ECS 170 Project 2 Part 1

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The evaluation function first checks to see if the state is an end state. If so it returns what is effectively ∞ for MAX and $-\infty$ for MIN. Assuming the state is not terminal, it takes into account all of the chips on the board. It looks first for any blocks, any three in a row, and any two in a row. Then it assigns a weighted value to each of these and sums them together. This should work because it will give more weight to a state that has more coins grouped together than a sparser board. This is ideal because it is easier to get four in a row, with a more densely packed board than a sparser one.

The evaluation function as a numerical expression:

$$\text{utility} = \infty \cdot win_{MAX} - \infty \cdot win_{MIN}$$
$$+ 500 \cdot \sum_{b \in blocks_{MAX}} b - 500 \cdot \sum_{b \in blocks_{MIN}} b$$
$$+ 75 \cdot \sum_{t \in threes_{MAX}} t - 75 \cdot \sum_{t \in threes_{MIN}} t$$
$$+ 25 \cdot \sum_{t \in twos_{MAX}} t - 25 \cdot \sum_{t \in twos_{MIN}} t$$

One game state:

Let $X = MAX, O = MIN$

			X			
			X	O		
X	X	O	X	O	O	O

This would work out to:

$$\text{utility} = \infty \cdot 0 - \infty \cdot 0$$
$$+ 500 \cdot 1 - 500 \cdot 1$$
$$+ 75 \cdot 1 - 75 \cdot 1$$
$$+ 25 \cdot 1 - 25 \cdot 1$$
$$= 0$$