

# Project Proposal - 2048 Solver

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**2048** is a very simple but fascinating puzzle game. The player is given a 4×4 grid with an initial state that two tiles with the number 2 appearing in random spots on the board.

Tiles can slide in four directions via player's control. Two tiles of the same number can merge into a tile with the total value of the two if they collide. In general, the objective of the game is to slide numbered tiles on a grid to combine them and create a tile with the number 2048. To obtain this goal, just treat the tiles with the number 2 or 4 which will be generated randomly after player's move as the opponent's moves. The opponent actually plays a random not optimal strategy, so it is better to use expectimax search rather than minimax search to find every optimal move for the player. As for heuristic functions, some strategies should be applied. First, higher valued tiles should be clustered in a corner. Second, minimize the value difference between adjacent tiles. Third, maximize the number of free tiles.