# Project 4: Tic-Tac-Toe

Using Python, students will create a Tic-Tac-Toe game. This project has two parts

1. Designing the game so that two users can play Tic-Tac-Toe against one another.
2. Creating a Tic-Tac-Toe checker which will check the board to see if Xs or Os have won the game.

## Overview

[Tic-Tac-Toe](http://www.merriam-webster.com/dictionary/tic-tac-toe) is a game in which one player draws X’s and another player draws O’s inside a set of nine squares and each player tries to be the first to fill a row, column, or diagonal of squares with either X’s or O’s. We will be writing an interactive Tic-Tac-Toe program. At the end of each turn the computer will check to see if X’s have won the game or if the O’s have won the game.

### Behavior

* The program will prompt the user to enter their name and their opponents name.
* Whoever enters their name first will be playing as X’s, and the other player will be O’s.
* The players will take turns inputting the row and column they would like to place their mark.
* If that spot is already taken the program will ask for the spot again.
* At the end of each player’s turn the program will
  + check if that player has won.
  + print the updated game board.
* If there are no more spots open and nobody has won the game, the program will print Tie game!.

### Implementation Details

* Use variables to store the user names for personalized prompts.
* Create a game board represented as a list of lists, size 3 by 3. ***Note: This is a change from our earlier implementations of Tic-Tac-Toe. Why do you think this might be better?***
* Check for a winner horizontally, vertically, and on both diagonals.
* Cannot allow a user to overwrite a spot on the board.

## Grading

### Scheme/Rubric

|  |  |
| --- | --- |
| **Functional Correctness (Behavior)** |  |
| Program prompts user for name | 2 |
| Program marks board where user requested | 5 |
| Program prints a readable board after user’s turn | 5 |
| Program won’t overwrite value on board | 5 |
| Program reports who won or if there was a tie | 15 |
| Program ends after win, loss, or tie | 3 |
| **Sub total** | 35 |
| **Technical Correctness** |  |
| Correct use of game loop | 5 |
| Correctly indexes into lists of lists to store board | 5 |
| Correctly check board for mark | 5 |
| Check for winners on all three horizontals and verticals | 20 |
| Checks for winners on both diagonals | 10 |
| **Sub total** | 45 |
| **Total** | 80 |