**Alpha Beta Pruning:**

Alpha-beta pruning is a modified version of the minimax algorithm. It is an optimization technique

for the minimax algorithm.

As we have seen in the minimax search algorithm that the number of game states it has to examine

are exponential in depth of the tree. Since we cannot eliminate the exponent, but we can cut it to

half. Hence there is a technique by which without checking each node of the game tree we can

compute the correct minimax decision, and this technique is called pruning. This involves two

threshold parameter Alpha and beta for future expansion, so it is called alpha-beta pruning. It is also

called as Alpha-Beta Algorithm.

Alpha-beta pruning can be applied at any depth of a tree, and sometimes it not only prune the tree

leaves but also entire sub-tree.

The two-parameter can be defined as:

1. **Alpha**: The best (highest-value) choice we have found so far at any point along the path of

Maximizer. The initial value of alpha is **-∞**.

2. **Beta**: The best (lowest-value) choice we have found so far at any point along the path of

Minimizer. The initial value of beta is **+∞**.

The Alpha-beta pruning to a standard minimax algorithm returns the same move as the standard

algorithm does, but it removes all the nodes which are not really affecting the final decision but

making algorithm slow. Hence by pruning these nodes, it makes the algorithm fast.

