**REVERSI GAME USING MINIMAX ALGORITHM**

**ABSTRACT**

Reversi is a strategy board game for two players, played on an 8×8 uncheckered board. Two players compete, using 64 identical game pieces ("disks") that are light on one side and dark on the other. Each player chooses one color to use throughout the game. Players take turns placing one disk on an empty square, with their assigned color facing up. After a play is made, any disks of the opponent's color that lie in a straight line bounded by the one just played and another one in the current player's color are turned over. When all playable empty squares are filled, the player with more disks showing in their own color wins the game. Algorithms for AI solutions come in many different forms and sizes. The Minimax algorithm is the hardest to defeat because it is a recursive or backtracking algorithm which is used in decision-making and game theory. This algorithm provides an optimal move for the player assuming that the opponent is also playing optimally. This algorithm includes two players in the game, one is MAX and the other is MIN, where they will fight for their maximum benefit while the opponent is getting the minimum benefit. The MAX will select the maximized value whereas the MIN will select the minimized value. This algorithm uses Depth-First Search algorithm for the exploration of the complete game tree. This Minimax algorithm is complete, optimal, and has the time and space complexities as O(b^m) and O(bm) respectively. The AI solution has different degrees; they are random, defensive and aggressive. Random, as the name implies, randomly picks a play and is the easiest to beat. Defensive AI makes blocking a win a priority, while aggressive AI makes winning a priority. Both are harder to beat than the random AI. The AI should evaluate the current state of the board to determine the best move, recursively search through possible moves and their outcomes, and assign a score to each possible move and choose the one with the highest score. When the game ends, display the result as win, lose or draw.

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