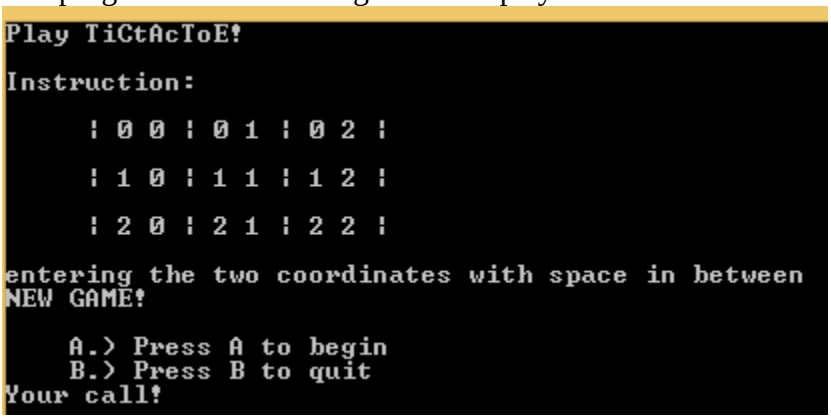
CS145 Computer Science II
Programming Assignment 1
(100 points)
No late submission will be allowed!

Problem Statement

Write a program that plays the ***TicTacToe*** game. In the game, you will play with the computer to take turns marking an available cell in a 3×3 grid with tokens (O for yourself and X for the computer). When a player has placed three tokens in a horizontal, vertical, or diagonal row on the grid, the game is over and that player wins the game. A draw (no winner) occurs when all the cells on the grid have been filled with tokens and neither player has achieved a win.

- The program initializes the grid and display instructions as follows.



- Player and computer are placing tokens in turns, and the player should enter correct coordinates to place a token "O" (i.e., in which row and which column, and **The index of both rows and columns starts from 0**).

- Player gets to play first, then computer, until there is a winner or a draw.

- A draw occurs when no one wins the game and there is no space to place tokens.

- The computer will randomly chose an ***available*** (need to determine which cell is available) cell to place a token "X", then determines the status of the game (is game over or not?).

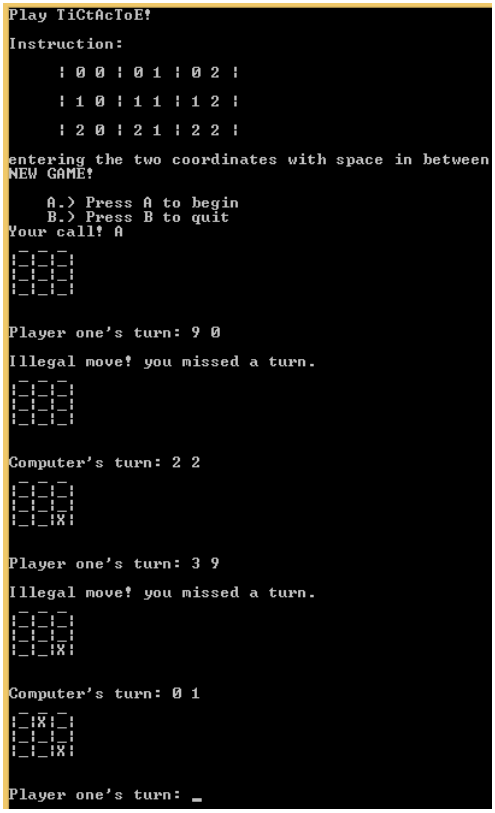
Requirements for the program:

1. Your program should compile with no building/compilation errors.
2. Your program should display a nice interface with instructions and options for player to start the game.
3. Your program should check if player entered valid coordinates (i.e., if within the range or cell has not been taken), otherwise prompts error massages.
4. If player entered in invalid coordinates, s/he will lose this turn and has to wait for the next turn.
5. Your program should be well documented.

The following are some examples when you run the program:

Example 1: win the game

Example 2: invalid coordinates



Submission Guidelines:

To receive full credit, you must follow these guidelines

1. All code must include comments, be properly indented and use descriptive variable names where appropriate.
2. Compress the entire project folder with solution directory to a compressed file and *submit this to the appropriate dropdox on D2L*
3. After submission, double check to make SURE that you submitted the proper files, ***YOU WILL NOT HAVE A CHANGE TO FIX THIS AFTER THE DUE DATE!!***

Grading Guidelines:

1. If your program does not compile and lack efforts (i.e., lack comments and function implements), you receive 0.
2. If your program does not compile but shows significant efforts in code, you receive at most 50% of the total credit.
3. If you program can compile but missing small functionalities (i.e., checking if input is valid or not), you receive at most 70% of the total credit if you showed significant efforts in code. Or, graded according to the grading sheet below.

Grading Sheet for Programming Assignment 1

Total: 100 points.

	Points	Deducted Points
Correctness	80	
1. Program makes the correct judge about which player wins the game, or it is a draw.	50	
2. Program checks invalid rows and/or columns from user input.	10	
3. Program checks invalid cell that has already been marked from user input.	10	
4. Program displays error message if the input value is invalid.	10	
Style	20	
5. Lay out your program in a readable fashion	10	
6. Include comments as specified in the lecture notes	5	
7. User-friendliness in I/O design	5	
Your Score		

Note: this assignment will be graded in-class during the due day. Failure to attend the class will result in a zero even if the assignment was submitted to the dropbox before the due day.