**Course : CS 6364.0U1 - Artificial Intelligence - Su17**

**Instructor : Haim Schweitzer;**

**Project : Morris Game, Variant-D**

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All programs are ran with Depth : 3

MiniMax Opening :

Input board is: xxxxxxxxxxxxxxxxxxxxxxx

Board Position: Wxxxxxxxxxxxxxxxxxxxxxx

Positions evaluated by static estimation:10626

MINIMAX estimate: 1.0

Input board is: WWxxxBxxxWxxxxxBxBxxWxx

Board Position: WWxxxxxxWWxxxxxBxBxxWxx

Positions evaluated by static estimation:5994

MINIMAX estimate: 4.0

MiniMax Opening Improved:

Input board is: xxxxxxxxxxxxxxxxxxxxxxx

Board Position: Wxxxxxxxxxxxxxxxxxxxxxx

Positions evaluated by static estimation:10626

MINIMAX estimate: 1.0

Input board is: WWxxxBxxxWxxxxxBxBxxWxx

Board Position: WWxxxxxxWWxxxxxBxBxxWxx

Positions evaluated by static estimation:5994

MINIMAX estimate: 9.0

MiniMaxOpening Black:

Input board is: xxxxxxxxxxxxxxxxxxxxxxx

Board Position: Bxxxxxxxxxxxxxxxxxxxxxx

Positions evaluated by static estimation:10626

MINIMAX estimate: 1.0

Input board is: WWxxxBxxxWxxxxxBxBxxWxx

Board Position: WWBxxBxxxWxxxxxBxBxxWxx

Positions evaluated by static estimation:5500

MINIMAX estimate: -1.0

ABOpening:

Input board is: xxxxxxxxxxxxxxxxxxxxxxx

Board Position: Wxxxxxxxxxxxxxxxxxxxxxx

Positions evaluated by static estimation:506

Alpha-Beta MINIMAX estimate: 1.0

Input board is: WWxxxBxxxWxxxxxBxBxxWxx

Board Position: WWxxxxxxWWxxxxxBxBxxWxx

Positions evaluated by static estimation:227

Alpha-Beta MINIMAX estimate: 4.0

MiniMax Game:

Input board is: WWWxWWxxxWxxBxBxBxxBxxx

Board Position: xWWWWWxxxWxxBxBxxxxBxxx

Positions evaluated by static estimation:3395

MINIMAX estimate: 2958.0

MiniMax Game Improved:

Input board is: WWWxWWxxxWxxBxBxBxxBxxx

Board Position: xWWWWWxxxWxxBxBxxxxBxxx

Positions evaluated by static estimation:3395

MINIMAX estimate: 5958.0

MiniMaxGame Black:

Input board is: WWWxWWxxxWxxBxBxBxxBxxx

Board Position: WWWxWWxxxWBxBxxxBxxBxxx

Positions evaluated by static estimation:3709

MINIMAX estimate: -3005.0

ABGame:

Input board is: WWWxWWxxxWxxBxBxBxxBxxx

Board Position: xWWWWWxxxWxxBxBxxxxBxxx

Positions evaluated by static estimation:353

Alpha-Beta MINIMAX estimate: 2958.0

***Write a short (one or two paragraphs) explanation of why you believe your function to be an improvement over the function proposed by the instructor.***

Improved function : Consider Number of potential Mills for White while calculating Static Estimation.

The static estimation provided by instructor does not consider number of mills in the board. It only considers number of white and black coins and number of black moves. It is also important that we progress to more number of mills in the opening game, mid game, it progresses to make mills which can be opened and close again and in the end game, where hopping is allowed the heuristic focuses on number of non- blockable mills just by three coins. It also considers number of non blockable mills of the opponent. More about these will be shown in demo.