

CS150 Assignment 8

Tic-Tac-Toe

Date Assigned: Monday, November 26, 2012

Date Due: Tuesday, December 4, 2012, @ 5pm

Total Points: 40 pts

There is no late grace period for this final assignment!!!

Write a program that will allow two players to play a game of tic-tac-toe. Use a two-dimensional integer array with 3 rows and 3 columns as the game board. Each element of the array should be initialized with a zero. The program must display the initial board configuration, with a blank in place of the zero, and then a start loop that does the following:

- Allow player 1 to select a location on the board for an X by entering a row and column number. Then redisplay the board with an X replacing the blank in the chosen location. You must clear the screen during every round of the game.
- If there is no winner yet and the board is not yet full, allow player 2 to select a location on the board for an O by entering a row and column number. Then redisplay the board with an O replacing the blank in the chosen location.

The loop should continue until a player has won or a tie has occurred.

- Player 1 wins when there are three Xs in a row, a column, or a diagonal on the game board.
- Player 2 wins when there are three Os in a row, a column, or a diagonal on the game board.
- A tie occurs when all of the locations on the board are full, but there is no winner.

The program must display an appropriate message indicating the winner or reporting that a tie occurred.

Input Validation: Only allow legal moves to be entered. The row must be 1, 2, or 3. The column must be 1, 2, or 3. The (row, column) position entered must currently be empty (i.e. no player has previously selected a location on the board).

Sample Output:

```
C:\Windows\system32\cmd.exe
*****
*   Tic-Tac-Toe   *
*****

  1  2  3
  _  _  _
1|  |  |  |
  _  _  _
2|  |  |  |
  _  _  _
3|  |  |  |
  _  _  _

Player 1 make your selection:
Row: _
```

```
C:\Windows\system32\cmd.exe
*****
*   Tic-Tac-Toe   *
*****

  1  2  3
  _  _  _
1| 0 | X | X |
  _  _  _
2| X | 0 | 0 |
  _  _  _
3| 0 |  | X |
  _  _  _

Player 1 make your selection:
Row: 3
Col: 2
Press any key to continue . . . _
```

```
C:\Windows\system32\cmd.exe
*****
*   Tic-Tac-Toe   *
*****

  1  2  3
  _  _  _
1| 0 | X | X |
  _  _  _
2| X | 0 | 0 |
  _  _  _
3| 0 | X | X |
  _  _  _

Cat's Game. The game was a tie.
Press any key to continue . . . _
```

```
C:\Windows\system32\cmd.exe
*****
*   Tic-Tac-Toe   *
*****

  1   2   3
  _   _   _
1| O | X | X |
  _   _   _
2| O | O |   |
  _   _   _
3| O | X | X |
  _   _   _

Congratulations player two! You have won.
Press any key to continue . . . _
```

► A partial program exists called **ticTacToe.cpp** with function prototypes. You are to write the definition for each function prototype.

To complete this assignment you must submit the following:

1. An electronic copy of your program on Turing

- a. Add a new project named **08_TicTacToe** to your previously created assignment solution called **PUNetID-Assignments**. It is vital that you name your project correctly!
- b. Type your program (fully documented/commented) into the project. You must follow the coding standards!
- c. Pay attention to the example output! Your program's output must look **exactly** like the example output! The spacing and newlines in your output must match exactly.
- d. Make sure that your program compiles and runs correctly. If you get any errors, double check that you typed everything correctly.
- e. Make sure that your program does not produce any warnings.
- f. Once you are sure that the program works correctly it is time to submit your program. You do this by logging on to Turing and placing your complete solution folder in the **CS150-02** Drop folder. This solution folder must contain eight projects.
- g. The program must be in the drop folder by 5pm on the day that it is due. Remember, there is no late grace period for this last assignment.

2. A hard copy of your program

- a. The hard copy must be delivered to the instructor's office by 5pm on the day that it is due.

b. The hard copy must be printed in color, double-sided, and stapled if necessary.

c. Your tab size must be set to 2 and you must not go past column 80 in your output.

Good luck! And remember, if you have any problems, come and see straight away. 😊