

CS150 Assignment 5

Tic-Tac-Toe

Date assigned: Wednesday, October 24, 2007

Date due: Wednesday, November 7, 2007, 1 PM

Total points: 40

Problem

This problem is a modification of Problem 6 on page 551 of your textbook.

Write a program that will allow two players to play a game of tic-tac-toe. Use a two-dimensional character array with 3 rows and 3 columns as the game board. Each element of the array should be initialized with an asterisk (*). The program should display the initial board configuration 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 * 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 * 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 should display an appropriate message indicating who won, 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., still have an asterisk in it).

You must also display a title for your program.

To complete this assignment you must

1. Create a new C++ project in Visual Studio. Name your project "05TicTacToexxxxxxx", where xxxxxxxx should be replaced by your PU Net Id. As an example, my project would be called "05TicTacToekhoj0332". It is vital that you name your project correctly!
2. Type the solution (fully documented/commented) to the problem into your project. **Make sure you follow the coding standards.**
3. Make sure that your program compiles and runs correctly. If you get any errors, double check that you typed everything correctly. Be aware that C++ is case-sensitive.
4. 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 project folder in the **CS150-01 Drop** folder. Make sure that you copy your program folder and don't move it. If you move it, then you will not have your own copy!

Answer the following questions:

What will your program need to do conditionally? What data will this decision be based on?

What data will need to be stored in an array? What will each row in the array represent? What will each column in the array represent?

What will your program need to do in a loop? When data will your program use to stop the loop?

Notes

1. You must follow the coding standards.
2. You must use constants when possible.
3. Your program will be graded on efficiency. In other words, you will be marked down for repeating code statements unnecessarily.
4. You may only use the C++ programming concepts covered thus far in class. Do not use any more advanced concepts that we have not covered or any other programming concepts that you have had experience with.
5. You must comment your code appropriately.
6. Refer to the syllabus for what constitutes plagiarism, and the consequences for plagiarizing.

To receive full credit for this assignment, your project must be in the drop box by 9am on the day that it is due. Anything later will be considered late. Further, you must bring a color hard copy of your program and the answers to the above questions to class and place it on the instructor's desk by 1pm.

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

START EARLY!!