

Heuristic Analysis

Heuristic evaluation function or static evaluation function, is a function used by game-playing programs to estimate the value or goodness of a position in the minimax and related algorithms. One popular strategy for constructing evaluation functions is as a weighted sum of various factors that are thought to influence the value of a position.

Following three heuristic function were evaluated

1. **Weighted_Improved_Score:** Addition weight of 1.5 (1.5 was choose after hit and trails) was added opposition moves to improved_score, Idea was to make evaluation function more aggressive on game play.

$$Function = my\ moves - 1.5 * opposition\ moves$$

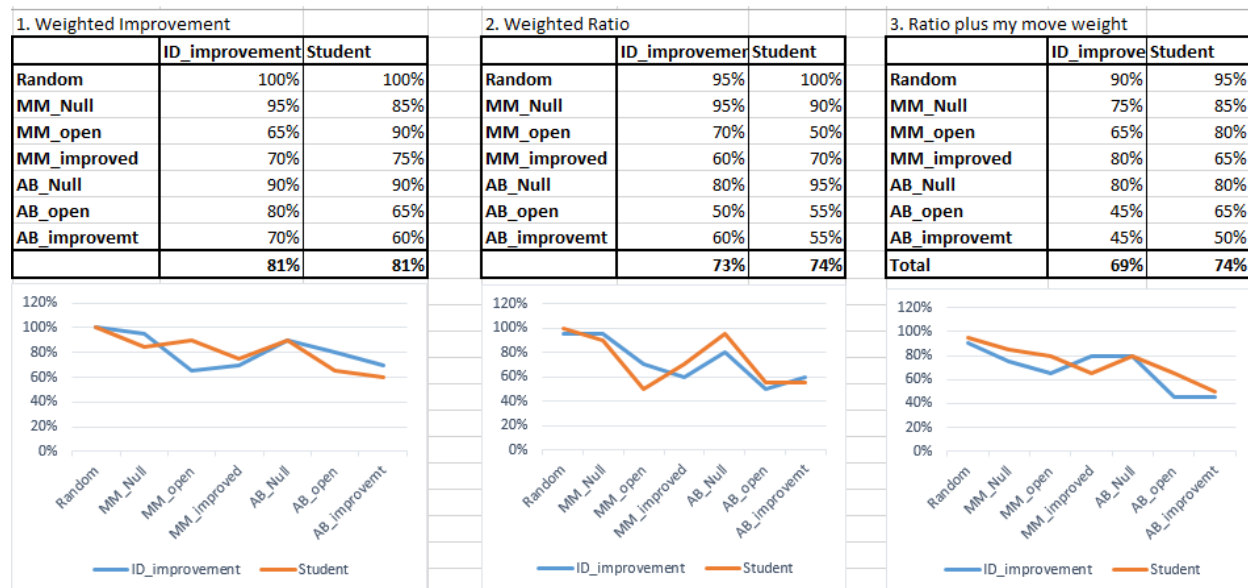
2. **Weighted_Ratio_Score:** My moves was divided by 1.5 times opposition moves, idea was to explore other combination of my moves and opposition moves. 1.5 addition weight was added to opposition moves to make evaluation function more aggressive.

$$Function = my\ moves / 1.5 * opposition\ moves$$

3. **Ratio_Plus_my_moves_weight_score:** Addition parameter my moves / blank_space_in_game was added to ratio of my moves /opposition moves. Idea was to give more score to those move which maximize weighted average of my moves which adjust after each move.

$$Function = (my\ moves / opposition\ moves) + (my\ moves / blank_space_in_game)$$

Here is final result after 140 games trials



As we can see that weighted ratio and weighted improved score didn't achieve any significantly better result against ID_Improved. Only ratio plus my moves weight performed better with significant opponent like AB_open vs AB_improved and overall score has increase by 5%. Hence, We choose this as evaluation function.