CS6364 AI - Project Report

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For Board – xxxxxxxWWxxxxxBBxxxxx
Running MiniMaxOpening and ABOpening

python MiniMaxOpening.py board1.txt board2.txt 4
Input Board Position: xxxxxxxWWxxxxxBBxxxxx
Output Board Position: xxxxWxxWWxxxxxBBxxxxx
Positions Evaluated by static estimation: 75714
Minimax estimate: 1

python ABOpening.py board1.txt board2.txt 4
Input Board Position: xxxxxxxWWxxxxxBBxxxxx
Output Board Position: xxxxWxxWWxxxxxBBxxxxx
Positions Evaluated by static estimation: 1709
Minimax estimate: 1

For Board – WWWBBBxxWBxWBWxxxBBBx
Running MiniMaxGame and ABGame

python MiniMaxGame.py board1.txt board2.txt 4
Input Board Position: WWWBBBxxWBxWBWxxxBBBx
Output Board Position: xWWBBBWxWBxWBWxxxBBBx
Positions Evaluated by static estimation: 21323
Minimax estimate: -3023

python ABGame.py board1.txt board2.txt 4
Input Board Position: WWWBBBxxWBxWBWxxxBBBx
Output Board Position: xWWBBBWxWBxWBWxxxBBBx
Positions Evaluated by static estimation: 2267
Minimax estimate: -3023

➔ We can clearly see that Alpha-Beta algorithms takes a smaller number of positions to be evaluated.

For Board – WWWBBBxxWBxWBWxxxBBBx
Running MiniMaxGame and MiniMaxGameImproved

python MiniMaxGame.py board1.txt board2.txt 2
Input Board Position: WWWBBBxxWBxWBWxxxBBBx
Output Board Position: WWWBBBxxWBWxBWxxxBBBx
Positions Evaluated by static estimation: 170
Minimax estimate: -3009

python MiniMaxGameImproved.py board1.txt board2.txt 2
Input Board Position: WWWBBBxxWBxWBWxxxBBBx
Output Board Position: xWWBBBWxWBxWBWxxxBBBx
Positions Evaluated by static estimation: 170
Minimax estimate: -3009

For Board – xxxxxxxWWxxxxxBBxxxxx
Running MiniMaxOpening and MiniMaxOpening Improved

python MiniMaxOpening.py board1.txt board2.txt 2
Input Board Position: xxxxxxxWWxxxxxBBxxxxx
Output Board Position: xxxxxxWWWxxxxxxBxxxxx
Positions Evaluated by static estimation: 290
Minimax estimate: 1

python MiniMaxOpeningImproved.py board1.txt board2.txt 2
Input Board Position: xxxxxxxWWxxxxxBBxxxxx
Output Board Position: xxxxWxxWWxxxxxBBxxxxx
Positions Evaluated by static estimation: 290
Minimax estimate: 100

- ➔ Referring the board "xxxxxxxWWxxxxxBBxxxxx", We can see that my evaluation function produces a different move than the standard evaluation function. This is because I have introduced a new parameter which counts the potential mills that can be formed. The standard evaluation function produces a move which creates a Mill at [6,7,8] but no potential mills are there for next move.
- ➔ My Improved static evaluation function produces a move at location 4 which means there are two potential mills that can be created in the next move. The possible mills would be at [4,8,12] and [6,7,8]. Hence my function is an improvement. Running this board on depth 4 with standard evaluation function gives same result as when running on my improved static evaluation function with depth 2.