Quoridor: The Route to the Finish Line
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The Board
- 9x9 Board
- 2 to 4 Pawns
- 20 Fences
- Each player places his pawn in the center of his base line to begin the game.

Background
- The goal is to be the first player to reach the opposite side of the board.
- Your opponents are putting up fences to block your chances and slow you down.

The Rules
- Each player in turn chooses to move his pawn or put up one of his fences.
- Pawns move 1 square at a time (front-back or left-right).
- Fence placements must allow at least one access route to the finish line for each pawn.
- Jumping occurs when 2 pawns are face-to-face:
  1) pawn may jump his opponent to land directly behind him
  2) pawn may jump his opponent diagonally left or right if there is a fence obstructing his movement forward.
- A player wins by reaching his finish line first.

3x3 Game
- Before studying the complex strategies of the 9x9 game, we begin with the simplified 3x3 game with only two players.
Let there be two players, Player A and Player B, that move sequentially respectively and always move in their own best interest in order to win. Player B will always win if he applies the following strategies:

a. If Player A moves his pawn, then Player B should move along the shortest path to the finish line.

b. If Player A places a fence, then Player B should mirror Player A’s fence placement.
Let there be two players, Player A and Player B, that move sequentially respectively and always move in their own best interest in order to win.
Establishing the Base Case

- Let the number of spaces between each player and their finish lines be equal.
- Let the number of possible spaces between the players be 1.
- Then Player A will move into that space and Player B will jump him.
- This makes the distance between Player B and his finish line 1 less than the distance between Player A and his finish line.
- Thus Player B wins.

Case One: Shortest Distance

- If Player A moves his pawn, then he has either:
  - Shortened the distance between the two by 1 space or...
  - Lengthened the distance between the two by 1 space.
- In each case, the distance between the two has changed from odd to even.

- Therefore Player B has the opportunity to either:
  - Gain the jump or ...
  - Move closer to the finish line if the jump is not an option.
- In each case, the distance between Player B and his finish line is 1 less than that of his opponent’s.
- Thus Player B wins.

Case Two: Mirroring Fences

- If Player A places fence, he has abstained from moving his pawn a space.
- Therefore he has not changed the number of spaces between the two from odd to even.

- If Player B moves his pawn a space, the two have switched roles and Player A will gain the jump.
- If Player B places another fence in the mirror image of his opponent’s, then the number of spaces between the two remains odd and the distance to the finish lines remains equal.
- Player A has no more room to place a fence legally, so he must move his pawn making the spacing even.
- Thus Player B gains the jump and wins.

End of Proof

- We have shown that in every case Player B wins using our proposed game strategy.
Future Research

- We have begun research on possible game strategy applications for the 5x5 board game.
- We hope to apply our current research to a universal game strategy for the 9x9 board game.

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Works Cited