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CS470

MCTS Lab

1) Regardless of the c value used the mcts would seem to win against the ab algorithm. The c value that seemed to be the best would be the 0.01 as it was the smallest and focused on the best value rather than generalizing the values to find other possible best values.

C = sqrt(2)	C = 0.01	C = 1	C = 10
Wins=ab(1), mcts(9)	Wins=ab(0),mcts(10)	Wins=ab(1),mcts(9)	Wins=ab(2),mcts(8)

2) With greater max depth iterations the ab algorithm would win more times. The iterations would take a while to run especially at depth 5 and would win more regularly than the lower depth levels. However the mcts algorithm seemed to be better than the other algorithms at its base unless the depth level was increased.
3) When playing against the MCTS algorithm it would sometimes win when playing as the first player but would not usually win. It was a lot better at predicting and blocking my moves than the other two but was not as good as the expectimax algorithm. In my testing the expectimax algorithm did the best.
4) This took not as much time to put together than the other algorithms as there was provided sections of the code to use but I had a lot of problems with getting the algorithm to not divide by 0 in the ucb calculation function. I found that it was being caused when one person would be in a winning state and it would not register that the terminal parameter was updated and try to calculate the ucb value from a node that was not visited yet, this dividing by 0. Im not sure if I did not code things right or not but this caused a lot of problems and took most of my time to figure out.