• Players can play against each other on the same device. They take turns marking the grid with 'X' and 'O' until a winner is determined or the board is full.

2. Single-Player Mode with AI:

• Players can compete against a basic AI. The AI is implemented using a random move generator for beginners and can be enhanced with the Minimax algorithm for smarter moves.

3. Custom Board Size:

• Players can choose from various board sizes (e.g., 4x4, 5x5). The win condition adapts to the size, requiring a certain number of consecutive marks to win.

4. Win Condition Check:

• The game automatically checks for horizontal, vertical, or diagonal lines of consecutive marks to determine the winner.

5. Restart Option:

• Players can restart the game after it ends, resetting the board without restarting the program.

6. Replay Game Animation:

• The sequence of moves is stored during gameplay and replayed with animation after the game finishes.

7. Game Progress Display:

• The board is updated and displayed after each move, allowing players to track the game's progress.

Technologies Used:

- **Programming Language: Java**

- **Algorithms: Minimax (with Alpha-Beta pruning for optimized AI moves)**

- **UI: Command Line Interface (CLI)**

Future Improvements:

- **Add difficulty levels for the AI (easy, medium, hard).**

- **Implement a graphical user interface (GUI) for a more interactive user experience.**

- **Add multiplayer support over a network.**

Conclusion:

The Tic Tac Toe game integrates advanced features such as AI, customisable board sizes, and game replay functionality, making it a comprehensive and engaging project. Adding a replay animation and an intuitive restart option enhances the user experience. The AI's efficiency and the dynamic nature of the board size offer exciting challenges for players of all levels.