

Homework 5: Finding Winning Moves in Tic-Tac-Toe

Due: Feb. 22 at 11:55pm

This assignment should be completed using Pair Programming.

Tic-Tac-Toe is a game played on a three-by-three grid of squares. Two players take turns marking empty squares; one player marks with "X" and the other player marks with "O". The first player to make three similar marks in a row, in any direction, wins the game.

For example, after two moves by player X and two moves by player O, the game might look as shown below. If it is X's turn to move, she can win by marking "X" in row 2, column 3.

	O	
X	X	
	O	

Your assignment is to write a program that reads some descriptions of partly-finished tic-tac-toe games. For each game, your program should print the coordinates of the winning moves for player X, if any. If the input to your program were a description of the game shown above, your program should print "2, 3" to indicate a winning move for player X in row 2, column 3.

Your program should read its input from `System.in`. The input consists of one or more games, where each game is described by three lines. The games are separated by blank lines in the input. For each game, the three lines represent the three rows of a tic-tac-toe board, from top to bottom. Each line contains three characters that represent the content of the squares in that row: 'X', 'O', or '.' (dot) for an empty square. The game shown above would be represented by the following three input lines:

```
.O.  
XX.  
.O.
```

The output of your program should be as follows:

1. For each game, print the three input lines, just as they appear in the input. This will allow the grader to see the problem that your program is solving.
2. Next, print a blank line followed by "Winning moves for X:"
3. Next, for each winning move for player X, print the row and column of the winning move, separated by a comma, on a separate line.
4. If the game has no winning move for X, print "None".
5. Print a blank line between games.

The following is an example input that describes three games:

```
.O.  
XX.  
.O.  
  
.XX  
O.X  
OO.  
  
X.O  
..X  
.O.
```

The expected output for this example input is as follows:

```
.O.  
XX.  
.O.  
  
Winning moves for X:  
2,3  
  
.XX  
O.X  
OO.  
  
Winning moves for X:  
1,1  
3,3  
  
X.O  
..X  
.O.  
  
Winning moves for X:  
None
```

Test your program on this example input before submitting it. The graders will test your program on a different input.

Your program should not prompt the user for input. Assume that the input will be provided by redirecting `System.in` to read from a file. Note that the following command runs your `TicTacToe` program, taking input from the file `testinput.txt` and directing output to the file `testoutput.txt`:

```
java TicTacToe <testinput.txt >testoutput.txt
```

Submit one file named `TicTacToe.java` to Moodle before the assignment deadline. You do not need to submit the output of the program. Each partner should submit a file, as described in [Pair Programming Guidelines](#).