Methods/Functions Assignment (Tic-Tac-Toe)

Due date: _____

Objectives

The purpose of this assignment is to assess your understanding of the following concepts:
- Methods/functions

Remember, if you're spending a lot of time on something that isn't part of the assignment objectives, then get some help. Search the internet first, then ask a neighbor. If you still can't figure it out, then ask Mr. Brooks.

Assignment

Write a tic-tac-toe game. The game board will consist of nine buttons arranged in three rows and three columns, as pictured at right. When someone clicks the "Start Game!" button, the program should clear the board (so all of the game board buttons are blank) for a new game. A textblock above the game board should state whose turn it is. When a player clicks a game board button, the program should change the Text property of that button to be either "X" or "O" depending on whose turn it is. When either player gets three in a row (horizontally, vertically, or diagonally) then the textblock above the game board should state who the winner is. If the game board is completely full and there is no winner, then the textblock above the game board should state that there is no winner.
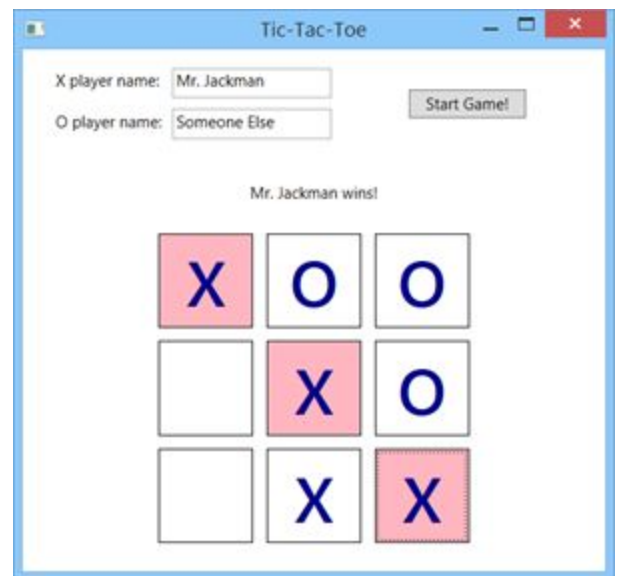
Note that for this program you are allowed to use the buttons to keep track of the state of the game squares. (In other words, you don't have to use separate variables to keep track of whether a square is X, O, or blank.)

Points Breakdown

- (10 points) The program uses meaningful variable and method names (including control names) that use the correct naming convention ("camelCase" for variables and "PascalCase" for methods).
- (5 points) There is a textblock above the game board that specifies whose turn it is, who the winner is (if someone has three in a row), or that there is no winner (if the game board is full).
- (10 points) Clicking a game board button changes the text of that button to "X" or "O" depending on whose turn it is.
- (10 points) Each time a game board button is clicked it changes whose turn it is.
- (20 points) Each time a game board button is clicked it determines whether a player got three in a row and won the game (note that there are 8 ways to win the game).
- (10 points) Use a method to check for a winner that takes three buttons as parameters, checks for a win with those three squares (changing the color if there is a win and displaying the winner) and returns a value to the caller about whether there was a winner.

- (10 points) If the game board is full and no one has won then the textblock above the game board states there is no winner.
- (10 points) If a player clicks a game board button that has already been played it does not change the text for that button and does not change the current player. (You are not allowed to disable the buttons or use the `IsHitTestVisible` property to achieve this behavior.)
- (5 points) The "Start Game" button clears the board to start a new game. The player names should not be removed when this happens (i.e. it starts a new game but doesn't restart the program).
- (5 points) Player names are specified in text boxes and those names are used in the text block to specify whose turn it is and who the winner is.
- (5 points) When a player gets three in a row it highlights the three squares by changing the Background property (I used a value of `Brushes.LightPink`).

Additional Learning

- (1 ticket/5 points) Change your program so all of the game board buttons use the same event handler method.
- (1 ticket/5 points) Change the program to make you go first all the time if your name is given as one of the player names.
- (1 ticket/5 points) Change the program to keep track of how many games each player has won. When starting a new game, the player with the fewest wins should go first.
- (1 ticket/5 points) Have the program display a special message if the winning move causes more than one three-in-a-row sequence.