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-----Mini Max-----

**Morris Game Using Mini Max algorithm:**

If Mini max algorithm is for White Pieces, Input with value ***X*** shows possible places for White keeping the game rules intact. Mini max algorithm creates all possible moves (output) for White from the given input string.

For given particular depth, it goes on creating all possible output at that particular depth. Considering White should be at MAX level, static estimation when depth value equals to the input depth evaluates node estimation and returns the best possible board position for White.

Mini Max evaluates all the possible board positions for given input and for given depth. And, it returns the best move for white when algorithm plays for white.

-----Alpha Beta Pruning-----

**Morris Game Using Alpha Beta Pruning algorithm:**

Alpha Beta Pruning algorithm works same as Mini-Max except it skips the node evaluations which won’t be affecting in the final result to get the best move for White pieces.

**Morris Game Opening:**

This is the start of the Morris Game, in which participant puts its pieces on the board and wants to make a Mill.

**Morris Game Mid game - End game:**

Each opponent can move their pieces by one position unless its number of pieces remained 3 on the board.

**Improved Static Estimation:**

Handout uses number of Black and White pieces to calculate the node/ position value. Improved static estimation also considers the possible mill positions for particular piece to win in the evaluation. For particular board, if game is played for White, then Improved Static estimation also considers number of possible mill formation in the future after playing that move.

**Conclusions:**

1. Mini Max algorithm evaluates all the possible node values even if they are not affecting the final result.
2. Using Alpha Beta Pruning, node evaluations can be reduced and it is optimized version of Mini Max algorithm.
3. Results using Mini Max and Alpha Beta Pruning are same but the number of node evaluations are reduced in Alpha Beta Pruning.