Disjoint Path Covers: All About Connecting The Dots!

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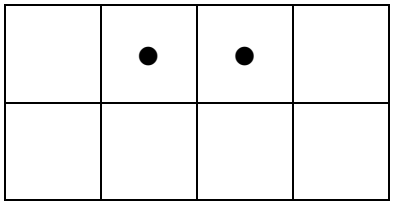
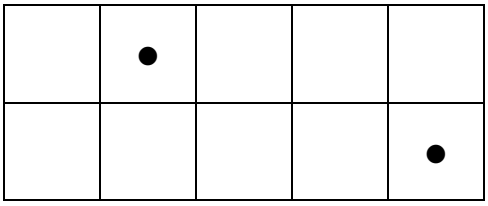
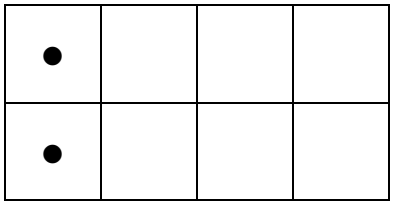
Part 1: One-path covers

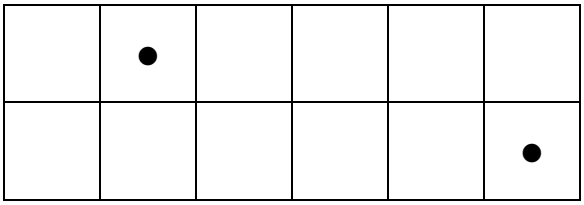
For each of the following boards, do one of the following:

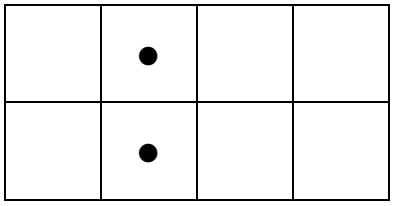
1) Draw a path from one dot to the other using steps that go up, down, left, or right. Diagonal steps are **NOT** allowed! Also, your path must be a "disjoint path cover". This means that **the path must visit every square exactly once** (every square must be visited, and no square may be visited more than once).
   OR
2) Explain why it is impossible to find a one-path cover as described in option 1.

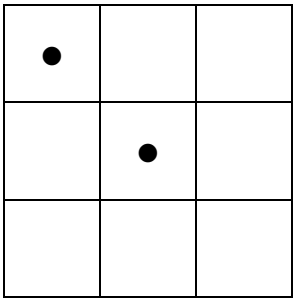


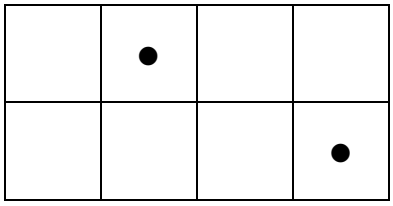


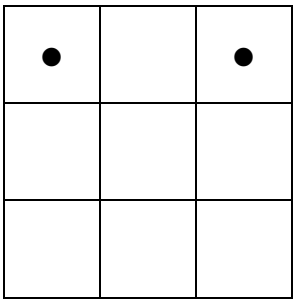


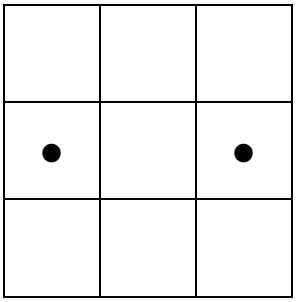


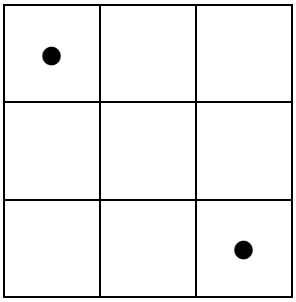


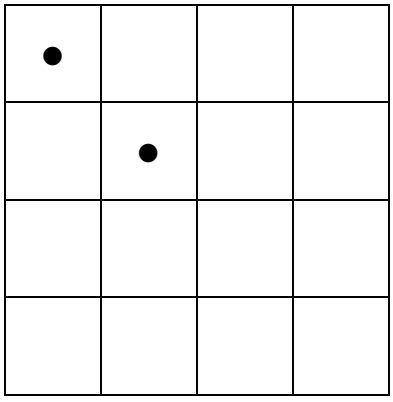


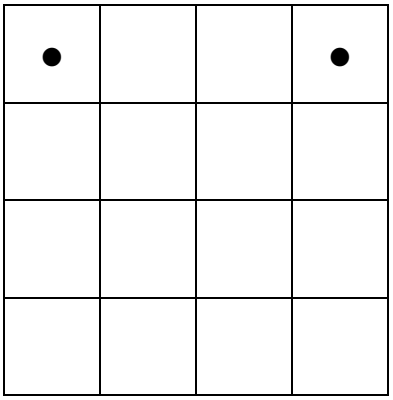


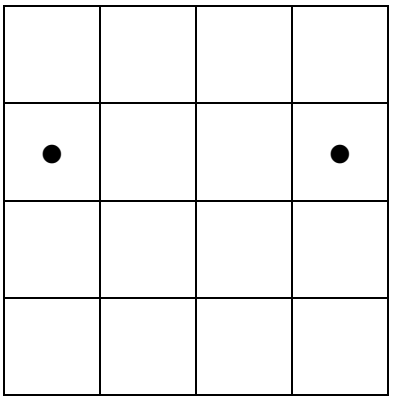


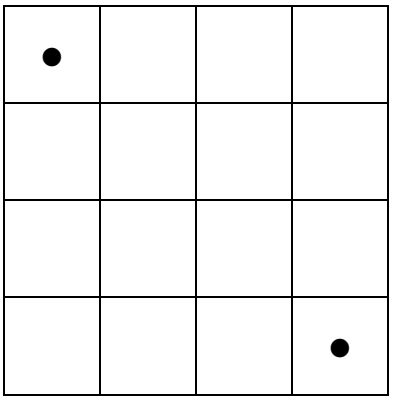








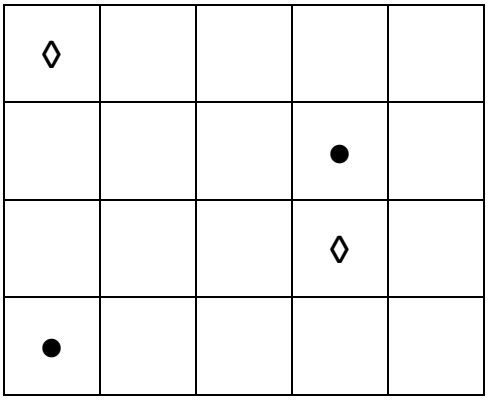


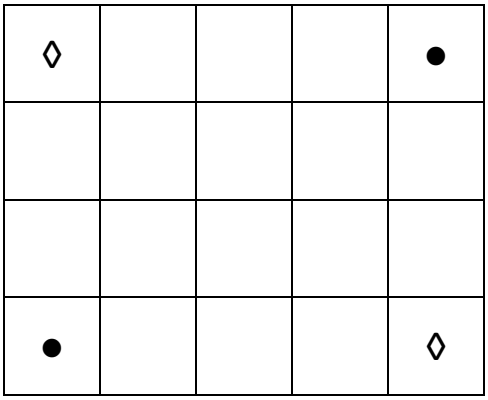


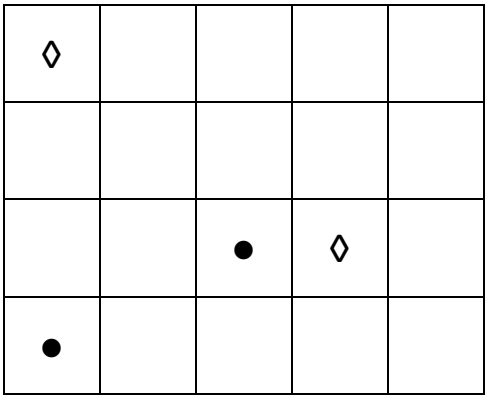
Part 2: Two-path covers

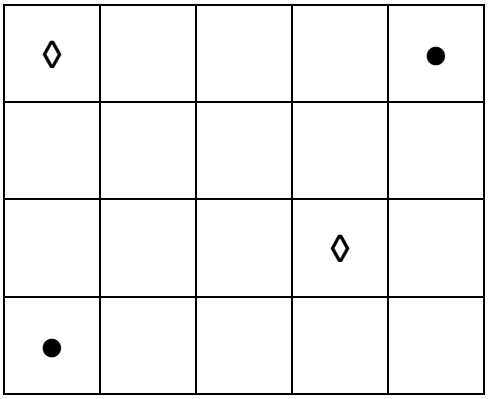
For each of the following boards, do one of the following:

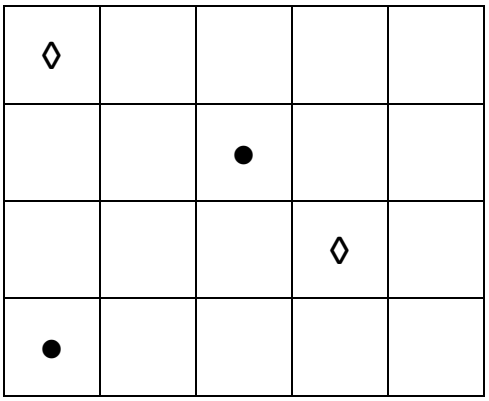
1) Draw a path from one ● to the other, and a second path from one ◊ to the other. Both paths must use steps that go up, down, left, or right. Diagonal steps are **NOT** allowed! Also, your paths must form a "disjoint path cover". This means that **every square on the board must be visited exactly once** (every square must be visited by one of the paths, and no square may be visited more than once).
   OR
2) Explain why it is impossible to find a two-path cover as described in option 1.

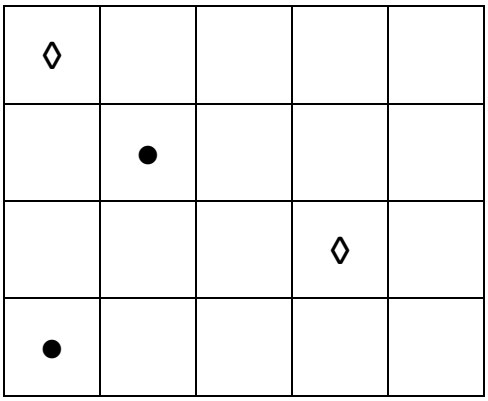


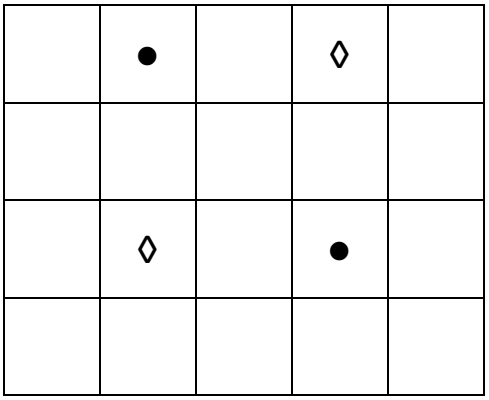
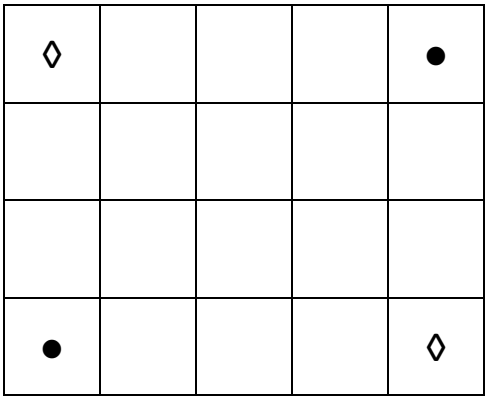
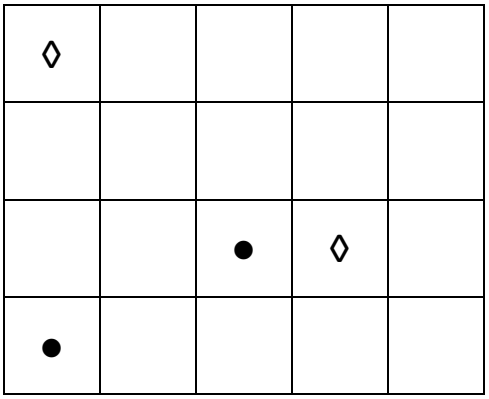
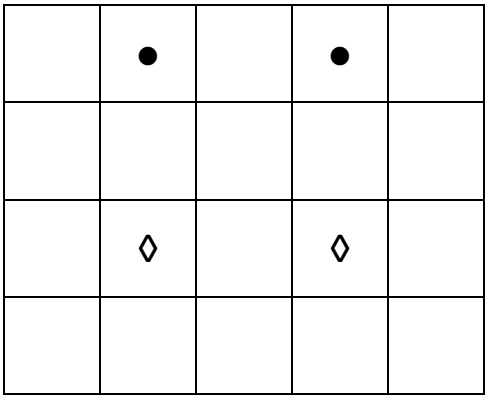
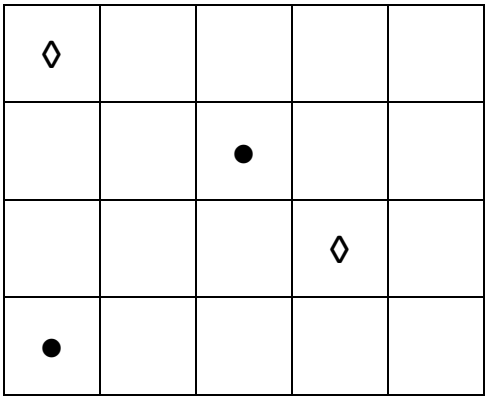
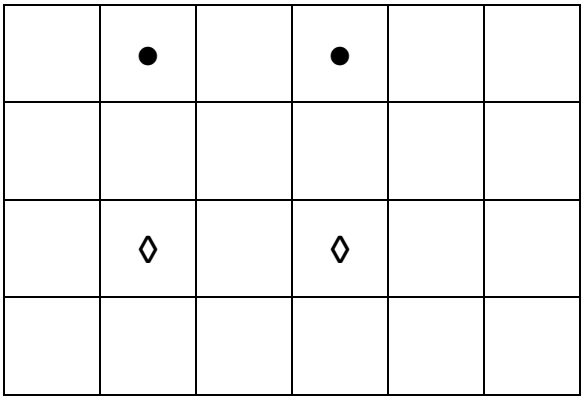










Part 3: Two-path covers on a torus (doughnut)

This is almost the same as part 2, but now you may pretend you are playing Ms. Pac Man. In other words, you may exit one side of the board and reenter into the square directly opposite. Again, for each board, either find a two-path cover or explain why none exist.