**Connect 4 Report**

**Evaluation function:**

Evaluation function is called when the MAX Depth is reached by the ‘Min Max Alpha beta pruning’ algorithm. So, the algorithm is forced by the function to stop and return current values since a move will never (theoretically) get this deep, the column doesn't matter (-1) but we're more interested in the score. The score is taken by the Evaluation function.

EvaluateState(GameBoard\* Board)

Takes Board and traverse it in nested loops and initialize the three arrays:

std::vector<unsigned int> rs(NUM\_COL); Takes rows values

std::vector<unsigned int> cs(NUM\_ROW); Take columns values

std::vector<unsigned int> set(4); To contain sets of 4 similar char

First nested loop checks the horizontal set, looking for sequences of 4, containing any combination of AI, PLAYER, and empty pieces.

Second nested loop checks the vertical set, looking for sequences of 4, containing any combination of AI, PLAYER, and empty pieces.

Third and fourth nested loops check the diagonal sets, looking for sequences of 4, containing any combination of AI, PLAYER, and empty pieces.

After finding set: score += scoreSet(set, p); // find score

Helper function:

scoreSet(std::vector<unsigned int> v, unsigned int p)

V is the set of 4, p is the AI

int good = 0; // points in favor of p

int bad = 0; // points against p

int empty = 0; // neutral spots

Loop is there just to enumerate how many of each.

After the loop the heuristic function is called.

heurFunction(unsigned int g, unsigned int b, unsigned int z)

Return the score calculated through if else statements.

Evaluation function then return the array<int,2> containing score at index 0 and column at index 1.