

MM101: Project 1

Noughts and Crosses

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Introduction

Your first programming project for this course is to implement a computerised board for the game “Noughts and Crosses” that will allow a person to play a game against a computer.

Details

Noughts and Crosses (also known in the U.S. as “Tic-Tac-Toe”) is a simple game for two players. The game is played on a 3x3 grid such as the one shown in figure 1.

	X	
O		

Figure 1: Partially played game

Your javascript program should print an empty grid into the HTML document, and then should alternately take a move from a player. Following this an updated grid should be printed, and if the game has not ended the next player should move. One of the players should be the user, who will be prompted to enter their move.

Each player is known as either “O” or “X”, and playing a move consists of writing their symbol into a position in the grid. Each player should enter their move as a number, as shown in figure 2. Once a player has moved in a particular location it is no longer available for play. If a player attempts an invalid move they should be informed that the move is not acceptable and prompted to make another choice.

The game should end when one of the following two conditions holds:

1. One player has won by placing three of their symbols in a row (vertically, horizontally or diagonally), or

1	2	3
4	5	6
7	8	9

Figure 2: Numbered position on the grid

2. All positions on the grid are occupied, leading to a draw.

Your program should detect when the game is over and print an appropriate message.

Hints

1. Things will be much easier if you use an *array* to store the state of the grid.
2. There is no requirement for the computer to play *well*. It is enough to play a random (legal) move!
3. You will find the program easier to write if you divide up the tasks logically and write separate *functions* for the different parts of the program. Some suggestions for distinct parts of the program which could have their own functions:
 - (a) Displaying the game grid
 - (b) Reading a move from a player (and prompting them if they enter an illegal move)
 - (c) Checking the game grid to see if the game has been won
 - (d) Calculating a legal move for the computer payer
4. If you write appropriate *comments* in the program to explain your intent you will find it easier to debug the program.

Submission

The program should be submitted not later than 4pm on Monday the 14th of January, 2008. Submission will be both hardcopy and electronic, and details will be available on the course web page (<http://www.cs.tcd.ie/Andrew.Butterfield/Teaching/MM101>).

Extra work

If you wish you can make your computer player more intelligent by having it react to threats (such as 2-in-a-row). It is *not* necessary to do this in this program (but you could, if you are interested).