Department of Software Engineering

University of Engineering and Technology, Taxila

Final Project:

OOP Th & Lab

Title:

The Tic – Tac – Toe Game

Submitted to:

Madam Madiha

Madam Sidra Shafi

Submitted by:

Abdul Rehman 23-SE-69

Talha Khan 23-SE-63

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Source Code:

```
package application;


import javafx.application.Application;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.layout.GridPane;
import javafx.scene.text.Font;
import javafx.stage.Stage;


public class TicTacToe extends Application {


    private String currentPlayer = "X";
    private Button[][] buttons = new Button[3][3];


    @Override
    public void start(Stage primaryStage) {
        GridPane grid = new GridPane();


        // Initialize the grid with buttons
        for (int row = 0; row < 3; row++) {
            for (int col = 0; col < 3; col++) {
                Button button = new Button();
                button.setFont(new Font(24));
```

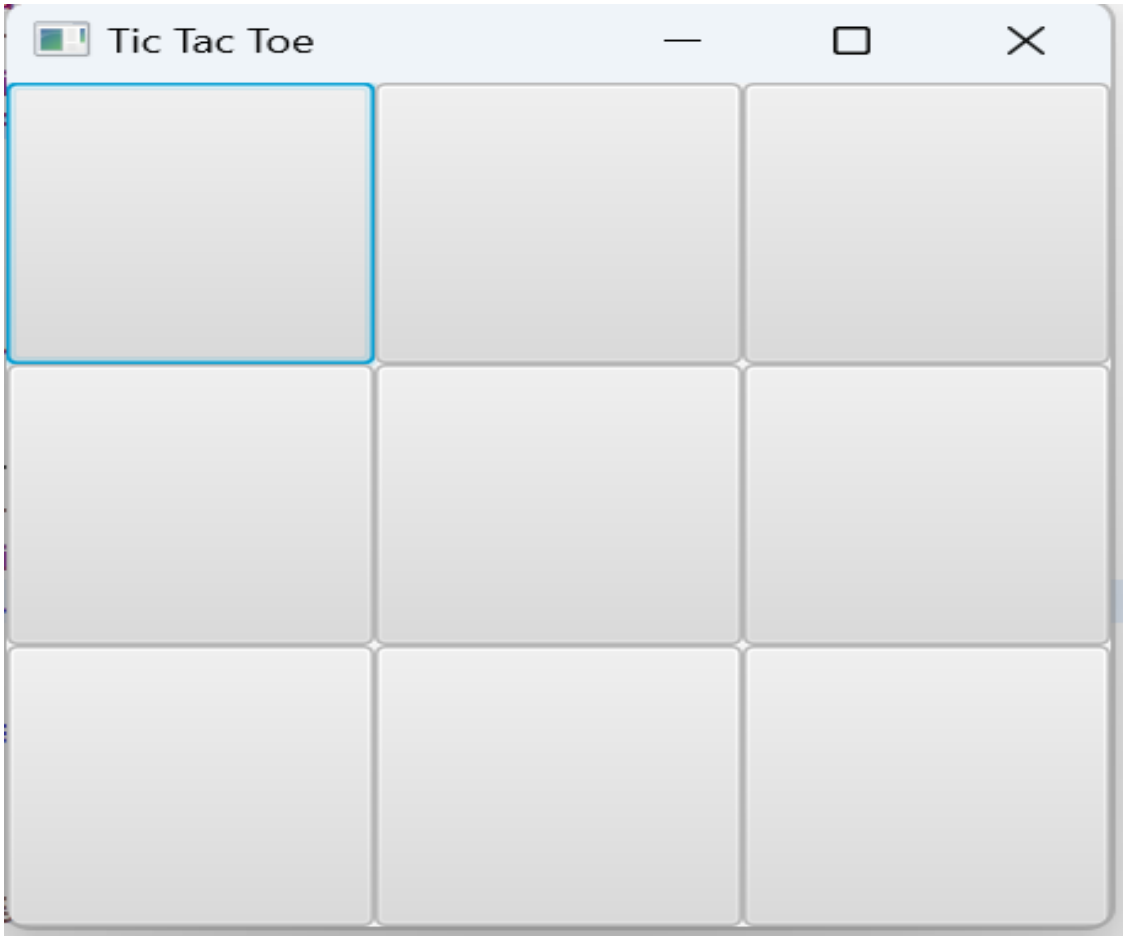
```
            button.setPrefSize(100, 100);
            buttons[row][col] = button;
            button.setOnAction(e -> makeMove(button));
            grid.add(button, col, row);
        }
    }

    Scene scene = new Scene(grid, 300, 300);
    primaryStage.setTitle("Tic Tac Toe");
    primaryStage.setScene(scene);
    primaryStage.show();
}

private void makeMove(Button button) {
    // If button is already clicked, do nothing
    if (!button.getText().isEmpty()) {
        return;
    }

    // Set the current player's mark
    button.setText(currentPlayer);

    // Check for win
    if (checkWin()) {
```

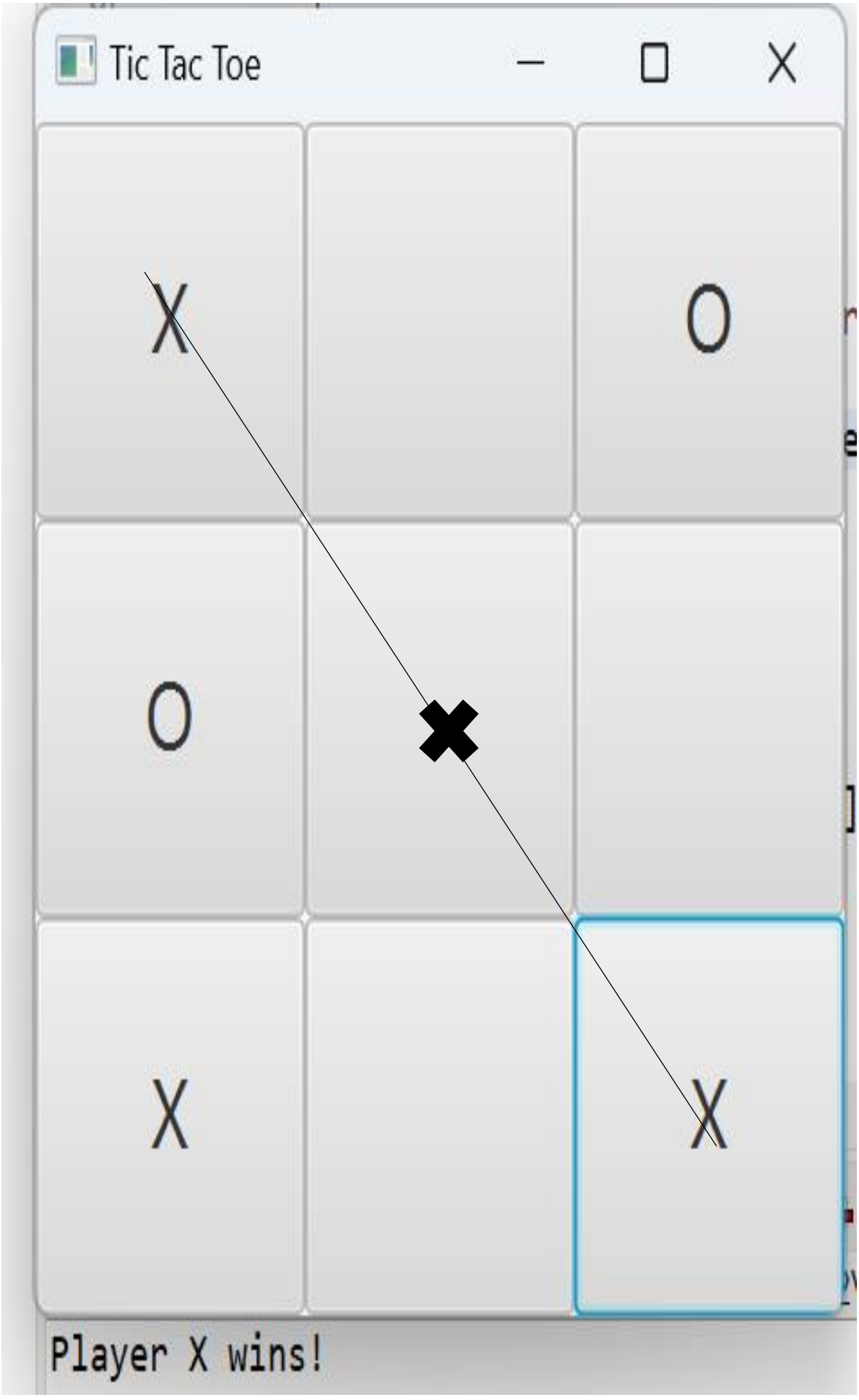
```
            System.out.println("Player " + currentPlayer + " wins!");
            resetBoard();
        } else if (isBoardFull()) {
            System.out.println("It's a draw!");
            resetBoard();
        } else {
            // Switch player
            currentPlayer = currentPlayer.equals("X") ? "O" : "X";
        }
    }

    private boolean checkWin() {
        // Check rows, columns, and diagonals
        for (int i = 0; i < 3; i++) {
            if (checkLine(buttons[i][0], buttons[i][1], buttons[i][2]) || // Row
                checkLine(buttons[0][i], buttons[1][i], buttons[2][i])) { // Column
                return true;
            }
        }
        // Check diagonals
        return checkLine(buttons[0][0], buttons[1][1], buttons[2][2]) ||
               checkLine(buttons[0][2], buttons[1][1], buttons[2][0]);
    }
```

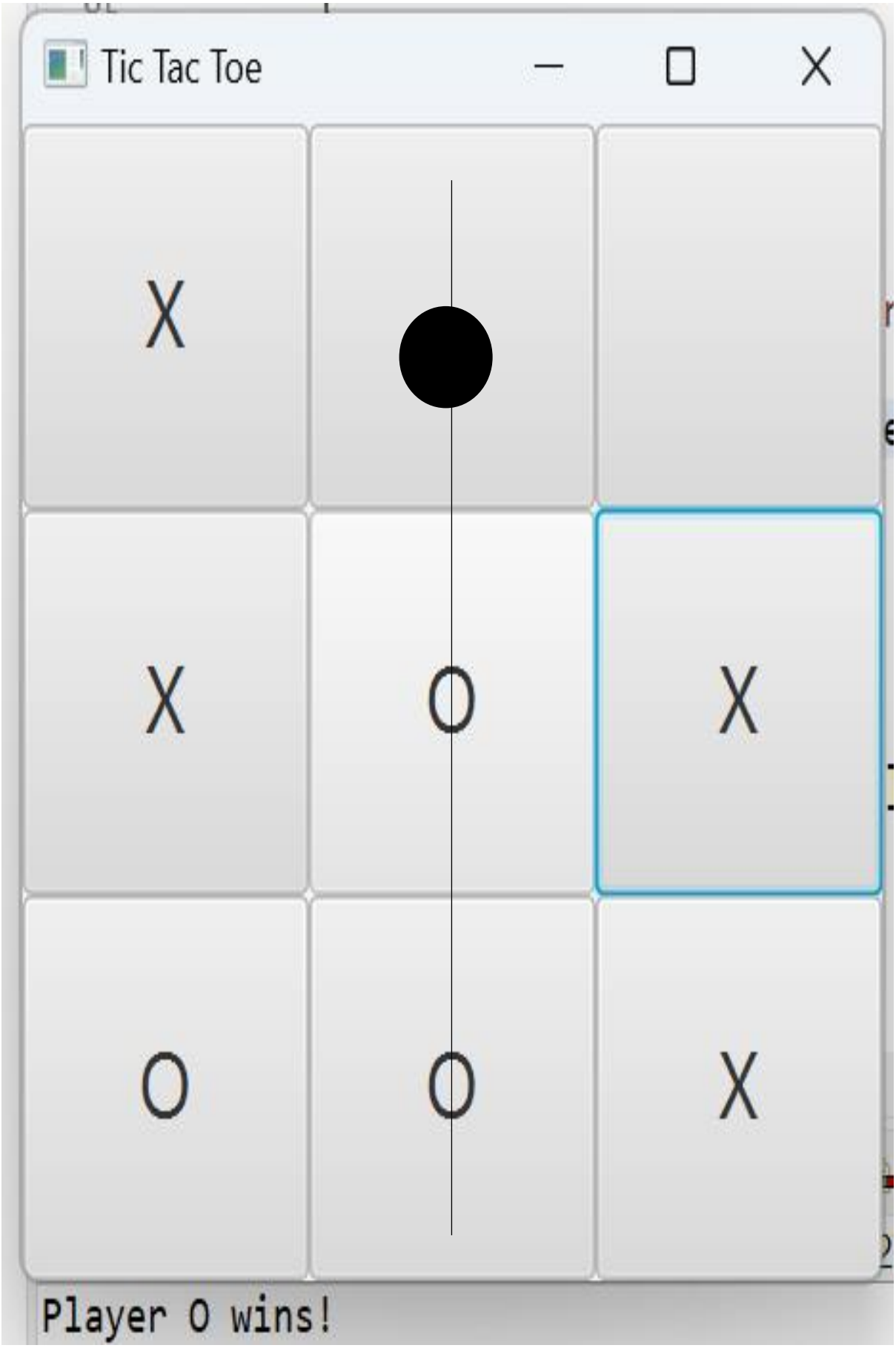
```
private boolean checkLine(Button b1, Button b2, Button b3) {
    return !b1.getText().isEmpty() &&
           b1.getText().equals(b2.getText()) &&
           b2.getText().equals(b3.getText());
}

private boolean isBoardFull() {
    for (int row = 0; row < 3; row++) {
        for (int col = 0; col < 3; col++) {
            if (buttons[row][col].getText().isEmpty()) {
                return false;
            }
        }
    }
    return true;
}

private void resetBoard() {
    for (int row = 0; row < 3; row++) {
        for (int col = 0; col < 3; col++) {
            buttons[row][col].setText("");
        }
    }
    currentPlayer = "X";
```

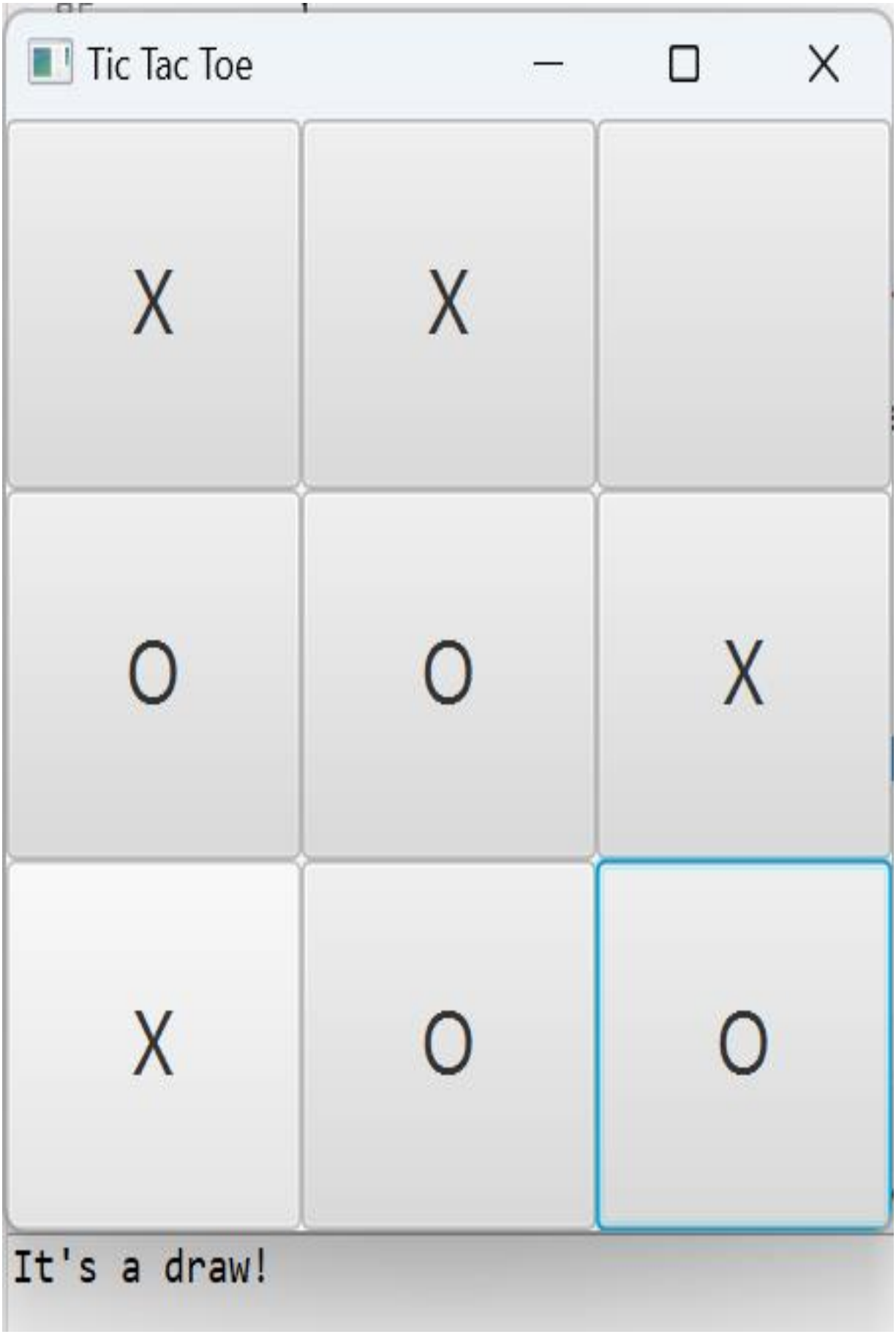
```
    }

    public static void main(String[] args) {
        launch(args);
    }
}
```

Output:




Tic Tac Toe
X
O
O
X
X
Player X wins!


Tic Tac Toe
X
X
O
X
O
O
X
Player O wins!


Tic Tac Toe
X
X
O
O
X
X
O
O
It's a draw!