
Problem 7.33. In the following solitaire game, you are given an $m \times m$ board. On each of its m^2 positions lies either a blue stone, a red stone, or nothing at all. You play by removing stones from the board until each column contains only stones of a single color and each row contains at least one stone. You win if you achieve this objective. Winning may or may not be possible, depending upon the initial configuration. Let $SOLITAIRE = \{\langle G \rangle \mid G \text{ is a winnable game configuration}\}$. Prove that $SOLITAIRE$ is NP-complete.

Proof. Try this... Reduce 3COLOR SOLITAIRE - Number of nodes v in graph G maps to m - v x v gives a grid which resembles an adjacency matrix of G - Color of stones in a columns gives the color of nodes of G - blue stone = color 1 - red stone = color 2 - empty column = color 3 $\square$