

COSC 311 Homework 2 (10 points)

Due Wednesday, 15 March 2023 at 11:59 PM

Please finish the following tasks and submit your homework report via MyClasses. Your submission must contain your source code file (one “.py” file for all code) and a PDF document. The PDF contains the test results (may use screenshot) of your program.

Tic-tac-toe

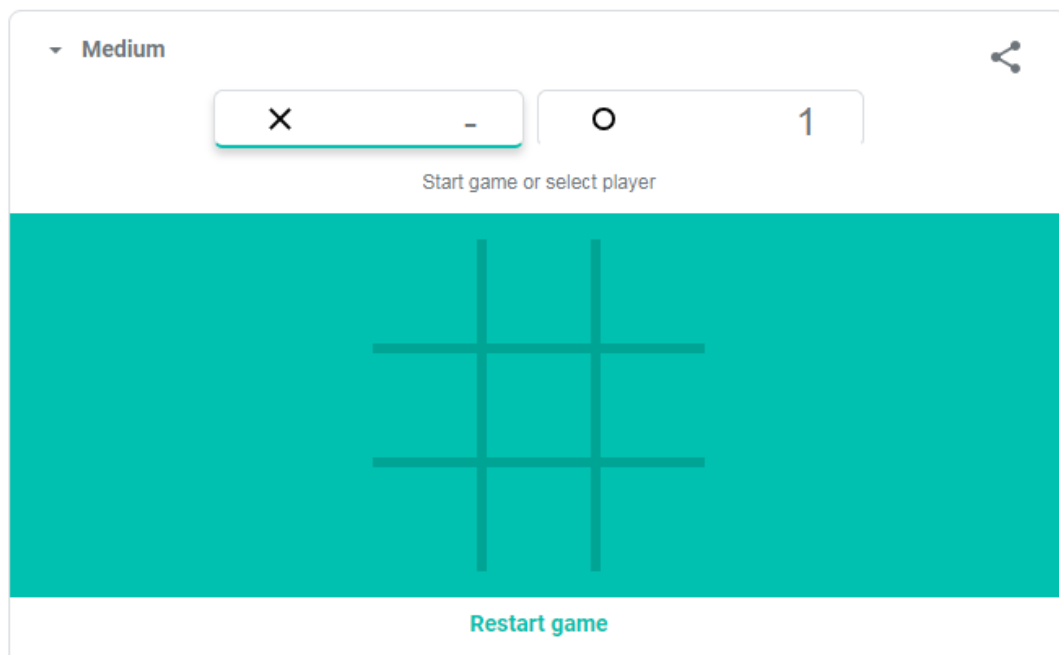
1. Game description (from Wikipedia):

Tic-tac-toe is a paper-and-pencil game for two players who take turns marking the spaces in a three-by-three grid with X or O. The player who succeeds in placing three of their marks in a horizontal, vertical, or diagonal row is the winner.

Tic-tac-toe is played on a three-by-three grid by two players, who alternately place the marks X and O in one of the nine spaces in the grid. In the following example, the first player (X) wins the game in seven steps:



To try and play this game, you may Google “Tic-tac-toe” and find the game as follows:



2. Programming tasks

Write a program to implement the Tic-tac-toe game (you may choose any appropriate data structure/type to store the game data). You need to use a simple interface for the game grid (has 9 spaces) by printing lines and marks to your console. Players input integers for the row & column to indicate a space they would like to take. Some steps are shown as follows:

- 1) At the beginning of the game, show an empty grid; prompt player (assume X player goes first) to input the row & column of the space to take (row/column number is from 0 - 2 or 1 - 3);

```
  | |  
--  
  | |  
--  
  | |  
  
X player's turn:  
  
Input row for move:|
```

- 2) After taking a space, show the corresponding mark and the updated grid; then change player and prompt the other player (i.e. O player here) to take a space:

```
  X player's turn:  
  
Input row for move:0  
  
Input col for move:1  
|X|  
--  
  | |  
--  
  | |  
  
O player's turn:  
  
Input row for move:|
```

- 3) Repeat step 2) until one player wins and game finishes.

```
  X player's turn:  
  
Input row for move:2  
  
Input col for move:1  
|X|O  
--  
O|X|  
--  
  |X|  
X won!
```

4) Repeat step 2) until all the spaces are taken (i.e. draw) and game finishes.

```
X player's turn:
Input row for move:2
Input col for move:0
X|X|O
----
O|O|X
----
X|X|O
Draw!
```

5) If a player tries to take a used space, show “Invalid move!” and ask player to select another space.

```
|X|
----
O|X|
----
| |
O player's turn:
Input row for move:1
Input col for move:1
Invalid move!
O player's turn:
Input row for move:
```

3. What to hand in

You will upload the source code file (.py file) and a PDF document via myClasses.
Your PDF document should include the following results (may use screenshot):

- a) Error checking (input validation) for the row/column inputs (must be 0 - 2 or 1 - 3);
- b) Test results (all steps) from beginning to end (one player wins). The program follows the given user interface and game procedure;
- c) Test results (all steps) from beginning to end (draw). The program follows the given user interface and game procedure;
- d) Error checking (input validation) for the invalid move.

Policy

- 1. Each student MUST finish this homework independently. NO TEAM WORK and DISCUSSION are allowed. If you need any help, please feel free to contact the instructor.
- 2. You need to write your whole program in an editor and save your source code as a “.py” file, which will be submitted to MyClasses together with your PDF report.