COMP2230 Algorithms: Assignment 1 Report

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Type of Search for Engine: Minimax

My engine uses Minimax to create each possible variation of the connect four board to find which move to make. The minimax works by taking the board with the maximum score when its their turn and then taking the score with the minimum score when it’s the opponents. The amount of board variations the engine creates is limited by the given the depth. At depth 0, only 1 board is evaluated. At depth 1, 8 variations of the board are evaluated. The number of variations increases exponentially as the depth is increased. If a persons wins when evaluating a board the engine sees this and does not continue to evaluate variations on that board.

Evaluation Function:

My evaluation function evaluates a given board based on the amount of connect twos, three’s and fours player 1 and player 2 has and the amount of blocks its makes on the opponent creating connect three and four. If player 1 has a connect two, three or four it plusses to the score, if player 2 has a connect two, three or four it minuses from the overall score. It is the same concept for blocking the opponent and the opponent blocking you. If board contains a coin in the middle for player 1 it also adds 90 the score.

The exact amount for having a connection or block are listed below.

//universal scores for connecting and blocking  
int connectTwo = 10;  
int connectThree = 50;  
int connectFour = 1000;  
int middleMove = 90;  
int blockThree = 50;  
int blockFour = 500;

I find it interesting that at depth 5 it can create a win but at depth 7 it can create a draw. This leads me to believe my evaluation function needs someone tweaking to make it evaluate certain boards higher than others. (I.e. if a draw occurs this board is bad)