



COMP 130 - Introduction to Programming with Java

Class: **TicTacToe.java**

Score: ★★ ★ (Medium)

In a game of TicTacToe, two players take turns marking an available cell in a 3x3 grid with their respective tokens (either X or O). When one player has placed three tokens in a horizontal, vertical, or diagonal row on the grid, the game is over and that player has won. A draw (no winner) occurs when all the cells on the grid have been filled with tokens and neither player has achieved a win. Write a program for playing TicTacToe.

The program prompts two players to enter X token and O token alternately. Whenever a token is entered, the program redisplay the board on the console and determines the status of the game (win, draw, or continue). Also it should check whether the place is full or empty, if the place is already full it should give warning and ask to enter another place.

This is a simple yet fun programming problem, that you can solve using the programming skills that you have acquired so far. You may though need to put a bit of thought and creativity to be able to implement it.

Hint: You may hold the current state of the game board by using a 3x3 two dimensional character array (`char[][] board`), which the program repeatedly updates and displays until the game is over. Each grid will then have three possible state values, 'X', 'O' or ' '. You may also think writing your program in a modular way, that is, by using several methods. You may define methods, for example, to get input from both users and update the board; to display the board; or to check whether the game is over, whether a move is legal, etc.

Here are two sample runs:

Sample 1

```
-----
|   |   |   |
-----
|   |   |   |
-----
|   |   |   |
-----
Enter a row (0, 1, 2) for player X: 1
Enter a column (0, 1, 2) for player X: 1

-----
|   |   |   |
-----
|   | X |   |
-----
|   |   |   |
-----
Enter a row (0, 1, 2) for player O: 1
Enter a column (0, 1, 2) for player O: 2
```

```

-----
|   |   |   |
-----
|   | X | O |
-----
|   |   |   |
-----

```

Enter a row (0, 1, 2) for player X: 0
Enter a column (0, 1, 2) for player X: 0

```

-----
| X |   |   |
-----
|   | X | O |
-----
|   |   |   |
-----

```

Enter a row (0, 1, 2) for player O: 1
Enter a column (0, 1, 2) for player O: 0

```

-----
| X |   |   |
-----
| O | X | O |
-----
|   |   |   |
-----

```

Enter a row (0, 1, 2) for player X: 2
Enter a column (0, 1, 2) for player X: 2

```

-----
| X |   |   |
-----
| O | X | O |
-----
|   |   | X |
-----

```

X player won

Sample 2

```

-----
|   |   |   |
-----
|   |   |   |
-----
|   |   |   |
-----

```

Enter a row (0, 1, 2) for player X: 1
Enter a column (0, 1, 2) for player X: 1

```

-----
|   |   |   |
-----
|   | X |   |
-----
|   |   |   |
-----

```

Enter a row (0, 1, 2) for player O: 1
Enter a column (0, 1, 2) for player O: 1
This cell is already occupied. Try a different cell
Enter a row (0, 1, 2) for player O: 1
Enter a column (0, 1, 2) for player O: 2