

CPSC1012 Advanced Portfolio 2 – Multidimensional Array

Weight: **8%** of your final mark

Tic-Tac-Toe Game

In a game of tic-tac-toe, two players take turns marking an available cell in a 3 x 3 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. Create a program for playing a tic-tac-toe game.

The program prompts the two players to alternately enter an X token and O token. Whenever a token is entered, the program redisplay the board on the console and determines the status of the game (win, draw, or continue). Accessing a particular cell will be by row (Top, Middle and Bottom) and by column (Left, Center and Right). Here is a sample run:

```
*****
* Tie-Tac-Toe Game *
*****

-----
Enter cell row for player X Top (T), Middle (M) or Bottom (B): M
Enter cell column for player X Left (L), Center (C) or Right (R): C
-----
|  |  |  |
-----
|  | X |  |
-----
|  |  |  |
-----

Enter cell row for player O Top (T), Middle (M) or Bottom (B): T
Enter cell column for player O Left (L), Center (C) or Right (R): A
Invalid entry for game location. Try again.
Enter cell column for player O Left (L), Center (C) or Right (R): L
-----
| O |  |  |
-----
|  | X |  |
-----
|  |  |  |
-----

....more turns

Enter cell row for player X Top (T), Middle (M) or Bottom (B): B
Enter cell column for player X Left (L), Center (C) or Right (R): L
-----
| O |  | X |
-----
| O | X |  |
-----
| X |  |  |
-----

Player X wins!
Would you like to play again (y/n)? n
Good-bye and thanks for playing.
```

Marking Guide

Description	Marks Possible	Marks Earned
Correctness <ul style="list-style-type: none"> Game board is hold as a 2D array within the program New board is correctly displayed Requested cell is correctly indicated on board Logic to determine winner / tie game Logic to determine if cell is already taken Can play again and board is cleared Data validation is done for entered values 	5	
Structure <ul style="list-style-type: none"> Code to create and initialize game board 2D array Code to display empty tic-tac-toe board Appropriate methods to <ul style="list-style-type: none"> obtain play location display board with cell contents determine winner / tie 	3	
Style and Readability <ul style="list-style-type: none"> class course standards exists Meaningful identifiers 	1	
Documentation <ul style="list-style-type: none"> Opening documentation Method source code comments 	1	
Total:	10	

Coding Requirements

The following coding standards must be followed when developing your program:

- Your C# Console App project must be named as **AdvancedPortfolio02-*FName***(eg: AdvancedPortfolio02-DWelch)
- Opening documentation at the beginning of the program source file describing the **purpose, author, last modified date** of the program.
- Method documentation at the beginning of the method source file describing the **purpose, input, output** of the method.
- Proper structure programming techniques must be used
- Marks will be docked for any violations of the above (1 mark per violation).

Demonstration and Submission Requirements

- Demonstrate to your instructor your working program before submitting to GitHub. Be prepared to answer questions about your code after the demonstration. **No marks will be given** if you are unable to explain your code or if you submit your project without a demonstration of your working program to your instructor.