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Cross Validation:

Why is it needed?

* Cross validation helps to gauge the error rate of a learning algorithm. By using part of the data set for testing, its accuracy can be judged. A k-fold cross validation is often preferred, as it allows for all of the data to be used for both testing and learning. By doing this, how well the learning algorithm generalizes can also be judged, rather than its accuracy in one case.

Summary of Features:

1. Bottom Left Square: This feature returns which player controls the bottom left square, most likely has no correlation to victory.
2. Central Control: This feature returns which player controls more tiles in the center three rows, which may describe how effective the center column is compared to the rest of the board.
3. Turns to Victory: This feature returns the difference in the minimum turns needed for victory for each player, with higher numbers favoring player 1. It’s expected that this will closely predict victory.
4. Exposed tiles: This feature returns the difference between the number of tiles octodirectionally adjacent to open cells for each turn, the idea being that players only have an opportunity to win if they can advance their sequences, which should be easier if more tiles are exposed.
5. Side Control: This feature returns the difference in the scores given to players for each tile, where the score is equal to the number of tiles away from the center. This should help determine how important moving away from the center is to victory, if it is at all.