Project (Week 2)

Write a Python program to play the game Tic-Tac-Toe.

Use the code shown on page 222-223 of the textbook as a framework. Instead of 2 hard coded fixed players, modify the code to let a human play against the computer. You should let the human player to select if he or she wants to move first.

Hints:

1. To simplify the code, we always let the human player use ‘X’ mark and the computer use ‘O’ mark.
2. If a specific place has already been occupied, then the human can’t place another mark on top of it, otherwise an error message will occur.
3. You can research online to find some interesting algorithms or just design your own (primitive or advanced) algorithm to intelligently play against a human player.
4. Observe cases that the computer wins, the human wins, or tie.

**Submit your entire code and also include your multiple output runs (at least 3 times with different movements of the human player.)**

output runs:

**Tic-Tac-Toe!**

**0 | 1 | 2**

**----------**

**3 | 4 | 5**

**----------**

**6 | 7 | 8**

**The player use ‘X’ mark and the computer use ‘O’ mark.**

**The player will go first.**

**Your turn:**

**Please enter your move (0-8): 4**

**| |**

**-----------**

**| X |**

**-----------**

**| |**

**Computer move:**

**| |**

**-----------**

**| X |**

**-----------**

**O | |**

**Your turn:**

**Please enter your move (0-8): 0**

**X | |**

**-----------**

**| X |**

**-----------**

**O | |**

**Computer move:**

**X | |**

**-----------**

**| X |**

**-----------**

**O | | O**

**Your turn:**

**Please enter your move (0-8): 7**

**X | |**

**-----------**

**| X |**

**-----------**

**O | X | O**

**Computer move:**

**X | O |**

**-----------**

**| X |**

**-----------**

**O | X | O**

**Your turn:**

**Please enter your move (0-8): 3**

**X | O |**

**-----------**

**X | X |**

**-----------**

**O | X | O**

**Computer move:**

**X | O |**

**-----------**

**X | X | O**

**-----------**

**O | X | O**

**Your turn:**

**Please enter your move (0-8): 2**

**X | O | X**

**-----------**

**X | X | O**

**-----------**

**O | X | O**

**The game is a tie!**

**Do you want to play again? (yes or no)**

**yes**

**The player use ‘X’ mark and the computer use ‘O’ mark.**

**The computer will go first.**

**Computer move:**

**O | |**

**-----------**

**| |**

**-----------**

**| |**

**Your turn:**

**Please enter your move (0-8): 4**

**O | |**

**-----------**

**| X |**

**-----------**

**| |**

**Computer move:**

**O | |**

**-----------**

**| X |**

**-----------**

**| | O**

**Your turn:**

**Please enter your move (0-8): 6**

**O | |**

**-----------**

**| X |**

**-----------**

**X | | O**

**Computer move:**

**O | | O**

**-----------**

**| X |**

**-----------**

**X | | O**

**Your turn:**

**Please enter your move (0-8): 5**

**O | | O**

**-----------**

**| X | X**

**-----------**

**X | | O**

**Computer move:**

**Sorry! The winner is Computer!!! You lose.**

**O | O | O**

**-----------**

**| X | X**

**-----------**

**X | | O**

**Do you want to play again? (yes or no)**

**yes**

**The player use ‘X’ mark and the computer use ‘O’ mark.**

**The player will go first.**

**Your turn:**

**Please enter your move (0-8): 4**

**| |**

**-----------**

**| X |**

**-----------**

**| |**

**Computer move:**

**| |**

**-----------**

**| X |**

**-----------**

**| | O**

**Your turn:**

**Please enter your move (0-8): 2**

**| | X**

**-----------**

**| X |**

**-----------**

**| | O**

**Computer move:**

**| | X**

**-----------**

**| X |**

**-----------**

**O | | O**

**Your turn:**

**Please enter your move (0-8): 7**

**| | X**

**-----------**

**| X |**

**-----------**

**O | X | O**

**Computer move:**

**| O | X**

**-----------**

**| X |**

**-----------**

**O | X | O**

**Your turn:**

**Please enter your move (0-8): 3**

**| O | X**

**-----------**

**X | X |**

**-----------**

**O | X | O**

**Computer move:**

**| O | X**

**-----------**

**X | X | O**

**-----------**

**O | X | O**

**Your turn:**

**Please enter your move (0-8): 0**

**X | O | X**

**-----------**

**X | X | O**

**-----------**

**O | X | O**

**The game is a tie!**

**Do you want to play again? (yes or no)**

**yes**

**The player use ‘X’ mark and the computer use ‘O’ mark.**

**The player will go first.**

**Your turn:**

**Please enter your move (0-8): 0**

**X | |**

**-----------**

**| |**

**-----------**

**| |**

**Computer move:**

**X | |**

**-----------**

**| |**

**-----------**

**O | |**

**Your turn:**

**Please enter your move (0-8): 4**

**X | |**

**-----------**

**| X |**

**-----------**

**O | |**

**Computer move:**

**X | |**

**-----------**

**| X |**

**-----------**

**O | | O**

**Your turn:**

**Please enter your move (0-8): 7**

**X | |**

**-----------**

**| X |**

**-----------**

**O | X | O**

**Computer move:**

**X | O |**

**-----------**

**| X |**

**-----------**

**O | X | O**

**Your turn:**

**Please enter your move (0-8): 6**

**Sorry, that position has already been taken!**

**Please enter your move (0-8): 5**

**X | O |**

**-----------**

**| X | X**

**-----------**

**O | X | O**

**Computer move:**

**X | O |**

**-----------**

**O | X | X**

**-----------**

**O | X | O**

**Your turn:**

**Please enter your move (0-8): 2**

**X | O | X**

**-----------**

**O | X | X**

**-----------**

**O | X | O**

**The game is a tie!**

**Do you want to play again? (yes or no)**

**yes**

**The player use ‘X’ mark and the computer use ‘O’ mark.**

**The computer will go first.**

**Computer move:**

**O | |**

**-----------**

**| |**

**-----------**

**| |**

**Your turn:**

**Please enter your move (0-8): 2**

**O | | X**

**-----------**

**| |**

**-----------**

**| |**

**Computer move:**

**O | | X**

**-----------**

**| |**

**-----------**

**| | O**

**Your turn:**

**Please enter your move (0-8): 4**

**O | | X**

**-----------**

**| X |**

**-----------**

**| | O**

**Computer move:**

**O | | X**

**-----------**

**| X |**

**-----------**

**O | | O**

**Your turn:**

**Please enter your move (0-8): 7**

**O | | X**

**-----------**

**| X |**

**-----------**

**O | X | O**

**Computer move:**

**Sorry! The winner is Computer!!! You lose.**

**O | | X**

**-----------**

**O | X |**

**-----------**

**O | X | O**

**Do you want to play again? (yes or no)**

**yes**

**The player use ‘X’ mark and the computer use ‘O’ mark.**

**The player will go first.**

**Your turn:**

**Please enter your move (0-8): 4**

**| |**

**-----------**

**| X |**

**-----------**

**| |**

**Computer move:**

**O | |**

**-----------**

**| X |**

**-----------**

**| |**

**Your turn:**

**Please enter your move (0-8): 2**

**O | | X**

**-----------**

**| X |**

**-----------**

**| |**

**Computer move:**

**O | | X**

**-----------**

**| X |**

**-----------**

**O | |**

**Your turn:**

**Please enter your move (0-8): 3**

**O | | X**

**-----------**

**X | X |**

**-----------**

**O | |**

**Computer move:**

**O | | X**

**-----------**

**X | X | O**

**-----------**

**O | |**

**Your turn:**

**Please enter your move (0-8): 7**

**O | | X**

**-----------**

**X | X | O**

**-----------**

**O | X |**

**Computer move:**

**O | O | X**

**-----------**

**X | X | O**

**-----------**

**O | X |**

**Your turn:**

**Please enter your move (0-8): 8**

**O | O | X**

**-----------**

**X | X | O**

**-----------**

**O | X | X**

**The game is a tie!**

**Do you want to play again? (yes or no)**

**yes**

**The player use ‘X’ mark and the computer use ‘O’ mark.**

**The player will go first.**

**Your turn:**

**Please enter your move (0-8): 8**

**| |**

**-----------**

**| |**

**-----------**

**| | X**

**Computer move:**

**O | |**

**-----------**

**| |**

**-----------**

**| | X**

**Your turn:**

**Please enter your move (0-8): 2**

**O | | X**

**-----------**

**| |**

**-----------**

**| | X**

**Computer move:**

**O | | X**

**-----------**

**| | O**

**-----------**

**| | X**

**Your turn:**

**Please enter your move (0-8): 6**

**O | | X**

**-----------**

**| | O**

**-----------**

**X | | X**

**Computer move:**

**O | | X**

**-----------**

**| O | O**

**-----------**

**X | | X**

**Your turn:**

**Please enter your move (0-8): 7**

**Hooray! You have won the game!**

**O | | X**

**-----------**

**| O | O**

**-----------**

**X | X | X**

**Do you want to play again? (yes or no)**

**no**