Programming Assignment No. 2 Explanation

Given a board position like below:

0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
1	0	0	0	0	0

You are required to generate all possible moves from the given state with a fixed number of ply(levels). Using this generated tree, you need to find the best possible move from the game tree. The branching factor is 6. Hence

From this given board there are 6 possibilities, there are:

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	0
1	0	0	0	0	0

0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
1	2	0	0	0	0

0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
1	0	2	0	0	0

0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
1	0	0	2	0	0

0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
1	0	0	0	2	0

0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
1	0	0	0	0	2

And from there using the first one,

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	0
1	0	0	0	0	0

0	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
1	0	0	0	0	0

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	0
1	1	0	0	0	0

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	0
1	0	1	0	0	0

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	0
1	0	0	1	0	0

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	0
1	0	0	0	0	0

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	0
1	0	0	0	0	1

You need to generate the similar tree for a fixed depth. Using minimax you need to find the best move from a given state for the computer only one move is enough. Similarly, you can use alpha-beta search to get the move from the same tree using alpha-beta pruning. The selection and implementation of heuristic function or cut-off function is also a design choice that you need to make. For example, given the board position like

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	2
1	0	0	0	0	1

The best move for the computer, would be

0	0	0	0	0	0
0	0	0	0	0	0
2	0	0	0	0	2
1	0	0	**1**	0	1

I hope this will give you a fairly good idea for cut-off function and strategies for the game. Also look for solution of CA# 3 for a complete working on Tic-Tac-Toe.