CS561 Assignment 3 Report

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Topic: Tic-Tac-Toe game using MINIMAX Algorithm, an Adversarial Search

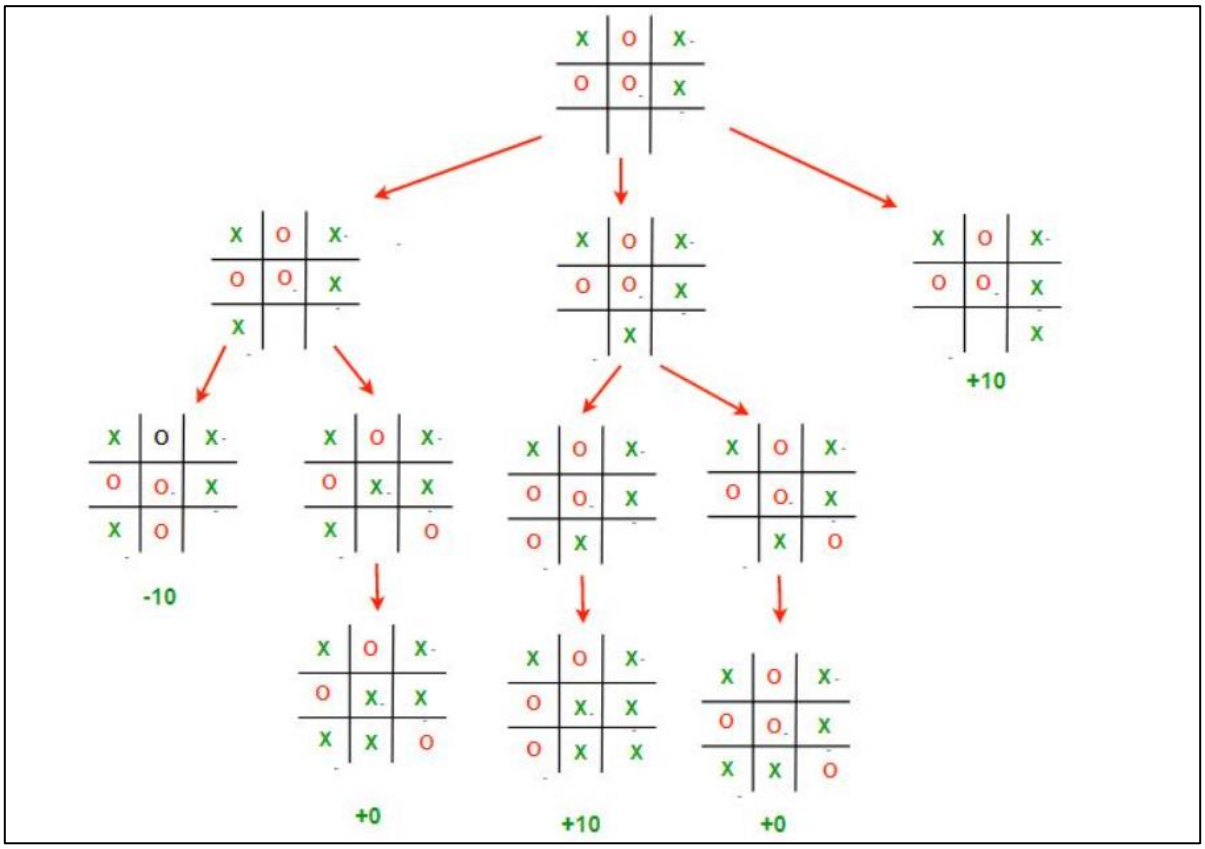
Problem:

To implement a 2 player (User V/s Computer) game of Tic-Tac-Toe using MINIMAX adversarial search algorithm.

Implementation Details:

The game has two difficulty levels: '*Easy'* and '*Hard'*.

The Easy level is based on random move selection by computer, while in hard level, computer uses minimax to find the most optimal move. For example, consider the image below:



This image depicts all possible paths that game can take from a present state. This is called the ***game tree***. The 3 possible moves for X are:

1. X plays cell [2,0], then O will play [2,1] and win the game.
2. X plays cell [2,1] and wins the game. Then best move for O will to play [2,2] which results in draw.
3. X plays cell [2,2] and wins the game.

Thus, the best move for X is [2,2] which will guarantee a win for him. Even though X has a possibility of winning if he plays the middle move, O will never let that happen and will choose to draw instead.

References:

https://www.geeksforgeeks.org/finding-optimal-move-in-tic-tac-toe-using-minimax-algorithm-in-game-theory/