4X4 TIC TAC TOE

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Abstract

4x4 Tic Tac Toe is but a natural extension to the normal, well known 3x3 version and it would seem trivial to extend the 3x3 strategy and naïvely search through the complete state space. However, if one were to check the state space of a general nxn Tic Tac Toe, it is obvious that it blows up exponentially. Hence, it is intractable to use a naïve search. However, one can use clever pruning techniques and heuristic methods to either reduce the state space or reduce the time spent at each state. This project aims to use a version of Minimax Algorithm [1] combined with Alpha Beta Pruning [2] to create a working Artificial Intelligence for this game which can play reasonably well within reasonable amount of time (i.e. time taken by AI per move to "think"). As a heuristic, a function which maps the counts of X or O in each row/column/diagonal to a value is used.

Code

Attached.

References

[1] http://en.wikipedia.org/wiki/Minimax
[2] http://en.wikipedia.org/wiki/Alpha_beta_pruning