

ICT 328 Spring 2016 Homework 3

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By turning in this assignment, I agree by the academic honor code and declare that all of this is my own work.

Problem 1

- (a) There are 9 choices for the 1st move, 8 for the 2nd move, 7 for the 3rd move, etc., giving us an upper bound of $9! = 9*8*7*6*5*4*3*2*1 = 362880$. But this is an overestimate, because some games end in 5, 6, 7 or 8 moves. The true gure is actually 255168. If we take symmetry into account, the number reduces substancially. For example, there are now only 3 choices for the rst move and at most 5 choices for the second move. In fact, the total is reduced to 26830 distinct games, of which 172 end in 5 moves, 579 end in 6 moves, 5115 end in 7 moves, 7426 end in 8 moves, 8670 result in a win in 9 moves and 4868 result in a draw.
- (b) Refer Figure 1 for answer.
- (c) Refer Figure 1 for answer.
- (d) Refer Figure 1 for answer.

Figure 1 shows a Game Tree.

Problem 2

- (a) Refer to the Git repository below.
- (b) Refer to the Git repository below.
- (c) An improved sort at any depth will exponentially reduce the total number of positions searched. It Increases the likelihood that the best move is searched first on the last (and most expensive) iteration.

Problem 3

- (a) Refer to the Git repository below.

Git repository.<https://github.com/karanabhi/CheckersnChess>

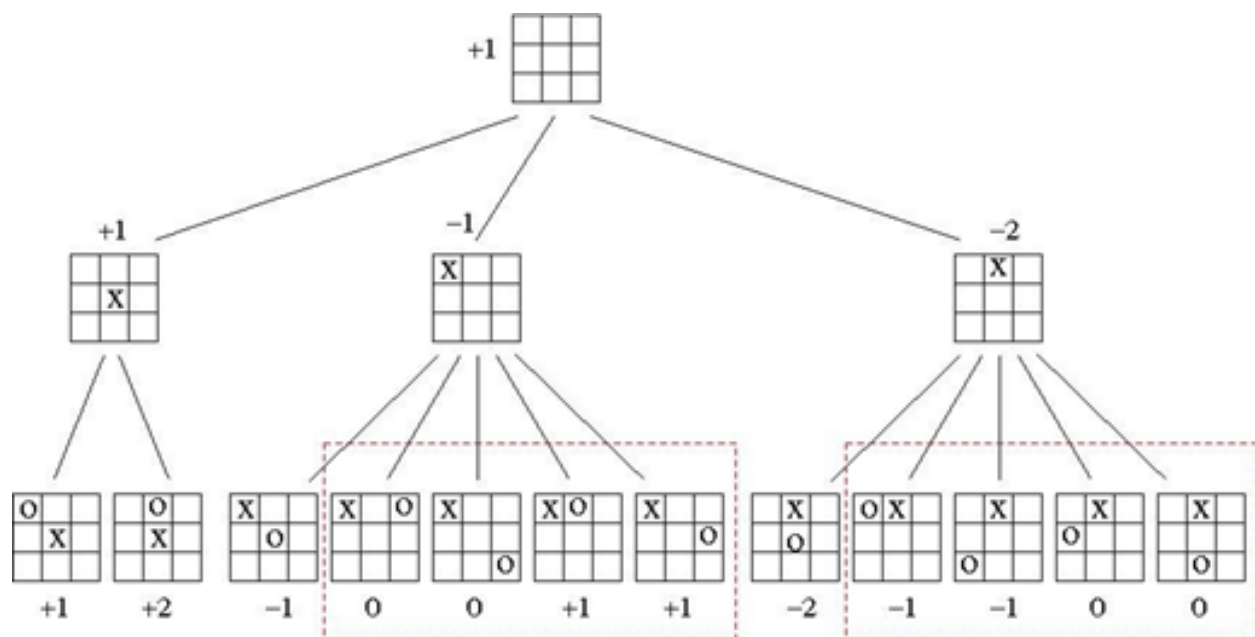


Figure 1: Game Tree