Enhanced Tic Tac Toe Game (Java Swing)

A Java-based Tic Tac Toe game with a modern GUI, AI opponent, and score tracking. Built using Swing and Object-Oriented Programming principles.

# Features

* ✅ Dual Game Modes:
* - Player vs Player (PvP)
* - Player vs AI (PvE)
* ✅ Basic AI Opponent (auto-move for O in PvE)
* ✅ Score Tracking: Win/Draw counters
* ✅ Visual Enhancements: Color-coded players (X=Red, O=Blue), winning line highlights
* ✅ Game Controls: New Game & Mode Toggle buttons

# Screenshots

📷 Insert the following screenshots:

1. Game Board - shows main interface with player turn

2. Winning Line - highlight example in green

3. Mode Selection - showing PvP and PvE toggle

4. Score Panel - tracking score at bottom

# How to Play

1. Select game mode (PvP or PvE)

2. Player X (Red) always starts first

3. Click empty squares to make a move

4. Player O will move automatically in PvE mode

5. Win by aligning 3 identical marks

6. Press 'New Game' to restart, or switch modes any time

# Installation & Run Instructions

1. Ensure Java 17+ is installed

2. Place `TicTacToe.java` in a suitable directory under `src/some/`

3. Use the following commands:

javac -cp . src/some/TicTacToe.java -d out/

java -cp out some.TicTacToe

# Requirements

- Java 17 or newer

- Swing library (included with JDK)

# Class Structure

TicTacToe (Main Class)  
├── main()  
├── TicTacToe() Constructor  
├── actionPerformed()  
├── makeAIMove()  
├── checkMatch()  
├── highlightWin()  
├── endGame()  
└── resetGame()

# OOP Concepts Used

|  |  |
| --- | --- |
| Concept | Implementation |
| Encapsulation | Private game state variables |
| Inheritance | JFrame & ActionListener usage |
| Polymorphism | Overriding actionPerformed() |
| Abstraction | makeAIMove() hides logic |
| Single Responsibility | Separate methods for logic blocks |

# Future Improvements

1. Smarter AI using MiniMax algorithm

2. Player name input

3. Online multiplayer mode

4. Animation effects

5. Save/load match history

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# Author

Developed by: Your Name

GitHub: github.com/your-username/enhanced-tic-tac-toe

Contact: your.email@example.com