**Evaluation:**

Overview:

+ Evaluation (or Heuristic) is the task where we calculate score for the board state. This score is not the same as the score the game uses, this score can be considered to be the signal that makes the AI knows how good the board state is so that it can make decision for the next move.

+ There are lots of ways to achieve this and here is our strategy:

+ The average score of non-empty tiles

+ The number of empty tiles

+ The number of possible merges

+ The structure of the board or we can call it monotonicity of the board

+ NOTE: We use the weight for each evaluation: 1, 30, 40, 2 with respect to the same order as above

Details:

+ With the first two idea, it is pretty simple to implement so we now jump to the third and fourth idea

+ Possible merges:

+ We search for two tiles which are adjacent and have the same value and count the number of them.

+ Monotonicity of the board:

+ To figure out the structure of the board, we use the weight matrix

+ The matrix above is one of the four matrices we use in our Heuristic

+ To determine the suitable matrix, we base on the tiles in each row

+ if the last row is not good, we use matrix number 0

+ if the last row is good enough, we use matrix number 1

+ if the last and second last rows are good enough, we use matrix number 2

+ otherwise we use matrix number 3

+ To check how the row is “good enough”, we have some example:

+ The row [1024, 512, 256, 128] is good enough

+ The row [1024, 512, 128, 64] is good enough

+ The row [1024, 512, 256, 32] is good enough

+ The row [1024, 512, 512, 256] is not good as the structure many be broken if the board move to the right

+ The row [1024, 512, 256, 0] is not good too