



```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace TTT
{
    public partial class Form1 : Form
    {
        int[,] board = new int [3,3];
        Random r = new Random();
        public Form1()
        {
            InitializeComponent();
        }

        private void newGameButton_Click(object sender, EventArgs e)
        {
            populateArray();
            //displayBoard();
            while (determineWinner() == -1)
            {
                //reload table
                resultLabel.Text = "Undetermined";
                populateArray();
            }
            if (determineWinner() == 0)
            {
                resultLabel.Text = "0 Wins!";
            }
            else if (determineWinner() == 1)
            {
                resultLabel.Text = "X Wins!";
            }
            else if (determineWinner() == 2)
            {
                resultLabel.Text = "Draw";
            }
            else
            {
                resultLabel.Text = "Undetermined";
            }
            displayBoard();
        }

        void populateArray()
        {
            for (int i = 0; i < 3; ++i)
                for (int j = 0; j < 3; ++j)
                {
                    this.board[i,j] = (int) r.Next(9999) % 2;
                }
        }
        /* returns 0 if "0" is winner
```

```
*           1 if "X" is winner
*           2 if draw
*           -1 if there exist invalid combinations
             both X's and O's winning
*/
int determineWinner()
{
    int winsOfX = 0;
    int winsOfO = 0;

    //count all wins of X
    // Wins on x axis
    if (this.board[0, 0] == 1 &&
        this.board[0, 1] == 1 &&
        this.board[0, 2] == 1)
        winsOfX++;

    if (this.board[1, 0] == 1 &&
        this.board[1, 1] == 1 &&
        this.board[1, 2] == 1)
        winsOfX++;

    if (this.board[2, 0] == 1 &&
        this.board[2, 1] == 1 &&
        this.board[2, 2] == 1)
        winsOfX++;
    // Count all wins for O
    //wins on y axis
    if (this.board[0, 0] == 0 &&
        this.board[1, 0] == 0 &&
        this.board[2, 0] == 0)
        winsOfO++;

    if (this.board[0, 1] == 0 &&
        this.board[1, 1] == 0 &&
        this.board[2, 1] == 0)
        winsOfO++;

    if (this.board[0, 2] == 0 &&
        this.board[1, 2] == 0 &&
        this.board[2, 2] == 0)
        winsOfO++;

    if (this.board[0, 0] == 0 &&
        this.board[0, 1] == 0 &&
        this.board[0, 2] == 0)
        winsOfO++;

    if (this.board[1, 0] == 0 &&
        this.board[1, 1] == 0 &&
        this.board[1, 2] == 0)
        winsOfO++;

    if (this.board[2, 0] == 0 &&
        this.board[2, 1] == 0 &&
        this.board[2, 2] == 0)
        winsOfO++;

    //wins on y axis
    if (this.board[0, 0] == 0 &&
        this.board[1, 0] == 0 &&
        this.board[2, 0] == 0)
```

```
winsOf0++;

if (this.board[0, 1] == 0 &&
    this.board[1, 1] == 0 &&
    this.board[2, 1] == 0)
    winsOf0++;

if (this.board[0, 2] == 0 &&
    this.board[1, 2] == 0 &&
    this.board[2, 2] == 0)
    winsOf0++;

if (winsOfX == 1 && winsOf0 == 0) //x wins
{
    return 1;
}
else if (winsOfX == 0 && winsOf0 == 1) //o wins
{
    return 0;
}

else if (winsOfX == 1 && winsOf0 == 1) // Draw
{
    return 2;
}
else // Invalid combination
{
    return -1;
}
}

void displayBoard()
{
    if (board[0, 0] == 0)
        label1.Text = "O";
    else if (board[0, 0] == 1)
        label1.Text = "X";
    else
        label1.Text = "";

    if (board[0, 1] == 0)
        label2.Text = "O";
    else if (board[0,1] == 1)
        label2.Text = "X";
    else
        label2.Text = "";

    if (board[0, 2] == 0)
        label3.Text = "O";
    else if (board[0,2] == 1)
        label3.Text = "X";
    else
        label3.Text = "";

    if (board[1, 0] == 0)
        label4.Text = "O";
    else if (board[1,0] == 1)
        label4.Text = "X";
    else
        label4.Text = "";
}
```

```
if (board[1, 1] == 0)
    label5.Text = "0";
else if (board[1,1] == 1)
    label5.Text = "X";
else
    label5.Text = "";
```

```
if (board[1, 2] == 0)
    label6.Text = "0";
else if (board[1,2] == 1)
    label6.Text = "X";
else
    label6.Text = "";
```

```
if (board[2, 0] == 0)
    label7.Text = "0";
else if (board[2,0] == 1)
    label7.Text = "X";
else
    label7.Text = "";
```

```
if (board[2, 1] == 0)
    label8.Text = "0";
else if (board[2,1] == 1)
    label8.Text = "X";
else
    label8.Text = "";
```

```
if (board[2, 2] == 0)
    label9.Text = "0";
else if (board[2,2] == 1)
    label9.Text = "X";
else
    label9.Text = "";
```

```
}
```

```
private void resetButton_Click(object sender, EventArgs e)
```

```
{
```

```
    for (int x = 0; x < 3; x++)
```

```
    {
```

```
        for (int y = 0; y < 3; y++)
```

```
            board[x, y] = -1;
```

```
    }
```

```
    displayBoard();
```

```
    resultLabel.Text = "";
```

```
}
```

```
}
```

```
}
```