Heuristic Explanation:

There's two parts of this heuristic.

The first part is simple. It basically assigns a value of 2 for each of your pieces in the four center spaces of the board (1/9, 2/7, 3/3, 4/1) and a value of 1 for the ring outside of that (1/5, 1/6, 1/8, 2/4, 2/5, 2/8, 3/2, 3/5, 3/6, 4/2, 4/4, 4/5). It also subtracts from the heuristic value by the same amount if the opponent is in those spaces. The reason why is the center squares are worth more since there are more potential to win and more space, as opposed to the perimeter squares. This part of the heuristic is more important during the beginning of the game. At the beginning of the game where there's just random spaces, it is better to just take the center.

The second part of the heuristic is slightly more complicated. First, it looks at all the pieces on the board and then looks at all adjacent pieces next to it. If there is a piece adjacent to the looked-at piece, it determines if a win is possible in that direction. For example, if there are two of your pieces at 2/8 and 2/7, it determines that a win is possible from the left, but if 1/7 is taken by the opponent, it's possible to win that as well with a piece on 2/9. Then if a win is possible, it looks at if there are any opponent pieces that are blocking the win.

Thus, if an opponent piece is blocking the win at 1/8, then no heuristic value is added. However, if it determines that a win is possible (with no hindering opponent pieces) then it adds 1.5 to the heuristic value for every piece in the chain (not including itself). Therefore, the piece at 2/8 would have a heuristic value of 1.5 for the piece at 2/9 (ignoring the center heuristic), but it also repeats for each different piece in the link so the piece at 2/9 would also have a value of 1.5 because of the piece at 2/8, making a total heuristic of +3.0. This also rewards higher chains more so a chain of 3 (2*1.5 + 2*1.5 + 2*1.5) would stronger than two chains of 2 [(1*1.5 + 1*1.5) + (1*1.5 + 1*1.5)]. In addition, the heuristic subtracts for the same concept for your opponent, but the heuristic value is -1.75 for each call instead of 1.5. This is such that the heuristic prioritizes disrupting the opponent's chain over trying to build your own (the best offense is a good defense).

Overall, I think it's a good heuristic because the overarching point of the game is to try to connect as many pieces as possible which is what the heuristic incentivizes. Longer chains are rewarded but disrupting your opponent's plays is also rewarded. And the fact that longer chains are compounded exponentially makes it even better since the heuristic is not just making many 2-chains or 3-chains, rather pushing to secure the win. Also, the second part of the heuristic completely overshadows the first part of the heuristic since as the game progresses, it's more important to try to push towards creating a chain than putting pieces in the center, but the first part lingers such that if the board is in a neutral position (and no chains are possible), it puts pieces closer to the center for set up more potential plays.